The Annals

OF

Scottish Natural History

A QUARTERLY MAGAZINE

WITH WHICH IS INCORPORATED

"The Scottish Naturalist"

EDITED BY

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

MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION

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

PROFESSOR OF BOTANY IN THE UNIVERSITY OF ABERDEEN

AND

WILLIAM EAGLE CLARKE, F.L.S., F.R.S.E.

KEEPER OF THE NATURAL HISTORY DEPARTMENT, THE ROYAL SCOTTISH MUSEUM, EDINBURGH

1908

EDINBURGH

DAVID DOUGLAS, CASTLE STREET

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

Yours sincerely
Howard Saunders

The Annals of Scottish Natural History

No. 65] 1908 [JANUARY

IN MEMORIAM: HOWARD SAUNDERS.

WITH PORTRAIT.

WE greatly regret to record the passing from amongst us of Howard Saunders, on the 20th of October last, at the age of seventy-two. No name is more familiar to British ornithologists than his; and rightly so, for no one in recent years has given such an impetus to the study of their favourite science. His successful completion of the fourth edition of "Yarrell" under circumstances that were peculiarly trying, established his reputation as a writer on British birds. But the work by which he will be best remembered in this country is the well-known "Manual" which bears his name: a remarkable work, wherein all the essentials concerning the numerous and varied members of our avifauna are treated of, with wonderful skill and discrimination, in a single volume. The merits of this book were at once recognised, and it became the standard authority on the subject.

Saunders' reputation as a naturalist by no means rests upon these important contributions to British ornithological literature. He devoted many years of his life to the study of the Terns, Gulls, and Skuas, and his monograph of these groups published in vol. xxv. of the "Catalogue of Birds in the British Museum," is in all respects one of the best in that

great series, and earned for him a world-wide reputation. He possessed, too, a wide knowledge of Palæarctic birds; wrote the bird section of the "Antarctic Manual"; was joint Editor of two series of "The Ibis"; and was Secretary of the British Ornithologists' Union. Much more might be written about Howard Saunders, but enough has been alluded to to indicate how great is his loss to the science of ornithology.

As a man and a friend it is impossible to speak of him in terms too high. His great strength of character, his amiable disposition, his honourable nature, his helpfulness to all who sought his aid, won for him a host of friends; and we doubt if he ever made a single enemy. The death of such a man is very greatly to be deplored on many grounds.

It may interest the readers of the "Annals" to know that before he died, Mr. Saunders expressed the desire that Mr. Eagle Clarke should edit such future editions of his "British Birds" as might be called for, and that all his notes have been placed in Mr. Eagle Clarke's hands for that purpose.

NOTES ON BIRDS OBSERVED IN THE SCOTTISH ISLANDS DURING THE SPRING AND AUTUMN OF 1907.

By The Duchess of Bedford.

On the 2nd June, I left Invergordon in my yacht for Orkney. On the 4th, I anchored in Rousay Sound and visited some of the adjacent islands. Soon after leaving the yacht, I had a close view of two Great Northern Divers in full summer plumage. Landing on one of the small islands, I found nests of the following species, many of which, owing to the lateness of the nesting season, contained but one egg. Great Black-backed Gull, Herring Gull, Common Gull, Black-headed Gull, Lesser Black-backed Gull, Lapwing, Oyster-Catcher, Black Guillemot, Arctic Tern, and Eider Ducks. There were two large colonies of Arctic

Terns, and I looked very carefully to see if I could detect any Common Terns amongst them, but was unable to do so. Eider Ducks were very abundant. There were also many Shags, a few Cormorants, Puffins, and Redshanks.

The two following days were spent on the islands of Egilshay, Gairsay, Sweyne Holm, and Green Holm. Corncrakes were calling in every clover and rye grass field. Twites were abundant, also Redshanks, Skylarks, Eider Ducks, Black Guillemots, Common Gulls, Starlings, Common Guillemots, Lesser Black-backed Gulls, Oyster-Catchers, Rock Pipits, Shags, Arctic Terns, Herring Gulls, and Meadow-Pipits. There were large colonies of Herring and Lesser Black-backed Gulls breeding on the Green Holm, some of the former had chosen the stone slab placed over the grave of a young fellow drowned there in the "sixties" as a nesting-place. There was a small colony of Arctic Terns nesting on Sweyne Holm. Near the cottages were a few House Sparrows, and in the marshy ground I put up several Snipe, some of which were still "drumming." I also noted a good many Lapwings, Hooded Crows, and Ringed Plovers, a few Rock-Doves, one Turnstone, and a Golden Plover. A Sand-Martin, one of the only two I saw in Orkney, flew along the shore. Primroses were growing in abundance on the grassy slopes facing the sea. On my return to the yacht I again saw two Great Northern Divers, one in full summer plumage and one immature. As they remained near the yacht till I left for the Shetlands, I had a splendid opportunity of watching them.

On the 7th, I was delayed by fog for many hours, outside the Out Skerries, seeing many Fulmars, Richardson's Skuas, Kittiwakes, Guillemots, Puffins, Shags, Lesser Black-backed and Herring Gulls. The Black Guillemot is far less abundant than in the Orkneys, and the Great Black-backed Gull much scarcer than the Lesser Black-backed Gull. One Stormy Petrel, one immature Gannet, and about six Manx Shearwaters flew past the yacht. In the afternoon I landed at Collafirth, and pointed out four House-Martins to a resident, who said they were the first he had ever seen there. Wheatears were common, several pairs of Golden Plovers were evidently nesting on the moor, but

it was too late in the day to look for nests. I also saw three Red-throated Divers on one of the lochs, many Meadow- and Rock-Pipits, and a Corn Bunting.

The following day I walked over to the western shore, where I again saw several pairs of Fulmars, three Mergansers on an inland loch, and the usual Gulls, Guillemots, etc., the Black-headed Gull only being absent, and the Great Black-backed Gull very scarce. Returning to the yacht, I had a close view of a pair of White Wagtails at the foot of Roer Water Burn. In the afternoon we left for Cullivoe, Yell. Off Outsta Ness, I saw five Eider Ducks, which are scarce here comparatively; many Fulmars, Richardson's Skuas, and the usual sea birds.

June 9: I landed on Unst. Great numbers of Kittiwakes were flying down the Sound in one continuous stream. Lesser Black-backed Gulls, Black Guillemots, Herring Gulls, Common Gulls, Richardson's Skuas, Puffins, Common Guillemots, Razorbills, Starlings, Meadow-Pipits, Rock-Pipits, Skylarks, and Shags, were all abundant. There were a few Eider Ducks, Mergansers, and Oyster-Catchers in all the little bays. Three pairs of Curlews and a few Lapwings seemed to be nesting on the moor. Twites are always to be seen near the houses. In addition to the above, one Ringed Plover, a few Arctic Terns, and two pairs of Hooded Crows, were all that I saw.

In the afternoon we left for Balta Sound, seeing nothing of note on the way except Gannets. I walked over to Burra Firth on arrival, but the weather being very stormy, I only saw a few Sparrows about the houses at Haroldswick, and one or two Wrens. June 10 being again very stormy, I could do little bird-watching. I bicycled over to the Loch of Cliff, seeing the following birds, six Swallows, two Corn-Buntings, one Dunlin, several Richardson's Skuas, and many Wheatears, Twites, Lesser Black-backed and Herring Gulls, Oyster-Catchers, Starlings, and Meadow-Pipits.

June 11: I bicycled again to Loch Cliff and walked up Hermaness to see the colony of Great Skuas. On the way up, I passed a large colony of Richardson's Skuas with one pair of Great Skuas amongst them. The watcher told me that he knew of forty-two nests of the Great

Skua. Though exceedingly tame they were not at all pugnacious, even though I had a small dog with me. I attribute this to the fact, that none of the eggs were as yet hatched. The watcher's hut is peculiarly favourably situated for defending his protegés, as within a few yards he can practically survey the whole nesting area. On my return a hen Wigeon flew round me, as if nesting on the marshy ground between Loch Cliff and Burra Firth. Unfortunately, I was pressed for time and could not stay to watch her. Thousands of Kittiwakes had collected at the end of Loch Cliff. They were flying in one continuous stream up Burra Firth, and I counted one hundred pass me in less than a minute. In the afternoon I left for Kirkwall, again seeing many Fulmars when out at sea.

June 12: I visited the island of Damsay, where I found a large colony of Arctic Terns breeding, but again no Common Terns, though I looked carefully for them. There were a great many Common Gulls and Eider Ducks, but very few eggs, and I think they had probably been robbed. I also saw four Coots, some twenty to thirty Shags, a few Black Guillemots, one Richardson's Skua, three Mergansers, Lesser Black-backed, Herring, and Black-headed Gulls. A few pairs of Oyster-Catchers (breeding), one Dunlin, Starlings, Skylarks, and Lapwings. Leaving Damsay, I landed at Finstown and bicycled over to Stromness, seeing the following rather unusual list of birds for the Orkneys, most of which were in a small wood belonging to a private house above Finstown. Blackbirds (the wood was full of them), Song Thrushes, Greenfinches (one pair), Sparrows, Linnets, Twites, Wrens, Hedge-sparrows (a pair), Robins (two pairs), Corn-Buntings, Wood-pigeons (a flock of fourteen in a field near the wood), Yellow-Buntings, Redshanks, Shags, Dunlins, Rock-Doves, Meadow-Pipits, Snipe, Ringed Plovers, one Sand-Martin, and one Common Sandpiper. On my return journey to the yacht, I came across five Velvet Scoters, to which I got very close in the launch. In the evening I left for Stornoway.

During my visit to these Northern Islands I had the great pleasure of watching, at comparatively close quarters,

one of the few remaining White-tailed Eagles. As its mate had been shot a few weeks before, I will not assist in signing its death warrant by revealing the locality.

June 13: I bicycled over to the Sands of Tong, where a small colony of Arctic Terns were breeding, and I noticed two Lesser Terns amongst them. On the shore were two flocks of Sanderlings, one of fourteen birds and another of six. One bird appeared to be in perfect winter plumage, the silvery grey above and pure white below. Others seemed almost, if not quite, in summer plumage, showing the reddish chestnut round the neck, and at a little distance the backs looked almost "Turnstone" colour. The remainder were in intermediate plumage, showing less red on the neck and the backs were greyer. The following day, I again saw the Sanderlings, and three more Lesser Terns, also two Black-throated Divers and Several Turnstones.

June 15: I went over to the Flannan Isles. Unfortunately thick fog came on just as we approached them, and I could see nothing of the bird life except in our immediate vicinity. A great many Fulmars were flying about near the Islands, also Gannets. The Gulls were mostly Lesser Black-backed and Kittiwakes as far as I could see in the fog. Puffins, Razorbills, and Guillemots swarmed. One of the outlying rocks was covered with Shags. One Manx Shearwater and one Fork-tailed Petrel passed us some way out from the Islands. Two Eider drakes were sitting on a ledge of rock. As there was a considerable swell, I was unable to land by the steps, but climbed up a short perpendicular iron ladder. There was a lot of rabbits on the Island, which must have an uncomfortable time from the Puffins. We took two of the Fork-tailed Petrels out of their nesting-holes. They seemed very dazed and helpless when first given their liberty. Meadow- and Rock-Pipits were the only other birds noted under the very unfavourable conditions. I returned to Loch Carloway for the night, hoping that the weather might improve and enable me to return to the Flannan Islands. I spent the afternoon on Little Bernera, where I saw two Great Northern Divers, both in immature plumage, also a Swift. Terns were abundant, but I was unable to make sure of the species. I only saw

one Black Guillemot, two Eider Ducks, and a few other common birds.

June 16: As the weather was very stormy, I decided to abandon my idea of returning to the Flannan Islands, and to bicycle over to Stornoway (25 miles) whilst the yacht went round by sea. As the road was extremely rough, and it rained and blew the whole way, my ornithological observations were not worth recording, beyond the fact that I heard the Cuckoo's note at 11 p.m. from the yacht in Stornoway Harbour.

June 17: I again bicycled over to Broad Bay to see if the Sanderlings were still there, and found them. The majority of the Terns on this bay are Arctic, but I distinctly saw a few Common Terns amongst them. There was a flock of six Turnstones on the rocks, and in the bay a Great Northern and also a Red-throated Diver. Both birds were in full summer plumage and allowed me to get very near them. There were hundreds of Kittiwakes on Loch Braigh na Uidhe, and a few Curlews on the shore.

June 18: I left for South Uist. Just after landing a Hen Harrier got up close to me, and I saw several Red-necked Phalaropes near some of the inland lochs, also great numbers of Dunlin. On the western shore both Arctic and Lesser Terns were breeding, and in addition to the above I noted Reed Buntings, House Sparrows, Herons, Blackbirds, Mergansers, Hooded Crows, Twites, Coots, and a few of the common shore birds.

June 20: In the morning I went to one of the rocky headlands and saw two Grey Seals in one of the inlets of the sea near the yacht. Whilst watching these, six Greylag Geese flew close past me, and a Great Northern Diver in immature plumage and some Sheldrakes were disporting themselves in the sea below. I put up two Song Thrushes in the heather on this rocky, weather-beaten headland a long way even from any crofter's crops.

On my return journey to Stranraer, on the 21st, I saw a Fulmar about half-way between Barra and Rum.

The following Notes were made during a short visit to the Western Hebrides in August:—

August 28 to 31 at Barra: There are very large flocks of Sanderlings and a great many Bar-tailed Godwits and Turnstones, many of the latter quite young birds. Eider Ducks and Mergansers are here in hundreds, also Oyster-Catchers. Gannets, which were absent in November, were now here in large numbers. The White Wagtail appears to be the only representative of that family, though there were many young birds which I was unable to identify for certain. A pair of Hen Harriers might be seen every evening. Rock-Doves are very abundant, coming to feed on the corn-fields. Two or three Greenshanks were generally to be seen in suitable places. Two Common Terns were still anxious about a young one on some rocks in the bay. Herons are very common, as they seem to be everywhere in the Outer Hebrides.

September 1, Loch Eport: I saw two Red-throated Divers in the bay, and many Eider Ducks and Mergansers. I left at 10 a.m. for Stornoway, calling at the Shiant Islands on the way. The marshy ground on the largest of those islands was swarming with Snipe. Most of the breeding birds had left.

September 3: During an hour's walk in Broad Bay, Stornoway, I noticed two Common Terns, a few Turnstones, Sanderlings, and five White Wagtails (two adults and four young), in addition to other birds. The Rooks, which I believe are comparatively recent comers, are here in hundreds.

September 5, Loch Eport: I saw a Short-eared Owl, two Greenshanks, several Turnstones, two Merlins, a Red-throated Diver, and a Kestrel, the first I remember having seen in the Outer Hebrides, by which I infer that they are not common.

Returning to Barra on the 8th I saw a Black-tailed Godwit. This bird is now in the collection of Mr. W. M'Gillivray at Eoligarry.

On 26th October I spent a day on Fuday and Barra. It was a lovely, windless autumn day. The sea was "blue as blue could be," the sky blue also, with just a few heavy clouds, which, casting their shadows here and there upon the Islands, served but to increase the beauty of the landscape.

I had the Island all to myself, as it is only visited occasionally by men bringing cattle from Barra.

A couple of Mallard, a Heron, and a large number of Barnacle Geese got up as I landed. Feeling sure that I should meet with the Geese again later, I made my way up to the higher ground, hoping to see Snow Buntings, which I was told had arrived, but was unsuccessful. Twites and Starlings were the commonest of the small birds. The Rock-Pipit, which strays a considerable distance from the shore, was common also, Meadow-Pipits were fairly numerous, and three Golden Plovers allowed me to get very near them.

The upper ground not being very productive for bird watching, I made my way down to the shore, keeping a sharp look-out for the Geese. Half-way down the hill I saw them in a sandy bay on the N.E. side of the Island. The sand-hills afford excellent stalking ground, and I got within forty yards of them, looking down at them from above. There were 307. Once they caught sight of my dog and all were immediately on the alert, but they very soon got bored with watching, and, leaving their safety to the vigilance of three sentinels, settled down to the cares of their toilet and sleep. Seeing a great many birds off a rocky promontory, I disturbed the Geese as little as possible, and made my way down to it, hiding behind a rock. I had not been there two minutes before the Geese, which had only had their suspicions aroused, began to return. Time after time they flew so close over my head that I could almost have hit them with a stick—"Che Foo," who understands stalking as well as his mistress, keeping as still as a rock.

In the bay close to me were large flocks of Mergansers. Two Red-throated Divers in winter plumage came close in to the rocks, and I saw another farther out at sea. Many unsuspicious seals poked their noses up within a few yards of me, sinking again like floating bottles gradually filled with water. Great Northern Divers are very numerous, some of them being still in summer plumage, save for a little whitening of the chin and upper throat. A few Razorbills, Common Guillemots, and Black Guillemots (which are now very white Guillemots) were diving about amongst the Mergansers.

Two or three small flocks of Long-tailed Ducks were farther out in the bay. I notice that when one of these has urgent business below, all the others immediately follow suit. I always felt sorry for Simon Peter, who, when he announced that he was going "a-fishing," was greeted by his friends with "We also go with thee," and watching the Long-tailed Ducks I often wonder whether, when one is suddenly prompted to follow Simon Peter's example, his friends do not greatly disturb his fishing. The Great Northern Divers, which generally fish alone or with their wives, whom they presumably keep in order, seem to have much better sport.

Great numbers of Shags and one or two Cormorants were sitting about on the rocks or swimming and diving round them. Common, Herring, and Black-headed Gulls and Kittiwakes are all plentiful, the last named often hover and dive into the sea like Terns after their food. One solitary Great Black-backed Gull was swimming about in the distance. Nature never designed *his* plumage for concealment. The tide having gone out a number of Bar-tailed Godwits, Curlews, Oyster-Catchers, and Redshanks collected on the sand, and a Hooded Crow came down in the hope of finding some luscious morsel.

Having watched this happy family for the best part of an hour I reluctantly leave them, as there is always the possibility of seeing interesting birds on the sands of Barra at low tide. As I rose from my hiding-place I put up a Snipe within a few yards of me, which must have been watching me the whole time. A Thrush also got up. Some of the little rocky islets were covered with seals basking in the sunshine, and apparently enjoying it as much as I was. Only rarely when wandering over these lonely islands is my peace of mind momentarily dispelled. It is no uncommon thing to find oneself suddenly face to face with a ferocious-looking Highland bull, with nothing but a sand-hill or heathery "knowe" to get behind should he resent one's intrusion. But the qualm is but momentary, for he too has lived a life of peace and freedom, and has not acquired the manners of the bovine Lowlander, who might dispute my rights of way.

Landing on Barra, I wandered along the sandy shore

to see if there was anything of interest amongst the smaller waders. There are a great many Sanderlings still present, but very few Dunlins, and I only saw one Knot. The majority of the small waders were Ringed Plovers. In a pool amongst the seaweed-covered rocks I saw one Greenshank, and near it a few Turnstones. Lapwings were plentiful.

Leaving the shore I walked towards Eoligarry House, disturbing a Peregrine from its "kill" on the way. Rock Pigeons were still feeding on the stubble. In the little graveyard near the house I saw five Redwings. The cornstalks in the farmyard were covered with Twites and Tree Sparrows, the latter being here to the exclusion of their commoner relatives. There were a good many Corn Buntings also. A few Blackbirds, Thrushes, and a Hedge-Sparrow completed my list of 43 species seen during the day.

Woburn Abbey, Bedfordshire.

BIRD NOTES FROM THE ISLE OF MAY. 9TH SEPTEMBER—8TH OCTOBER 1907.

By Leonora Jeffrey Rintoul and Evelyn V. Baxter.

The Isle of May, situated at the entrance to the Firth of Forth, is a little over a mile in length by about a quarter of a mile in breadth, precipitous to the south and west, sloping to the north and east. The formation is basaltic; the cliffs which on the west side of the island rise to the height of 180 ft. are, in the nesting season, the home of innumerable Guillemots, Razorbills, Puffins, Kittiwakes, and a few Herring Gulls, but the crumbling nature of the rock renders any attempt at cliff-climbing an extremely dangerous undertaking. By the time we arrived the breeding season was over and the cliffs deserted, but we were amply compensated for this deprivation by the fact that the island, which is most favourably situated for their visits, was resorted to by many interesting migratory birds: to observe these was the main

object of our sojourn. Through the kindness of the Commissioners of Northern Lights, to whom we hereby tender our grateful thanks, we were enabled to spend a month in the lighthouse, from 9th September to 8th October ; during this time we saw 73 species of birds, which with 5 other species sent since our return, are the subject of the following remarks.

Our work was rendered easier by the covert on the island being very limited ; rough grass clothes most of its surface with every here and there an out-crop of rock, and the only shelter afforded to the migrants is that of the turnips and potatoes grown in the gardens of the light-keepers. Out of these most of the birds had to be beaten, frequently only to drop into covert a few yards off. No great number of birds came to the lantern while we were on the island, but various solitary specimens struck, and were brought to us for identification.

Our best days were from the 24th to the 30th September. The 24th was a clear day with a light westerly breeze, thereafter we had a south-east wind, with haze or fog of varying density till 2nd October when the wind became south and the fog lifted. The 26th September was quite the best migration day ; on that date the Redwings and Bramblings arrived, and along with these winter migrants there were many birds of passage—Warblers, Pied Flycatchers, Redstarts, Whinchats, Reed Buntings, Wagtails, and Ring Ouzels, etc.—all over the island. As a rule there were not very great numbers of any one species, Thrushes, Rock- and Meadow-Pipits, Wheatears, and Bramblings being the only Passeres seen in any great quantity.

We were particularly anxious to ascertain whether the Yellow-browed Warbler visited the May on migration. To our great joy one specimen appeared on Sunday, 29th September, and we were fortunate enough to secure it next day; it is the first record of this species for the "Forth" area. Amongst other interesting visitants were the Barred Warbler (first record for "Forth,") the Black-cap, Lesser Whitethroat, Pied Flycatcher, a curious variety of Red-backed Shrike, the Scarlet Grosbeak and the Lapland Bunting (the two last mentioned being also first records for "Forth.")

The only mammals seen were the Rabbit and the

House-mouse; the former is known to have been on the island for centuries, and May Island rabbits are said to have finer fur than those on the mainland.

We owe our very grateful thanks to Mr. and Miss Maccuish, who assisted us by every means in their power, and to whose kindly help much of the great pleasure we derived from our expedition and much of its success are largely due. We must tender our thanks to Mr. and Mrs. Ross and all the other lighthouse officials for allowing us to search their gardens for birds, and for other kindnesses too numerous to mention, and also to Mr. Eagle Clarke, who helped us with the identification of our specimens, and with much useful advice relating to our expedition.

Missel Thrush, *Turdus viscivorus*.—One bird of this species was seen on the island on the 17th and 18th September, and a specimen was got at the lantern on the night of 3rd October. Another was seen about the island next day, and two were observed on 6th October. They were extremely wild in every case.

Song Thrush, *Turdus musicus*.—A great deal of migration was going on amongst the Thrushes. From the time of our arrival till 18th September we only saw one or two each day, but on the 18th there were a good many, the main body of which passed on quickly, for only three were seen on the 19th. There was a rush on the 20th (S.E. wind, extremely light), further increased on the 21st (E. wind, fresh), but diminishing afterwards till on the 24th very few were left. On the 21st about mid-day a large flock of Thrushes flew over us coming from the north, and dropped rapidly to earth, the birds uttering a shrill note as they descended. The greatest number seen was on the 25th September, when the island fairly swarmed with Thrushes; very few were seen next day and on till the 29th when a good many appeared. From the 30th September to the 5th October, they were present in large numbers; on the 6th October only one or two were seen, and on our last day, the 7th, none were observed. This was the bird most frequently got at the lantern, and even if they did not actually come to the light, they might often be seen flying round in the rays.

Redwing, *Turdus iliacus*.—Three Redwings came in on 26th September (S.E. wind, very light), and several were seen on the 27th, 28th, and 30th September. On 1st and 2nd October

a good many were on the island, and they reappeared on the 5th October, after which day we saw them no more. On the 5th a flock of about twenty, after having been disturbed once or twice, rose gradually high in the air till they looked like dots, twittering as they rose, and then flew off to the S.W. straight into the wind.

Fieldfare, *Turdus pilaris*.—One solitary bird of this species was seen on the 4th October.

Blackbird, *Turdus merula*.—Blackbirds were plentiful on the island from our arrival till 26th September, from which date till the 30th only a few were seen each day. They then again became numerous till 6th October, on which day there were very few. We found two old Blackbirds' nests on the island: one in a hole in a stone gate-post, the other on the ground amongst some weeds by the side of a wall.

Ring Ouzel, *Turdus torquatus*.—The first Ring Ouzel came in on the 21st September (E. wind, fresh); the next on 26th September, and we saw a few daily till 1st October. They frequented the rocks and were very wild and unapproachable, but often betrayed their whereabouts by uttering their loud "kek-kek" note. Some came in after we left, and three specimens were sent us which had been procured on the 10th and 14th October.

Wheatear, *Saxicola œnanthe*.—Seen every day while we were on the island. There were a good many when we first arrived and they increased in number till the 13th September, on which day there were a great many. After this they gradually decreased. Wheatears were got at the lantern on several occasions: on the 10th September two, and on the 11th one male in grey breeding plumage.

Whinchat, *Pratincola rubetra*.—There were two Whinchats on 13th September (W. wind, fresh) in Mr. Ross's garden, one on 14th and 18th September, two on the 26th, and one from 1st to 3rd October. These seemed very cheery little birds, flitting from one potato-shaw to another, chasing each other, or, often, the Willow-warblers, and never appearing tired after their arrival.

Stonechat, *Pratincola rubicola*.—Only one seen, a male, not at all in good plumage, on 11th September.

Redstart, *Ruticilla phœnicurus*.—Two came in on 11th September, and one was seen on the 13th; then no more till 21st September when one appeared, lots on the 26th (S.E. wind, very light), and one or two off and on till 4th October. On several occasions they came to the light.

Robin, *Erithacus rubecula.*—Seen on five occasions during our stay, viz., several on 12th, 17th, and 20th September, and 4th and 5th October. They were always about the gardens, except on 4th October when we found them frequenting the rocks.

Whitethroat, *Sylvia rufa.*—Single birds were seen on the 11th and 12th September, two on the 13th, and one on 20th, 22nd, and 23rd September. They usually frequented the potatoes and turnips in the gardens, and were silent, shy, and difficult to put out of covert.

Lesser Whitethroat, *Sylvia curruca.*—One seen in the hemlock-tangle from 29th September to 3rd October, and one in the lighthouse garden on the 30th September. A third was procured by Mr. Maccuish on 10th October and sent to us. They had a low, harsh note, made more noise than any of the other Warblers, but were more confiding than the last-named species.

Blackcap, *Sylvia atricapilla.*—A beautiful full-plumaged male frequented the potatoes and turnips in Mr. Ross's garden on the 27th and 28th September, and a female was seen in the hemlock-tangle on 2nd October. They were rather tame, fearless little birds. A male was procured by Mr. Maccuish on the 5th November and sent to us.

Garden Warbler, *Sylvia hortensis.*—Two came in on 26th September (S.E. wind, very light) and left again before morning. They took covert in the turnips and potatoes, and were difficult to drive out into the open.

Barred Warbler, *Sylvia nisoria.*—We put a bird of this species out of a turnip-patch on the 24th September (W. wind, light). It took fairly long flights when disturbed, but always returned to the turnips, slipping into them so quickly and quietly from behind a wall or other shelter, that it was most difficult to locate, though not at all hard to flush. It was shot at twice, but in spite of this was found in exactly the same place next day and secured: it proved to be a female.

Golden Crested Wren, *Regulus cristatus.*—A female was got at the lantern on 26th October and a male on 5th November: they were sent to us by Mr. Maccuish. The light-keepers tell us that these little migrants frequently come into the houses and eat freely of the flies on the windows, and that about half-an-hour after this feast they fall dead.

Yellow-browed Warbler, *Phylloscopus superciliosus.*—This most interesting little Asiatic warbler was first seen on the morning of Sunday, 29th September (S.E. wind, light). It was in the hemlock-tangle, where it stayed for a time, and we got an

excellent view of it. It was a very neat little bird, and seemed neither tired nor shy. We then completely lost sight of it, but either it or another appeared next day out of a turnip-patch, took flights to the telephone wire, then down to the cabbages, the stem of a dock, and finally to a sow-thistle, where it appeared to be catching insects, and where we luckily secured it.

Willow-warbler, *Phylloscopus trochilus*.—One was seen on 12th September and a good many in the gardens on the 13th (W. wind, fresh); they, however, did not stay long, as there were none on the 14th. One on the 15th, two on the 20th, a lot on the 21st, and several on the 22nd, one appeared on the 26th, and another from 29th September to 1st October. One got by Mr. Maccuish on the 10th October and forwarded to us.

Sedge-warbler, *Acrocephalus schœnobœnus*.—We put one out of covert in the lighthouse garden on the 10th September, and one was found dead on the roof of the lighthouse on the night of 13th September.

Pied Wagtail, *Motacilla lugubris*.—This was the only Wagtail seen on the island; we saw them constantly from the 11th September to the 1st October, in both adult and immature plumage.

Meadow-Pipit, *Anthus pratensis*.—Seen every day during our stay: in numbers till the 24th September, then a few till the 30th, when they reappeared, remaining numerous till 4th October, thereafter a few each day. On the 25th September they were doing their parachute flight, with an attempt at song.

Rock-Pipit, *Anthus obscurus*.—Seen every day in varying numbers; a lot till 17th September, when great crowds were on the island. The numbers diminished in the afternoon, but a good many remained till the 24th, when only a few were seen. Next day, however, there were more, and they continued plentiful till 5th October when most of them left. Two were taken at the lantern on the night of 7th October.

Red-backed Shrike, *Lanius collurio*.—We procured a young female of this species on the 27th September in a remarkable stage of plumage which does not agree with any of the published descriptions. We compared it with the Shrikes in the Royal Scottish Museum, including young Red-backed Shrikes which had been procured at Fair Isle about the same date, but it differed much in plumage from all of them. It was finally sent to the Tring Museum to be compared with the specimens in Mr. Rothschild's collection, which is so rich in Palæarctic birds, and was pronounced to be an abnormally-coloured young Red-backed Shrike. In this singular specimen

the head and mantle are plain dark greyish-brown; the lower back, scapulars, and upper tail-coverts a little paler, and with dark vermiculations; the tail, which is decidedly long (3.25 ins.), is crossed at an inch from its tip by a bar of reddish-brown; the under surface is plain white, with a few dark bars on the sides of the fore-neck and breast and on the flanks. When alive this bird appeared to be very listless and dejected, occasionally it dropped into the grass from its place on a wall or fence, searched for something, and then returned to its former position, where it would sit for a considerable time, sometimes jerking its tail up and down, but always lethargic and depressed.

Spotted Flycatcher, *Muscicapa grisola.*—One seen hawking in the gardens on the 11th and 12th September.

Pied Flycatcher, *Muscicapa atricapilla.*—One seen on the island 11th September (S.E.-S.W. wind, very light, hazy). Several seen 26th September (S.E. wind, very light). They were very restless and unapproachable little birds, flitting from wall to rock and back in a nervous, hurried way, and flirting their wings and tail. One was taken at the lantern on the night of the 26th, and was most defiant, screaming loudly when held in the hand.

Swallow, *Hirundo rustica.*—One seen on the 18th and 24th September, several hawking over the loch on the 25th, two on the telephone wires on 28th September, one on the last day of September and first day of October, and on the 6th October several flew over going south.

House-Martin, *Chelidon urbica.*—Birds of this species were seen on the 19th and 23rd September.

Siskin, *Chrysomitris spinus.*—One seen in the lighthouse garden on the 30th September (S.E. wind, very light). When first observed it was flying round in jerky circles, high and apparently very wild; it then took covert in the garden, and when beaten out flew off again in a wide circle, but shortly returned, settled on a sow-thistle and began pulling out the seeds and eating them; while so occupied it permitted a very close approach. Next day (1st October) there were two pairs in Mr. Ross's garden: they were very tame, and each pair kept very close together.

Greenfinch, *Ligurinus chloris.*—Two seen 10th September, one off and on from the 12th to the 24th September, and two on the 25th and 26th.

Sparrow, *Passer domesticus.*—Several seen every day. We were told that a pair nested on the island this year for the first time.

Tree Sparrow, *Passer montanus*.—Seen most days while we were on the island; two from the 12th to the 21st September, and several afterwards.

Chaffinch, *Fringilla cœlebs*.—Several on the island from 27th September to 4th October.

Brambling, *Fringilla montifringilla*.—Four arrived on the 26th September (S.E. wind, very light), and there were large flocks on the island next day; these, however, passed on quickly, only a few being seen on 28th and 29th September. Large flocks were again on the island from the 30th September to the 2nd October; on the 3rd none were visible, but one was present from the 4th to the 6th October. One on 1st October had almost the entire head and neck in the black plumage of summer.

Scarlet Grosbeak, *Carpodacus erythinus*.—We procured one bird of this species in Mr. Macleod's garden on the 25th September (S.E. wind, light). When we first saw it, it was eating a moth among the potato-shaws, and it took short flights, settling on and amongst the oats, potatoes, or weeds. Every Sparrow and Meadow Pipit that came near chased it away, but in each case it returned to the garden after a short flight; while being chased it uttered a curious little monosyllabic note. It was in the green type of plumage, and was very tame and confiding. This is the second known occurrence of this species in Scotland.

Reed Bunting, *Emberiza schœniclus*.—Three came in on 26th September, and one or two were seen each subsequent day till 2nd October, one on 4th October. They frequented the gardens and were very fearless, sitting on a wall, etc., till we got quite close, flirting their tails, elevating the feathers of their heads, and uttering a peculiar single note.

Lapland Bunting, *Calcarius lapponicus*.—One seen, but not procured, on the 1st October (S.E. wind).

Snow Bunting, *Plectrophanes nivalis*.—The first bird of this species came in on 15th September (light W. breeze) and stayed till the 17th. The next one appeared on the 21st and was followed by another on 2nd October, which bird we saw on the two following days. All were fine white males; the last one sang a pretty little trilling song as he sat on a stone or rose to fly. Two more were sent us, that had been killed at the light during a rush on 5th November; one was very white indeed, the other, on the contrary, showed very little white.

Sky-Lark, *Alauda arvensis*.—One on the island on the 17th September, several next day, and one or two till the 20th.

They next appeared on 27th September, and we saw them most days till our departure; some came to the lantern on the night of 3rd October. We used constantly to see them flying over the island, coming from the N.E. and passing on without alighting.

SHORE LARK, *Otocorys alpestris.*—One was got at the lantern by Mr. Maccuish, at 10.30 p.m. on the 11th October, and sent on to us.

STARLING, *Sturnus vulgaris.*—Seen every day during our stay: a few only till 13th September, then a good many till the 25th, when a lot more came in and stayed till 2nd October; thereafter a good many each day till we left.

HOODIE CROW, *Corvus cornix.*—One on the island from the 28th September to the 5th October; it was very tired when it first arrived.

SHORT-EARED OWL, *Asio accipitrinus.*—Two on the island on the 2nd October (S. wind, light); they were seen by Mr. Maccuish coming in from the N.E. about noon.

PEREGRINE FALCON, *Falco peregrinus.*—One bird of this species came in over the sea from the N.E. on 16th September, going at a terrific pace, right into the wind. It made several zig-zag sweeps, coming quite close to us in one of them, and then went on over the island in the direction of the Bass.

MERLIN, *Falco æsalon.*—One ♀ seen near the harbour on the 15th September.

KESTREL, *Falco tinnunculus.*—One or two seen on several occasions from 13th September to 2nd October. An extraordinarily tame Kestrel was on the island on the 26th September; several times it allowed us to come within a few yards of it.

CORMORANT, *Phalacrocorax carbo.*—Several seen most days about the rocks and in the sea.

SHAG, *Phalacrocorax graculus.*—Seen in some numbers about the rocks and in the sea during our stay on the island. Towards evening, as a rule, the Shags and Cormorants might be seen hurrying off to the west cliffs; there they soared in circles, at varying heights, settling on the cliffs for a minute as they came round, and then flinging themselves off and circling again. Sometimes these flights were level with the top of the cliff, at others just over the water; we noticed that when there was a fresh west wind the flights were higher above the sea than at any other time.

GANNET, *Sula bassana.*—Seen passing throughout our stay; several times they fished close off the island, but we never saw one fly

over it. As we were lying off the Bass on our return on 8th October we saw some fluffy white young ones still on the ledges, and also old birds flying about with large bits of sea-weed in their bills.

HERON, *Ardea cinerea.*—Seen on the rocks most days during our stay.

MALLARD, *Anas boschas.*—Two or three were seen on four separate occasions. We found a drake almost out of eclipse plumage lying dead below the telephone wire on 4th October.

TEAL, *Querquedula crecca.*—Single birds were seen on the 28th and 29th September, and the 1st and 2nd October.

EIDER, *Somateria mollissima.*—A good many in the sea off the island throughout our stay. There were drakes in many interesting stages of eclipse plumage. On 5th October a considerable influx of full-plumaged drakes took place, and more arrived on the 6th. On this latter date the birds were very noisy, grunting and cooing loudly.

WOOD-PIGEON, *Columba palumbus.*—One flew off the west cliffs towards the north on the 27th September.

WATER-RAIL, *Rallus aquaticus.*—One was got on the 26th October by Mr. Maccuish and sent to us.

GOLDEN PLOVER, *Charadrius pluvialis.*—One seen on the 15th September (W. wind, light) had still traces of a black breast. Another was seen from the 1st to 3rd October, and one 5th and 6th October.

LAPWING, *Vanellus vulgaris.*—One was seen in the lantern rays on 11th September and remained on the island for the two following days. The next was seen on the 21st, and five were flying over from north to south on the 25th. From this date till 7th October we saw them constantly about the island, in greatest numbers on the 30th September, after hearing them calling a great deal on the previous night.

TURNSTONE, *Strepsilas interpres.*—Seen frequently about the rocks, in greatest number on the 28th and 29th September. On 4th October we saw a Turnstone swim a short way in the harbour and then flutter on to a rock, where it stood, looking very draggled.

OYSTER-CATCHER, *Hæmatopus ostralegus.*—Seen frequently about the rocks. A pair had evidently bred there, as on 14th September we saw a young bird hardly able to fly at all. On several occasions we saw them in the rays of the lantern.

SNIPE, *Gallinago cœlestis.*—Single birds seen on the 13th and 26th September and the 1st October respectively.

DUNLIN, *Tringa alpina.*—One got by Mr. Maccuish on the 10th October and sent to us.

PURPLE SANDPIPER, *Tringa striata.*—Seen on the rocks on a good many occasions between 14th September and 7th October, only one at first, but five or six later on. On 19th September we came upon three Purple Sandpipers one of which had a damaged wing and could not fly. On our approaching the invalid one of the others flew close by us several times uttering an anxious little note as it passed.

REDSHANK, *Totanus calidris.*—Seen frequently about the rocks and bogs.

CURLEW, *Numenius arquata.*—A few seen frequently about the rocks and bogs.

ARCTIC TERN, *Sterna macrura.*—Several came in from the N.E. on the 23rd September; they lit on the rocks and stayed for a few hours before passing on.

COMMON TERN, *Sterna fluviatilis.*—Eight or nine flew by quite close to the island on the 19th September. A bird belonging to this or the previous species flew about in the rays on the night of 11th September. We saw Terns passing on several other occasions, but not close enough to be certain of the species.

SANDWICH TERN, *Sterna cantiaca.*—Several seen passing on the 10th, 19th, and 22nd September.

BLACK-HEADED GULL, *Larus ridibundus.*—One seen 15th September.

COMMON GULL, *Larus canus.*—One seen 19th September.

HERRING GULL, *Larus argentatus.*—Large numbers of both mature and immature birds seen during our stay on the island.

LESSER BLACK-BACKED GULL, *Larus fuscus.*—Single birds seen on the 16th and 20th September on the rocks.

GREATER BLACK-BACKED GULL, *Larus marinus.*—A good many mature and immature birds of this species seen throughout our stay.

KITTIWAKE, *Rissa tridactyla.*—Flocks of both mature and immature birds seen on many occasions during our month. On 23rd September a big flock was fishing close to the S.E. end of the island.

ARCTIC SKUA, *Stercorarius crepidatus.*—Seen constantly, very often chasing the Kittiwakes, but as soon as the chase was over hunter and hunted would settle quietly on the sea, frequently in the midst of a flock of Kittiwakes; in other cases, after obtaining his booty the Skua would continue on his way, while one gazed with admiration at his marvellous powers of flight. The Skuas sat a good deal on the sea, occasionally swimming, and on one

occasion we saw one dive. It had hunted a young Kittiwake till the latter had dropped a fish that it was carrying; this fell into the sea about 20 to 30 yards from the rocks where we were sitting. The Skua lit on the water near his booty, pecked at it once or twice in a half-hearted manner, and then took no notice of it for a minute, during which time it sank. The Skua looked here and there for it, then slightly opening its wings, dived right under the water very neatly, stayed under for a moment, and then reappeared minus the fish. This all took place quite close to the rocks on a perfectly calm day, and we got a most excellent view of it through our glasses.

Storm Petrel, *Procellaria pelagica*.—One got at the lantern on the 14th October by Mr. Maccuish and sent to us.

Manx Shearwater, *Puffinus anglorum*.—One seen flying near the island on the 18th and 24th September.

Razorbill, *Alca torda*.—Seen pretty frequently from 11th September to 3rd October.

Guillemot, *Uria troile*.—Seen on several occasions in the sea off the island.

Colinsburgh, Fife.

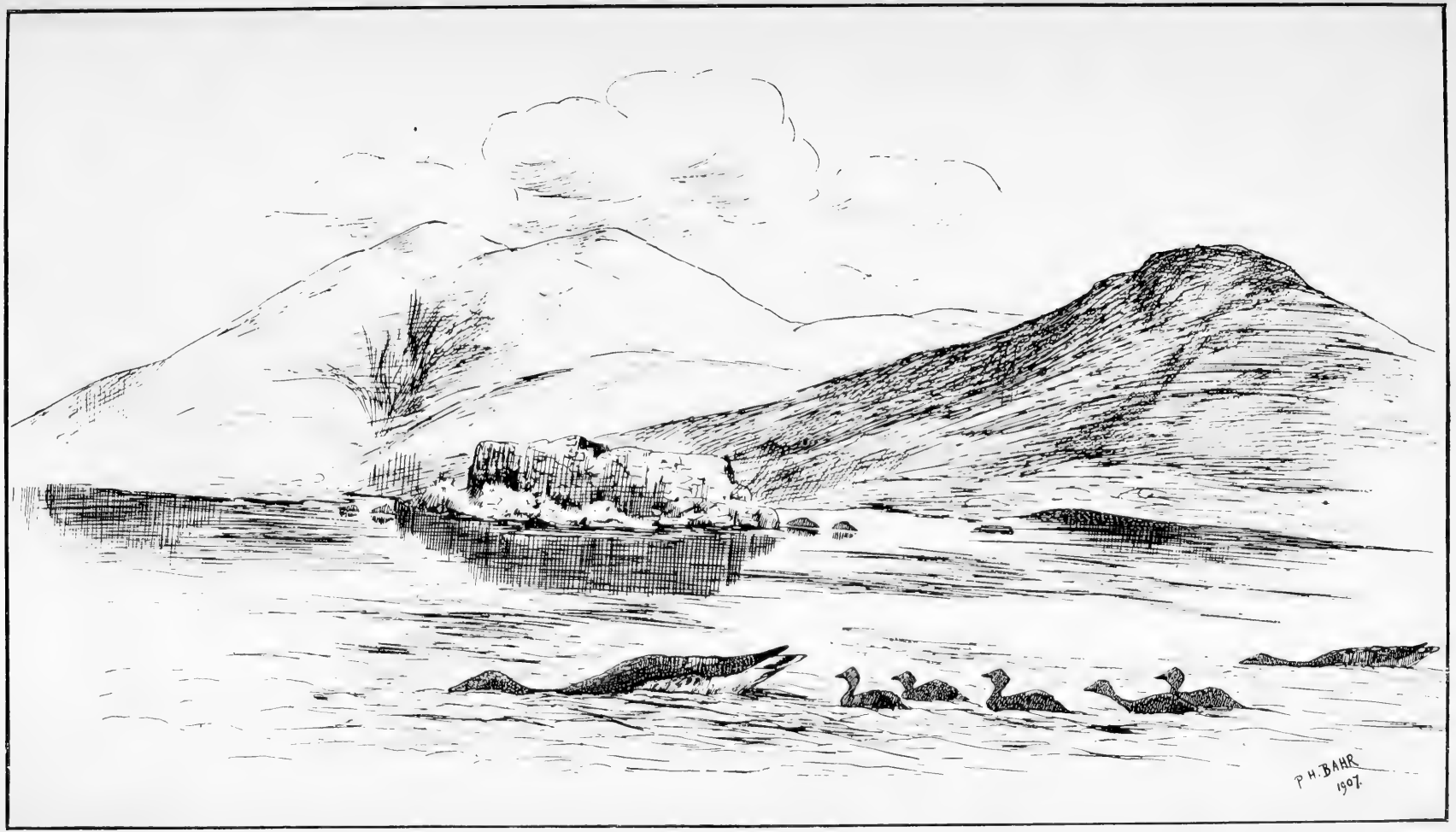
SOME BIRD NOTES FROM THE OUTER HEBRIDES DURING A MONTH SPENT THERE, MAY–JUNE 1907.

By P. H. Bahr, B.A., F.Z.S., M.B.O.U.

Plate II.

(*Continued from p.* 215, *No.* 64.)

Oyster Catcher, *Hæmatopus ostralegus*, Linn.—In spite of the brave show they make in defence of their nests, few if any seem to be able to rear their young. All the nests we found came to grief, as their eggs come next to those of the Ringed Plover in order of precedence in the Gull's menu. On the rocky islands, where their nests are obvious, the birds adopt tactics similar to that of the Common Sandpiper, and by shuffling and shamming lameness endeavour to lure the intruder away. On the foreshore and the "machair," on the other hand, they are not nearly so noisy, and when the vicinity of their nest is approached slink off to some pool and quite unobtrusively pretend to feed. Though commonly an extremely wary bird at the nest, yet one in particular proved the very easiest prey to the camera. I had no difficulty with her at



GREY LAG GEESE WITH BROOD, SHOWING METHOD OF ESCAPING OBSERVATION.

all, and often I would find that she had returned to her nest before I reached my hiding-place amongst the sand-dunes. She always adopted the same tactics, approaching the nest from the same direction, and in order to distract our attention would pretend to feed, eventually turning round and running on to the nest at top speed. The male kept guard on the borders of an adjacent pool, and would sound the alarm when any "Hoodie" or other egg-stealer hove in sight. Once we saw him swimming in this very pool, progressing by jerks in much the same way as a water-hen. Within a stretch of eighty-four paces there were nests of four different species, namely, Oyster Catcher, Pewit, Dunlin, Ringed Plover, and one could from a certain point of vantage observe all four species sitting on their nests at once. Out of all these only two of the Pewit's eggs managed to escape the unwelcome attention of the Common Gull.

It has often been remarked that migrating flocks of this species may be seen during the midst of the nesting season. This year a flock, consisting of fourteen individuals, was observed on 6th of June, at which date all other members were engaged in incubation. Towards the middle of June those pairs whose nesting efforts had been unproductive—a vast majority, I fear—were to be seen commonly soaring in the air, uttering shrill cries, and shooting downwards, evidently having every intention of nesting again. After a while, however, they appeared to give up the attempt and gathered into small flocks. One evening I observed two specks in the sky, and though at a great altitude, I was able to distinguish one as a Heron; the other I conjectured to be a Peregrine, and expected to be witness to an exciting flight. Imagine my disappointment when I found my Peregrine merely to be an Oyster Catcher.

Red-necked Phalarope, *Phalaropus hyperboreus*, Linn.—Arrived in detachments at the end of May. The first were seen on 28th May. One pair apparently mated by 29th May. During the first ten days in June many females arrived, and were followed later by the males. About the middle of June two males were frequently seen consorting with one female, and in one instance two females with one male; this state of affairs continuing till our departure on 27th June. No eggs or other evidences were found after continual search till 26th June, when quite unexpectedly four newly hatched young were found on an island inhabited by a large colony of Arctic Terns. At this time none of the other pairs even had eggs. The young were being cared for entirely by the male, the female apparently taking no interest in their welfare. His anxiety was quite

pathetic, and he was tame to a ridiculous degree, consenting to brood his young in front of the camera erected on its tripod, wholly without a covering of any sort, even with the operator standing behind. The young were very weak and appeared to thread their way between the grass with difficulty, but showed no inclination to take to the water. The cock, in paternal fervour, was constantly seen attempting to brood a clutch of three Tern's eggs in mistake for his own young. Curious evolutions performed by the male during the process of courting were observed. In so doing he would dart with amazing rapidity above the head of his mate, who was floating placidly in the water, zig-zag from side to side, uttering a low sort of warble all the time; then flit off to the marsh and settling there would call vigorously to his mate, turning his head from side to side as if expecting her to follow him. According to my experience, the male takes just as prominent part in the process of courting as the female, and he just as often chases and pecks her, though occasionally she turns the tables and gives him a very bad time. Owing no doubt to the adverse conditions, only about one-third of the usual number remained to breed.

Dunlin, *Tringa alpina*, Linn.—Advance parties arrived at the end of May, and braving the elements commenced to nest. The remainder arrived in straggling detachments early in June. At that time "scrapes," evidently made by the cock bird, were to be found on almost every tussock of grass; but the energy consumed in making these is entirely wasted, for not one in a hundred are occupied. The first nest, containing four eggs, was found on 5th June. This and three others found subsequently all fell victims to the rapaciousness of the Common Gull, a fact which gauges the accuracy of that bird's eyesight. During the breeding season the male Dunlin becomes a most sprightly bird, and resents the presence of another individual of the same sex. His attachment to his mate he displays by chasing her continuously, uttering his characteristic trill. While the female is incubating he soars to quite a considerable height, and descends with quivering wings to the same tune. Often two, as if vying with each other, may be seen thus performing. Often I watched them courting. The male sidles up to the female and raises one wing, whereupon she coyly flits off and he after her, to repeat the performance. I found the sitting bird easy to photograph, taking no notice whatever of the camera, but objecting strongly to our presence in the vicinity. These birds make no demonstration against the Common Gulls. Even while taking our pictures one of the latter was always in attendance, and we had the greatest difficulty in keeping the contents of the nest safe. The female was always accompanied to

within a few yards of the nest by the male, who then would leave her, to mount guard on some favourite knoll. Once both birds seemed desirous of incubating. The female arrived there first, and sat gravely for a few seconds, when she was pushed off by her partner; and thus engaged we left him.

Common Sandpiper, *Totanus hypoleucus*, Linn.—Ubiquitous throughout the north, so too here it nests in considerable numbers. I have few notes of any interest regarding this species. All the nests we observed managed to hatch off in safety without attracting the attention of the Gulls. One bird, in her frantic efforts to lure us away from her nest, fell into the water, and proceeded to flap there in much the same way as a duck under similar circumstances. One young Sandpiper enjoyed the entirely novel experience of being hatched in our bed, whither we had taken the egg on retiring to rest. We observed that the young of this brood remained in the nest for a whole day after hatching.

Black-tailed Godwit, *Limosa belgica* (J. F. Gmelin).—A solitary specimen in full breeding plumage was seen on 17th June feeding on a marshy island in one of the lochs in company with Oyster Catchers and Black-headed Gulls. The other specimens recorded for this locality have, I believe, been shot in winter.

Whimbrel, *Numenius phæopus*, Linn.—Were extremely belated on their migrations. I find it recorded that a flock of twenty was seen on 31st May, while on 2nd June they were extremely numerous, and a flock of thirty remained as late as 17th June. After that stragglers, evidently non-breeding birds, used to feed in company with Curlew.

Arctic Tern, *Sterna macrura*, Linn.—Arrived late, and began to nest correspondingly late. The first egg was not found till 8th June, and the full complement was in the majority of instances not laid till ten days later. We found one colony of fifty nests on an island, many of which were situated round a deserted Swan's containing five addled eggs. Here the full clutch was three eggs, while down on the beach the nests contained two at the most. So well did they defend their nests that not a single nest was robbed by Gulls. On 11th June I saw a specimen in winter dress associating with the breeding birds.

Little Tern, *Sterna minuta*, Linn.—I am glad to report that this delightful species is on the increase. They too were extremely late in arriving and commencing to breed. One pair had already arrived by 27th May, but it was not till 20th June that the first egg was found. They are extremely fond of bathing, and a charming sight it is to see an affectionate couple performing their ablutions in some fresh-water pool. They

adopt quaint little ways when courting, at which pastime they spend the greater part of the day. The male may often be seen strutting before his partner with a tiny fish in his bill, first offering it her, and then turning quickly aside as she is about to snatch the proffered morsel, behaving in much the same way as his human confrère would under similar circumstances. That there are occasionally "odd men out" in this pairing-off process must evidently occur, for three birds were to be seen chasing each other on three consecutive days. The leading bird carried a small fish, and the two others seemed quite unable to overtake him in spite of their eagerness. Just before laying commenced, individual pairs were seen soaring to a tremendous height, then, half-closing their wings, would shoot down to a few feet of the water. In doing so they would call in a characteristic way. Pair after pair would then mount into the air and repeat the performance. It is curious—others too have noticed it before—that for a time a colony of these birds may vanish into space, and their breeding haunts appear to have been deserted, when all of a sudden the whole body will appear again, vociferating louder than ever. This bird is none the less charming from a photographer's standpoint, since it appears to take no notice of the presence of human beings, evidently trusting to its protective coloration for concealment. The bird whose portrait I succeeded in obtaining returned to its nest regularly after an interval of two minutes.

Black-headed Gull, *Larus ridibundus*, Linn.—Owing to the protection afforded, is on the increase. In every colony there are to be found several nests of the Common Gull, who, being of a less nervous disposition, are always the last to leave their nests when disturbed, and the first to return. One bird which, for some considerable time, we had under observation invariably insisted in first settling on a nest of the former species, whereupon it would be attacked and buffeted by the rightful owner, assisted by the efforts of the rest of the colony. Like the Terns under similar conditions, it is curious to note how the whole colony acts in concert. Often while peaceably settled on their nests, acting on an alarm note of one of their number, they would arise, and a great hubbub, sounding in the distance like that of a gigantic swarm of bees, would ensue. A minute later they, as if by common consent, all wheel. For a moment complete silence reigns, once more to be broken as they return to their nests. Owing to quarrels innumerable between the neighbours a great quantity of eggs get smashed, and when the young are hatched conditions are worse still. We were greatly impressed by the great mortality amongst the young. Many appeared to die from sheer want; others we found in

great quantities in the throes of death with marks on their heads, showing where they had been pecked just behind the eye. On the tenth day after the young were hatched we found but one in every five alive. On disturbing the colony many of the young swim out into the loch, and when once their backs become wet they are paralysed, and fall victims to the ever watchful Common and Greater Black-back Gulls. Yet they are not difficult to rear. I took six when just ten days old. They are fully fledged now, and are doing well, yet for the first week they were fed on tinned salmon! From the contents of the stomachs of young birds examined, it would appear that they are to a great extent fed on wire-worms and other larvæ.

Common Gull, *Larus canus*, Linn.—Commoner than the Sparrow on the housetop, this, in my opinion, is the most destructive and the blackest thief of the genus. I am fully convinced that, in view of their immense increase during the last years, an effort ought to be made to thin their numbers, as the mischief caused is infinitely greater than that by all the Ravens, Falcons, and Hoodie Crows put together. It would be better from every point of view were a little more attention given to them and a little less to the Falcons and Harriers. It would appear, from what I was able to observe, that certain individuals would quarter the same ground in search of eggs and young birds day after day. I append a list of the number of eggs which fell victims to their depredations, and it will be seen that very few out of the total number found managed to hatch off:—

Species.	Number of nests found.	Number of eggs found.	Number of eggs taken.
Ringed Plover . .	6	12	9
Pewit . . .	3	12	4
Oyster Catcher . .	4	8	3
Dunlin . . .	4	16	16
Lesser Tern . .	3	6	1
Red-throated Diver .	1	2	1

It must be remembered that this is but a small portion of the total, as we were only engaged in finding suitable nests for our purpose, and they were all found, with the exception of the Diver, on a stretch of ground some one and a half miles in extent. Besides this formidable array we observed them snatching young Pewits from in front of their agonised parents, and broods of ducklings were devastated in four instances. When such a brood is disturbed one is sure to be floating overhead, and no sooner have the young raised their heads above the water, than they are pounced on and borne away. In

this way a whole brood is destroyed in a few minutes. We found them waiting on the Greater Black-backed Gull, mobbing him directly he had seized his prey, and compelling him to drop it, in much the same way as a Skua. Often unable to swallow their victims, they would leave them floating on the water. In spite of these facts, their eggs are not smashed, nor is any effort made to reduce their numbers. Once having found a nest, they do not forget its whereabouts, and if driven off once invariably return. Often they are to be seen catching flies in the long grass in company with the Black-headed species. The stomachs of specimens examined contained large quantities of slugs and worms rolled together in a ball by tenacious mucus. In the act of courting they assume curious positions, pouting out their chests after the manner of a Pouter Pigeon. One I saw wheeling and tumbling in the air almost like a Pewit. Before the young are fledged, it would appear that they leave the islands on which they were hatched and congregate on some islet, possibly to evade the depredations of the Herring Gulls. Thus one small island appeared almost grey from the number of young birds we found on it, though there were no signs of a single nest. On other lochs we noted the same thing.

Herring Gull, *Larus argentatus*, Linn.—It is curious to note the extent to which the different members of this genus prey upon each other. Thus whenever a Herring Gull puts in an appearance it is instantly mobbed by all the Common Gulls. Large numbers nest undisturbed on an island in a solitary loch amid the hills. Here each species have their own particular boundaries: the Herring are confined to the most exposed end; in the middle a large colony of Greater Black-backs, of which more anon; finally an equally large one of the Lesser Black-back. On two occasions we swam out to this island and noted that the young of the two smaller species were few in number, owing no doubt to the unwelcome attentions of their larger neighbour.

Great Black-backed Gull, *Larus marinus*, Linn.—On the island above mentioned there exists a colony of this species, which for size must have rivalled that mentioned by Mr. Harvie-Brown in his Fauna of the Outer Hebrides. Here I counted no less than sixty-two old birds on one island. Here too we killed no less than thirty-four young in all stages, and took away four eggs. Many of the young when captured ejected large slabs of fish, one in particular weighing at least a pound. All the nests were huddled together in one small area a hundred yards or so square. One young one whose primaries were just sprouting survived an immersion of some five minutes on his swim back to land. I found that he soon

became tame, and succeeded in rearing him. I watched one pounce on a young Pewit who on his first effort at flying tried to cross a loch. After having held the unfortunate victim under water till life was extinct, he tried to swallow it, but being unsuccessful, flew off, leaving his booty in the water to be torn to pieces by the attendant host of Common Gulls. We attempted to photograph this extremely wary bird on its nest, and as might be expected our efforts did not meet with much success. The camera, protected by a couple of mackintosh cloths and hidden as carefully as we could possibly devise, was left overnight on a small rocky islet in the midst of the loch. The shore was some 600 yards distant, and three fishing-reels were used to bridge over the gap. That night was one of the worst we experienced; it rained and stormed, so that I feared that in spite of the mackintoshes the camera would be ruined. The next morning revealed both old birds with their "weather-eye" open perched on a rock close to the nest, while a third member sailed aloft. The eggs had disappeared—not a trace was to be found. Little doubt was left in our mind as to the thief. Though birds are not generally endowed with the sense of smell, yet it is curious to note that an inveterate egg-stealer like this species never takes a bad egg, though no marked objection to incubated ones is shown

Black-throated Diver, *Colymbus arcticus*, Linn.—On 29th May a nest with its usual complement of eggs was found. It was placed within two feet of the water's edge. Owing to the terrible weather which ensued, no attempt to photograph the owner was possible. On 5th June the site was revisited, and the eggs were found to have hatched off. No signs were seen either of the old or the young birds, and daily after that regularly, towards 4 o'clock in the afternoon, the old ones were seen wending their way from their fishing out at sea back to the loch. What becomes of the young in the meantime I am at a loss to know.

Red-throated Diver, *Colymbus septentrionalis*, Linn.—A nest was found in exactly the same position as last year, that is on a small island in full view of the public road. It contained but one egg, the other having been robbed by Gulls. Last year I was successful in obtaining several studies of the old bird as she left the water and settled on the eggs, eventually becoming so tame that I was able to make exposures when standing in full view only some thirty yards distant. But our attempts this time were not crowned with success owing to many unforeseen circumstances. First of all the bird was unaccountably alarmed by the camera, which on the last

occasion she had viewed with indifference. Once, however, she faced the lens and sat for a few minutes, but becoming scared, shuffled off again. In the meantime some wandering Gulls had espied the eggs and were hovering dangerously near. At the sight of these both old birds rose from the water and vociferating loudly flew after them. In doing so they espied us in our lair. Then the game was up, for they left the loch at once. We had other causes for annoyance, for a couple of women tending their cows had become overpowered by curiosity, and had drawn near with their whole herd, thus effectually putting a stop to any further attempts. For no sooner had one cow become disentangled from the string than another would blindly run into it. On approaching the nest the bird would swim swiftly inshore, push itself breast foremost up the bank, and *waddle*, not shuffle along the ground as generally described, on to the eggs. Before settling down she would stand upright and arrange the eggs beneath her. On leaving she would slide down the incline into the water and dive noiselessly. While the hen was sitting the male would be within thirty yards. He would accompany her to the landing-place. Often she would approach the island by a series of long dives, remaining as long as a minute and a half under water. When alarmed she would raise her wings above her head and dip her head under water in a peculiar way in the intervals of eyeing the camera, evidently an outward and visible sign of her uneasiness. I wish to draw attention to a habit of this Diver of which mention will be found in the "Ootheca Wolleyana," vol. ii. p. 415. This I have had the opportunity of observing once last year. The bird was descending from some hill loch to the sea to fish, hurtling downwards with incredible speed, and the noise made by the air rushing through the primaries sounded like the roar of an express train.

Little Grebe, *Podiceps fluviatilis*, Tunstall.—Undoubtedly on the increase. I have seen pairs in even the most barren and uninviting-looking lochs. In 1906 I found a nest with five eggs, and this year one with four, among the reeds.

NOTES ON COLEOPTERA FROM ST. KILDA.

By Prof. T. Hudson Beare, F.R.S.E., F.E.S.

Two collections of Coleoptera have recently been made on the island of St. Kilda; the first was made by Mr. James Waterston, B.Sc., of Edinburgh, who was on the island from

June 17 to July 17, 1905, the weather during his visit being very fine; and the second collection was made by Mr. C. Gordon Hewitt, M.Sc., of Manchester, during a visit of four weeks' duration in July 1906—the weather during Mr. Hewitt's visit was very bad, and made collecting at times anything but enjoyable.

I have had the pleasure of identifying Mr. Waterston's captures, and Mr. Hewitt has kindly sent me a complete list of his specimens, with notes on localities, etc., and he desires to express his thanks to Mr. J. R. Hardy of the Manchester Museum for assistance in identifying his captures.

Mr. Waterston informs me that the whole of his collection was made on Hirta, which is the main island, or St. Kilda proper. Most of the captures were made under stones, under bits of wood above tide-mark, on dry-stone dykes, in birds' nests on the cliffs, in dried grass on the top of the island, in carrion, and under dung, and a few by sweeping long grass.

In the table below I have indicated Mr. Waterston's captures by (W.) and Mr. Hewitt's by (H.).

As there are very few records dealing with the fauna of this isolated and out-of-the-way spot, it has been thought desirable to give a complete account of the whole of the two collections :—

List of Species and Notes.

1. *Carabus catenulatus*, Scop.—2 specimens (W.).
2. *Notiophilus biguttatus*, F.—4 specimens (W.).
3. *Notiophilus aquaticus*, L.—Common (H.).
4. *Nebria brevicollis*, F.—6 specimens (W.); and (H.).
5. *Nebria gyllenhali*, Sch.—1 specimen (W.).
6. *Dyschirius globosus*, Hbst. (H.).
7. *Pterostichus niger*, Schal.—3 specimens (W.)
8. *Pterostichus nigrita*, F.—2 specimens (W.); and (H.).
9. *Calathus cisteloides*, Pz.—4 specimens (W.); common on Cairn Mor (H.).
10. *Calathus melanocephalus*, v. *nubigena*, Hal.—1 specimen (W.).
11. *Anchomenus albipes*, F. (H.).
12. *Olisthopus rotundatus*, Pk.—3 specimens (W.).
13. *Trechus minutus*, F. (W.) } 9 specimens in all of the two
14. *Trechus obtusus*, Er. (W.) } species.
15. *Patrobus assimilis*, Chaud.—4 specimens (W.); and (H.).
16. *Hydroporus pubescens*, Gyll.—Very common in the marshy places (H.).

17. *Hydroporus ferrugineus*, Steph.—1 specimen (W.).
18. *Agabus bipustulatus*, L.—Common. Some of these are very narrow, and are probably the variety *A. solieri*, Aub., which Sharp calls the "dimorphic Alpine form" of *A. bipustulatus*. (H.).
19. *Anacæna globulus*, Pk.—3 specimens (W.); common with *Hydroporus pubescens* and *Agabus bipustulatus* (H.).
20. *Helophorus dorsalis*, Marsh. (H.).
21. *Helophorus æneipennis*, Th.—1 specimen (W.); and (H.).
22. *Helophorus affinis*, Marsh. (H.).
23. *Cercyon flavipes*, F.—1 specimen (W.).
24. *Megasternum boletophagum*, Marsh.—4 specimens (W.).
25. *Aleochara nitida*, Gr.—Under dung at top of Glen (H.).
26. *Homalota fungicola*, Thoms.—1 specimen (W.).
27. *Tachyporus chrysomelinus*, L.—4 specimens (W.); and (H.).
28. *Tachyporus hypnorum*, F.—1 specimen (W.).
29. *Tachinus rufipes*, De G.—8 specimens (W.); and (H.).
30. *Quedius fuliginosus*, Gr.—4 specimens (W.).
31. *Quedius boops*, Gr.—2 specimens (W.).
32. *Ocypus olens*, Müll.—1 specimen (W.).
33. *Ocypus ater*, Gr.—3 specimens (W.).
34. *Philonthus varius*, Gyll.—2 specimens (W.).
35. *Philonthus albipes*, Gr.—Under stones on Boreray. Fowler gives this as scarce in Scotland. (H.)
36. *Xantholinus tricolor*, F.—Not a common Scotch species (H.).
37. *Othius fulvipennis*, F.—2 specimens (W.).
38. *Lathrobium elongatum*, L.—Under stones on Runadone (H.).
39. *Lathrobium fulvipenne*, Gr.—2 specimens (W.).
40. *Stenus nitidiusculus*, Steph.—1 specimen (W.).
41. *Oxytelus rugosus*, F.—2 specimens (W.).
42. *Lesteva longelytrata*, Goez.—1 specimen (W.).
43. *Micralymma brevipenne*, Gyll.—This maritime species is found at the top of the Glen (H.).
44. *Homalium concinnum*, Marsh.—1 specimen (W.).
45. *Megarthrus depressus*, Pk.—1 specimen (W.).
46. *Silpha rugosa*, L.—1 specimen (W.).
47. *Choleva morio*, F.—3 specimens (W.).
48. *Bryaxis hæmatica*, Reich.—In marshy places. A rare Scottish species according to Fowler. (H.)
49. *Enicmus minutus*, L.—1 specimen (W.).
50. *Cryptophagus scanicus*, L.—On Cairn Mor (H.).
51. *Atomaria analis*, Er.—1 specimen (W.).
52. *Cytilus varius*, F. (H.),
53. *Simplocaria semistriata*, F.—2 specimens (W.).
54. *Aphodius lapponum*, Gyll.—In dung. A mountain species. (H.).
55. *Aphodius rufipes*, L.—Common (H.).
56. *Cryptohypnus riparius*, F.—11 specimens (W.); and (H.).

57. *Athous hæmorrhoidalis*, F.—7 specimens (W.); and (H.).
58. *Helodes minuta*, L.—5 specimens (W.)
59. *Chrysomela hyperici*, Forst.—1 specimen (W.).
60. *Crepidodera ferruginea*, Scop. (H.).
61. *Apion hæmotodes*, Kirb.—7 specimens (W.).
62. *Apion rubens*, Steph.—In cultivated area (H.).
63. *Otiorhynchus blandus*, Gyll.—7 specimens (W.). This sub-alpine species is common as in the rest of Scotland. (H.)
64. *Barynotus schönherri*, Zett.—3 specimens (W.).
65. *Ceuthorhynchus ericæ*, Gyll.—2 specimens (W.).
66. *Ceuthorhynchus quadridens*, Panz.—1 specimen (W.).

The only previous references to captures of Coleoptera on St. Kilda which I can find are:—(*a*) A brief note by the late Mr. C. W. Dale ("Ent. Mo. Mag.," xx. 214, 1883), where the capture of *Nebria brevicollis*, F., and *Pterostichus striola*, F., is recorded; and (*b*) an article by Mr. John MacGillivray in the "Edin. New Phil. Jour.," xxxiii. 47-70, 1842, where the following captures are noted: *Elaphrus lapponicus*, Gyll. ("in the Glen"); *Morychus æneus*, Er. (Mr. MacGillivray adds that both these were then recent acquisitions to the British fauna); *Carabus granulatus*, L., and *C. catenulatus*, Scop.; *Elaphrus cupreus*, Duft.; *Dascillus cervinus*, L.; *Corymbites æneus*, L., and *C. cupreus*, F., and *C. tessellatus*, F.; and *Geotrupes sylvaticus*, Pz. It will be observed that none of the beetles in the above two lists, except *Carabus catenulatus* and *Nebria brevicollis*, were found by Mr. Waterston or Mr. Hewitt.

In Dr. Joy's list (see p. 34) 35 species not given in the above are enumerated, making a total of 111 species so far recorded from St. Kilda.

THE UNIVERSITY OF EDINBURGH, *December* 1907.

NOTES ON COLEOPTERA FROM ST. KILDA, MAINLY COLLECTED FROM BIRDS' NESTS.

By NORMAN H. JOY, M.R.C.S., F.E.S.

LAST year, when studying the beetles that occur in the nests of birds, I thought it might be possible to obtain some species of special interest by examining the nests of sea-

birds from outlying parts of the British coast. Through Mr. Newstead's kind help I got into communication with a man who visits St. Kilda every year, and I arranged with him to send me nests of the Gannet, Cormorant, or any other he could get. At the same time I thought it worth while to give him a bottle for any beetles he might pick up, and instructed him to get me some hay-stack refuse and some sheep's dung. He carried out these instructions well, getting me Gannets', Cormorants', Fulmar Petrels', and Rock-Pipits' nests. I was disappointed in finding nothing very rare in the beetle line; but one flea, taken in the Gannets' or Cormorants' nest, turned out to be new to science, and was described under the name *Ceratophyllus borealis*, sp. nov., by the Hon. N. C. Rothschild, in the "Ent. Mo. Mag.," xviii. 11. It was extremely interesting examining this mass of rubbish, although some of it—the Cormorants' nest, for instance—was by no means pleasant to the olfactory nerves. This year I obtained more nests and some moss, or rather "sphagnum." Altogether I am able to record 49 species from the island. Most of these are generally distributed species, but some are decidedly local, and one, viz., *Homalota cavifrons*, Sharp, rare.

By this method of collecting I am able to record some of the smallest British beetles from St. Kilda, which would never be noticed except by a specialist, and I would suggest that besides giving bottles for beetles to friends who may be visiting these outlying islands, they should be instructed to pull up a bagful of moss, etc., and fill another bag with hay-stack refuse.

The following is a list of the beetles I have taken from St. Kilda:—*Carabus catenulatus*, Scop.; *Pterostichus niger*, Schall.; *Calathus cisteloides*, Panz. (these were the only three in the bottle I supplied); *Cercyon littoralis*, Gyll. (very common in Gannets' and Shags' nests made of seaweed); *C. flavipes*, F.; *Megasternum boletophagum*, Marsh.; *Aleochara moesta*, Grav. (these were named for me by Mons. Fauvel); *Homalota circellaris*, Grav., *H. cavifrons*, Sharp (sphagnum); *H. trinotata*, Kr.; *H. nigricornis*, Thoms.; *H. sericea*, Muls.; *Myllæna brevicornis*, Matth. (sphagnum); *Tachyporus chrysomelinus*, L.; *Tachinus rufipes*, De G.; *T. laticollis*, Grav.;

Quedius fuliginosus, Grav.; *Q. molochinus*, Grav.; *Q. umbrinus*, Er.; *Ocypus olens*, Müll.; *Philonthus æneus*, Rossi; *P. cephalotes*, Grav.; *P. fimetarius*, Grav.; *Xantholinus linearis*, Ol.; *Othius melanocephalus*, Grav.; *Stenus brunnipes*, Steph.; *Homalium rivulare*, Payk.; *H. riparium*, Thoms.; *H. rufipes*, Fourc.; *H. concinnum*, Marsh.; *Calyptomerus dubius*, Marsh. (hay-stack refuse); *Choleva morio*, F.; *C. nigrita*, Er.; *C. watsoni*, Spence; *Scydmænus collaris*, Mull. (sphagnum); *Euplectus ambiguus*, Reich (sphagnum); *Ptenidium evanescens*, Marsh; **P. atomaroides*, Mots.; *Trichopteryx thoracica*, Waltl.; **Orthoperus atomus*, Gyll.; *Mycetæa hirta*, Marsh; *Enicmus minutus*, L.; *Silvanus surinamensis*, L.; *Cryptophagus pilosus*, Gyll. (very common in a Cormorant's nest and in hay-stack refuse); *C. umbratus*, Er.; *C. scanicus*, L.; **Atomaria munda*, Er.; *A. analis*, Er.; *Apion cruentatum*, Walt. (several specimens breeding out of Rumex in a Cormorant's nest).

The species marked * are apparently new to Scotland.

BRADFIELD, BERKS, *6th Oct.* 1907.

PROPOSED DEALER'S RAID ON THE BIRDS OF ST. KILDA AND THE OUTER HEBRIDES.

[We have to thank a friend interested in the protection of our native birds for the loan of the following circular.—EDS.]

"34 LLOYD STREET,
"GREENHEYS, MANCHESTER.

"DEAR SIR—I intend during the forthcoming nesting season to make an extended tour through the Hebrides in order to collect a comprehensive series of sea birds—their young and eggs. Thinking you a probable subscriber, I put my scheme before you in detail.

"I propose to start early in May and to return in September, making St. Kilda (where the majority of the specimens are to be obtained) my headquarters, and visiting the Islands of the Hebridean group for certain specimens from time to time.

"The abundance of Bird life in these Islands enables me to guarantee for the sum of £15 the large and representative

collection of which I append full particulars, but the arduous nature of the work compels me to limit the number of my subscribers to ten. The specimens would be delivered in the form of first-class cabinet skins with full data attached to each. Apart from the educational value of such a series of British Birds, *many are likely to greatly increase in value owing to their growing scarcity* [the italics are ours.—EDS.] and to the increasing stringency of the Wild Bird protection laws.

"Having made a short but successful collecting trip to St. Kilda this year, I have every confidence in my ability to carry the scheme to a satisfactory issue.

"As references I have pleasure in giving you the names of Dr. W. E. HOYLE, M.A., D.SC., Director of the Manchester Museum; and BEN H. MULLEN, Esq., M.A., Director of the Royal Museum, Salford.

"The guaranteed series of Birds comprises:—[Here follows a list of twenty-five species of birds to be supplied, in most cases in adult, nest-feathered, and nestling plumage. The species include the St. Kilda Wren, a bird specially protected by an Act of Parliament, and the much persecuted Fork-tailed Petrel].

"Such other specimens as may be collected, in addition to the specified series guaranteed above, will be divided amongst the subscribers. A clutch of eggs will be sent with each series of 'Sea Fowl' by—Yours respectfully,

"HARRY BRAZENOR."

[We do not print the above as a gratuitous advertisement for the enterprising Manchester dealer, but as a means of making known to Proprietors, and the Society for the Protection of Birds, Mr. Brazenor's intentions.—EDS.]

JUNCUS BALTICUS, WILLD.

By ARTHUR BENNETT.

THE interesting note by Dr. Trail in last year's "Annals," p. 251, caused me to look up some of the recorded stations. In the following habitats I have given the distances roughly:—

CAITHNESS, 109.—Wester Loch, 1½ miles from the sea, Dr. Ward, *sp.* Robert Dick also found it by the margin of a loch 6 miles inland (Durran?).

ELGIN, 95.—Kellas on the Lossie, 10 miles; and Cuilleachan and Freeburn[1] on the Findhorn (96, Easterness), 18 miles from the sea, Messrs. Stables and Gordon, 1832.[2] St. Andrews-Llanbryde (Elgin), "where the sea formerly reached," Dr. Gordon.

EASTERNESS, 96.—Ardclach on the Findhorn, Dr. Playfair, *sp.*, 7 miles from the sea.

S. ABERDEEN, 92.—Loch of Park or Drum, on the south side, 12 miles inland. I have a specimen gathered here in 1872 by Dr. Roy. Can it be traced to a later date, and is there any reason why it has become extinct?

All the other Scottish stations seem near the sea, but in W. SUTHERLAND (108) it occurs at 2½ miles inland, Hanbury, *sp.*

In Europe most of its stations are near the sea, but it grows on the shores of Lake Ladoga (itself almost an inland sea, 450 sq. miles in area) in Russia.

"In Norway it grows at Ibbestad, at 215 metres above the sea; and Mr. O. Holmberg has this year found it halfway between the sea and Sulitelma, probably more than 20 miles from the sea. In Sweden it is both a coast and a subalpine species; in Nordland between the sea and the subalpine region; at Pajala, 80 miles N. of the Gulf of Bothnia; and at Jockmock, Swedish Lapland, about the same distance."—Dr. Nordsted *in litt.*

In N. America it grows round the Great Lakes, Lake Winnipeg, and Knee Lake, Keewatin, Canada; but a variety, *montanus*, Englm., extends from Red River across the prairies to Donald on the Columbia. The plant of the coast has a panicle much more compact than that from the Great Lakes;[3] and I notice a tendency to the same in Scottish specimens that grow only a short distance inland.

On my specimens from Ardclach are many examples

[1] [This locality is between three and four miles from, and nearer the sea than, where I found the plant, and is about 960 feet above sea-level. I had overlooked the record.—J. W. H. T.]

[2] "Flora of Moray," 12, 1839.

[3] Macoun, "Cat. Canadian Pl." iv. 56, 1888.

of the white larval cases of a small moth. On sending specimens to my friend, Mr. Thurnel, he tells me they are made by the larvæ of one of the species of the genus Coleophora,[1] *i.e.* either *C. cæspititiella*, *C. obtusella*, or *C. adjunctella*, "but which of these I am not prepared to say; but on the whole I am not far away in stating that your larvæ are probably *C. obtusella*. I have found it commonly on the Essex coast on *J. maritimus*, L. But the interest in this is that neither of the last two species have been found farther north than Yorkshire."

Although there is a great family likeness amongst the members of this big genus, they are interesting from the fact that their larval cases are often exceedingly curious in shape and construction, and they feed on a great variety of plants. Mr. Thurnel names 30 "as a few among them." So Dr. Trail's note introduces a new moth to Scotland.

There is another interesting Scottish Juncus, *J. filiformis*, L. This is recorded as found by the Loch of Loirston, Kincardine, where it was found by Dr. Dickie in 1850.[2] I have specimens gathered by "Covestone Loch, Aug. 10, 1850, *ex herb.*, J. Taylor." This is simply another name for the same loch. Dr. Dickie gives the loch as being "two miles from the sea, and 250 feet above its level." I also possess specimens gathered there in August 1885 by Messrs. Fox and Hanbury.[3]

Although this is the only record for Scotland of *filiformis*, yet it may be expected in other parts of the country, as it is abundant in Denmark and Finland, extends from South Sweden to Nordland in every province, is dispersed over Norway and Finland, occurs also in Iceland, and hybridises with *balticus* in Skåne. It occurs sparingly in Belgium, and is rare in Holland.

[1] The genus contains nearly eighty British species.

[2] "Guide to Aberdeen, Banff, and Kincardine," 167, 1860.

[3] [It is not rare on the damp stony margins of the small loch, which is about 270 feet above the sea and barely a mile from it, but it does not appear to extend to pools in the neighbourhood. I find it grows freely in my garden, but does not fruit well there.—J. W. H. T.]

CROYDON, *November* 1907.

PLANTS OF SUTHERLAND AND CAITHNESS.

By G. Claridge Druce, M.A., F.L.S.

In the July of 1907 I spent a short time in the delightful air of the north, first working the neighbourhood of Invershin, in East Sutherland, then that of Inchnadamph, in the western division of the county, with its splendid range of limestone cliffs. Here many alpines come much lower down than we are accustomed to see them, for instance *Carex capillaris*, a variety (*alpina*) of *Festuca ovina*, and *Dryas octopetala* being characteristic plants as low as 250 feet. The Wych Elm and the Holly, as well as the White Beam, appear thoroughly native. The physical features, especially from a geologic point of view, are extremely interesting. The season was too backward to allow of any critical study of many species, the Hawthorn being in full bloom on the 14th July ; and this perhaps prevented my success in finding *Gentiana nivalis*, which has been recorded for this neighbourhood. The beauty of the mountain masses of Suilven, Canisp, and Quinag adds much to the delight of the district. I then worked the ground round Altnaharra and the rocks of Ben Hope, and spent a short time at Tongue. At Bettyhill the abundance of *Oxytropis uralensis* is a great pleasure ; and a curious feature is presented by the drifting sand being thrown up so as to cover a sloping cliff, to the height of at least 200 feet. On such a place a little farther inland the sand is covered with masses of *Dryas octopetala* from base nearly to the summit. The sand is a glistening micaceous-looking substance, which, however, we were told burns to lime, thus explaining the occurrence of such a typical gypsophile as *Dryas* on an arenaceous soil. The same stone, locally called whinstone, from which the sand is derived is common on Ben Hope, thus accounting for the prevalence of *Galium sylvestre*, *Draba incana*, etc., on that hill. On the grass-covered cliff-tops, in full exposure, occurred a new form of *Kœleria britannica* ; and in slightly moister places *Primula scotica* abounded.

The pleurostichous Thrift, *S. linearifolia*, was the only form observed. On the less accessible cliff-tops where the

birds frequent, and which are covered with their excrements, the leaves of the Thrift become larger ; and *Rumex Acetosa* and *Plantago maritima* appear to benefit by the excess of nitrates, so luxuriant do they become. In the fissures of the gullies *Ligusticum scoticum* is frequent, and the large flowers of *Matricaria inodora*, var. *phæocephala*, are a great adornment. *Anthyllis* abounds on the edges of the more sunny cliffs, where there is little competition. On the flat tract of low-land sand a form of *Vicia sepium*, which is small and quite appressed to the ground, is common. In the almost bare moist sand by the river *Carex incurva* and a slender form of *C. arenaria* occur. In the marshes and on the moister parts of the cliff turf *Orchis latifolia* of a magnificent colour is to be seen. *Rosa spinosissima* occurs on the rocks, but the season was too backward to make it worth while to collect the varieties of the Roses which are numerous here.

In Caithness, which I only visited in order to collect the Calamagrostis which has been recorded by Mr. A. Bennett as *C. strigosa*, I found the plant which Prof. Hackel named *neglecta* for me some years ago in the old locality on the site of Loch Durran, but alas, sadly dwindled in quantity, and it is practically doomed. Near it Mr. A. J. Evans showed me the still smaller patch of "*strigosa*" in Grant's locality. Subsequently, I visited Loch Watten where I saw "*strigosa*," in the locality visited by Hanbury and Marshall, in very considerable quantity, and in excellent condition. I also found the same plant by Loch Scarmclett in considerable quantity, the locality being 89 feet above sea-level. I have not yet made a critical examination of these plants to see if two species occur ; but I may say the term "cæspitose," which is given as a character of *C. strigosa* by Messrs. Groves, does not fit any of these plants, the Caithness plants having an extensively creeping rootstock, so intermixed with the rhizomes of sedges, etc., as to prevent any adequate rooting specimens being obtainable for the herbarium. Later on I will report on them.

Thalictrum dunense, *Dum.*—Plentiful on the sand-dunes at Betty-hill.

Thalictrum alpinum, *L.*—East side, Ben More, Assynt 107.

Ranunculus acris, *L.*, var. *tomophyllus* (Jord.).—A very characteristic plant, with broad segments to the lower leaves, which are densely hairy, and with rich golden-yellow blossoms, occurs by the coast at Bettyhill, Tongue, and more rarely in barren soils at Inchnadamph. It also occurs on the Ross-shire coast near Ullapool, and on the Caithness coast at Reay, etc. It may be a distinct species, as it has a different facies from the plant of Jordan, to which it has been referred.

R. Steveni, *Andrz.*—Altnaharra 108; Inversbin 107.

R. scoticus, *Marsh.*—Near Loch Meadie 108.

Caltha radicans, *Forster.*—By the river at Inversbin, East Sutherland 107; by a stream at Inchnadamph, and at Bettyhill 108. I saw *C. palustris* also at Bettyhill. *C. radicans* occurs, Herr Domin tells me, also on mountains in Bohemia in considerable quantity.

Trollius europæus, *L.*—was in beautiful flower at Inchnadamph on July 20.

Arabis petræa, *Lam.*, var. *hispida*, DC.—On the cliffs of Ben Hope 108. The var. **grandifolia*, Druce, occurred there also, but very rarely.

Draba incana, *L.*, var. **contorta* (Ehrh.).—On the cliffs of Ben Hope 108. The type occurred in Traligill Glen, Inchnadamph, and on the cliffs of Blar nam Fiadhag 108, and on the coast at Golspie †107.

*Erophila verna, *DC.*—Inversbin, East Sutherland 107.

*E. stenophylla, *Jord.*—Inversbin 107.

*Cochlearia alpina, *Sweet.*—Ben More, Assynt 108.

C. grœnlandica, *L.*—Inversbin 107; Tongue 108.

Brassica alba, *Boiss.*—Inversbin 107; Tongue 108.

Viola canina, *L.*—Bettyhill 108; also *var. *calcarea*, Reichb.

V. tricolor, *L.*—Very beautiful at Inversbin, also at Altnaharra 108; *var. *vivariensis* (Jord.), Inversbin 107, Inchnadamph 108.

Polygala vulgaris, *L.*—A beautiful large deep-blue-flowered plant, was common on the limestone about Inchnadamph, and a prostrate form on the sand at Bettyhill.

Silene maritima, *Sm.*—Abundant on the sea-cliffs, and fairly constant in character 108, Golspie 107.

S. acaulis, *L.*—Descends to 500 feet near Inchnadamph, east side of Ben More 107.

Lychnis dioica, *L.*—A small dark-flowered form, was seen on the limestone in Traligill Glen 108.

Cerastium tetrandrum, *Curt.*—Near Iversh in *107. Plentiful on the coast at Tongue, Bettyhill, etc. 108.

*C. semidecandrum, *L.*—Inversh in 107.

C. arvense, *L.*—In fields between Inversh in and the coast *107.

Stellaria Holostea, *L.*—On the cliffs of Ben Hope 108.

Arenaria leptoclados, *Guss.*—Inversh in *107, Tongue *108.

A. norvegica, *Gunn.*—In flower July 14, in the original station 108. I failed to find any on the hills above Inchnadamph, although in physical features they strongly remind one of the Ben Bulben plateau, where its congener *A. ciliata* attains an altitude of 1950 feet.

A. sedoides, *Kittel* (Cherleria).—Plentiful on Ben More, Assynt 108, and also on the eastern side 107.

Sagina subulata, *Presl.*—Rather common on Ben Hope, also at Altnaharra, at Inchnadamph, and at Bettyhill 108.

Spergularia media, *Presl.* (marginata).—Tongue 108.

Spergula sativa, *Boenn.*—Altnaharra 108; Inversh in, Lairg 107.

Anthyllis Vulneraria, *L.*, *var. *maritima*, Koch.—To this variety must, I think, be referred a striking form seen on the cliffs of Ben Hope 108.

Oxytropis uralensis, *DC.*—In immense quantities at Bettyhill and Farr Point, and in magnificent bloom, not only in bare sand, but in turfy places on rocks, preferring full exposure.

Vicia Cracca, *L.*, var. *incana*, Thuill.—At Bettyhill.

V. sepium, *L.*—As a very dark-flowered small form near Inchnadamph, and Ben Hope, and also (forma prostrata) as a small prostrate plant growing in almost bare sand at Bettyhill 108.

V. angustifolia, *L.*—Inversh in 107.

V. tetrasperma, *Moench.*—Inversh in *107.

Pyrus Aria, *Ehrh.*—Growing out of the limestone precipices of Blar nam Fiadhag 108.

Alchemilla vulgaris, *L.*, var. *filicaulis* (Buser).—*Inversh in 107; var. *glabra*, DC., Ben More, Canisp *108.

Rosa tomentosa, *Sm.*—Inversh in, Lairg 107.

R. dumalis, *Bechst.*—Bettyhill *108.

Pyrus Aucuparia, *Ehrh.*—Cliffs of Ben Hope 108.

Cratægus Oxyacantha, *L.* (*monogyna* only).—In full flower on July 14 at Inchnadamph.

Saxifraga oppositifolia, *L.*—In the village street, or at least on the rocks between the houses, near the sea-level at Bettyhill, also on Ben Hope, Ben More, etc.

S. hypnoides, *L.*—On the eastern side of Ben More, Assynt *107, as well as in the rocks on the western side, and on Quinag 108.

Ribes Grossularia, *L.*—Growing on the limestone cliffs of Blar nam Fiadhag 108, perhaps bird-sown; but in that case there is a possibility of *Pyrus Aria* being sown in the same way, but with less probability, since the latter is much less frequently in culture than the former.

Sedum roseum, *Scop.*—At the sea-level, or near it, at Bettyhill, etc. 108.

Drosera obovata, *M. and K.*—At Invershin *107, and Altnaharra, near Rheidhachaistel, and near Mudale 108, with both parents, *D. anglica* being in beautiful flower.

Epilobium angustifolium, *L.*—Cliffs of Ben Hope, Ben Loyal, etc. 108.

Pimpinella Saxifraga, *L.*, var. *major*, Koch.—At Bettyhill.

Ligusticum scoticum, *L.*—Rather frequent at Farr Head 108.

Galium sylvestre, *Poll.*—Common on the limestone about Inchnadamph and in Glen Traligill, and about Ardvrick Castle, but ceasing directly the limestone gave way to other rocks. On Ben Hope, and at Bettyhill, in several forms 108.

Asperula odorata, *L.*—On the cliffs of Ben Hope 108.

Antennaria dioica, *Br.*, var. **pedicellata*, F. B. White.—Beinn an Fhuran, Canisp 108.

Gnaphalium supinum, *L.*—Ben More 108 and 107.

Bellis perennis, *L.*—A discoid form occurred at Altnaharra 108.

Matricaria inodora, *L.*, var. *phœocephala*, Rupr.—On the sea-cliffs at Farr, etc.; and in some places where there is much sea-bird excrement it becomes, as does *Rumex Acetosa*, very luxuriant.

Senecio aquaticus, *Huds.*—Bettyhill 108, with large dark yellow anthodes, also near Castleton and Watten, Caithness 109.

Arctium minus, *Bernh.*—Invershin *107.

Centaurea Scabiosa, *L.*—Not only as the var. *Gelmii*, Briq., but in several intermediate forms, so far as leaf-cutting goes, about Tongue and Bettyhill.

Hieracium Pilosella, *L.*, var. *nigrescens*, Fr.—Inchnadamph.

H. anglicum, *Fr.*, var. *longibracteatum*, F. J. H.—Common about Inchnadamph, also on Ben Hope, and near Bettyhill.

H. iricum, *Fr.*—Very luxuriant at Bettyhill, also by the Traligill at Inchnadamph.

H. caledonicum, *F. J. H.*—Probably this on Ben Hope 108.

H. subhirtum, *F. J. H.*—Ben Hope, also probably *H. rivale*, F. J. H.

H. pollinarium, *F. J. H.*—At Bettyhill.

H. murorum, *L.*, var. *asymmetricum* (Ley).—Ben Hope *108, var. *micracladium* (Dahlst.), Glen Traligill, var. *subtenue* (W. R. L.), Ben Hope 108, probably this, *H. pretenerum*, Almq., Ben Hope.

H. crebridens, *Dahlst.*, forma.—Ben Hope.

H. sarcophyllum, *Stenstr.*—Probably this on Ben Hope.

Tragopogon pratense, *L.*—Mr. Watson queried this as being native in W. Sutherland, but it appears to be thoroughly so in the drifted sand at Bettyhill 108.

Arctostaphylos Uva-ursi, *Spreng.*—Sea-level at Bettyhill 108.

Statice linearifolia, *Laterr.*—On the cliffs of Ben More, Assynt, Canisp, Quinag, Ben Hope, and on the coast generally 108. No holotrichous form was noticed.

(*To be continued.*)

ADDITIONS AND CORRECTIONS TO THE TOPOGRAPHICAL BOTANY OF SCOTLAND.

By James W. H. Trail, A.M., M.D., F.R.S., F.L.S.

(*Continued from No.* 64, *p.* 232.)

Leguminosæ.

Lupinus nootkatensis, Sims. Well established by the Nairn river. Its vice-county distribution as a denizen in Scotland is at least 88, 89, 91, 92, 96, 111; *L. albus*, L., 83 cas.

The following species have been recently recorded as casuals on rubbish or on cultivated ground :—

Ononis mitissima, L., 83.

Trigonella arabica, Del., 83; *T. azurea*, C. A. Mey, 83; *T. Besseriana*, Ser., 83; *T. crassipes*, Boiss., 83; *T. Fœnum-græcum*, L., 92; *T. gladiata*, Stev., 83; *T. laciniata*, L., 83.

Medicago ciliaris, Willd., 83; *M. disciformis*, DC., 83; *M. littoralis*, Rhode, 83; *M. sphærocarpa*, Bert., 83; *M. tornata*, Willd., 83; *M. turbinata*, Willd., 83.

Melilotus infesta, Guss., 83.
Trifolium agrarium, L., 83; *T. Cherleri*, L., 83; *T. hirtum*, All., 83; *T. involucratum*, Ortega, 83; *T. nigrescens*, Viv., 83; *T. pannonicum*, Jacq., 83; *T. purpureum*, Lois., 83; *T. resupinatum*, L., 92; *T. subterraneum*, L., 83; *T. suffocatum*, L., 83.
Lotus ornithopodioides, L., 83; *L. Tetragonolobus*, L., 83.
Astragalus sesameus, L., 83.
Hippocrepis multisiliquosa, L., 83; *H. unisiliquosa*, L., 83.
Hedysarum coronarium, L., 83.
Scorpiurus sulcatus, L., 92.
Galega officinalis, L., 83.
Cicer arietinum, L., 83.
Vicia amphicarpa, Dorthes, 92; *V. dasycarpa*, Ten., 92; *V. Ervilia*, Willd., 85, 92; V. lutea, *L.*, 92; *V. monanthos*, Desf., 92.
Lathyrus annuus, L., 92; *L. Aphaca*, L., 92; *L. latifolius*, L., 92; *L. sativus*, L., 92.

ROSACEÆ.

Potentilla argentea, L. and *P. fruticosa*, L. Casuals in 92.
Alchemilla vulgaris, *L.*, *var.* filicaulis, *Buser*, 84, 85, 94, 111, 112.
A. argentea, *Lam.*, 83†, 112 (?†).
Aremonia agrimonioides, DC., 81.

ROSA.—In the "Journal of Botany" for May 1907, pages 200 to 210, is a paper on "British Roses of the *mollis-tomentosa* group," by the Rev. Augustin Ley, in which these are distributed among 18 forms, "which, exclusive of varieties, may legitimately be assumed to be of equal value and termed *species*. The arrangement into two species, *mollis* and *tomentosa*, the latter with numerous varieties, melts away when the group is studied, although, as divisional names, these still remain advantageous."

Of these forms the author includes the following as found in Scotland, authenticating most as seen by himself from the vice-counties.

R. pomifera, J. Herrm. (Roxburgh), 80.
R. mollis, *Sm.*, 76, 77, 80, 83, 85, 88, 92, 95, 97, 108.
R. submollis, *A. Ley, f.n.*, 72, 73, 74, 76, 79, 85, 87, 88, 95, 96, 97, 104, 108.
R. omissa, *Déségl.*, 73, 76, 85, 86, 88, 90, 106, 110.
var. resinoides, *Crépin*, 72, 73, 74, 80, 85, 87, 88, 89, 90, 96, 97, 98, 106.
R. pseudorubiginosa, *Lejeune*, 72, 88.
R. suberecta (*Woods*), 74, 76, 80, 81, 87, 89, 92, 95, 96, 97, 98, 104, 105, 106, 108.
var. glabrata, *Fr.*, 96, 97, 106.
R. pseudomollis, *E. G. Baker*, 97, 98, 104.

R. Andrzeiovii, *Steven ex Besser*; Perth, 92, 95, 96, 97.
R. uncinata, *F. A. Lees*, 96, 98, 106, 108.
R. sylvestris, *Lindley*, 80, 96.
R. tomentosa, *Sm.*, "Distribution general."
R. farinosa, *Rau.*, Perth.
R. cinerascens, *Dumort.*, rare, Perth, 106.
R. cuspidatoides, *Crépin*, 95.
R. obovata (*Baker*), 83, 92.

Of the other roses the only additional record is—

R. glauca, *Vill.*, 112 (rare, W. H. B.).
Pyrus Aria, *Ehrh.*, *var.* rupicola, *Syme*, 94.

Saxifragaceæ.

Saxifraga oppositifolia, *L.*, 102; *S. umbrosa*, L., 84.
Astilbe japonica, A. Gray, 83 cas.
Ribes alpinum, L., 92; *R. nigrum*, L., 81.

Haloragaceæ.

Callitriche hamulata, *Kuetz.*, *var.* homiophylla, *Gren. and Godr.*, 88.

Lythraceæ.

Lythrum Salicaria, *L.*, 92†.

Onagraceæ.

Epilobium obscurum, *Schreb.*, 112 (Fair Isle).
E. alsinefolium × montanum, 94; E. alsinefolium × obscurum, 94.
E. alsinefolium × palustre, 94.
E. anagallidifolium × obscurum, 94.
Œnothera purpurea, Curt., and *Œ. tenella*, Cav., casuals in 83.

Cucurbitaceæ.

Ecballium Elaterium, A. Rich., 83 casual, as seedlings.

Umbelliferæ.

Carum Petroselinum, Benth. and Hook., 81 cas.
Chærophyllum nodosum, Lam., 83 cas.
Scandix australis, L., and *S. pinnatifida*, Vent., casuals in 83.
Crithmum maritimum, *L.*, 102.
Meum Athamanticum, *L.*, 94.
Levisticum officinale, Koch., 92 and 94, escape.
Peucedanum Ostruthium, Koch, 112.
Capnophyllum dichotomum, Lag., 83 cas.
Caucalis arvensis, Huds., 83 cas.

Caprifoliaceæ.

Symphoricarpus racemosus, DC., 91†, 92†.

Rubiaceæ.

Galium palustre, *L.*, *var.* Witheringii (*Sm.*), 112 (Fair Isle).
Asperula arvensis, L., casual in 91 and 92.
Crucianella angustifolia, L., 83 cas.

Valerianaceæ.

Valerianella eriocarpa, Desv., and *V. rimosa*, Bast., casuals in 83.
Fedia Cornucopiæ, Gærtn., 83 cas.

Dipsacaceæ.

Dipsacus sylvestris, *L.*, 83 cas.
Scabiosa maritima, L., 83 cas.

Compositæ.

Solidago lanceolata, L., 82 cas.
Erigeron acre, *L.*, 94.
Xanthium strumarium, L., 83 cas.
Lasthenia glabrata, Lindl., 83 cas.
Achillea Millefolium, *L.*, *var.* lanata, *Koch.*, 112 (Fair Isle).
Anthemis mixta, L., 83 cas.
Chrysanthemum macrophyllum, Waldst. and Kit., 83.
Artemisia maritima, *L.*, 83†; *A. longifolia*, Nutt., and *A. sericea*, Weber, casuals in 83.
Xeranthemum annuum, L., 83 cas.
Carduus nigrescens, Vill., 83 cas.
Onopordon illyricum, L., and *O. tauricum*, Willd., casuals in 83.
Centaurea Cyanus, L., 112.
Crepis virens, *L.*, 112†; *C. tectorum*, L., 92 cas.
Hieracium Pilosella, *L.*, *var.* concinnatum, F. J. Hanb., 94; *var.* nigrescens, *Fr.*, 94.
H. anglicum, *Fr.*, *var.* acutifolium, Backh., 94.
H. iricum, *Fr.*, 94.
H. alpinum, *L.*, *segr.*, "known certainly for 90, 92, 94, 97; confirmation is desirable for other records" (E. F. L.).
H. nigrescens, *Willd.*, *var.* gracilifolium, *F. J. Hanb.*, 94.
E. F. Linton gives for the true *H. nigrescens* only 88 as certain, 90 × 92 as practically certain, 72 as probably correct, the records for 94, 97, and 108 as belonging to *H. curvatum*, Elfstr., and the others (85, 89, 98, 105) as "*sub nube* for the present."

H. Schmidtii, *Tausch.*, *var.* crinigerum, *Fr.*, 94.
H. argenteum, *Fr.*, 94.
H. pseudonosmoides, *Dahlst.*, 92, 94, 104.
H. buglossoides, *Arv. Touv.*, "106, 107 are the only records for this species; most others referring to the preceding species" (E. F. L.).
"H. silvaticum, *Gouan*, aggr." Rev. E. F. Linton points out that Gouan's plant is not equivalent to H. murorum, *var.* β silvaticum, of Linnæus, as understood in English works, and that therefore "all except 73, 103" is too general a distribution for H. silvaticum, *Gouan*, which includes only a few scarce and very local varieties; and he questions "very strongly" phæotrichum, *Dahlst.*, as having been found in Britain.
H. variicolor, *Dahlst.*, 94.
H. serratifrons, *Almq.*, *var.* Stenstroemii, *Dahlst.*, 94.
H. petrocharis, *Linton*, 90.
H. sagittatum, *Lindeb.*, *var.* subhirtum, *F. J. Hanb.*, 90; *var.* lanuginosum, Lönnr., 84.
H. sarcophyllum, *Stenstr.*, 94.
H. euprepes, *F. J. Hanb.*, *var.* clivicolum, *F. J. Hanb.*, 94, 96.
H. eustalis, *Linton.* "Omit 92; I have withdrawn the plant as not identical" (E. F. L.).
H. duriceps, *F. J. Hanb.* "The counties from which this has been recorded must all be struck out except 98, 108, and 112" (E. F. L.). Most of the gatherings recorded from other counties as *H. duriceps* "proved to be *H. micracladium*, Dahlst., and in course of time came to be so recorded" (E. F. L.).
H. pinnatifidum, *Lönnr.*, 96.
H. angustatum, *Lindeb.*, *var.* elatum, *Lindeb.*, 94.
H. sciaphilum, *Uechtritz.*, *var.* strumosum, *Ley*, 80.
H. truncatum, *Lindeb.* "To the best of my knowledge 112 is the only genuine record" (E. F. L.).
H. stictophyllum, *Dahlst.* "I can confirm 72 and 73, also 110, and can add 108; but can find no data for 86, 99, 102, 105. Omit 97; this record belongs to *H. sparsifolium*, Lindeb." (E. F. L.).
H. sparsifolium, *Lindeb.*, 94.
H. strictum, *Fr.*, 96.
H. corymbosum, *Fr.*, 94; *var.* salicifolium, *Lindeb.*, 111.
H. auratum, *Fr.*, 94.
H. umbellatum, *L.*, *var.* linariifolium, *Walbr.*, 74 (J. M'A., *t.* E. F. L.); *var.* coronopifolium, *Fr.*, 72.
Taraxacum (officinale, *Weber*), croceum, *Dahlst.*, 112.
Lactuca Scariola, L., 83 cas.

(*To be continued.*)

ZOOLOGICAL NOTES.

Rare Birds at Fair Isle.—Since my note in the last number of "The Annals," the following uncommon birds have occurred at Fair Isle, concerning which full particulars will be given in our next number:—Short-toed Lark (*Calandrella brachydactyla*); a small flock of Little Buntings (*Emberiza pusilla*); several Yellow-browed Warblers (*Phylloscopus superciliosus*), Bluethroats (*Cyanecula suecica*), and Wood Larks (*Alauda arborea*); and a Black Redstart (*Ruticilla titys*).—Wm. Eagle Clarke.

Rose-coloured Starling in Argyllshire.—A fine male *Pastor roseus* was found dead by Mr. Baird, of Bonawe, during the early days of autumn.—"Oban Times," 31st August 1907.

Male Reed-Bunting Incubating.—It may be worth recording that on 25th May 1907, when passing through some tussocky grass near the margin of Loch Eldrig, Wigtownshire, I flushed a male Reed-Bunting (*Emberiza schœniculus*) from a nest containing five eggs. It then went through the time-honoured pantomime of feigning cripple, which I do not remember to have seen performed by the male bird of any species, unless it were a nightjar, the sex of which I could not distinguish.—Herbert Maxwell, Monreith.

Marsh Titmouse in Aberdeenshire.—There were one or two Marsh Titmice (*Parus palustris*), together with a good many Coal Tits, on some spruce firs beside the river Don, near Alford, on 21st August, and on the same day it was noticed that a good many Willow Warblers and Spotted Flycatchers were on the move.—J. H. Gurney, Keswick, Norfolk.

[A similar account of a single bird near Newburgh, in the extreme east of the county of Aberdeen, is given by Sim in his "Fauna of Dee" (p. 85); and likewise one seen by Geo. Sim, of Gourdas, on 2nd February 1896 (*loc. cit.*). A. G. More included it as an Aberdeenshire bird, and is quoted by R. Gray ("Birds of the W. of Scotland," p. 106). But proof of it nesting anywhere east of the watershed of Dee is still required.—J. A. H.-B.]

Red-breasted Flycatcher at the Bell Rock Lighthouse.—Writing from the Bell Rock, Mr. Robert Clyne tells me that on the 25th October a small bird came to the lantern, along with a few Blackbirds and Thrushes. From the front view he had of it through the glass, it resembled a Willow Warbler; but there were no superciliary markings, and the greenish brown plumage was a little lighter in colour round the eye. On going outside to try and catch it for examination, the bird escaped, leaving half its tail feathers in his hand. These he fortunately preserved and sent to me. If Mr. Clyne was only destined to secure a few of the stranger's plumes,

he could not have secured any which, in this case, would have revealed the secret of its identification with greater certainty than the pretty black and white feathers which form the tail of this little bird. This species has not occurred previously on the east coast of the mainland of Scotland, for the young male recorded for Berwick-on-Tweed, on the 5th of October 1883, was captured on the south side of the river. Mr. Clyne is to be congratulated on the fact that his efforts have led to the detection of this interesting visitor at his lonely station.—Wm. Eagle Clarke.

Spoonbills in the West of Scotland.—Two specimens of the Spoonbill (*Platalea leucorodia*), obtained in November last, have been forwarded to Mr. Bisshopp, of Oban, for preservation. The first of these was an immature male from the Island of Canna; the second was from the Island of Inchkenneth, Loch-na-keal, West Mull. Both were duly recorded in the "Oban Times."

Flock of the Glossy Ibis in Orkney.—On 24th September a flock of nineteen or twenty Glossy Ibises (*Ibis falcinellus*) appeared at Sandwick, in Orkney, a small township about four miles inland and about eight miles from Stromness, where they frequented some marshy ground. The man who discovered them did not think of shooting them at first, and so for three days they remained in peace, but on the 27th until 1st October he shot two or three each day as they were feeding in a burn, until he had accounted for no less than ten. They were very wary and rose high in the air when disturbed. Most of them were sent to Mr. Malloch, of Perth, and it would be interesting to know whether they were old or young birds. I do not think there are a dozen records of this bird having visited Scotland, and the occurrence of a flock of them in Orkney is most unusual, as I believe the species has only occurred twice before in these islands: viz. a young bird near Stromness, on 19th September 1903, which I mentioned in the "Field" at the time, and another near Kirkwall as long ago as September 1857, exactly half a century ago.—H. W. Robinson, Lansdowne House, Lancaster.

[The specimens sent to Mr. Malloch are, we are informed, all immature birds.—Eds.]

Glossy Ibis at Speymouth.—This bird was seen on the Lein Burn by Mr. John Smith, of Garmouth, who shot at and wounded it. He kept it alive for several days, when it died and was cast away. Mr. James Geddie, hearing that a strange bird had been shot, rescued it and had it preserved. I got the specimen a few days afterwards for the Duke of Richmond and Gordon, and it is now at Gordon Castle. The back and upper parts are black with greenish reflections; and the head and neck are buff-coloured with some dark feathers in them.—George Muirhead, Fochabers.

Note on a Young Gannet.—A strange bird visited Strathmore at the latter end of September, and was fed wholly on mice; indeed, it would take nothing else. It only lived for a fortnight, and little wonder. Its identity puzzled the person with whose fowls the bird associated. The colour of the plumage was different to anything he had previously seen in the vicinity. Feathers of the bird were brought to me after it had been dead a fortnight. Failing to identify it from the feathers, I cycled up to see its remains, and was surprised to find it to be a Gannet, in first year's plumage. Seldom, indeed, are Gannets of this age seen in Lochbroom—and why I cannot conceive. Never were there more mature birds of this species seen in Lochbroom than this year, and rarely was there a better herring fishing in the loch than in the past autumn. —J. T. HENDERSON, Lochbroom.

Early Nesting of the Shag.—This year the Shags (*Phalacrocorax graculus*) started nesting remarkably early in Orkney. They commenced building their nests in January, and the first eggs were found on 24th February, on the Island of Sule Skerry. The weather during these months was very stormy, but not cold, and perhaps this latter fact had something to do with their early nesting, which was much earlier than had ever been known in Orkney before. —H. W. ROBINSON, Lansdowne House, Lancaster.

Nesting of the Quail in Scotland. — Mr. Harvie-Brown's editorial to Mr. H. N. Bonar's note upon the Quail (*Coturnix communis*) nesting in East Lothian during the late most inclement summer ("Annals," October 1907, p. 248) is apt to be misunderstood by persons who have not studied the habits of this desirable little bird or followed the records of its visits to the United Kingdom. It does not follow that the East Lothian Quails had any connection with those turned down in Stirlingshire. Quails turn up in the most unlikely places and at uncertain times. Who, for example, would have expected Quails to nest in Fair Isle? Yet Mr. Eagle Clarke obtained eleven eggs in that diminutive and remote island in 1905. When I was a boy, about the year 1855, Quails were quite common and resident in Galloway. I was told that they had appeared in quantities after a great gale in 1839, and partridge shooters seldom returned without a few Quail in the bag. But they gradually diminished in numbers, becoming rare after 1862, and I have not seen one on the wing since about 1874. There is probably nothing unsuitable in British soil or climate to the nature of Quails. The chief cause for its irregular appearance seems to be the position of these islands, lying outside the regular track of migration; wherefore only wanderers or storm-driven flocks find their way hither. All their needs for feeding and breeding may be satisfied; they may remain stationary for several seasons; but sooner or later the inveterate impulse comes upon them; away they go to winter

under the sun, and it may be years before another immigration takes place.—HERBERT MAXWELL, Monreith.

Woodcocks and Blackgame in Dumfriesshire.—It is gratifying to read Mr. Gladstone's note ("Annals," October 1907, p. 249) about the increasing number of Woodcocks bred in Dumfriesshire. This is the direct outcome of the Wild Birds Protection Acts. Previous to 1880, March and April were the months when most Woodcocks were shot on the seaboard of Wigtownshire, as I can testify to my shame. We thought that they were birds collecting for emigration; whereas they were confiding immigrants, proposing to rear their young in our inhospitable woodlands. But it is sad to read that in Nithsdale, as elsewhere in Scotland, no mercy is shown to immature birds in August. Were I still in Parliament, I should introduce, and back myself to succeed in carrying, an extension of the statutory close time from its present termination on 31st July to 1st October. Will no legislator undertake the task? The House of Commons is always sympathetic to proposals for the protection of wild animals, provided they are not promoted in the interest of landlords. Meanwhile, it is in the power of County Councils to obtain an order from the Home Secretary or the Secretary for Scotland, extending or reducing the close time for any wild bird.

In another category are Blackgame, whereof the steady diminution demands serious attention. Nithsdale used to be the most famous resort of this noble fowl. The five best years at Drumlanrig yielded the following returns:—

1861	1586	Blackgame.
1865	1530	,,
1869	1508	,,
1870	1486	,,
1871	1429	,,

The best day's bag, shot by ten guns on Sanquhar, contained 247 Blackgame, of which 200 were cocks. Now, I am told, 20 or 30 brace is considered a fair bag. Let Blackgame have the same close season as our other polygamous gamebird, the Pheasant, namely from 1st February to 1st October, instead of the present unreasonable one from 11th December till 19th August. Who would not blush to floor Pheasants before they got their full plumage? Yet it is a common practice, especially among those who hire Scottish shootings, to massacre Blackgame poults when they cannot take wing without a struggle.—HERBERT MAXWELL, Monreith.

Note on the Waterhen.—On 23rd October, when shooting in a flooded meadow, one of the beaters found a Waterhen (*Gallinula*

chloropus) sitting at the side of a small stream. He tried to catch it with the crook of his stick but failed, and it slid into the water. It then swam down the stream under water for about fifty yards, using its wings as a man uses his arms in swimming. We headed it off, and it then swam up stream in a similar manner—when it came to the surface it was nipped up by a retriever. It was a sight I had not seen before, and all present were astonished at the length of time the bird swam below water.—HUGH S. GLADSTONE, Capenoch, Dumfriesshire.

Black-tailed Godwit and Great Grey Shrike in Fife.—On the shore at St. Andrews, on the 5th of December, we saw a Black-tailed Godwit (*Limosa belgica*). It was standing at the edge of the sea with a Bar-tailed Godwit (*L. lapponica*), and they allowed us to come quite close and examine them for some time through our glasses; they then took flight, and the white upper tail-coverts and black tail of *belgica* were extremely noticeable. On the 28th November a Great Grey Shrike was procured here: it turned out to be an adult male.—EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL.

[According to "The Field" (23rd November, p. 937), a Black-tailed Godwit was shot on the Beauly Firth during the previous week.—EDS.]

Sabine's Gull in the Firth of Forth.—On 31st August last (1907) I had an excellent view, with the aid of binoculars, of an immature Sabine's Gull (*Xema sabinii*) from the deck of the *Roslin Castle* shortly after leaving Elie for Leith. It followed the steamer for some distance, occasionally coming within 50 to 60 yards of us, but did not mix with the other gulls which were eagerly picking up bits of bread, etc., thrown to them. This is the second time I have seen a Sabine's Gull in the Forth (see "Annals," 1896, p. 257), and it may be recalled that a specimen was shot at North Berwick early in October 1877.—WILLIAM EVANS, Edinburgh.

Angler Fish in the Tay.—On the 10th of October last I received from a man in Errol a specimen of the Angler Fish or Fishing-frog (*Lophius piscatorius*) which I have preserved for the fish case in the museum. The species is common enough on the East Coast, and is often to be seen on the sands at Carnoustie. The interest of the present specimen is that it should have been taken alive at Port Allan (on the Tay), which is not much more than eight miles east of Perth.—A. M. RODGER, Perth.

Lepidoptera from East Ross and other Localities in the North of Scotland.—The following is a further list of species which have not been recorded so far north, or in East Ross, in Barrett's "British Lepidoptera," and which I have taken within an eight-mile radius of Swordale, either in larva or imago state, this year:—

Lucania pallens, *Miana literosa*, *Noctua augur*, *N. baja*, *Amphipyra tragopogonis*, *Mania typica*, *Calymnia trapezina*, *Orthosia lota*, *O. macilenta*, *Dianthœcia capsincola*, *D. cucubali*, *Epunda nigra*, *Agriopes aprilina*, *Aplecta herbida*, *Hadena protea*, *Gonoptera libatrix*, *Eugonia alniaria*, *Acidalia aversata*, *Hybernia rupicapraria*, *H. progemmaria*, *H. defolaria*, *Anisopteryx æscularia*, *Eupithecia subfulvata*, *E. castigata*, *E. fraxinata*, *E. vulgata*, *E. absinthiata*, *E. abbreviata*, *E. togata*, *Melanthia rubiginata*, *Pyrausta ostrinalis*, *Botys forficalis*, *B. lutealis*, *Hydrocampa symphœlis*, *Platyptilus ochrodactylus*, *P. gonodactylus*, *Amblyptilus acanthodactylus*, *A. punctidactylus*, *Aphomia sociella*, *Pandemis corylana*, *Steganoptycha ramella*, *Lithographia cinereana*.

An exceedingly wet week-end spent at Balmacara, West Ross, in June, resulted in the capture of the following species, in the larva state, all which appear to be unrecorded for that district:—*Calymnia trapezina*, *Amphipyrata tragopogonis*, *Agriopes aprilina*, *Plusia festucæ*, *Hypœna proboscidalis*, *Phigalia pilosaria*, *Eupithecia abbreviata*, *Cidaria fulvata*, *Hybernia defolaria*. The year before, in June 1906, I took one imago of *Phytometra æna*.

At Dornoch, at the end of September, I got larvæ (also unrecorded) of the following:—*Biston betularia*, *Notodonta dictæa*, *Eupithecia centaureata*, *E. absinthiata*.

A few days spent in the neighbourhood of Wick in September resulted in the following still more northerly records:—*Smerinthus populi*, *Notodonta ziczac*, *Rumia cratægata*, *Odontopera bidentata*, *Cabera exanthemaria*, *Eupithecia fraxinata*, *Hypsipetes impluviata*, *Cidaria miata*, *Cidaria corylata*.

An afternoon's beating in some oak woods close to Inverness was rewarded with one larva of *Nola confusalis*, and one larva of *Sarothripa revayana*, together with many other commoner species.—Dorothy Jackson, Swordale, Ross-shire.

Amblyptilus punctidactylus.—On 4th September 1907, the gardener of a neighbouring estate drew my attention to the numbers of this small moth which were resting on the inside of the window-pane in his toolshed. Much puzzled at finding this insect in such a strange situation, I searched round the shed for some clue to its entry, and came upon a basket of cowslips which had been kept for seed, and noticed that the handle and sides of the basket, as well as the withered stalks, had a number of pupæ of this species attached to them. On further examination I found the seed-vessels to be almost all bored through by the ravages of the larva, nothing but the larval excrement being left in its place. Surely this is a new food-plant of this species. Barrett only mentions the flowers of *Stachys sylvatica* and *Salvia glutinosa*, and on the Continent on the seeds of *Acquilegia vulgaris*.—Dorothy Jackson, Swordale, Ross-shire.

Cheiridium museorum (*Leach*) **and Chernes rufeolus** (*Simon*) **in the Tweed Area.**—On the 19th of September last, while staying at Haswellsykes Farm, Peebles, I found the small Pseudo-Scorpion, *Cheiridium museorum*, common on pieces of wood, etc., which seemed to have lain undisturbed for a considerable period in the stable-loft. Specimens have also been obtained on subsequent dates both by my friends Messrs. G. A. and R. B. Whyte and by myself, the habitat always being the same. Several nests were discovered on 19th October, one with two young. I believe it is generally understood that *C. museorum* never has more than from two to three young.

On 19th September last I also obtained my first record here for *Chernes rufeolus*, one mature specimen being taken from some chaff in one of the stalls. Mr. R. B. Whyte took four of the same species from under some stones on the floor of the same stable on 1st October.—ALASTAIR URQUHART, Edinburgh.

Sirex noctilio, *F.*, **in Forth.**—It appears that the Wood Wasp which it has been the custom to record in this country under the name of *Sirex juvencus* is not the true *S. juvencus*, F., but *S. noctilio*, F. (*cf.* Rev. F. D. Morice's remarks in "Ent. Mo. Mag.," 1904, p. 34). I have submitted a specimen (♀), which was caught on a felled pine at Penicuik in September 1906, to Mr. Morice, and he says it is *noctilio* and not *juvencus*. Other specimens in my collection from Dalmeny and Gosford clearly also belong to this species. —WILLIAM EVANS, Edinburgh.

BOTANICAL NOTES AND NEWS.

OBITUARY NOTICES.

Edward A. L. Batters, B.A., LL.B.—The death of Mr. Batters has been a grievous blow to British algological study; for there seemed every reason to expect many years of energetic and successful investigation among the seaweeds of our coasts, and the publication by him of the book or books on his favourites that he had showed himself so fit to write and that are so much required, embodying the advances made in this field in other regions along with his personal discoveries. It is known that he intended to prepare an algological flora of the British coasts; but the manuscript was not advanced enough to be of service.

Born in December 1860 at Enfield, he was educated at King's College School, London, and at Cambridge, and afterwards studied law at Lincoln's Inn. But, possessed of private means, he did not

follow law as a profession. While a child he spent the summers at Berwick-on-Tweed with his mother, from whom he inherited a love of seaweeds and fossils. She died when he was seven years old; but he retained his love for seaweeds. Becoming early acquainted with Mr. E. M. Holmes, he was assisted by him in his earlier difficulties, and brought into relations with other algologists. In 1889 he published his first important paper, the admirable 'List of the Marine Algæ of Berwick-on-Tweed,' extending to 171 pages of the "Berwickshire Naturalists' Club's Transactions," and illustrated by 5 plates. This was followed in 1891 by a 'Hand-List of the Algæ of the Clyde Sea Area,' which appeared in the "Journal of Botany"; to which in subsequent years he contributed short papers on new and critical species, several belonging to new genera characterised by him, while other papers on new forms were issued in the "Phycological Memoirs," in the "Annals of Botany," and in "Grevillea." In 1902 was published in separate form a "Catalogue of the British Marine Algæ," which had appeared as a supplement to the "Journal of Botany." Its title does not adequately express its importance, as it embodies his views on their classification and gives a very full statement of their local distribution. He formed a very large herbarium of British seaweeds, a good exotic collection, and a great number of microscopic preparations. There is reason to hope that these collections will be acquired for the British Museum Herbarium. A biographical notice by A. and E. S. Gepp, with a portrait, is given in the "Journal of Botany" for November 1907.

During the years 1905 and 1906 the Botanical Society of Edinburgh lost several Fellows, of whom obituary notices are given in the addresses of the President, Professor Balfour. Among those Fellows the following were students of the flora of Scotland:—

Patrick Neill Fraser.—One of the oldest Fellows, he took an active interest in the work of the Society, and devoted especial attention to the Ferns, of which he possessed a very fine collection of living plants and a large herbarium, now in the Herbarium of the Royal Botanic Garden. His collection of herbaceous plants was also exceptionally fine.

Rev. James Farquharson, D.D., Minister of the parish of Selkirk. A brief notice of him appeared in this journal in 1906 (p. 188); but to it a little may be added. In 1876 he published a "List of the Flowering Plants and Ferns observed in Selkirkshire," and also a paper "On the Leafing of Certain Trees, etc.," being a record of observations made in 1861-76 on the leafing and flowering of the Scots plane, the Norway plane, and the common lime. The effects of winters 1878-81 on gardens and shrubberies of Selkirk formed the subject of another essay. In 1883 he found *Carex divisa* on

Holy Island. In 1878 he contributed to the "History of the Berwickshire Naturalists' Club" an account of the "hained ground," of 300 acres of the old Ettrick Forest, at Bowhill, where the "haining," or enclosure of the ground from cattle and sheep, had allowed the growth of the indigenous trees and bushes.

Frank Townshend, F.L.S.—Though not directly associated with the investigation of the flora of Scotland, Mr. Townshend gave ready and valuable aid to those who sought his help in determining the various forms of the critical groups that he especially studied (*Euphrasia* and *Ranunculus acer*), and Scottish botanists shared that aid in the investigation of local floras.

Cordiceps ophioglossoides in Peeblesshire.—This rare fungus was found last September by Mr. Rupert Smith at Stobo, near Peebles. The only other record of it being found in Scotland is Crosbie, West Kilbride, where it was gathered by the late Prof. Thomas King and Mr. D. A. Boyd, who recorded it in the "British Association Handbook of the Natural History of the Clyde Area."

At some of the fungus forays last autumn several interesting fungi were collected. At Gosford, East Lothian, the Jew's-ear fungus, *Hirneola auricula-Judæ*, was found in hundreds growing on elder trees, and in one instance more than a dozen specimens were seen growing on a fallen plane tree, *Acer pseudo-platanus*, and probably this is the first time this fungus has ever been found growing on the plane tree. In the old Caledonian forest at Dalkeith, where the beef-steak fungus is so common, a very large specimen of *Tremella foliacea* was found, and great quantities of *Bulgaria inquinans* on the trunks and branches of cut timber. At Arniston, Midlothian, *Leotia lubrica* was got in its old station, where it is still plentiful.—A. B. Steele, Edinburgh.

Rosa hibernica, *Sm.*, in Banffshire.—In the beginning of September last Mr. W. G. Craib sent me for determination a small parcel of roses which he had collected in the district around Banff. Amongst them was a specimen of what seemed *R. hibernica*, Sm. This was gathered at Mill of Melrose, in the parish of Gamrie, two or three miles to the east of Banff. At my request Mr. Craib sent on other specimens which put the matter beyond doubt. *R. hibernica*, Sm., var. *glabra*, was discovered by Prof. Trail a few years ago in the same parish, but on its eastern border, and has been recorded by him in the "Flora of Buchan." Mr. Craib's rose, however, is not the glabrous, but the hairy form, similar to the original *R. hibernica* of Belfast. So far as I know, there is only one other station for this form in Scotland, viz. near Ormiston, on the boundary between Mid and East Lothian. The Ormiston rose is hairier than that of Gamrie, and indeed the hairs in the latter

seem to have a tendency to wear off, though it cannot be said to be glabrescent. There are some other slight differences between the two, but in all their main characters they agree with each other and with the Belfast rose. The fruits in both are abortive to such an extent that I have not seen any sufficiently advanced to make sure whether the sepals become erect or not, and until this point be determined, one cannot decide whether the second parent is *R. dumetorum*, Thuill, or *R. coriifolia*, Fr. There can of course be no doubt that the other parent is *R. pimpinellifolia*, Sm.—W. BARCLAY.

Casuals near Aberdeen.—During the year 1907 I have continued to keep a watch on the plants that spring up on rubbish deposits around Aberdeen. The most productive site has for a few years been on the Links east of Old Aberdeen, where quantities of town refuse have been deposited to form a drive along the coast and a football ground on a low part, which has thus been raised above the level of the highest tides. The football ground has for some time received almost all the refuse; and a sparse vegetation has grown on parts of the surface, where not destroyed by new deposits. During 1907 I have found, among numerous other casuals, the following, none of which has been previously recorded from this part of Scotland:—*Sisymbrium Columnæ*, Jacq., β[1]; *S. tanacetifolium*, L., α; *Erysimum repandum*, L., α; *Lepidium incisum*, Roth., β; *Silene cretica*, L., α, weed in my garden, among strawberries; *Medicago littoralis*, DC., β; *Melilotus sulcata*, Desf., γ; *Trifolium Thalii*, Vill., α; *Apium leptophyllum* (DC.), F. Muell., α; *Schkuhria isopappa*, Benth., β; *Senecio arabicus*, L., γ; *Centaurea melitensis*, L., γ; *Statice Suworowi*, Regel, α; *Phleum tenue*, Schrad., γ. Of casuals previously recorded from near Aberdeen, but extremely rare here, I found on the football ground *Sisymbrium Sophia*, L., β, and *Hordeum murinum*, L., α.—JAMES W. H. TRAIL.

Fungi from the Isle of May.—During their sojourn on the Isle of May for the purpose of witnessing the migratory movements of birds, the Misses Baxter and Rintoul collected the following species of Fungi, specimens of which they submitted to me for identification:—

Tricholoma grammopodium, *Clitocybe dealbata*, *Pholiota mutabilis*, *Naucoria semiorbicularis*, *N. melinoide*, *Stropharia æruginosa*, *S. semiglobata*, *Psilocybe fœnesecii*, *Panœolus separatus*, *Hygrophorus pratensis*, *H. virgineus*, *H. coccineus*, *H. psittacinus*, *Clavaria inequalis*, *C. fusiformis*, *Calocera viscosa*, *Bovista plumbea*. A. B. STEELE, Edinburgh.

[1] The frequency of occurrence is denoted by α for one example, β from two γ several.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—October-December 1907.

[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.

Some New European Insectivora and Carnivora. By Gerrit S. Miller. *Ann. and Mag. Nat. Hist.*, November 1907, pp. 389-398.—Putorius erminea ricinæ, a new sub-species, is described from specimens obtained in the islands of Islay and Jura; and Felis grampia, a new species of Wild Cat, from examples obtained at Inverness.

Black-tailed Godwit and Shoveller on the Beauly Firth. Alick Ross, *The Field*, 23rd November 1907, p. 937.—A specimen of each killed "during the past week."

Nesting of the Lesser Tern (Sterna minuta) in the Outer Hebrides. Percy F. Bunyard, *Zoologist*, October 1907, pp. 386-387.—Two eggs found on 18th June on the island of Kirkibost, N.W. side of North Uist. Note on same subject by J. A. Harvie-Brown, *Zoologist*, November 1907, p. 432.

Lepidoptera in Glenshian, Inverness-shire, in July 1907. James J. Joicey and A. Noakes, *Ent. Mo. Mag.*, November 1907, pp. 255-256.—Ninety-four species recorded.

Tortrix semialbana, Gn., in Argyllshire. T. A. Chapman, *Ent. Mo. Mag.*, November 1907, p. 258.—Refers to specimens taken in July 1857 near Lochgoilhead.

Occurrence of Gelechia streliciella, H.S., in the Highlands. C. T. Cruttwell, *Ent. Mo. Mag.*, October 1907, pp. 235-236.—Several specimens obtained at Aviemore. A further note on these specimens is given by Eustace R. Bankes.

Gelechia solutella, Z., ab. Cruttwelli, n. ab. By Eustace R. Bankes, M.A., F.E.S., *Ent. Mo. Mag.*, November 1907, 244-245.—One specimen taken by Canon Cruttwell at Aviemore.

Coleophora marginatella, H.S. (?) in Scotland. Eustace R. Bankes, *Ent. Mo. Mag.*, November 1907, pp. 257-258.—One from Braemar and three from Aviemore, all taken by Canon Cruttwell.

Micro-Lepidoptera in the Highlands. C. T. Cruttwell, *Ent. Mo. Mag.*, November 1907, pp. 256-257.—A list of species captured at Braemar and Aviemore.

COLEOPTERA AT AVIEMORE AT EASTER. By Prof. T. Hudson Beare, B.Sc., *Ent. Mo. Mag.*, December 1907, pp. 272-273.—Twenty-two species recorded.

A FORTNIGHT IN THE HIGHLANDS. By H. St. J. K. Donisthorpe, F.Z.S., F.G.S., *Ent. Record*, October 1907, pp. 229-230.—A record of Coleoptera captured in various Scotch localities, including Rannoch, Aviemore, and Nethy Bridge.

COLEOPTERA IN THE HIGHLANDS. C. T. Cruttwell, *Ent. Mo. Mag.*, November 1907, pp. 251-252.—A long list of species taken at Aviemore and Braemar.

OCYPUS CYANEUS, PAYK., IN SCOTLAND. Thos. G. Bishop, *Ent. Mo. Mag.*, November 1907, p. 251.—A male captured near Grantown-on-Spey in June 1907.

OCYPUS CYANEUS IN SCOTLAND. Horace Donisthorpe, *Ent. Mo. Mag.*, December 1907, p. 275.—Taken by Col. Yerbury at Nairn.

CRYPTOPHAGUS SUBDEPRESSUS, GYLL., A NEW BRITISH BEETLE. By Norman H. Joy, M.R.C.S., F.E.S., *Ent. Mo. Mag.*, October 1907, pp. 225-226.—Two specimens captured on young fir trees near Strathpeffer, Ross.

HENOTICUS SERRATUS, GYLL., FROM SCOTLAND. Richard S. Bagnall, *Ent. Mo. Mag.*, October 1907, p. 234.—Found at Arrochar, Loch Long, in July 1906.

CHRYSOMELA MARGINATA, L., ON ARTHUR'S SEAT. T. Hudson Beare, *Ent. Mo. Mag.*, December 1907, pp. 274-275.—Several specimens taken in June and July 1906.

MYRMECOPHILOUS NOTES FOR 1907. By H. St. J. K. Donisthorpe, F.Z.S., F.E.S., *Ent. Record*, November 1907, pp. 254-256.—Formica sanguinea taken at Aviemore and Nethy Bridge, Staphylinus stercorarius at the Forth Bridge, Othius myrmecophilus at Nethy Bridge, Piezostethus formicetorum at Rannoch, and Urotrachytes formicarius on Arthur Seat, Edinburgh.

NOTES ON THE HYMENOPTEROUS FAMILY AGATHIDIDÆ. By Claude Morley, F.E.S., *Entomologist*, October 1907, pp. 217-220.—Microdus clausthalianus recorded from Barr, in Ayrshire (Dalglish.)

NOTES ON BRITISH BRACONIDÆ, V. By Claude Morley, F.E.S., *Entomologist*, November 1907, pp. 251-254.—Macrocentrus marginator recorded from the Isle of Arran (Waterston), Possil Marsh (Dalglish), and Balmoral (Duncan).

THE MYRIAPODS (CENTIPEDES AND MILLIPEDES) OF THE FORTH AREA—*Continuation.* William Evans, *Proc. Roy. Phys. Soc. Edin.*, vol. xvii. No. 3 (August 1907), pp. 109-120.—Deals with the Symphyla and Diplopoda, eighteen species.

HYDRACHNIDÆ COLLECTED BY THE LAKE SURVEY. William Williamson, *Proc. Roy. Soc. Edin.*, vol. xxvii. pt. iv. No. 30, pp. 302-307, figs. 1-7.—Eighteen species, belonging to twelve genera, recorded from various localities.

SCOTTISH HYDRACHNIDS—SPECIES COLLECTED DURING 1906. By William Williamson, *Trans. Edin. Field Nat. and Micro. Soc.*, session 1906-7, pp. 393-394.—Twenty-six species recorded, of which seven are new to Scotland.

THE RE-DISCOVERY OF APUS IN BRITAIN. *The Field*, 26th October 1907, p. 765.—This note refers to specimens obtained by Mr. Frank Balfour Browne in two pools on Preston Merse, near Southwick, Kirkcudbrightshire.

BOTANY.

SUMMER EXCURSIONS OF 1906. *Proc. Perthsh. Soc. Nat. Sc.*, iv., pp. cxxxviii-cxliii.—Near Ochtertyre were found *Strobilomyces strobilaceus*, *Cortinarius bolarius*, and other rare fungi.

RUBUS MUCRONATOIDES. By the Rev. Augustin Ley, M.A. *Journ. Bot.*, 1907, pp. 446-447.—Described as a variety of *R. mucronatus* in Rogers's *Handbook of British Rubi*, but here regarded as a distinct species. It has been recorded in Scotland from Nairn (96) and Rosemarkie (106).

NOTE ON THE FLORA OF THE BLACK ISLE. By Rev. Canon Spence Ross. *T. and P. E. B. S.*, xxiii. pp. 251-252.—Enumerates *Pinguicula grandiflora* near Fortrose and near Ferintosh, *Atropa Belladonna* near Cromarty, and *Corallorhiza* near Fortrose.

NOTE ON PINGUICULA VULGARIS, LINN., AND ITS VARIANTS TOWARDS GRANDIFLORA. By Dr. Wm. MacLean. *T. and P. E. B. S.*, xxiii. p. 251.—Relates to forms observed in the Black Isle, Ross-shire, in 1905.

NOTE ON JUNCUS EFFUSUS, VAR. SPIRALIS. By Magnus Spence. *T. and P. E. B. S.*, xxiii. p. 233.—Records its being "pretty common in Orkney."

ALIEN AND CASUAL GRASSES FOUND NEAR EDINBURGH. By James Fraser. *T. and P. E. B. S.*, xxiii. p. 239 and pp. 255-256. —Twenty-one species recorded, about half not having been found in Scotland previously.

LASTRÆA REMOTA from the Ben Lomond district. Exhibited (9th May 1907) by W. B. Boyd. *T. and P. E. B. S.*, xxiii. p. 281.

NOTE ON PETALOPHYLLUM RALFSII AND PALLAVICINIA HIBERNICA. By Bertram Cockburn, Ph.C. *T. and P. E. B. S.*, xxiii. pp. 279-280.

On the Ricciæ of the Edinburgh District. By William Evans, F.R.S.E. *T. and P. E. B. S.*, xxiii. pp. 285-287, t. 3.

Notes on New Diseases on Picea pungens (on buds, due to an Ascomycete) and on Abies pectinata (on leaves, due to an Ascomycete). By Dr. A. W. Borthwick. *T. and P. E. B. S.*, xxiii. pp. 232-233.

Warty Disease of the Potato (*Chrysophlyctis endobiotica*). By Dr. A. W. Borthwick. *Notes from the Royal Botanic Garden, Edinburgh*, pp. 115-119, t. 23.—The destructive "Black-Scab," first observed within the British Islands a few years ago in Cheshire, is now recorded from Scotland.

Pleurotus decorus, from Drumnadrochit (96), exhibited. *T. and P. E. B. S.*, xxiii. p. 235.

BOOK NOTICES.

A Natural History of the British Alucitides. Vol. i. By J. W. Tutt, F.E.S. London: Elliot Stock, 1906. Price £1 net.

This is the first of two ponderous volumes which are to treat of the so-called "Plume Moths," and although bearing a separate title they really form vols. v. and vi. of the author's great work on the British Lepidoptera. Although issued at short intervals it is obvious that the materials for these exhaustive volumes must have been accumulating for a long period, and we read in the preface that the notes for the present one were commenced twenty years ago. It would thus be difficult to imagine any person better prepared or more competent to produce a thoroughly good account of these interesting, if neglected, insects than the present author. If Mr. Tutt be spared to complete his second volume in the same style, and we sincerely hope that he will, the British entomologist will possess the best account, by a long way, of the "Plume Moths" that has ever been produced.

As in previous volumes, we are treated to a first part containing a portion of a general history of Lepidoptera, and in vol. v. there are two chapters in part i., the first dealing with hybridisation, and the second with "mongrelisation."

These chapters are of much interest, and should be read by all students of variation and heredity.

The second and systematic part of the book is treated in the same masterly fashion as in the previous volumes, and in consequence of the increased difficulty met with in studying these tiny moths the accounts (one might well call them monographs) given of

the twenty species are of proportionately high value, and represent practically all that is known about them.

It would perhaps be out of place for us to criticise the technicalities of classification, nomenclature, and other details gone into in this splendid volume. We are quite content to accept the author's dicta on these difficult points, for he has studied the subject as probably few (if any) have done. We shall only say, therefore, that the student of Scottish Lepidoptera *must* use the volume, and the oftener he consults it the greater will be the benefit he derives from its 558 closely printed pages.

GILBERT WHITE OF SELBORNE. By W. H. Mullens, M.A., LL.M. London: Witherby & Co., 1907. 2s. 6d. net.

The text of this brochure formed the subject of a lecture delivered before the Hastings and St. Leonards Natural History Society. As an epitomised account of Gilbert White and his work, it is a most excellent production, and will rank among the best of its kind ever penned. It is extremely tastefully printed, and is illustrated by a series of plates, reproduced from photographs, depicting the entries in the parish register relating to White's birth and death, his tombstone, the "Wakes" in his time and to-day, Selborne church, etc. The concluding pages are devoted to a bibliography giving particulars of the most important editions that have been issued of the celebrated classic—"The Natural History and Antiquities of Selborne."

THE HOME-LIFE OF SOME MARSH BIRDS. Photographed and Described by Emma L. Turner, F.L.S., and P. H. Bahr, B.A., M.B.O.U. With 32 plates, and many text illustrations. London: Witherby & Co., 1907. 2s. 6d. net.

This work affords a series of remarkably pleasing peeps into the home-life of a number of birds—the Great Crested Grebe; Coot; Snipe; Water Rail; Red-throated Diver; Bearded Tit; Sedge, Reed, and Grasshopper Warblers; and the Black-headed Gull. The plates, which are exceedingly well reproduced, have been very cleverly secured, the subjects evidently being quite unconscious that they were "being taken," and consequently are depicted in very interesting attitudes, or engaged in the performance of various domestic duties. The letterpress, in which is given a number of sketches from pen and ink drawings, is attractively written and very appropriate.

MAMMALS OF THE WORLD. By W. F. Kirby, F.L.S., F.E.S. With an Introduction on Structure by W. Egmont Kirby, M.D. With 30 full-paged coloured plates. London: Sidney Appleton, 1907. 6s. net.

Of the various groups of which the animal kingdom is composed, there is none which lends itself to more attractive treatment than the

Mammals, and a popular work, at a popular price, and with coloured illustrations was certainly a *desideratum*. The book under consideration aims at supplying this want, and does so with partial success. A great deal of useful information is afforded about a large number of species, and on the families and orders to which they belong; but the author has not, we think, treated his subject as attractively as he might have done. The chapter on Structure is rather too technical to be in consonance with the elementary aim of the volume. The coloured plates, each of which figures several species, must be considered satisfactory, when the very reasonable price of the book, which is very nicely got up, is borne in mind.

THE SENSE OF TOUCH IN MAMMALS AND BIRDS, WITH SPECIAL REFERENCE TO THE PAPILLARY RIDGES. Walter Kidd, M.D., F.Z.S. pp. viii + 176. With 164 Illustrations from Drawings and Micro-photographs. London: A. & C. Black, 1907. 5s. net.

The sense of touch is here discussed in relation to the capillary ridges and the papillæ of the corium. The mode of treatment is purely anatomical and intended to demonstrate the great variations in the epidermis and corium on the palmar and plantar surfaces. The complexity of the ridge patterns in different regions—digital, palmar, and plantar—is found to be in close correspondence with the activity and function of the respective parts, a generalisation especially borne out by a comparison of the palm and sole of the baboons with the digits, of the digits of the gibbons with the palm and sole, and of the terminal phalanges of man with any region of any animal. The microscopic studies are concerned only with the outlines of the papillæ of the corium and the papillary ridges, the degrees of development of which are closely related. The author shows that the differentiation of these papillæ and ridges increases with the higher development of the species examined, and he holds that, although they certainly serve as aids to the prehensile efficiency of the limb, this is a secondary function, the nature and arrangement of the ridges, and the intimate and essential connection of the papillary ridges with the sensory papillæ of the corium are more compatible with the view that the ridges primarily subserve the sense of touch. Considerable attention is devoted to the "imbrication" of the papillary ridges, an arrangement which increases the discriminative sensibility of the skin, and the nature of the papillary ridging of the foot in relation to its aid in the maintenance of equilibrium is also discussed.

It is evident that great care has been bestowed upon the observations on which the conclusions are based, and upon the preparation of the figures with which the book is well illustrated. The numerous facts would have been rendered more easy of access had an index been provided.

The Annals
of
Scottish Natural History

No. 66] 1908 [APRIL

WHALING IN SCOTLAND FOR 1907.

By R. C. HALDANE, F.S.A. (Scot.).

THE season of 1907 has been a very productive one, whales appearing in large numbers and showing no signs of diminution, the number killed at each station being :—

	B. musculus.	*B. sibbaldii.*	*B. borealis.*	Sperm.	*B. biscayensis.*	*Megaptera.*	Bottle-nose.
Norrona Co. .	87	1	24	...	...	...	1
Shetland Co. .	39	...	18				
Alexandra Co. .	83	...	19				
Buneveneader Co.	96	9	11	4	24	1	1
Olna Co. . .	many	2	79	6	...	4	
	305, etc.	12	151	10	24	5	2

BALÆNOPTERA MUSCULUS.

The particulars of these whales are :—

	Number of Bulls killed.	Average Length.	Number of Cows killed.	Average Length.	Proportion of Bulls per cent.	Proportion of Cows per cent.
		ft. ins.		ft. ins.		
Norrona . .	47	59 4	40	63 0	54.0	46.0
Shetland . .	23	58 6	16	62 8	59.0	41.0
Alexandra . .	50	62 2	33	62 4	60.0	40.0
Buneveneader .	63	60 0	33	64 0	65.6	34.3
Olna . . .	many					
	183, etc.	60 0	122	63 0	59.6	40.3

By the kindness of Mr. Theodore Salvesen of Leith I am able to give the results of whales killed at Captain Bull's station at Nordfjord, East Iceland, for 1906. This is interesting for comparison: 12 *B. sibbaldii*, 23 *B. musculus*, 25 *Megaptera*, 1 *B. borealis*. Mr. Salvesen also sends me the catch made at the Thorsvig station at Faroe: 3 *B. sibbaldii*, 24 *B. musculus*, 18 *B. borealis*, 3 Bottle-nose.

Norrona station had Finner cow whales of lengths of 70, 70, 70, 71, 72, 70, 72, 70 feet, but the two largest bulls were 68 feet each.

Shetland station had cows of 72 and 73 feet, but the largest bull was 65 feet.

Alexandra station had cows of 71, 70, 70 feet, the two longest bulls being 70 and 69 feet.

Bunaveneader station had cows 73, 71, 71, 70, 70 feet the three largest bulls being 69 feet each. Taking these with what I have recorded in former years, there can be no doubt that cows of *B. musculus* attain a greater size than the bulls; and on an average of all the bulls and cows the latter will be found, as a rule, to be about 3 feet longer than the bulls.

Migration.

The migration of whales is a difficult subject to handle, for we know really very little about the movements of most whales. All that I attempt to do is to put the little I know before the reader and allow him to draw his own conclusions.

In the Antarctic, *Megaptera*, *B. sibbaldii*, and *B. musculus* are very common. Sperm Whales are scarce, though often seen near the River Plate. *Balæna biscayensis* is said to be found near the south coast of South America during March, April, and May. Again, on the west coast of Africa, Sperms and *Balæna biscayensis* are found. Off the coast of Brazil, Megaptera are numerous. Off Tristan da Cunha, Sperm and Atlantic Right Whales are said to be abundant. In south latitudes Finners, Blue Whales, Megaptera, Bottle-nose, Sperm Whales, and Atlantic Right Whales are all seen. But the *Balænoptera borealis* does not seem to be known. It is but right to mention that the Dundee

whalers in 1892[1] did not meet the Atlantic Right Whale; nor is it mentioned among those described by Dr. Wilson in the "Natural History (Vertebrata) of the Voyage of the 'Discovery.'" I am informed by Norwegians that it is to be met with near the South Shetlands. I take it that *Balæna biscayensis* is the same as *B. australis*, which Mr. Beddard seems to think the case. It is probable that it keeps clear of the ice.

But it is the migration of whales in the Northern Hemisphere, and especially in our own seas, to which I want to call attention.

Balæna biscayensis.

This year the Buneveneader station has got 24 of these whales. None have been got at any of the Shetland stations, though, as I mentioned in the "Annals" for January 1907, one was got by a Faroe whaler 50 miles west of Shetland in 1903. In 1906 this Harris station got 6 of these whales. They seem to pass about a degree west of St. Kilda and the Flannen Islands to Iceland, Saxa Fjord and Brede Fjord on the west coast being favourite resorts for them; in the latter 14 were once got in one season.[2] From there they are supposed to pass down the Western Atlantic to Bermuda, where many winter, but probably many go farther south. From there it seems as if they worked northward again, till in summer they once more passed west of St. Kilda. Goldsberg says one was shot on the Arctic coast of Norway, and that old bones have been found at Finmark. Hjort says they must at one time have gone to Norway, probably following the course of the Blue Whale, *B. sibbaldii*. One Norwegian name for this whale is the "Gulf Stream Right Whale." I can only hear of one of these whales having been killed off the Faroes.

Physeter macrocephalus.

This last season Bunaveneader station got 4 Sperm Whales. Olna station got 6. This shows that these

[1] W. G. Burn-Murdoch, "From Edinburgh to the Antarctic."
[2] "A Book of Whales," p. 133.

whales follow the coast of Scotland much in the same course as the Atlantic Right Whale, but after passing Scotland they go more to the east and then pass by the Faroes to Iceland, after which they probably go south towards Bermuda, or even to the South Atlantic.

The total killed off Scotland and Shetland being—

1903.	Norrona Station . . .	1
1904.	Alexandra „ . . .	1
1905.	Olna „ . . .	1
„	Buneveneader Station . .	3
1906.	„ „ . .	1
1907.	„ „ . .	4
„	Olna „ . .	6

this shows that they are but rare visitants at most in these seas, but they have been killed off the coast of Finmark in Norway, and off Faroe and Iceland.

They, especially the cows, like to keep to the warmer parts of the sea, just outside the tropics, as the only cow Sperm killed so far in British waters is the one got at Buneveneader in 1905. They may be said to be found in nearly every part of the world, from the seas off the Azores, South Africa, New Zealand, Chili, to Japan. The stomachs of those got at Olna in 1907 were absolutely empty, containing only some fish-hooks. Off Harris they feed on Sharks, Octopus, and a fish called "Moonfish" by the Norwegians, 7 or 8 feet long by 2 feet deep, probably a species of Sunfish. The Sharks off Harris are often of large size, but that does not protect them from the Sperm Whales.

Megaptera.

These whales do not seem to be frequenting the seas round Scotland and Shetland as much as they once did. Not that they are diminishing in numbers; the catch at Iceland given above disproves this. Off the coast of Brazil, and about South Georgia, they are in great numbers, one of the most common whales. My impression is that when migrating they follow a course something like that of the Sperm Whales. Mr. Salvesen received from Captain Bull a harpoon found in the blubber of a Megaptera killed off

Iceland. It is a curious thing, 10 inches long, composed of a round rod with a loose harpoon-head into which one end of the rod fits. On the other end of the rod are two india-rubber rings, and the place where a third has been. It most likely has a South American origin, and shows what great distances these whales travel.

Balæna biscayensis.

The extraordinary success of the Buneveneader station in capturing 24 of these rare whales is said to have been exceeded by a Company using a floating factory and fishing near South-West Africa, who are said to have got 42 of this species.

The Buneveneader whales consisted of—

12 cows—48, 48, 47, 44½, 44, 49, 47, 47½, 47, 48½, 46, 47½ feet long;
12 bulls—47½, 46, 45, 46½, 45, 45½, 46, 48, 45, 43, 47, 46 feet long;

the cows having an average length of 47 feet and the bulls 45 feet. The cows had an average girth of 36.6 feet, the bulls of 33.7 feet. As is usual with most whales, the cow is larger than the bull.

The whalebone is worth about £400 a ton; but the yield is much less than that of the Greenland Right Whale, as the bone is shorter, generally from 7 to 8 feet, the weight of bone being about 6 to 7 cwt. per whale.

Balænoptera sibbaldii.

The Buneveneader station, as I have said, got six bulls of 69, 80, 73, 76, 81, 71 feet long, or an average length of 75 feet.

The three cows were 82, 79, and 78 feet—an average of 79.6. The large cow had a girth of 50 feet, the largest bulls 42 and 45 feet.

The Norrona cow was 68 feet long.

These "Blue Whales" seem more common off Faroe and Iceland, also off Finmark, than they are off Scotland. Off Shetland they are decidedly rare, the Buneveneader

station, Harris, being the only one that falls in with them in any numbers.

They are said to go very far north, to the neighbourhood of the ice, and seem to pass along by Iceland to Newfoundland, where they are common; 96 having been got in the season of 1906, according to the return of the Department of Marine and Fisheries. In the season 1904-5 the return of Blue Whales (there called Sulphur Bottoms) was 263. The Inspector of Whale Fisheries there attributes the falling off in numbers to either scarcity of whales or that they are shyer and more difficult to approach; but owing to the heavy tax on the stations many of the steamers are being sold to go to Japan, which may account for part of the smaller catch.

Balænoptera musculus.

I had several opportunities for studying the colour of these whales in the sea. The conclusion I came to was that the effect of light makes a great difference. One morning I saw on one side of the steamer a whale which was absolutely sepia in colour; on the other side was a whale so dark grey that it seemed to be black. Neither of these were killed.

Speaking, however, to one of the managers of the stations, he assured me that there really was considerable variation in colour. He thought there were distinct varieties of Finner whales—a large brown whale, the dark grey one, and a smaller black variety. The manager of another station said there were different varieties both of *B. musculus* and *B. sibbaldii*. This is an interesting question, and should be investigated. It shows how little we really know about whales. At the same time one finds trout in the same loch of different colours in different places, yet one could not call them varieties, the colour being due to the nature of the bottom of the part of the loch where they live. It may possibly be that the colouring of whales is affected by the nature of the sea.

It was only in August 1907 that whales were found which were living upon herrings. This is easily explained,

as herrings were very late in appearing on the west coast of Shetland.

I could only hear of three *Pennella balænopteræ* having been observed this year. But a curious parasite, somewhat resembling a tænia, was found under the blubber of a whale's abdomen. The flenser said it was living when taken out. I sent it to Professor Arthur Thomson, Marischal College, Aberdeen.

Finners are plentiful at South Georgia, about 55° S. lat., as are also *B. sibbaldii.*

On 3rd August two whales were brought to the Alexandra station, which had been feeding on a small species of Gadus about the size of anchovies.

In the uterus the head of the fœtus lies next the vagina.

I got the sexes of fœtuses kept for me, and, taking the average of *B. musculus* and *B. borealis*, I find the proportion of males and females is just equal. As more bull whales are killed than cows, it confirms me in my opinion that the cow whale is more timid than the bull and avoids danger. Towards September the size of the fœtus increases greatly, and leads me to think that birth takes place in October and November. Among the contents of the stomachs of *B. musculus*, cuttle-fish are found; one observer reporting "small white fish," probably the species of Gadus referred to above. Owing probably to the cold spring, the first Finners had an unusual quantity of blubber, and the farther one goes north the fatter the whales get.

There has been more outcry this last year that killing whales injures the herring fishing; yet no one can explain why it should do so, and most say there is no proof that it does so. The complainers seem to forget that the migration of fishes, and especially of herrings, is a complex and little understood subject. Temperature, currents, salinity of the sea, must all be considered; while, to quote from the Second Report of the North Sea Investigation Committee (1907, p. 28): "In the northern area of the North Sea, during the summer months, we thus have the inflowing salt Atlantic water bounded by surface layers of Continental coast water on the one side and of fresh Scottish coastal water on the other. The changes in the relative distribution of these

various waters from one season to another form a most interesting problem in connection with the study of the North Sea—a problem which Professor Pettersson believes to have a most important bearing on the migration of the herring."

I am now able to add that the Olna station got 79 *B. borealis*—49 bulls averaging 40.5 feet, 30 cows averaging 38.9 feet. The largest bulls were 54, 50, and 50 feet long; The largest cows were 51 and 47 feet long.

There were two *B. sibbaldii*, 58 and 60 feet, both bulls; four *Megaptera*—one cow, 47 feet; three bulls, 58, 55, and 52 feet long, an average of 55 feet.

The Sperm Whales were, as usual, all bulls—58, 63, 54, 59, 58, and 55 feet, an average of 57.8 feet.

Among the *B. musculus* killed the longest bulls were 71, 71, 71, 71, 72, and 73 feet; the longest cows were 71, 71, 71, 72, 72, 73, and 73 feet.

Lochend, Ollaberry, Shetland.

THE BIRDS OF FAIR ISLE.—III. REPORT ON OBSERVATIONS MADE DURING THE YEAR 1907.

By Wm. Eagle Clarke, F.R.S.E., F.L.S.

Observations on the movements of birds were systematically carried on at Fair Isle throughout 1907; and, like those for the preceding year, have yielded results of considerable interest.

It is not, however, my intention to deal with the main mass of the observations at present; they are reserved as a contribution towards a future report on the remarkable passage movements witnessed at this station, which I hope to prepare when further investigations have been carried out.

The object of this contribution is to afford such additional information on certain birds, already recorded for the island, as may be interesting and necessary; and to enumerate,

with details of their occurrence, those species which have been added to the fauna during the past year.

The chief sources of information are the observations made by Mr. George Stout, who has again earned my grateful acknowledgments for the thorough manner in which he has carried out my instructions; and the investigations made by myself and Mr. C. Preston Donaldson during a five weeks' sojourn on the island during the autumn, when 80 species of migratory birds came under our notice. In this connection, too, I must not omit to mention, and express my thanks for, the valuable assistance rendered by Mr. J. W. Anderson and the Lightkeepers.

During the year the movements of no less than 117 species were recorded. Of these, 77 came under notice on their journeys northward in spring; while in the autumn the observations on the movements southwards, and the visits of a few rare wanderers, related to 111 species. The identical species known to have visited the island on both the spring and autumn passages in 1907 were 71 in number. The new birds added to the fauna were 17, making the total ascertained Ornis of Fair Isle at the close of the year to be 160 species.

Foremost among the new birds in point of interest, and, it may be added, not less so in rarity, is the Siberian Chiff-Chaff. This species is a summer visitor to the extreme N.E. of Europe and to N.W. Asia, and is only known to have reached our shores on one previous occasion. Several examples, however, of this inconspicuous species occurred at Fair Isle in October, and their appearance is of considerable importance since it suggests the possibility that the bird is not a mere accidental visitor, but that further research may prove it to be a more or less regular autumn migrant with us, like its Siberian congener the Yellow-browed Warbler.

The other new birds of the rarer type are the Black-headed Bunting, the Black-throated Wheatear, and the Short-toed Lark; all of them natives of the far south, which should have flitted farther south. These are additional instances of those erratic wanderings of migrants to which the Fair Isle observations have already contributed some remarkable

records. They are possibly due to some unaccountable failure of that special faculty possessed by migratory birds which leads them unconsciously to proceed along the lines they should go to reach the seasonal haunts resorted to by their forebears. The incentive to migrate was, however, evidently strong within them, or they would not have reached such a far-off goal as Fair Isle. The weather at the time was fine and settled, so that the storm-driven theory does not afford an explanation of these vagaries in migration phenomena.

Among the remaining novelties are several well-known though unlooked for British birds, to wit, the Grasshopper Warbler, the Wood Warbler, and the Black Redstart; while the rest comprise species which are less surprising in their appearance but are yet to be deemed of considerable interest: these are the Grey-headed Wagtail, the Hoopoe, and the Snowy Owl.

A number of species — the Little Bunting, Ortolan Bunting, Lapp Bunting, Red-breasted Flycatcher, Yellow-browed Warbler, Arctic Bluethroat, etc. — are worthy of special mention as having again visited the island, and thereby strengthened their claim to be regarded as regular birds of passage, not only at Fair Isle but on Scottish shores.

The repeated appearance, too, of such birds as the Tree Pipit, Whinchat, Red-backed Shrike, Shore Lark, and others, which have hitherto been regarded as exceptional in their visits to the Northern Archipelagos, is not less gratifying, and is, most assuredly, not less important. On the other hand, certain species were remarkable for their great scarcity during the autumn of 1907, among others the Goldcrest and Woodcock; while some were either entirely absent or escaped notice, such as the Pied Flycatcher and Sedge Warbler.

A considerable number of birds were killed at the lanterns of the two Lighthouses. The greatest immolation of these innocents took place on the early morning of October 17th, when at the South Lighthouse alone not less than 500 Redwings and Song Thrushes; 100 Fieldfares; 12 Ring Ousels; many Blackbirds; a number of Starlings, Bramblings,

and Chaffinches; single examples of the Woodcock, Jack Snipe, and Mistle Thrush were found dead near the tower. The death-roll at the North Lighthouse is believed to have been equally great, but no attempt was made there to count or estimate the number of the slain.

It is again my pleasant duty to express to the Commissioners of Northern Lighthouses my gratitude for, and appreciation of, the privileges they so kindly granted to Mr. Donaldson and myself; and to Mr. Dick Peddie for his valued co-operation and advice. Acknowledgments are also due to Mr. and Mrs. Wallace for their great kindness and attention to us during our residence at the Skaddan Lighthouse; and to all our good friends among the inhabitants of Fair Isle, who most obligingly permitted us to wander at will over their crofts in search of the feathered travellers sheltering therein.

In the following list, the species which are numbered are additions to those included in my previous contributions, and also to the avifauna of the island.

Specimens of the more interesting species about to be mentioned have been presented to the collection of British birds in the Royal Scottish Museum.

144. Carrion Crow, *Corvus corone*.—A Carrion Crow was seen continually by us, and we were told that it had been on the island for some weeks previous to our arrival. It always associated with the Grey Crows. This species is one of the additions to the Fair Isle avifauna, and has only been observed as an occasional visitor to both the Orkney and Shetland groups.

Grey Crow, *Corvus cornix*.—An example showing a tendency towards albinism was shot on 20th September. This specimen had several of the primaries in each wing, the chin, right nasal plumes, claws, and soles of the feet white. The bill was tipped with white, and the mandible was white at the base. The grey portions of its plumage were paler than usual and were slightly tinged with buff.

Jackdaw, *Corvus monedula*.—This species had only once before come under our notice, a pair having been seen on 8th September 1905. In 1907 many arrived on 15th April, a few appeared late in October, and a single bird was observed in November.

Greenfinch, *Ligurinus chloris*.—Two Greenfinches frequented one of the geos all the summer, and may have nested there. This bird usually arrives late in the autumn, and a few remain to winter on the island; but it seems to have been absent during the past season.

Greater Redpoll, *Acanthis rostrata*.—A small party of this large Greenland form of the Mealy Redpoll was seen on 21st September. This race is characterised by its large size; the robust form of its bill; and its sombre-coloured, heavily-striped plumage. None of the Fair Isle birds obtained or seen by me in the autumns of 1905 and 1907 showed any signs of pink on the breast.

Linnet, *Acanthis cannabina*.—The second known occurrence of this species on the island is recorded for 17th August, when a single example was observed. Later in the autumn several appeared in October, and the last was seen on the 21st of that month.

145. Black-headed Bunting, *Emberiza melanocephala*.—A female example of this summer visitor to South-Eastern Europe occurred on 21st September. When first observed it was perched on some thistles, to which it returned several times on being disturbed. The contents of its stomach were found to consist, according to Mr. Grimshaw to whom they were submitted, chiefly of fragments of the husks of grass, some seeds (probably of a species of *Polygonum*), fragments of an earwig, an entire phalangid (harvestman), and portions of the larva of a May-fly.

This species has only been chronicled as a visitor to the British Islands on five previous occasions. One of these, the Scottish record, cannot be regarded as entirely satisfactory, for the bird was discovered in a bird show in London in 1887, and was said to have been captured near Dunfermline in November of the previous year.

Little Bunting, *Emberiza pusilla*.—On 14th April, George Stout saw, at the distance of a few feet only, the first Little Bunting that has ever been detected in the British Islands during the spring. He is quite certain as to the identity of the bird, and he speaks with knowledge, for he carefully examined in the flesh the bird which was procured by Mr. Kinnear and myself during the previous autumn.

In October quite a number of these birds visited the island. They were first noticed on the 10th, and were seen until 5th November. No less than nine were observed, but these probably only represented a small proportion of those present, for they are extremely difficult to detect amidst

the vast flocks of Twites which they join after arrival on the island.

The previous records of the visits, few in number, of this species to our shores, relate to the appearance of single examples only; and its appearance at Fair Isle in some numbers is a remarkable event in its history as a British bird.

YELLOW BUNTING, *Emberiza citrinella*.—This species was observed in some numbers as a bird of double passage in 1907. In spring it appeared during March and April; and in the autumn from mid September to mid November. During both seasons it participated in the general movements, or "rushes," of migrants.

ORTOLAN BUNTING, *Emberiza hortulana*.—It would seem from the Fair Isle records for the past two years that this species can no longer be considered as the rare casual visitor to the shores of Northern Britain it was formerly supposed to be, but must be regarded as a bird of double passage. It again occurred on the island in some numbers in the late spring; and in September several came under our notice at intervals during the month.

CORN BUNTING, *Emberiza miliaria*.—In my first contribution to the Birds of Fair Isle, I described this bird as a resident species. It certainly bred on the island in 1905, for birds newly on the wing were observed in September; but it does not appear to have nested since. It occurs, however, in small numbers on both the spring and autumn passages.

LAPLAND BUNTING, *Calcarius lapponicus*.—The Lapp Bunting was for the third season in succession observed on the island in fair numbers throughout our visit. It arrived at a remarkably early date, being first observed by George Stout on 25th August, and we saw a small party on 1st September, our first day on the island. The largest number seen together was thirteen. These birds chiefly frequented rough grass, the seeds of which formed their chief food, on the higher ground; and I have no doubt they were much more numerous than our observations might lead one to suppose, as their haunts were only occasionally visited. We saw them, however, on twelve different days, and after our departure they were under notice down to 29th October.

146. SHORT-TOED LARK, *Callandrella brachydactyla*.—The second Scottish specimen was fortunately detected as a stranger among a small party of Skylarks on 11th November. It may, George Stout opines, have been present on the island for some time before it was noticed; and he mentions that

its note was not unlike that of its chosen companions. When recording the occurrence of the first Scotch example for the Flannan Isles, I too remarked that when the bird was disturbed it uttered a note very similar to that of a Skylark. This bird is a native of Southern Europe, and is a very uncommon straggler to any portion of the British area.

Shore Lark, *Otocorys alpestris*.—The spring passage northwards of this species was witnessed during the early days of March, and a few returned to the island late in October and remained for about a fortnight.

147. Grey-headed Wagtail, *Motacilla borealis*. — This is an interesting, but not unlooked for, addition to the list of Fair Isle migratory visitors. It is a species whose presence on our shores during the periods of its migrations has, no doubt, long been overlooked, for the bird is a common summer visitor to Northern Europe, including Scandinavia. It has only previously been noticed at one Scottish Station, namely at the Pentland Skerries, where it was obtained in May 1888. It has, however, been noted on several occasions on the South Coast of England (where it is even recorded as having nested), and has once been captured inland in Yorkshire. Fair numbers visited the Isle during the latter part of May and early June; and its southern passage came under my notice late in September.

In this species the adult male has the crown and nape dark grey, verging on black on the sides of the head and lores, and lacks a superciliary streak; while the female appears to be indistinguishable from that of *Motacilla flava*, the Central European summer bird known as the Blue-headed Wagtail.

Pied Wagtail, *Motacilla lugubris*.—This is decidedly a scarce species on passage, and has only, as yet, come under notice in spring. One was observed late in March, and two single birds appeared at the end of May; all, presumably, on their way north.

Tree Pipit, *Anthus trivialis*.—This bird again appeared in numbers in both spring and autumn, and has quite established its claim to be regarded a bird of double passage. It seems strange, in the light of the Fair Isle data, that this species should have entirely escaped notice in the other isles of the Shetland group, and should have only once or twice been observed in Orkney. As in the autumn of 1907 it occurred very late, *i.e.* down to the fourth week of October.

GREAT GREY SHRIKE, *Lanius excubitor.*—Our previous information regarding this species at Fair Isle related to a solitary example seen some years ago by Mr. Tulloch, a former lightkeeper there, who was interested in birds. In April 1907 single Great Grey Shrikes were seen on three occasions on their northern passage; and in the autumn several (also single birds) were recorded for dates ranging from the last week of October to the second week of November. Several were obtained, all of which belonged to the variety known as *L. major.* In one of these the white wing-bar was exceptionally narrow, only showing to the extent of two-tenths of an inch on the closed pinion.

RED-BACKED SHRIKE, *Lanius collurio.*—Several occurred on the spring passage in May; and a few young birds were seen by us at intervals during the first three weeks of September—the first autumn passage of this species which has come under our notice.

GOLDCREST, *Regulus cristatus.*—One of the ornithological features of last autumn was the all but entire absence of this species, only a single Goldcrest being observed, namely on 4th November. During my previous visits, this little bird has swarmed for several days, affording an interesting lesson in the shifts for a living which have to be resorted to by migratory birds when *en voyage.* On these occasions they were observed in numbers creeping about the lichen-spangled faces of the great cliffs in pursuit of insects, uttering the while their feeble squeaky notes, which struck one as being tinged with irritability—perhaps a reflection of their feelings at finding themselves committed to such uncongenial hunting-grounds! On the spring migration it occurred on two occasions in April.

GARDEN WARBLER, *Sylvia hortensis.*—The Garden Warbler, a species which was not detected during the spring migration of 1906, occurred on five dates during the vernal passage in 1907. It is probably a fairly common bird on both passages.

148. WOOD WARBLER, *Phylloscopus sibilatrix.*—This bird is a somewhat surprising addition to the gipsy element in the ornis of Fair Isle; and it has not hitherto been recorded as visiting either the Orkney or Shetland groups. Single birds were captured on the island early in June and in August.

It has, however, occurred on that far-off Atlantic outlier of the Orcades, Sule Skerry, where an example caught at the lantern on the night of 27th September 1906 was forwarded to me in the flesh.

The Wood Warbler is only known to have visited Norway on one occasion, but is found in Sweden up to the 60° N. lat. Possibly some of the Swedish birds may move westwards when emigrating in the autumn, and in this way reach the Norwegian coast, whence they depart for the south, travelling by the well-known route which traverses the British shores.

CHIFF-CHAFF, *Phylloscopus rufus.* — This bird was newly detected as a spring visitor; one, captured on 24th May, having been forwarded to me for identification. It is doubtless more frequent at this season than is supposed, for it is an easily overlooked species, especially at Fair Isle, where so many insectivorous visitors resort to the faces of its twenty miles of lofty encircling cliffs. In the autumn it was present during the second or third weeks of October.

149. SIBERIAN CHIFF-CHAFF, *Phylloscopus tristis.*—This Eastern species has recently been admitted to a place in the British avifauna on the strength of a specimen captured at the lantern of the Sule Skerry lighthouse on the night of the 23rd September 1902 ("Ann. Scot. Nat. Hist." 1907, 15). The ornithological investigations at Fair Isle during 1907 have fully justified the claim of this bird to be regarded as a British species, for in the past autumn four examples were captured during the fourth week of October, and as others were seen it is probable that species was present in some numbers at the time.

The four specimens referred to were all females. The first was taken on the 21st October, and the other three on the 24th.

Since the above was penned I have received for determination a specimen in the flesh from Orkney, where some of these birds have evidently passed the winter. On 5th February, Mr. Wm. Cowan, who forwarded the bird to me, received one of two which had frequented some nursery grounds at Kirkwall for a fortnight, being first noticed on 25th January. This bird had killed itself in attempting to escape from one of the greenhouses into which it had ventured, and had been shut in.

YELLOW-BROWED WARBLER, *Phylloscopus superciliosus*—In the autumn of 1907, this interesting little migrant either did not occur, or escaped notice, until 13th October when a single bird was observed. Single examples were also seen on the 22nd and 29th, and two on the 21st.

150. GRASSHOPPER WARBLER, *Locustella nævia.*—Like the Wood Warbler, this is an hitherto unrecorded bird for the

northern groups of islands. A female was captured on 29th May during a rush of migrants. This species has not been recorded, I believe, for Scandinavia or Northern Europe, and its appearance at Fair Isle can only be attributed to erratic wandering (overshooting its range when seeking summer quarters), or to being carried out of its course by the influence of adverse weather conditions.

GREATER WHEATEAR, *Saxicola leucorrhoa* (Gmelin).—The first Wheatears that came under our notice as immigrants on their passage southwards consisted of numbers of this large brightly-coloured race. They arrived during the first week of September, and their movements continued at intervals down to the end of the month. Some days they were very numerous, and their large size was in marked contrast with that of the native birds. The wing measurement of specimens varied from 98 to 105 mm.; several males and females reaching the latter dimension. The adult male at this season has the mantle a mixture of pale grey and light brown, and the two pretty white stripes on the side of the head, one extending from the forehead over and well behind the eye, and the other from the chin to under the eye, are conspicuous. I had seen these birds on my previous visits to the island, but had never found them so abundant as in the past autumn. In the spring the northern passage commenced during the first week of April, and the old males were then remarkable for the brilliancy of their plumage. This early date for the northward passage was probably induced by the wonderful outburst of summer weather experienced during the last week of March.

The summer home of this race is E. and W. Greenland and the lands on the opposite side of Davis Straits, and Iceland; and it probably winters in West Africa. Its regular lines of migration are by way of the Faroe and British Islands; and I have captured examples at the lanterns of the Eddystone Lighthouse and Kentish Knock Light Vessel, when on their southern passage in the autumn.

151. BLACK-THROATED WHEATEAR, *Saxicola occidentalis*.—On 25th September a fine male in winter plumage was detected by me among the numerous scattered examples of the Common Wheatear. Mr. Grimshaw, who examined the crop, found it to contain entirely insect matter, consisting of the larvæ of two noctuid moths and the fragments of several ichneumons (Hymenoptera).

This bird is new to Scotland, and is the third example which is known to have visited the British Isles ; the others having been obtained in Lancashire and Kent respectively, and in the spring. It is not so very extraordinary, perhaps, that this species should overstep its distribution when moving northwards to reach its south-western European summer quarters in spring ; but it is very remarkable that it should proceed northwards instead of southwards when embarking upon its autumn journey to winter quarters.

152. Black Redstart, *Ruticilla titys*.—This bird is new to the fauna of Fair Isle, and has not hitherto been recorded for any island of the Shetland group. An immature bird was detected among a rush of migrants in April, and another, a female, appeared on 8th November.

This species is only a wanderer to northern parts of Britain, but is a regular winter visitor, in small numbers, to the southern counties of England and Ireland.

Arctic Bluethroat, *Cyanecula suecica*.—The Bluethroat was not observed in September, as in our previous visits, but may have escaped notice owing to the shelter afforded to it and other migrants by the standing corn. Only two came under notice during the past autumn, namely, on the 7th and 9th of October.

Whinchat, *Pratincola rubetra*.—This once supposed rare visitor to the Shetlands again appeared during the spring passage, when it was observed on no less than eight dates in May and early June, sometimes in fairly considerable numbers. It did not appear, or escaped notice, during the autumn movements until 9th October, on which late date a young male was captured.

153. Mistle Thrush, *Turdus viscivorus*.—The Mistle Thrush is regarded as a very rare visitor to both Orkney and Shetland Archipelagos, and has not hitherto been detected at Fair Isle. During the past year, however, it visited the island in small numbers in both the spring and the autumn passage movements, occurring in March, October, and November, and is probably an annual visitor.

Hedge Accentor, *Accentor modularis*.—This species is mentioned on account of the great numbers which appeared on several occasions in April, especially on the 9th, when hundreds were observed in all parts of the island.

Red-breasted Flycatcher, *Muscicapa parva*.—I saw a bird of this species in immature plumage on 27th September. Like those seen last year, it was extremely shy, wary, and restless,

as are nearly all the woodland and cover-haunting passerines which visit this shrubless island. As is the case with most of the insect-feeders among the birds of passage, it haunted the face of the lofty cliffs, especially those which tower perpendicularly above the Atlantic on the west side. Here, under the genial influence of the afternoon sun, flies and other insects are abundant; but a more hopeless situation in which to attempt bird-watching it would be impossible to conceive, and thus many miles of retreats for migrants are lost to the would-be observer.

[Red-rumped Swallow, *Hirundo rufula.* — George Stout informed me during my recent visit to the island that *three* of these birds visited Fair Isle at the end of May 1906, and of these the bird found dead and recorded ("Annals," 1906, 205) was one. He noticed these swallows for several days, being attracted by their red band across their lower backs, but did not then know the significance of this character, or of the bird's rarity.]

House Martin, *Chelidon urbica.*—The Martin was more than usually abundant in the spring; and was observed, for the first time since these investigations were instituted, in the autumn.

Swift, *Cypselus apus.*—This is another new bird for the autumn, when several were observed between 11th and 16th September—late dates for this species so far north. They frequented the face of the high cliffs on the sheltered side of the island.

154. Hoopoe, *Upupa epops.*—An adult male of this remarkable wanderer visited the island on 9th September. It frequented stone walls, and was very shy and difficult to approach.

Short-eared Owl, *Asio accipitrinus.*—This owl was first seen on 28th September, and at intervals throughout October. On two occasions from forty to fifty were observed.

155. Long-eared Owl, *Asio otus.*—Two arrived late in October, along with other immigrants; and single birds occurred in November and December. This is an addition to the ascertained fauna of the island.

156. Snowy Owl, *Nyctea scandiaca.*—One seen on 26th October is the first example reported for Fair Isle.

Peregrine Falcon, *Falco peregrinus.*—In the early autumn the Fair Isle Peregrines feed almost entirely on young Herring Gulls. We found the freshly-killed remains of this species almost daily during our rambles, and on several occasions disturbed the raptor while still engaged with its kill. The

remains of two Woodcocks, recently killed, were also found; and one of the Falcons was seen to capture on the wing (by clutching it) a Ring Ouzel, and to fly off with its victim apparently still alive.

TURTLE DOVE, *Turtur turtur.*—A few were seen at intervals between 9th and 25th May, and again in the autumn about the middle of September.

157. GOLDEN-EYE, *Clangula glaucion.*—A male was seen off the island on 28th October, and a female was obtained on 27th November. The Golden-eye is new to Fair Isle, which is devoid of haunts suited to the bird's requirements; the few lochs being very shallow and small, and wanting in this bird's accustomed food.

VELVET SCOTER, *Œdemia fusca.*—An adult male was observed in one of the bays on 17th September. This is the second Fair Isle record.

158. COMMON SCOTER, *Œdemia nigra.*—Single adult males were seen on the sea, but close in, on 5th and 9th September. This species is new to the recorded fauna of the island.

WOODCOCK, *Scolopax rusticula.*—The first, a few only, were seen on 1st October, an early date; and one or two were observed daily down to our departure on the 4th. Later a small number appeared at intervals down to 2nd November; but there was no great autumn flight as in most years.

159. KNOT, *Tringa canutus.*—This bird had no place in my previous lists, though it is doubtless a regular visitor to the extensive rugged reefs which fringe the S.W. corner of the island, where several were met with during our recent sojourn. Here one still bearing traces of its summer dress was obtained late in November.

GREEN SANDPIPER, *Totanus ochropus.*—Single birds were seen on five occasions between 31st July and 22nd August. This is the third year in succession that this species has visited Fair Isle on its autumn passage, though it has not yet been detected elsewhere in Shetland nor in the Orkneys.

LESSER BLACK-BACKED GULL, *Larus fuscus.*—This species was noted by us as late as 20th September, and a single bird was seen on 10th October. Thus it would appear that it is not such an early autumn emigrant from Fair Isle as our previous experience led us to believe.

160. GLAUCOUS GULL, *Larus glaucus.*—First seen on 28th October, and remained off the island all the winter. Although not previously recorded, this species is, no doubt, a regular winter visitor to Fair Isle seas.

STORM PETREL, *Procellaria pelagica*.—A bird just able to fly was captured at the lantern of the Skaddan Lighthouse at 9 P.M. on 2nd October. This visitor to the light was fully feathered on its upper surface and neck; but its wings and tail had not nearly attained their full length, and its chest and abdomen were entirely clad in a mass of down. One would hardly have expected to find such a youngster on the wing, and perhaps less as a visitor to a lofty beacon; and should a bird so attired have alighted on the water, as seems certain, then its nether plumage would become about as water-logged as a sponge.

THE BAR-TAILED GODWIT AS A SOLWAY BIRD.

By ROBERT SERVICE, M.B.O.U

THIS species is a very regular visitant to the muddy portions of the Solway shores ("mud" being relatively greatly scarcer than "sand" on our long flat stretches) at the normal migration periods, though but seldom in large flocks. For a series of years in succession this elegant bird will appear in autumn in much larger flocks—say 150 to 400 birds, and on such occasions many large or small parties remain the whole winter, though the tendency to dwindle in number as the season goes on is well marked. The whole of the winters of the '80's were marked by a continuance of the Bar-tailed Godwits. The decade following was just as strongly marked by sharply defined autumn and spring visits only. In more recent seasons only few have put in an appearance in autumn, and very seldom have I seen them at all during winter proper. This current season has been, up to the present time, remarkable for the large numbers on the Solway. I heard of them from many localities, but the first that came under my own observation was on December 12th, 1907, not far from the town of Kirkcudbright. Here, all along the green grass merse that extends from the Artillery Battery along the eastern margin of what is partly estuary of the Dee, but mainly inlet of the sea, towards the

Little Ross Lighthouse guarding the narrow entrance, were long straggling scattered flocks of waders that had evidently come in from the outlying shores for the comparative shelter and quiet of the margins of the Manxman's Lake. Curlews were in great force, and so were Golden Plovers, Redshanks, and Lapwings, while many Sea-pies were also conspicuous. But what specially attracted me was the large proportion of Bar-tailed Godwits. All the members of this assemblage were very tame, probably to be accounted for by the buffetings to which the winds of the previous week had subjected them. They paid little heed when looked at over the hedge of the adjacent public road from a distance of ten or fifteen yards. It was quite an unusual experience to watch at this distance a Curlew stalking along searching the grass for food, and observation of Bar-tailed Godwits in like circumstances is unique so far as I am concerned. Since then, Bar-tailed Godwits have remained numerously in various of their usual feeding-places in the Solway. These last few days (16th January) many have been exposed in the Dumfries poulterers' windows (and also, I may add, in those of Carlisle), a thing I have not noticed for many years past.

But the most extraordinary thing in connection with the Bar-tailed Godwit, as a Solway species, I have now to record. During the whole summer season (so-called) of 1907, a flock of the species, estimated to consist of about 200 birds, has remained near to Carsethorn, far down the estuary of the Nith. My attention was only drawn to this on 15th August, and the flock was pointed out to me, too far off for positive identification, but I saw nothing about them to lead me to doubt their identification. However, seeing them at that date proves nothing, for the ordinary northern parties are regularly back by that time—if not on the Solway, at all events on the shores of Eastern England. My informant is Robert M'Call, one of the most experienced fishers and gunners of the Scottish Solway, and the owner of a fine little collection of local rarities obtained and mounted by himself. I obtained full and sufficient confirmation of the continued stay all through June and July from the other gunners and boatmen. Most of the birds

assumed full breeding plumage, but it was not noticed that any separations for nesting ever took place. So far as I can find out, not one was shot, nobody apparently having thought of breaking the close time.

THE PRESERVATION OF BRITISH BIRDS: AN APPEAL.

To the Editor.

Sir—The scope of the work of the Royal Society for the Protection of Birds is now generally understood, and we feel that the Society has established a fair claim upon the appreciation of all persons who have at heart the preservation of the beautiful and interesting avian fauna of their country.

The appeal with which we, the "Watchers' Committee" of this Society, are here concerned is the protection at their breeding-grounds of rare species, such as the White-tailed Eagle, Chough, Bearded Tit, Kentish Plover, Stone Curlew, Dotterel, Red-necked Phalarope, Pintail Duck, Roseate and other Terns, and the Great Skua.

This, the special work of the Watchers' Committee, is taken in hand each spring and continued through the breeding season. It is carried out by means of paid watchers, who are stationed in various places, from the Island in the Shetlands where the Eagles have their eyrie to the shingle flats of Dungeness, a nesting-place of the Kentish Plover. In addition to this the Society contributes towards local funds for promoting similar objects which may require financial aid, *e.g.* the Farne Island Protection Fund.

It might be supposed that in the case of some of these birds their very rarity and inaccessibility would prove their best protection. This unfortunately is far from being so, for there are in this country a certain number of collectors who under the name of British Ornithologists are among the worst enemies with which British Ornithology has to reckon, because it is their ceaseless endeavour to obtain rare "British-taken" eggs and birds. It is a deplorable ambition and traitorous to the cause of British Ornithology, but it exists; and the high prices paid for authenticated eggs and birds are a direct incentive to egg-stealing and bird-taking in defiance of the law for their protection.

It is obvious, then, that the watchers employed by the Society must be men of high character, and in view of their temptations it is only fair that they should be well paid. A watcher receives a weekly salary throughout the nesting season, is provided with a badge of authority, and where necessary is supplied with field-glasses.

Members of the Watchers' Committee visit the men from time to time and thus test their reports by personal inspection.

The results of the past five years' work are so encouraging and satisfactory that the Society can point to birds once on the verge of extinction, now either greatly raised in numbers, or at any rate spared to the British list.

Contributions available for the Watchers' Fund are needed at the beginning of each year, and the money is spent with the greatest possible thought and discretion. At present, owing to limited means, only the most pressing cases can be met. So far the expenses have been borne by a very few contributors, and we feel that this is neither fair nor in the best interests of the work itself, and are confident that many naturalists and bird-lovers in this country would gladly help if they knew of the existence of this department of the work of the R.S.P.B. It is to these that we now venture to appeal. The ideal possession would of course be a capital sum, the income from which would each year be available. Perhaps some day a rich man's benefaction may put us into this desirable position, but meanwhile those who are willing to help by subscriptions may feel sure of their money being well and wisely spent; and we may add that the Society will always be pleased when possible to arrange that any contributor who wishes to visit a protected spot shall have the Watcher as a guide.

Subscriptions, marked Watchers' Fund, may be sent to the Hon. Secretary of the Royal Society for the Protection of Birds, 3 Hanover Square, London, W.

We remain, sir, your obedient servants,

Watchers' Committee

MONTAGU SHARPE, Chairman of the Council of the R.S.P.B.
E. G. B. MEADE-WALDO.
W. H. HUDSON.
W. R. OGILVIE-GRANT.
W. H. ST. QUINTIN.
A. TREVOR-BATTYE.

February 12, 1908.

A CONTRIBUTION TO THE INSECT FAUNA OF THE ISLE OF MAY.

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

I HAVE been favoured by the Misses Evelyn V. Baxter and Leonora J. Rintoul with the opportunity of examining a collection of Insects made by them in the months of

September and October of the present year on the May Island. Since many of the specimens were captured at the lantern of the lighthouse, it may be of interest to put the whole of the species on record.

Of LEPIDOPTERA the following species were obtained :—*Xylophasia polyodon*, L.—three at lantern, 9th September ; two at lantern, 10th September ; one during day, 13th September. *Triphæna pronuba*, L.—one at lantern, 9th September ; three at lantern, 10th September ; one at lantern, 27th September. *Mamestra brassicæ*, one at lantern, 9th September. *Cerastis vaccinii*, L.—one at lantern, 9th September. *Apamea unanimis*, Tr.—one at lantern, 10th September. *Leucania pallens*, L.—one at lantern, 10th September. *Orthosia lunosa*, Haw.—five at lantern, 10th September ; one at lantern, 11th September. *Orthosia macilenta*, Hb.—one at lantern, 26th September. *Charæas graminis*, Linn.—one at lantern, 10th September ; one at lantern, 11th September ; one during day, 7th October. *Agrotis nigricans*, Linn.—one at lantern, 10th September. *Plusia gamma*, Linn.—one at lantern, 11th September ; one at lantern, 26th September ; one at lantern, 6th October. *Oporabia dilutata*, Schiff.—one at lantern, 23rd September. *Cidaria testata*, L.—two at lantern, 23rd September. Several other Moths were taken, but these are too much damaged to be determined ; on 14th September larvæ were found (on cabbage) of *Triphæna pronuba*, Linn., and *Hadena oleracea*, Linn., and on the 19th a small Tortricid Moth (undetermined).

The COLEOPTERA include *Geotrupes stercorarius*, Linn.—two specimens, 10th September ; one on 17th September, and one on 19th September. *Aphodius contaminatus*, Hbst. —one on 17th September ; *Serica brunnea*, Linn.—one specimen taken at lantern, 10th September ; *Harpalus rufi-cornis*, Fab.—one, 14th September ; and *Pristonychus terri-cola*, Hbst.—one specimen, 19th September.

The four HYMENOPTERA captured comprise a number of Ants (males, females, and workers) belonging, I believe, to the *mixtus* race of *Lasius umbratus*, Nyl., taken on 10th, 11th, and 27th September and 3rd October ; also two

female specimens of *Lasius flavus*, Deg., and an undetermined Ichneumonid.

DIPTERA are represented by two female specimens of *Tipula confusa*, Wlp., taken at lantern on 19th and 23rd September respectively, and by the following species captured during the day: *Scatophaga stercoraria*, Linn.—two, 10th September; one, 11th September; one, 17th September; one, 20th September. *Eristalis tenax*, Linn.—one male and one female, 11th September; one male, 19th September; one male and one female, 3rd October. *Eristalis arbustorum*, Linn.—one male, 11th September. *Syrphus luniger*, Mg.—one female, 11th September; and three females, 7th October. *Syrphus corollæ*, Fab.—one male, 17th September; *Syrphus ribesii*, Linn.—one female, 20th September: *Ascia podagrica*, Fab.—one female, 3rd October; *Calliphora erythrocephala*, Mg.—six females, 27th September; *Euphoria cornicina*, Fab.—one female, 3rd October; and two males, 7th October. *Spilogaster duplicata*, Mg.—two females, 27th September; *Homalomyia canicularis*, Linn.—two females, 27th September; and *Tipula oleracea*, Linn.—one male, 14th September.

A single male example of the Common Earwig, *Forficula auricularia*, Linn., was picked up on 10th September, and a specimen of *Machilis maritima*, Leach, on 3rd October. A specimen of *Hemerobius* sp. was obtained on 17th September, a Centipede on the same day, and a Phalangid on the 19th, but I have not been able to identify these specifically.

THE ROYAL SCOTTISH MUSEUM,
EDINBURGH, 19*th December* 1907.

THE FALSE-SCORPIONS OF SCOTLAND.

By ROBERT GODFREY, M.A.

TO Mr. H. Wallis Kew I wish to express my deep indebtedness for the invaluable aid received from him in the preparation of this paper. He has not only examined many of my specimens, but he has also in a voluminous correspondence discussed the subject with me in all its bearings, and has most freely placed at my disposal his unique knowledge of

this group in Britain, and has besides, on two different occasions, read through and carefully criticised and corrected my manuscript. Whatever claim, therefore, this little work may have to the attention of other naturalists is due in no small measure to the help and guidance I have received from him.

My thanks are also due to Mr. Wm. Evans, Rev. O. Pickard-Cambridge, Mons. E. Simon, and Mons. Edv. Ellingsen for help received in the identification of specimens; and to Rev. James Waterston and Messrs. G. B. Barbour, H. D. Simpson, A. Urquhart, G. A. Whyte, and R. B. Whyte for valuable aid in working out the Scottish distribution.

The present work cannot claim to be more than an introduction to the study of False-scorpions, but it should prove a stimulus to the further study of this interesting group.

Introduction.

False-scorpions belong to the great class Arachnida, which includes, besides the False-scorpions, the true Scorpions, the Spiders, the Harvestmen, the Mites, etc. They receive their popular name from their external resemblance to true Scorpions, but they are distinguished at a glance from true Scorpions by the absence of any sting-bearing, tail-like elongation of the hind-body. They are rather small animals, measuring from one to four millimetres in length, and have flask-shaped bodies with six pairs of appendages.

External Features.

In their bodies are recognisable two main parts, long known as the cephalothorax and the abdomen, but now more simply termed the *fore-body* and the *hind-body* respectively. The *fore-body* is covered on the dorsal aspect with a rigid chitinous plate of one piece, the *carapace*, which varies in shape, in colour, and in surface texture in different species. In some genera the side-margins of the carapace form straight lines, but these may assume any one of the three possible relationships to one another—converging forward, parallel, or diverging forward; where the side-

margins form straight lines, the front margin of the carapace is generally truncated. In other genera the side-margins are more or less curved, and form a rounded or almost pointed margin in front. Though always forming a single piece, the carapace is in some genera transversely grooved by one or two sinuous lines. Again, the carapace may be beautifully smooth and polished, or it may be more or less coarsely granulated or tubercled. The *eyes*, when present, are placed symmetrically on each side of the carapace near the fore-margin, and their number—four, two, or none—has been regarded as forming a useful aid for the purposes of classification. But such classification is largely artificial, for it has been found that allied forms have the eyes present or absent, and when present they may be distinct or indistinct, and either four or two in number. The exceedingly minute *mouth*, adapted only for sucking, is situated in front of the fore-body between the cheliceræ or first pair of appendages.

The *hind-body* is slightly elongated and rounded posteriorly; its anterior margin is united with the fore-body along the entire terminal margin of the latter. There are twelve segments, eleven of which are distinct and evident from a dorsal aspect, the twelfth or hindmost segment being evanescent. Both surfaces of the segments bear transverse plates—those of the upper surface being termed *tergites*, and those of the under surface *sternites*—but the junctions of the various segments and the sides of the hind-body are free of any chitinous covering, and admit of the hind-body's expanding and contracting considerably. In the case of gravid females the plates of the segments are very distinctly separated from one another. The *genital opening* is situated behind the coxæ of the fourth pair of legs, at the base or anterior end of the hind-body, and the *anus* is placed in the centre of the hindmost segment.

The first pair of appendages, the *cheliceræ*, project immediately forwards under the front margin of the carapace. Each chelicera is of two pieces. The inner or basal piece is the larger; on this the smaller moves and forms with it a pincer for grasping purposes. Under the microscope the cheliceræ are seen to be equipped with certain

processes, to which have been given the names of the *flagellum*, the *serrula*, and the *galea*. The *flagellum* consists of a series of whip-like bristles—at least ten in number in *Chthonius rayi*—springing from a distinct projection at the base of the under side of the fixed finger. The *serrula* is a comb-shaped transparent process, attached to the inner side of the movable finger. In some cases the serrula is attached throughout its length to the movable finger, and in other cases it is attached at its basal half only; this character—with which a number of distinctive features are correlated—has been taken advantage of to form a basis for classification, creatures having a serrula of the first type being *Panctenodactyli*, and those having a serrula of the second type being *Hemictenodactyli*. In addition to the serrula, there is in some species, near the extremity of the movable finger of the chelicera, and directed forwards, a second transparent process, the *galea*. Its shape differs in different species, and in certain of our British genera it is wholly absent. Where absent, however, it is represented by a tiny knob, on which the spinning ducts open out. The galea is closely associated with the spinning faculty. (See C. J. With's "Chelonethi," 1906, p. 23.)

The second pair of appendages, the *pedipalps*, arise on the under side of the fore-body immediately behind the chelicerae. Each pedipalp is of six pieces, the basal piece being the *coxa*, and the others in order, the *trochanter*, the *femur*, the *tibia*, and the *tarsus*. The last-named, of two pieces, resembles a pair of pincers or nippers, and forms the most conspicuous feature of the False-scorpions: it consists of a swollen bulb or hand which is extended forward in a thin pointed finger, against which the sixth piece, which is articulated to the apical portion of the bulb, is more or less closely appressed when the fingers are shut. The fingers of the pedipalps are furnished with long hairs, which serve as delicate sense-organs to the creatures in the dark crannies in which they dwell.

Four pairs of walking *legs* form the third to the sixth pairs of appendages. These, in comparison with the pedipalps, are weak and slender and less deeply coloured; each leg consists of *coxa*, *trochanter*, *femur*, *tibia*, and *tarsus*.

The *femur* (except in Legs I. and II. of *Cheiridium*) is always subdivided, either into two distinct pieces, or else being provided with a small piece, the *trochantin*, at its basal end. The *tarsus* also is subject to variation in different genera, and may be of one or of two pieces. The tarsus is terminated by two distinct claws, between and hindwards of which is a transparent organ of adhesion, the *arolium*; under the microscope I have watched *Chernes dubius* walking along the cover-slide applying these tiny organs at each step to the glass, and proving to me their usefulness in the case of creatures that spend a great part of their time in prowling about in an inverted position on the under surface of stones and other material.

Haunts.

False-scorpions live generally in obscure places, under stones or in the crevices of rocks, beneath the bark of trees, among dead leaves and moss in woodlands, under inverted flower-pots in conservatories, among the refuse of stables and mills, and even in the furniture of houses, and in old books. Owing to their skulking habits they easily escape notice even where they are most abundant, but, when once seen, they demand attention by their striking aspect and by their curious habit of running backwards when disturbed.

Food.

So far as I have observed, False-scorpions live entirely on animal food. Among the various articles of diet which I have found them consuming are tiny worms, mites, molluscan eggs, springtails, a larval centipede, and a beetle. Although I was convinced that False-scorpions caught their prey with their large nippers, and was besides assured by Mr. Wallis Kew that he had repeatedly witnessed them do so, I had to wait a long time before I actually saw one seize its prey. Repeatedly in the fields I had come on various species in the act of sucking their prey, and I had always found that the False-scorpion was holding its victim in its cheliceræ, and I occasionally watched a False-scorpion move off, still carrying its prey in its cheliceræ. But in

such cases I had not seen the first act in the drama, nor was I permitted to see the last, for I could not induce a False-scorpion disturbed at its meal to continue feeding when under observation, and to reveal to me the method it employs in rejecting the creature whose juices it has sucked dry.

Method of Feeding.

At last, on 27th May 1905, I obtained the long-wished-for opportunity of watching the external operations associated with feeding in False-scorpions. I had brought home some specimens of *Obisium muscorum* with their embryonic young attached, and, detaching one of these hemispherical embryonic masses from a female *Obisium*, I placed it in front of an adult *Chelifer latreillii* and waited developments. After some time the *Chelifer* touched the mass with its right pedipalp, then brought its left pedipalp in contact with the other side, and closing both pairs of nippers on the mass it drew the latter towards its head; then relaxing its hold with its right pedipalp, it gripped the mass at a point farther from its head, and brought it into contact with its chelicerae. With these latter it now gripped the mass, and drew back its pedipalps from the mass altogether. The food-mass, however, lay over the top of the chelicerae and prevented my seeing the actual sucking process by which the creature obtains it nourishment. I began to time the *Chelifer* at 8.19 P.M., after it had drawn back its pedipalps. At 8.25 the *Chelifer* again brought its pedipalps into action; gripping the mass in its pedipalps, it released its hold with the chelicerae, and raising up the food-mass with its pedipalps it tested it with its chelicerae, and, as soon as it had brought these latter into definite action again, it once more withdrew its pedipalps from the mass. At 8.31 it took hold of the mass again with its pedipalps and held it aloof from its chelicerae while it cleaned these latter, the one in the other; and on again bringing the mass into contact with the chelicerae it retained a hold with its left pedipalp for nearly two minutes before it withdrew it. At 8.43 it touched the mass several times with both pedipalps to steady it. At 8.51 it again gripped the mass with its

pedipalps to alter the position of the mass, and, having done so, it retained a hold with its left pedipalp for four minutes. At 9.2 another *Chelifer latreillii* that had up to this time been quietly resting about an inch from the scene began to move about and presently came round to where the first was feeding. The feeding *Chelifer* seemed to know of the other's approach before as yet this latter was within touching distance, and stretched forth its pedipalps beyond the mass on each side, guarding it and defying the second *Chelifer* in such a threatening manner that the latter took the hint and moved off. The first *Chelifer* once more removed the mass with its pedipalps, and brought another portion of it into contact with its cheliceræ, then again withdrew its pedipalps. At 9.10 it repeated this performance, and began to move off backwards, carrying the mass in its cheliceræ alone. At this hour daylight was beginning to fail me, and I touched the *Chelifer* to drive it from the edge of the box that I might close it up; it moved off carrying the mass in its cheliceræ, without using its pedipalps at all, and settled again.

Mr. Wallis Kew, who has watched this feeding process to a conclusion, says that "after the meal *Chelifer latreillii* may be seen to bring one of the great pincers towards the mouth in the most deliberate manner for the purpose of removing the remains of the prey."

One species of False-scorpion, the blind *Chernes nodosus*, lays hold of flies and of other forms of prey many times too large for it, and, instead of being able to bring the fly to closer quarters with its mouth, it is itself carried off by the fly whithersoever the latter pleases, and is often found hanging by a pedipalp to a fly's leg. Yet in the end it seems probable that *Chernes nodosus*, by patiently waiting, may get his opportunity of feeding on his carrier when the fly dies. The whole question of relationship between False-scorpions such as *Chernes nodosus* and their carriers has been fully discussed by Mr. Wallis Kew in the "Naturalist" for July 1901, pp. 195-215, who writes in his summary: "The subject will bear further investigation; but from the facts now in our possession it seems impossible to avoid the conclusion that pseudo-scorpions found on the

legs of other Arthropods—often relatively gigantic—are attacking the creatures for food, and that notwithstanding their diminutiveness they are to be regarded, not as parasites, but as animals of prey." In my experience some False-scorpions have great powers of abstinence, and will live for months in captivity without any food—a fact which, by the way, strengthens the belief that *Chernes nodosus* is quite able to cling to his huge prey till the latter dies and affords him the expected feast.

The above observations on *Chelifer latreillii* clearly indicate the reason why False-scorpions when feeding do not retain hold of their food by the large nippers. While engaged in the slow process of sucking the juices of its prey, the False-scorpion must be ready to defend itself against an enemy or a rival, and it keeps its pedipalps free as far as possible, so that, in a sudden emergency, it may, while still retaining hold of its prey in its chelicerae, be able to use its great nippers for defence or attack.

False-scorpions, even to the naked eye, may be seen passing the fingers of their great pincers through the fingers of the chelicerae, and under the microscope they may be observed to pass the fingers of one chelicera through the fingers of the other. The suspicion at once arises that they are cleaning these fingers by passing them through the serrula, but it is no easy matter to satisfy oneself absolutely as to this. I have watched with great care the newly-hatched *Chthonius rayi* under the microscope perform both of the actions I refer to, but yet, owing to the constant necessity for focussing under the high power I was using, I could not positively affirm that the serrula was used in cleaning either the great nippers or the little ones. My suspicions were put beyond all doubt, however, on May 24, 1905, by observations made on *Chelifer latreillii*. On that day I had noticed one pass the fingers of the pedipalps singly through the chelicerae, and later in the day I watched another under the microscope at the same performance. It passed a finger of the pedipalps through one serrula, forcing apart the teeth of the serrula between which it passed as it pushed the finger through, and then it drew the same finger back through the serrula of the other chelicera, thus cleaning both sides of the

finger. It then repeated the operation with its other fingers, and also cleaned one chelicera with the other. I did not clearly see the finger of the chelicera open up the teeth of the serrula, but the action in this case also was quite distinctly a cleaning process.

Reproduction.

The habits of False-scorpions during the period of reproduction form by far the most interesting episode of their life-history. These habits are subject to great variation and must be considered in detail under the different species, but they may be described here in a general way. The females of some genera, e.g. *Obisium* and *Chthonius*, before beginning to lay, shut themselves up in a compact nest constructed of earth or other material and lined with silk, and they remain inside this nest until the young are able to go off on their own accord. The females of other genera, e.g. *Chelifer* and *Chernes*, carry their larval mass about with them while they continue to live a free life. The eggs appear at first as a small white speck on the under-surface of the hind-body, and gradually swell out in the process of developing till they form a relatively large mass attached to the female. The eggs soon hatch and give place to larvæ of peculiar form, which in the majority of cases undergo all their changes during the attachment to the mother; when the young False-scorpions are able to begin life for themselves, they are perfect copies in miniature of the adults. At first these free young ones are practically colourless, and they only gradually assume the deep hues of the adult. Subsequently, they moult at least once, in a nest made for the purpose, before they reach their adult stage; and in some species both immature and adult individuals hibernate solitarily inside nests.

Spinning.

The method of spinning in this group is surrounded even yet with some uncertainty, but it is known that the chelicerae play an important part in the spinning processes of the False-scorpions. Further observations are neces-

sary to prove whether or not the spinning faculty is common to all False-scorpions.

Enemies.

In alluding to the enemies of False-scorpions, I find myself standing on the verge of another great unexplored territory. I have had repeated indications of the raids made by Ichneumons on these creatures, and on August 9, 1907, I received a hint of the probable method adopted by the Ichneumons in stinging the False-scorpions. On that day, at Dalmahoy Crags, I saw an Ichneumon at work on a Spider's cocoon. The Spider had selected as the site of her nest an inequality on the under-surface of a stone, and she had covered her mass of eggs with a thick layer of silk which served the double purpose of holding them in position and affording them the needed protection. On this silken covering the tiny Ichneumon was resting, her antennæ in continual motion. Suspecting that the Ichneumon was stinging the egg-mass, I examined her carefully with my lens and saw her with the greatest ease thrust her sharp ovipositor its full length perpendicularly through the silk, and, rapidly withdrawing it, insert it immediately in another spot. She did this very smartly several times before I disturbed her. I then opened the silken mass, and found inside eighteen Spider's eggs, of such small size that it took three of them to equal in breadth the diameter of an ordinary pin-head. From this observation I am led to believe that the ichneumon of a False-scorpion rests on the nest of the False-scorpion, and, piercing the clay covering of the nest with her sharp ovipositor, deposits her egg or eggs in the embryo mass attached to the False-scorpion. The young Ichneumon (for only one reaches perfection) is provided with food in the embryo mass of the False-scorpion, and is, I should imagine, quite able to enter the body of the False-scorpion through the genital pore.

My information regarding the ichneumons of False-scorpions is practically confined to the pupæ. I first found an Ichneumon's pupa in a nest of *O. muscorum*, containing the chitinous remains of the animal, at Woodcockdale in

West Lothian on April 4, 1903. I handed the pupa to Mr. James Waterston, under whose care the perfect insect was hatched out. Again, on September 15, 1905, at Cambo in East Fife, I took two pupæ from nests of *O. muscorum*, also containing fragments of the Obisium. These hatched out in the following spring, and proved to be male and female. The female appeared first, on February 19, 1906, and the male on February 26. In each case the little creatures moved actively about on the day on which they were hatched, and were on the following day found dead. The time of hatching of these Ichneumons corresponds with the time at which *O. muscorum* is retiring into her nest for reproductive purposes. On February 14, 1907, near Dumbarton, I opened two nests containing the remains of *Obisium muscorum* and Ichneumon pupæ ; from one pupa the fly had already emerged, and the other pupa was unfortunately wasted in my handling of it. And again, on August 9, 1907, at the same spot where I watched an Ichneumon sting a Spider's egg-mass, I opened an Obisium's nest containing the remains of the creature, and an empty Ichneumon pupa.

The perfect insects that emerged from the pupæ obtained on April 4, 1903, and on September 15, 1905, were forwarded to Mr. Claude Morley, who identified them as *Aptesis stenoptera*, Marsh, and who, in his work on "British Ichneumons" (ii. 60-61), has created a new genus for their reception, *Obisiphaga stenoptera.* It would appear from my meagre observations that the parasites have a double period of appearing, and the probability is that at both periods they seek out reproducing females

Chthonius rayi is also preyed upon by an Ichneumon, and apparently under similar circumstances, though my observations here are exceptionally meagre. On September 19, 1903, near Aberdour, Fife, I took an Ichneumon pupa from a nest of this False-scorpion, in which also the remains of the host were present. The Ichneumon was forwarded to Mr. Morley, and identified by him (ii. 213) as *Pezomachus impotens*, Först.

(*To be continued.*)

TRITICUM PEREGRINUM, HACKEL, *nov. spec.*

ALIEN PLANTS.

By James Fraser

Plate III

The following list of Alien Plants, mainly from the neighbourhood of Edinburgh, brings the number of such, seen by Mr. M'Andrew and myself during the last five years, up to about eight hundred, of which over a hundred are new to Britain. Many in this list were found previously to 1907 (and since 1903) but have only now been identified.

As will be seen below, I have again to thank Professor Hackel not only for naming a large number of the grasses and for interesting and helpful remarks on them, but also for describing and naming a new species and a new variety. To A. O. Hume, Esq., C.B., F.L.S., I am also indebted for many identifications and for much help in various ways.

As in previous papers, the names under each Natural Order are in rough alphabetical order: an asterisk in front of a name indicates a new British record: α = once found; β = twice or thrice, but rare; γ = neither rare nor frequent; δ = frequent; ϵ = abundant.

RANUNCULACEÆ.

*Ranunculus monspeliacus, *L.* Linlithgowshire, ϵ.
*R. spicatus, *Desf.* Leith, β.

BERBERIDACEÆ.

Epimedium alpinum, *L.* Linlithgowshire, β.

FUMARIACEÆ.

Corydalis lutea, *DC.* Near Borthwick Castle, β.

CRUCIFERÆ.

*Brassica oxyrrhina, *Coss.* Leith and Slateford, β.

CARYOPHYLLACEÆ.

Lychnis Coronaria, *Desr.* Sea-shore at Inverkeithing, Fife, α.
Lychnis chalcedonica, *L.* Craigmillar Quarry (outcast), α.

MALVACEÆ.

Malva Alcea, *L.* Leith and Slateford, *β.*

LEGUMINOSÆ.

Medicago obscura, *Retz.* Leith, *β.*
M. obscura, *Retz., var.* spinosa. Leith, *β.*
M. Soleirolii, *Duby.* Leith, *α.*

ROSACEÆ.

Rubus spectabilis, *Pursh.* Near Dolphinton, Peebles, *ε.*
Spiræa salicifolia, *L.* New Galloway, *δ.*

UMBELLIFERÆ.

*Bupleurum nodiflorum, *Sibth. and Sm.* Leith, *α.*

CAPRIFOLIACEÆ.

Sambucus laciniata, *Mill.* Near Slateford (outcast), *β.*

COMPOSITÆ.

Anthemis tinctoria, *L., var.* discoidea. Leith, *β.*
Aster Tripolium, *L., var.* discoideus. Leith, *γ.*
Chrysanthemum frutescens, *L.* Near Slateford (outcast), *β.*
*C. monspeliense, *L.* Leith, *β.*
Hieracium maculatum, *Schrank.* Gilmerton, *γ.*
Rudbeckia laciniata, *L.* Leith, *β.*
Scolymus hispanicus, *L.* Leith, *α.*

CAMPANULACEÆ.

Campanula Medium, *L.* Leith, *β.*
Specularia Speculum, *A. DC.* Slateford, *α.*

POLEMONIACEÆ.

Gilia multicaulis, *Benth.* Slateford, *β.*
G. tricolor, *Benth.* Leith, *β.*

SCROPHULARIACEÆ.

Collinsia bicolor, *Benth.* Leith, *β.*
Erinus alpinus, *L.* Near Dolphinton, Peebles, *δ.*

LABIATÆ.

Ballota ruderalis, *Swartz.* Leith, *α.*
Salvia officinalis, *L.* Leith, *α.*

LILIACEÆ.

Allium carinatum, *L.* Linlithgowshire, *ε.*
A. neapolitanum, *Cyr.* Warriston (escape), *α.*
Tulipa sylvestris, *L.* Linlithgowshire, *γ.*

JUNCACEÆ.

Juncus tenuis, *Willd.* New Galloway, *δ.*

GRAMINEÆ.

Agrostis nigra, *With.* Plentiful in a derelict garden, along with *Apera Spica-Venti*, Beauv., at Carnoustie, Forfar.

Apera intermedia, *Hackel.* Several plants of this species were found in 1904-5-6, in the neighbourhood of Edinburgh, where it was evidently introduced with foreign grain. This plant was only recently (1902) discovered on the Erdschias-Dagh (Mons Argæus), Asia Minor, by Drs. Penther and Zederbauer, from whose paper on the Flora of that district in the "Annalen des K. K. Naturhistorischen Hofmuseums" (Band xx. Nr. 4, Vienna, 1905) the following description of the plant by Professor Hackel is taken :—

"Annua. Culmi graciles, 10-25 cm. alti, erecti v. ascendentes, teretes, glaberrimi, simplices, 3-4 nodis. Folia glabra: vaginæ laxiusculæ, laeves v. scaberulæ, internodiis breviores; ligula oblonga, 2-5 mm. lg., obtusa vel acutiuscula, sæpe fissa; laminæ anguste lineares, obtusiusculæ, breves (2-4 cm. lg.), 1-2 mm. lt., utrinque marginibusque plus minusve scabræ, nervis prominulis percursæ. Panicula linearis, densa, lobata sed non interrupta, 3-8 cm. lg., contracta, rhachi lævi, ramis subverticillatis brevibus (primario panicula ca. 4-5-plo breviore), ab ima basi spiculiferis, spiculis æqualiter dispositis imbricatis, quam pedicelli subterminales pluries longioribus. Spiculæ lanceolatæ, 2·5 mm. longæ, viridulæ v. raro lividæ, glabræ, rhachilla in stipitem brevissimum (0.3 mm. longum) glabrum producta. Glumæ steriles parum inæquales, lanceolatæ, subito tenuiterque acuminatæ: I. 2 mm. lg., 1-nervis, II. 2.5 mm. lg., 3-nervis, setaceo-apiculata, utraque obtuse carinata, lævis, herbaceo-membranacea; gluma fertilis lanceolata, 2 mm. lg., herbaceo-membranacea, integra, paullo infra apicem aristam exserens rectam scabram quam gluma 3-plo longiorem, dorso

scaberrima, 1-nervis, callo nuda. Palea glumam subæquans, ovalis, obtusa, 2-nervis, inter nervos sulcata. Antheræ 3, 1.5 mm. lg. (quam palea paullulo breviores)."

An interesting paper on this plant, with comparison between it and *A. interrupta*, Beauv., by Mr. A. B. Jackson, appeared in the "Ann. Scot. Nat. Hist." for July 1907.

Bromus commutatus, *Bab.*, *var.* multiflorus *Parn.* On waste ground, near Murrayfield; several.

B. macrostachys, *Desf.* A form with glabrous spikelets; Leith and Slateford; plentiful.

*B. macrostachys, *Desf.*, *var.* triaristata, *Hackel.* Leith; three or four.

*B. marginatus, *Nees.* Leith; one large plant. A perennial, native of the Western U.S. (California, Oregon, Arizona, etc.). Identified by Professor Hackel, who points out that my specimen from the plant as originally found agrees better with the type, than do specimens from the same plant grown in my garden. The latter specimens represent better *B. marginatus latior*, Shear, in "Studies on American Grasses" (a larger and stouter plant than *B. marginatus*), which he first found at Walla Walla, Washington, and which was again gathered "on wool waste heaps at North Berwick, Maine." Shear mentions that it is a very variable species.

B. molliformis, *Lloyd.* Leith; many plants. Identified by Professor Hackel.

B. secalinus, *L.*, *var.* divergens, *Rchb.* One fine clump at Pettycur, Fife.

Cynosurus aureus, *L.* Two or three plants in an old quarry, near Slateford.

*Elymus canadensis, *L.* One plant on waste ground at Burntisland Docks, and one fine plant at Leith. A perennial, native of N. America. Identified by Professor Hackel.

Festuca ambigua, *Le Gall.* Several in a sand-pit at Comiston, Edinburgh.

*Lepturus cylindricus, *Trin.* A single plant, at Leith.

*Phalaris brachystachys, *Link.* One plant at a pit-mouth near Joppa, several at Leith, a few scores at Slateford. Identified by Professor Hackel.

*P. intermedia, *Bosc.*, *var.* angusta. Several at Leith.

*Polypogon maritimus, *Willd.* Several at Leith and Gorgie, hundreds (along with *P. monspeliensis*, Desf.) at an old quarry, near Slateford, used as a "toom" for clean refuse.

*Triticum Ægilops, *Beauv.* (*Ægilops caudata*, L.). Two fine clumps, at Leith.

*T. caudatum, *G. and G.* One plant, Leith, in 1904. This plant was in error recorded as *T. speltoides*, var. *Aucheri*, Aschers. and Grbn. in my paper on 'Alien Plants' in the "Ann. Scot. Nat. Hist." for April 1905.

*T. crassum, *Ait. and Hemsley, nov. var.* oligochætum, *Hackel.* Plentiful at Slateford, several at Gorgie and Leith. Identified by Professor Hackel, who adds the following remark: "Differt a typo glumis fertilibus scabridis non tomentellis, aristis glumarum fertilium in spicula terminali elongatis, in spiculis lateralibus brevissimis vel ad mucronem redactis. Spica quam illa typi minus crassa."

*T. peregrinum, *Hackel*, nov. spec. Once found at Leith and once at Slateford in 1906.

For convenience the description of this plant, by Professor Hackel, is reproduced below to accompany the figure (Plate III.), which is from a dried specimen grown from the seed of one of the original plants.

"*Triticum* (sub-gen. *Ægilops*) *peregrinum*, Hackel, nov. spec.—Annuum. Culmi graciles, circ. 35 cm. alti, apice longe nudi, glaberrimi. Vaginæ ventricosæ, ore plus minus fimbriatæ, ceterum glaberrimæ. Ligula brevissima, truncata. Laminæ anguste lineares (6-8 cm. longæ, 2-7 mm. latæ), acutæ, utrinque pilis mollibus patentibus plus minus conspersæ. Spica brevis (3-6 cm. lg., 6-8 mm. diam.) sursum attenuata, e spiculis fertilibus 4-5 constans, adjectis in basi spiculis sterilibus 3 parvis v. minutis, rhacheos articuli subcurvati sursum modice dilatati dorso complanati, ventre concavi, plus minus scabri, spicula adjacente plus minusve breviores. Spiculæ fertiles ovato-oblongæ (circ. 12 mm. lg., 4 mm. lt.), 4-floræ, floribus 2 inferioribus fertilibus, superioribus sterilibus, decrescentibus, viridulæ. Glumæ steriles subæquales, $\frac{2}{3}$-$\frac{3}{7}$ spiculæ æquantes, obovato-oblongæ, circ. 7 mm. lg., sinuato-bidentatæ, dentibus triangularibus acutis v. acutiusculis in spicula terminali interdum (altero v. ambis) in aristam brevem latiusculam productis, inter dentes interdum denticulum minutum exhibentes, dorso elevato 7-nervis, nervis aculeolato-scaberrimis. Glumæ fertiles oblongæ, retusæ, bidentatæ, dente altero nervum medium excipiente plerumque in mucronulum crassum obtusiusculum producto, altero depresso-triangulari, interdum tertio rotundato aucto, ceterum muticæ, 5-nervis, tota superficie minute scabro-punctatæ. Palea glumam fertilem aequans, oblonga, obtuse bidentata, carinis setuloso-ciliolata. Lodiculæ ciliatæ.

Ovarium apice hispidulum. Spica cum omnibus spiculis fertilibus demum caduca, spiculis sterilibus in culmo manentibus.

Patria ignota, introductam in Scotia prope Edinburgh (Slateford et Leith Docks), invenit J. Fraser.

Affinis *Tritico mutico* (*Ægilopi muticæ*, Boiss.) quod differt a nostro spica elongata gracili multispiculata, internodiis spicula adjacente longioribus, spiculis minoribus angustioribus oblongis, glumis sterilibus vix dimidiam spiculam æquantibus apice dilatatis obscure sinuato-denticulatis, glumis fertilibus obtusissimis subintegris."

LEITH, *December* 1907.

PLANTS OF SUTHERLAND AND CAITHNESS.

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

(*Continued from p.* 44.)

Primula acaulis, *L.*—In plentiful flower in July.

P. scotica, *Hook.*—Abundant at Farr, and near Bettyhill, in beautiful flower.

Myosotis repens, *Don.*—Inversh in 107 ; Inchnadamph, Altnaharra, etc. 108.

M. palustris, *Relh.*, var. *strigulosa*, M. and K.—Inchnadamph, Bettyhill.

M. versicolor, *Reichb.*—Invershin, Altnaharra, etc.

Veronica officinalis, *L.*—Luxuriant specimens on Ben Hope.

V. humifusa, *Dicks.* (*V. serpyllifolia*, L., var. *borealis*).—East side of Ben More 107 ; Ben Hope, Canisp 108.

*Rhinanthus monticola, *Druce.*—Near Oykell Bridge 107. Altnaharra, Strathmore, near Tongue, etc. 108.

Melampyrus pratense, *L.*, var. **hians*, Druce.—Base of Canisp, also near Bettyhill 108.

Pinguicula vulgaris, *L.*—A pinkish purple-flowered plant grew on the north side of Creagan Breaca 108.

*Thymus glaber, *Miller* (*T. Chamædrys*, Fr.).—Ben Hope, Quinag 108.

*T. ovatus, *Miller* (*T. Chamædrys*, auct. ang.).—Strathmore 108.

T. Serpyllum, *L.*—Ben Hope.

Galeopsis Tetrahit, *L.*, var. *bifida* (Boenn).—Invershin *107 ; Altnaharra *108.

Ajuga pyramidalis, *L.*—On rocks, under shade of hazel, about 50 feet above sea-level, near Bettyhill 108; very rare.

Plantago lanceolata, *L.*, var. *sphærostachya.*—Common on the coast, as at Bettyhill, Tongue, and also in dry places inland 107 and 108.

P. maritima, *L.*—A curious variety or state grew on the sea-sand on Bettyhill 108, with small short fleshy leaves and very thick root-stock.

Polygonum viviparum, *L.*—Sea-level at Bettyhill 108.

Ulmus montana, *Stokes* (*U. campestris*, L.).—Native by the streams and on rocks about Inchnadamph.

Betula tomentosa, *Reith* (*B. glutinosa*).—Altnaharra *108.

Quercus sessilis, *Ehrh.*—Invershin 107, Tongue 108.

Q. Robur, *L.*—Invershin *107 (planted).

Populus tremula, *L.*—Native on cliffs, Inchnadamph.

Salix alba, *L.*—Invershin 107, probably introduced.

S. cinerea, *L.*—Tongue 108.

S. repens, *L.*—In several forms above Inchnadamph 108.

S. Myrsinites, *L.*—In Traligill Glen, and on limestone above Inchnadamph.

S. herbacea, *L.*—Near coast level at Cape Wrath, A. M. Bell.

Helleborine atrorubens (*Epipactis atrorubens*).—Traligill Glen 108.

Orchis mascula, *L.*—On cliffs in Traligill Glen 108, and on slopes of Ben More, Assynt *107.

Orchis latifolia, *L.*—Inchnadamph, rather variable 108.

O. incarnata, *L.*—Near Ardvrick Castle 107, and as the var. **angustifolia* at Inchnadamph 108.

O. incarnata, latifolia.—With the above, but very rare.

O. ericetorum, *Linton.*—Invershin 107, Altnaharra, Bettyhill, etc. 108; Watten 109.

Habenaria conopsea, *Br.*—Dark-flowered forms at Invershin 107.

H. albida, *Br.*—Abundant in Traligill Glen 108.

H. bifolia, *Br.*—Abundant at Inchnadamph.

*H. virescens (*Zollik*), (*H. chloroleuca*, Ridley).—At Inchnadamph with the foregoing, 108.

H. viridis, *Br.*—Bettyhill, etc., var. *ovata* occurs on the Scrabster Cliffs, Caithness 109, with broadly oval leaves, an analogous plant to the var. *ovata* of *Liparis* which is a seaside form from Glamorganshire.

Scilla verna, *Huds.*—Abundant on the cliffs at Bettyhill 108.

*Juncus Gerardi, *Lois.*—By Tongue Bay 108.

*J. triglumis, *L.*—Eastern side of Ben More, Assynt 107.

Juncoides campestre, *Morong*, var.—A dark glossy-glumed plant on Ben More 108.

J. spicatum (*L.*).—Ben More, Assynt 108.

Scirpus lacustris, *L.*—Plentiful near Invershin 107.

Eleocharis multicaulis, *Br.*—Altnaharra 108; Invershin *107.

Scirpus pauciflorus, *Lightf.*—Invershin *107; Inchnadamph 108.

Eriophorum paniculatum, *Druce* (*latifolium*). Rather frequent on the limestone at Inchnadamph. Is it confined to calcareous bogs? It is so according to my experience.

Carex dioica, *L.*—Abundant about Inchnadamph 108.

C. pauciflora, *Light.*—Plentiful near Strathmore and at Altnaharra, also at base of Quinag 108.

C. rupestris, *All.*—Abundant on the low limestone cliffs at Inchnadamph 108.

C. incurva, *Lightf.*—In the damp sand by the river at Bettyhill 108.

*C. disticha, *Huds.*—In a marsh by the river at Invershin 107.

C. chordorrhiza, *Ehrh.*—Plentiful in the locality where the Rev. E. S. Marshall and Dr. Shoolbred discovered it, and also by the stream and in a bog higher up the Naver near Mudale Farm 108.

C. arenaria, *L.*—A slender form growing with *C. incurva* at Bettyhill 108.

C. rigida, *Good.*—East side of Ben More, Assynt 107.

C. Goodenowii, *Gay*, var. *chlorocarpa* (Reichb.) *Druce.*—Altnaharra, Inchnadamph, 108; Invershin 107.

C. canescens, *L.*—Altnaharra, Inchnadamph 108.

C. leporina, *L.*—Exceptionally common at Altnaharra, with compact spikes, also at Bettyhill 108; and Invershin 107.

C. aquatilis, *L.*—The type (var. *Watsoni*) at Altnaharra 108; also at Watten 109.

C. flacca, *Schreber.*—Slender form on Canisp. A stiff, stout form with very dark glumes at Bettyhill.

C. limosa, *L.*—Plentiful with *C. chordorrhiza* at Altnaharra and at Mudale 108.

C. panicea, *L.*, var. *tumidula*, Laestad.—Canisp 108.

C. capillaris, *L.*—Abundant on the limestone, descending to 200 feet near Ardvrick Castle 108.

C. Hostiana, *DC.* (*Hornschuchiana*).—Typical at Bettyhill, also at Inchnadamph, etc. 108.

*C. lepidocarpa, *Tausch.*—Loch Watten and Loch Scarmclett 109.

C. filiformis, *L.*—Altnaharra, 108.

C. inflata, *Huds.* (*ampullacea*).—Abundant as a large-fruited form with brownish perigynia at Altnaharra. Var. **brunnescens* (And.), and as a narrow-leaved plant, var. *angustifolia*, mihi, at Altnaharra 108, and by Loch Watten 109, as well as near Invershin 107.

Anthoxanthum odoratum, *L.*—Ben More, Assynt, var.? A dark glossy-glumed form grew on Ben More about 2500 feet in some quantity 108.

Agrostis canina, *L.*—Altnaharra 108.

A. pumila, *L.*—Altnaharra 108.

A. tenuis, *Sibth.* (*vulgaris*), var.—Altnaharra 108.

Avena pubescens, *Huds.*, var. **alpina*, Gaud.—Glen Traligill, also on Quinag, Inchnadamph, 108.

Phragmites vulgaris, *Druce.*—Invershin 107; and as the var. *subuniflora*.

*Koeleria britannica, *Domin*, forma—Bettyhill and Farr 108.

Poa pratensis, *L.*, var. *subcœrulea* (Sm.).—Bettyhill and Altnaharra.

*P. nemoralis, *L.*—Invershin.

Glyceria fluitans, *Br.*, var. **triticea*, Fr.—Inchnadamph 108.

Festuca bromoides, *L.* (*sciuroides*).—Extremely luxuriant at Invershin 107.

F. ovina, *L.*, var. **alpina*, Gren. and Godr.—Abundant on the limestone at Inchnadamph, descending to 200 feet.

*F. rubra, *L.*, var. *barbata* (Hack.).—Ben Hope.

*Bromus racemosus, *L.*—Invershin 107.

Lycopodium inundatum, *L.*—Canisp, near the base 108.

*L. alpinum, *L.*—East side of Ben More 107.

Nitella opaca, *Ag.*—Inchnadamph 108; Scarmclett 109.

In the foregoing notes, * prefixed to a locality means that it is not recorded for the vice-county or county in *Topographical Botany*.

OXFORD.

ON THE FLORA OF SHETLAND.

By William H. Beeby, F.L.S.

In the following lines I have endeavoured to give a Revision of the *Hieracia* known to occur in the Shetland Islands. I have undertaken the task with some diffidence; for although the plants have been observed with some care in their native habitats, and many of the forms have been cultivated through a series of years, yet, on the other hand, my knowledge of even the British forms is somewhat partial, and had it not been for the ready assistance rendered by the Rev. W. R. Linton I should not have ventured to describe several of the forms mentioned below.

Apart from the distinctions which separate the sub-genera, our *Hieracia* may be said to possess characteristics rather than characters; and it is seldom that a character can be found which is not at the same time variable within the species, and also present in a more or less modified form in other species, allied or distant. Hence the species are not separated by few or single well-marked characters, but their determination often depends on the assessing of the aggregate value of a number of small differences. Their determination thus becomes to some extent a matter of opinion, and it is quite natural that different names should sometimes be given to the same plant by different authorities.

My collection, amassed during the past twenty years, is now a large one, and many of the plants have been criticised by various authorities, both British and Scandinavian. With the object of getting a more consistent view of the Shetland forms as a whole, I asked Mr. Linton some time ago whether he would look through them. Not only did Mr. Linton accede to my request, but he very kindly examined carefully such plants as required it, and also favoured me with numerous notes without which I could not have hoped to make this account of the group so complete as it is; and I take this opportunity of expressing my great indebtedness to him for his valuable help, as well as for the loan of specimens. In the case of the varieties of *H. crocatum* and *H. strictum* I

have relied almost entirely on Mr. Linton's notes, not being myself sufficiently well acquainted with the characteristics of the types ; while Mr. Linton also rendered special assistance in connection with *H. truncatum.* For my own satisfaction I have confirmed Mr. Linton's observations, and have re-examined the various forms both microscopically and otherwise.

In the "Botany of the Faeroes" (Part II., 1903) Mr. Hugo Dahlstedt has given an interesting and exhaustive account of the species at present known, from which it appears that those islands possess twenty-three forms, of which two are varieties, while in Shetland we have eighteen forms, of which four are varieties. The following table shows the relative distribution of the various groups. The numerals in brackets indicate the number of varieties *included* :—

	Faeroes.	Shetland.
Cerinthoidea . . .	12 (2)	...
Oreadea . . .	...	4 (2)
Vulgata § silvatica . .	2	1
,, § caesia . . .	...	1
,, § eu-vulgata . .	4	...
Alpestria	2	7 (1)
Rigida	3	1
Prenanthoidea . . .	...	1
Foliosa	...	3 (1)

From this comparison it appears that Shetland, with its far greater diversity of rock formation, possesses five forms less than the Faeroes ; on the other hand, seven groups and sub-groups are represented in Shetland against five in the Faeroes, a circumstance which may possibly have some connection with the same feature. Whether we consider the number of forms occurring or the great abundance of some of those forms, the Alpestria are beyond question the dominant group in Shetland ; and it is very remarkable that the Cerinthoidea, the dominant group in the Faeroes, and regarded by Dahlstedt as an essentially Atlantic type, should be quite wanting in Shetland, although sparingly represented in the Orkneys. Mr. Dahlstedt remarks (*l.c.* p. 627) that the Cerinthoidea are "met with dispersed over the Shetland Islands"; but I think that he must have been misinformed on

the point, as there is not even a record of the occurrence of any species of this group, except Tate's erroneous one of *H. flocculosum* referred to below.

The rocks and crags on the north shore of Roeness Voe extend for a distance of some miles, and as the *Hieracia* occur from near the sea-level to a height of 450 feet or a little more, it is very probable that this rich locality will yet afford additional species; in the meantime the following are the forms at present known to occur:—

The abbreviations used are—

U. = Unst. N. = Northmaven.

Hieracium Schmidtii, Tausch.—N. North side of Roeness Voe, and on the lower banks of the Grud Burn. The type appears to be the less common form.

Var. *crinigerum*, Fries.—N. In many places, north side of Roeness Voe, Björgs of Skelberry, etc.

Var. *fealense*, Beeby, var. nov.—Leaves narrower, margins setose, heads with numerous glands. *H. lasiophyllum*, Tate?—N. In two places near the croft of Feal, Roeness Voe (Nos. 1045, 1100). Mr. Linton writes: "Identical with the second example, *forma angustifolia glandulosa*, in Lindeberg's No. 113. I have not seen this before from Britain."

The aggregate occurs in a number of localities from Clousta northwards to the Kattarönis and Björgs of Skelberry. The plants from the latter station (alt. 500 feet) would probably conform to Mr. F. N. Williams' conception of the var. *crinigerum*; but I can scarcely think that the much more robust forms growing among granite talus in the same locality, but 100-200 feet lower, are anything but the same.

H. Oreades, Fries, var. *subglabratum*, F. J. Hanb.—Cliva Hill rocks, north of Brae, Delting, sparingly (Nos. 1097, 1157).

H. silvaticum, Gouan, var. *micracladium*, Dahlst. (f.).—N. Among crags, west of Feal, Roeness Voe, sparingly (No. 1094). This is the plant formerly referred to *H. duriceps*, F. J. Hanb., from which Mr. Linton points out that it is at once distinguished by the copious glandular hairs on the pericline.

H. farrense, F. J. Hanb.—N. Crags west of Feal, Roeness Voe, in two places, alt. 400 and 450 feet (Nos. 1095, 1096).

H. breve, Beeby, sp. nov.—Root-leaves broadly elliptic, with a short broadly winged petiole; teeth irregular, broadly triangular, spreading, rather large. Stem-leaves similar, but narrower,

sessile, and with a broadly truncate base, about 6-11, gradually decreasing upwards. Leaves with numerous bulbous-based hairs on both sides, dull olive green, paler below, becoming copper-coloured in decay. Stem stout, 5-12 inches, simple or nearly so. Ped. densely floccose, with a few long simple and very few glandular hairs. Heads about 3-5 in a close corymb, rarely with a short branch below, broad and short, very truncate-based; phyllaries floccose, with a few simple and a few glandular hairs, outermost short, ovate sub-obtuse, innermost three times as long, lanceolate, acute or slightly acuminated, pale-margined. Flowers lemon-yellow, styles black or nearly so, ligules glabrous-tipped. N. Among rocks west of Feal, on the north side of Roeness Voe, extremely scarce (Nos. 1043, 1092).

Considered by Dahlstedt to be "a new form of the Vulgata section"; but I have reason to think that the plant is hypophyllopodous, in which case it comes near to *H. Scullyi*, W. R. Linton (Alpestria), which is the position Mr. Linton would assign to it. The latter, however, is a much larger plant, 18-24 inches high, with a "panicle corymbosely branched, leafy below." Its foliage, too, is of a remarkable grass-green colour, yellow in decay, and the leaves are quite glabrous on the upper surface. The flowers are larger, and both they and the styles are quite different in colour. In cultivation *H. breve* branches rather freely, but does not exceed 15 inches in height. It has been referred to *H. zetlandicum* both by the Rev. E. S. Marshall ("Journ. Bot.," 1898, p. 172) and by Mr. F. N. Williams ("Prodr.," p. 126), but I do not know on what character. *H. zetlandicum* differs in its full yellow somewhat orange flowers, and pure yellow styles, which, however, soon become tinged with brownish; stem leaves definite, 1-3 only, irrespective of the size of the plant. The teeth of the leaves are more directed forwards, often strongly so, and the phyllaries bear numerous long and short gland-tipped hairs. Root leaves narrower, with longer and more narrowly winged petioles; and finally, cultivation of the two forms, side by side, shows their mode of branching to be entirely different.

I can only account for the great scarcity of *H. breve* on the supposition that the plants seen represented a colony recently established from wind-borne seed, and that the headquarters of the plant will be found somewhere further out among the crags of Roeness Voe.—On granite.

H. zetlandicum, Beeby.—N. Confined to a tract near North Roe, about 2 × 1 miles, extending from Burga Taing northwards to Benegarth, but plentiful in many places within this area (Nos. 1044, 1082, etc.).—On gneiss.

H. dovrense, Fr.

Sub-sp. *humidorum*, Almq., var. *Hethlandiae* (F. J. Hanb.).—Cliva Hill Rocks, Delting, in some plenty (Nos. 1107, 1151).

Sub-sp. *demissum*, Strömf., var. *australius*, Beeby, var. nov.—Considered by Dr. Almquist to be closely allied to the Icelandic *H. demissum*, from which it differs in the more numerous stem-leaves, the upper ones more amplexicaul, and the lower ones less attenuated towards their base. Pericline short, broad, truncate-based, blackish, sub-glabrous, with a few glandular hairs. Ligules glabrous, styles livid.—*H. crocatum*, Tate?

U. In some plenty about the north-east corner of the Loch of Cliff; Burrafirth Cliffs (Nos. 609, 859, 860).

Sub-sp. *demissum*, Strömf., var. *pulchelliforme*, W. R. Linton, = *H. pulchellum*, auct. brit.

Dahlstedt places this near *H. demissum*, while Almquist regarded it as very closely allied to, but distinct from, the last, thus assigning it a similar position.

U. Burrafirth! W. R. Linton.—North-east banks of Loch of Cliff; by Queyhouse Loch (No. 608).

H. protractum, Lindeb. = *H. vulgatum*, Tate.—In many places from Unst and Yell southwards to Sandsting and Aithsting. The form with marbled leaves is the more common (Nos. 610, 611, 1093, etc.).

H. subtruncatum, Beeby, sp. nov.—Pseudophyllopodous? Root-leaves? Stem-leaves numerous, about 10-13, lanceolate or ovate-lanceolate, all sessile, upper clasping with a broad base, lower less so, with a few medium-sized more or less spreading teeth, a few long hairs on both sides, and rather many stalked stellate hairs beneath. Stem purplish red, hairy, especially below, branching dichotomously, branches sub-erect, 12-25 inches high according to situation. Peduncles sparingly floccose, with a few simple and glandular hairs. Pericline somewhat rounded below, outer phyllaries short ovate, inner lanceolate, all more or less blunt; the recurved tips violet-coloured in the living plant, very faintly floccose, otherwise glabrous. Flowers rather pale, ligules glabrous, styles yellow.

This plant has been referred to *H. truncatum*, Lindeb., by Dr. Elfstrand and the Rev. E. F. Linton, but that species differs conspicuously in its glabrous leaves, and in the long, winged petioles to the lower stem-leaves. It differs also from the Shetland plant in the following points among others—stem-leaves fewer, 5-7, broader in the middle, stem glabrous, phyllaries slightly floccose and senescent, panicle with branches "arcuato-patentibus," etc. Mr. Linton writes: "In all the above points Lindeberg's *H. truncatum* contrasts markedly

with your plant. Hence I consider your plant deserves a name as a separate form."

N. Abundant on the rocky and ferny banks of the Eela Water burn down to its mouth in Hamar Voe, and on banks about the shores of the same voe (Nos. 1105, 1106, 1153, 1154).

H. rigidum, Hartm., var. *Friesii*, Dahlst. (f.).—N. Banks of the Gluss Burn, near Ollaberry, abundant (Nos. 1040, 1104). Mr. Linton regards this as best kept here, although not fully agreeing with the variety named.

H. strictum, Fries, var. *humilius*, Beeby, var. nov.—About one-third shorter than the type; leaves rather narrower, closer, and shorter, decreasing more rapidly upwards, lower ones more attenuated at the base, veins beneath a little darker and more defined. Heads sub-truncate, with fewer hairs and glands; ligule-tips glabrous or nearly so. N. Gelli Gill, near Hillswick (No. 1156.); Sandsting, Holm in Hamari Water (No. 1633).

H. auratum, Fries, var. *thulense*, F. J. Hanb.—N. Abundant among rocks in many places on the north side of Roeness Voe, sparingly on the south side. Rocks a mile north of Mavisgrind.

H. crocatum, Fries, var. *vinaceum*, Beeby, var. nov.—Leaves less parallel-sided than in the type, narrow, much tapering to each end except the upper ones, more hairy beneath. Stems of a striking red-violet colour, which is fully maintained in cultivation. Stem hairy below, styles livid. N. In many places on the north side of Roeness Voe (Nos. 1087, 1089, etc.). Mr. Linton regards this as a slight variety, Dr. Elfstrand a distinct variety.

Var. *congestum*, Beeby, var. nov.—A dwarf form 12-15 inches high, with leaves, broad, short, sub-parallel-sided, much aggregated in the lower part of the stem, which is of a dull-greenish or sometimes somewhat reddish colour, and is sub-glabrous below. In cultivation the plant becomes 18 inches high, while the leaves become even broader in proportion to their length, and the reddish tint of the stem is nearly or entirely lost. "A distinct variety"—Dr. Elfstrand. N. Among fine pasture below the hills north of Burga Taing, North Roe (Nos. 1085, 1086). Sandsting, Holm in Burga Water (No. 1634). The description is made from the North Roe plant; the other is not perhaps quite identical.

Excludenda

H. maculatum.—Edmondston's record (1839) may have been a boyish guess at a name for *H. protractum*, which is the only spotted-leaved plant known to occur.

H. murorum, near North Roe.—Edm. Flo.—This vague locality may equally apply to the Björgs of Skelberry on the one side, or to Burga Taing on the other—to *H. Schmidtii* or to *H. zetlandicum*. For the rest, his *H. dubium* (?), *H. sylvaticum*, and *H. denticulatum* are even more ambiguous.

H. flocculosum, Backh.—Tate, in "Journ. Bot.," 1866, p. 6.—The single example in "Hb. Mus. Brit." cannot, I think, be referred to this species. It appears to belong to the Oreadea-scapigera, or possibly to the Vulgata-silvatica. Mr. Linton includes this in his "Brit. Hier.," but informs me that he has not seen the specimen.

H. buglossoides, Arv.-Touv.—Mr. Linton now considers that the much-discussed Cliva Hill plant is correctly referred to *H. Oreades*, var. *subglabratum*.

H. gothicum, Fries.—Included in Linton's "Brit. Hier.," but neither Mr. Linton, Mr. Hanbury, nor the writer can find any basis for the record.

H. rubicundum, Hanb., var. *Boswelli*, Lint.—Included in the "Brit. Hier.," on the authority, I believe, of the Rev. E. F. Linton. Mr. Hanbury refers the plant to *H. Schmidtii*, and the Rev. W. R. Linton writes, "I should rather agree with Mr. Hanbury and refer the plant to *H. Schmidtii*." In this case the material is rather scanty.

H. orimeles, W. R. Lint.—Hanbury, "Journ. Bot.," 1893, p. 18. Trail, "Additions, etc.," "Annals," 1906, p. 96.—The remark under *H. buglossoides* also applies to this.

H. stictophyllum, Dahlst.—In the "Botany of the Faeroes," p. 642, Mr. Dahlstedt writes, "I have seen specimens of this form from . . . the Shetland Islands (W. H. Beeby)." The plant, however, is not present in my collection. I wrote to Mr. Dahlstedt about it last June, but as I have not yet received his reply I think it best to exclude the species until information is forthcoming.

H. lasiophyllum, Tate, see *H. Schmidtii, fealense.*
H. duriceps, Hanb., see *H. silvaticum, micracladium.*
H. vulgatum, Tate, see *H. protractum.*
H. crocatum, Tate, see *H. demissum, australius.*
H. truncatum, Lindeb., see *H. subtruncatum.*

THAMES DITTON, *December* 1907.

[The foregoing was in type last December, but was held over from the January number owing to want of space. And now we have to deplore the loss of the Rev. W. R. Linton, who passed

away on the 4th January after a short illness. Mr. Linton's name occurs frequently in the above paper, and I feel that I cannot let the sad occasion pass without once more expressing my appreciation of his unfailing kindness, so fresh in my memory, as well as of the very real and sound knowledge which he possessed of the British *Hieracia*. His place will be a hard one to fill.

Since Mr. Linton is no longer with us, I think it right to add a word of explanation concerning one point: after I had written out the descriptions, etc., I sent the rough draft of the descriptive portion to Mr. Linton, who looked over it but found no alterations to suggest. The whole of the introductory portion was written afterwards, and was not seen by Mr. Linton at all.—W. H. B.]

ZOOLOGICAL NOTES.

Varieties of the Mole.—The varieties received from the Mole-catchers, who regularly consign such captures to me, during the past year of 1907 have again been numerous. Yellow and cream in all shades, those with yellow and buff patches and streaks on the abdomen comprise the range of variation, with one exception, which is a female, with pelage of a uniform shade of bluish lead colour. I have had this variety before, but never so bright and fine. Again, as always, no whites in any form.—ROBERT SERVICE, Maxwelltown.

Large Otter.—An Otter, stated to be 28 lb. in weight, was killed by Mr. John Tait, Kinbuck (Forth Area) on 10th May 1907, and recorded in "Strathearn Herald." I have once met with an Otter killed in the Carron River, Dunipace, which weighed 26 lb. Record weights which are authentic are desirable.—J. A. HARVIE-BROWN.

Bird Notes from Tiree.—It may interest you to hear that there are 14 Mute Swans here. Twelve of them came at the beginning of July and they were joined later by two others. These Mute Swans that come here in summer do not stay in winter with the exception of one pair which has remained here for several years; but they do not associate with the Wild Swans.

I have not seen any new birds. The migration season was about as usual, except that there has been a great scarcity of Redwings this autumn. I have not seen half a dozen, whereas they used to be swarming all over the place in November. [This is interesting, seeing that Redwings have been unusually abundant on the East Coast of Scotland, and were recorded as appearing suddenly in large numbers near Ullapool.—J. A. H.-B.] A good Redwing

year is always a good Snipe year. The ground never was in better condition for Snipe, but they are not at all plentiful.

Wild Swans, and especially Bewicks, are unusually numerous on all the lochs on the Island. On the East Church Glebe at Gott, there is a small pool caused by a choked drain ; and there has been from a dozen to eighteen Bewick's Swans on it daily for several weeks. The pool is only about half an acre in extent, and is within 100 yards of the manse door. The Swans don't pay any attention to the inmates moving about. They must be getting some feeding of which they are very fond. Previous to being flooded, the place was a mass of "Silverweed." I wonder if it is the rotting Silverweed they are feeding on!

The winter has been very mild, and we have not had any frost or snow up till now, 28th February 1908. It has not been a good Snipe year. Snipe were never very abundant all winter, although the ground was in capital order. Golden Plover were thick in the beginning of October, and they are so also at present with this bad weather. They are always most abundant when there is nobody here to shoot them.—PETER ANDERSON, Tiree.

Pied Flycatcher Nesting in Kirkcudbrightshire.—In the July "Annals" (p. 183) I recorded the finding of a nest of this species, and in doing so, hinted that further discoveries were anticipated. While standing beside the tree in the trunk of which the aforementioned nest was situated, I had noticed a male Pied Flycatcher at some little distance away sitting upon the top of a wire fence, and concluded that it was a different bird from the male on which I had put the glasses only half a minute previously, but of course could not be sure owing to the rapid and confusing movements of the birds. But my friend, resident near the spot, and whose name is not to be mentioned lest it should lead to the locality, continued his watch and within a few hours unravelled the mystery by discovering another nest with eggs scarcely one hundred yards away from the other. It was placed in a position such as a robin would choose—within a hole in the tree trunk just at the same level as the grass. My friend, who knows the Pied Flycatcher well in most of its English haunts, said he has never known of a nest in such a low-down position before, and says it was exactly similar to many Wrynecks' that he had seen. It is most gratifying to know that both nests had their contents duly hatched out and fledged, so that in all probability we have now a permanent summer colony that in future seasons will be watched with interest.—ROBERT SERVICE, Maxwelltown.

Waxwing in Banffshire.—It will, perhaps, be worth while to record the fact that a Waxwing (*Ampelis garrulus*) was shot at Garronhaugh, Rothiemay, on 20th November 1906. The specimen is now in my possession, and is the only one I have ever seen. —JOHN YATES, Banff.

Gadwall in the West of Scotland.—A male shot at Dougalston, by Mr. Riply Kerr, in December 1907. Mr. Kerr had not met with it on his property previously. One shot on the Dee, near Castle-Douglas, on 6th January, is reported by Mr. Hugh S. Gladstone.

Pintails in Argyllshire.—Four or five Pintails (*Dafila acuta*) were seen on Loch Tulla on 4th June, 1907, by General Stewart, who is well acquainted with the species.—CHAS. H. ALSTON, Letterawe.

[It would be interesting to know if the birds were breeding, or if a small party on passage northwards.—EDS.]

Smew in Dumfriesshire.—On 6th January two immature birds occurred inland at Dalswinton, Dumfriesshire; more than ten miles from the sea. Hard frost prevailed at the time, and they rose from a ditch, and one, a young male, was shot.—HUGH S. GLADSTONE, Thornhill, Dumfriesshire.

The Eider Duck in Solway Waters.—For many years past the Eider (*Somateria mollissima*) has been coming into the restricted waters of the Solway with slowly increasing frequency during the non-breeding season. It is only seldom that an odd straggler is noticed in summer. This past breeding season, however, two pairs remained close in to the rocky shores of Colvend from April till end of August, and I have a long series of notes of observations detailing their movements during that period. One of the two females was often absent, for a few days, but if on domestic duties, no results were seen. I fully anticipate ere long to hear of successful nesting of Eiders on our shores, more particularly from some of the quiet nooks of the Wigtownshire coast.—ROBERT SERVICE, Maxwelltown.

Siberian Chiff-Chaff and Wood Warbler in the Orkneys.—Information regarding the occurrence of these birds in the Orkney Islands will be found on pages 79 and 80 of this number of the "Annals."—WM. EAGLE CLARKE.

Glossy Ibis in Ayrshire.—An immature female example of the Glossy Ibis (*Plegadis falcinellus*) was shot near Irvine towards the middle of September 1907, and forwarded to M'Culloch and Sons, Glasgow, who sent it for exhibition to the October and November meetings of the Glasgow Natural History and Andersonian Naturalists' Societies. The bird subsequently passed into the possession of the Marquis of Bute at Rothesay. There is no record of the Glossy Ibis having been obtained before in the "Clyde" area.—JOHN ROBERTSON, Glasgow.

Bittern in East Lothian.—On 8th January last, a male Bittern (*Botaurus stellaris*) was captured alive by a shepherd near Whittinge-

hame, and taken to Mr. Pow, Dunbar, in whose hands I saw it. One of its legs had been injured, and its poor condition accorded with its inability to save itself by flight. Though well cared for, it survived scarcely four weeks.—WILLIAM EVANS, Edinburgh.

Capercaillie in Dee.—I am informed by Mr. J. H. Gurney, that nine Capercaillies (*Tetrao urogallus*) were shot on 9th September 1907, near Alford on the Don.—J. A. HARVIE-BROWN.

Land-rail at Edinburgh in Winter.—On 13th February I was told that one of the gardeners here had about ten days previously (*i.e.* about the first of the month) discovered a dead Land-rail (*Crex crex*). My informant told me that when the bird was found it was quite fresh, and had been discovered under a thick shrub, where it had evidently sought protection from the cold. He also told me where it had been placed, and I at once went and examined it.—P. M. CAMPBELL, Fettes College, Edinburgh.

Red-necked Phalarope in the Solway Area.—I have to record a specimen sent me in the flesh on 5th September. It was shot while swimming in the tide close to the shore at Powfoot, near Annan. This is the first local specimen I have handled, and I do not know of another. It seems strange that while the Red-necked Phalarope (*Phalaropus hyperboreus*) breeds at points to north or west of Solway, in Scotland, we should practically never see it here, While the Gray Phalarope breeding a thousand miles farther away should occur here with comparative frequency.—ROBERT SERVICE, Maxwelltown.

Leach's Petrel in Aberdeenshire.—As there are only three previous records of the occurrence of Leach's Fork-tailed Petrel (*Oceanodroma leucorrhoa*) in Aberdeenshire, and the last of these is for as long ago as 1884, it will probably be of interest to you that I found an example of that species a few feet above the tide-line on the shore about a quarter of a mile south of the Don, on the 5th January 1908. The specimen was quite fresh; it proved to be a female; its stomach contained only an oily fluid. It is being preserved for the Aberdeen University Museum.—A. LANDSBOROUGH THOMSON, Old Aberdeen.

The Saury or Skipper (*Scombresox saurus*) **in the Solway.**—I look upon this beautiful fish as a rarity in our waters. Doubtless, it is not really so, because its elongated form enables it to go through the meshes of anything but a shrimp net. I received a particularly brilliant specimen from the mouth of the Nith on 19th September.—ROBERT SERVICE, Maxwelltown.

Aleochara spadicea, *Er.*, **in Scotland (Tweed Area).**—I have a specimen of this beetle which I took in a mole's nest about a mile south of Leadburn, and therefore in Peeblesshire, on 30th March

1905. It has been identified by Prof. Hudson-Beare, and appears to be the first record for Scotland.—WILLIAM EVANS, Edinburgh.

Bethylus cephalotes, *Först.*, **in Scotland (Forth Area).**—Among some Oxyura (Proctotrypidæ) determined for me by the late Mr. A. J. Chitty there is a specimen of this species taken on Blackford Hill, Edinburgh, 6th May 1900. The name does not occur in Mr. P. Cameron's list of Scottish Proctotrypids published in the "Annals" for last year.—WILLIAM EVANS, Edinburgh.

BOTANICAL NOTES AND NEWS.

OBITUARY NOTICES.

Rev. John Fergusson, M.A., LL.D.—Born in 1834 in Glen Shee, Perthshire, he spent the greater part of his life in the neighbouring county of Forfar. A student of the University of St. Andrews, he became a clergyman in the Church of Scotland, and lived for some time in Glen Prosen, a *quoad sacra* parish in N.W. Forfarshire. In 1869 he went to the church of New Pitsligo in Aberdeenshire; and in 1875 he returned to Forfarshire, to Fearn or Fern, a parish a few miles from Brechin, in the basin of the South Esk. He died in Edinburgh on 6th August 1907. Mosses formed the chief objects of his interest and for several years he was a keen and successful student of the British species. In 1869 appeared a paper on the Mosses of Forfarshire ("Trans. Bot. Soc. Edinburgh," vol. x. p. 245.) in which many additions are made to the list for Forfarshire, several of them being new to Britain. To the "Scottish Naturalist," from 1873 to 1879, he contributed several papers from New Pitsligo and Fearn, chiefly on Mosses, but also on Fungi, and a more general one on the plants observed in a brief visit to Glen Shee. Other notes by him appeared in "Science Gossip" and elsewhere. He intended at one time to produce a work on British Mosses, but appears to have relinquished the idea. The late Dr. John Roy and he arranged to issue a Flora of the counties from Banff to Forfar inclusive. Dr. Roy's share of the manuscript was forwarded for revisal by his collaborateur, but remained in his hands. For the last twenty years Dr. Fergusson appeared to have lost interest in botanical studies.

Thomas Barker, M.A., Emeritus Professor of Mathematics, of Owens College, Manchester. A native of Old Aberdeen, Professor Barker graduated in 1857 as M.A. in King's College and University there, having taken a distinguished place as a student, especially in mathematics. Going to Cambridge, he was Senior Wrangler in

1862, and was awarded a Fellowship in Trinity College. In 1865 he became Professor of Mathematics in Owens College, then one of the constituents of the newly formed Victoria University. Here he taught until 1885, when he resigned the Chair; and he afterwards lived at Whaley Bridge and at Buxton until his death, at the age of 69, in November 1907. Although chiefly a mathematician, he had a strong taste for the study of plants, especially of the microscopic forms of freshwater Algæ, to which he gave attention during his visits to Scotland. He did not publish results of his work; but he gave a very marked evidence of his botanical tastes in leaving a large sum of money to Manchester University for the advancement of botanical and mathematical studies.

Notes on Plants from Scotland.—Miss Fowler of Inverbroom has found *Teesdalia nudicaulis*, hitherto not recorded from the vice-county 105, on shingle by the river at Inverbroom.

Dr. Domin has named a Thyme which I collected at Duns, Berwickshire, as *T. Serpyllum*, L., × *ovatum*, Miller. I have *Thymus ovatum*, Miller (= *T. Chamædrys* of British authors, not of Fries) from Newton Stewart and Port William in Wigtownshire, and from Tummel in Mid Perth, also *T. glabrum*, Miller (= *T. Chamædrys*, Fr.) from Ben Heasgarnich in Mid Perth, and Ben Laoigh in Argyll, and Strath Carron in West Ross.

I noticed *Bromus leptostachys*, Pers., growing by the Tay, in Perth, in July 1907.—G. Claridge Druce.

Critical Study of Ranunculus aquatilis, *L.*, var. γ.—In his very full study of the forms included under this head ("Journ. Bot." 1908, pp. 11-22, 44-52), Mr. F. N. Williams, after a discussion of the many opinions expressed and varied synonyms, groups them under the species *R. divaricatus*, Schranck (= *R. Drouettii* of British Floras), and *R. trichophyllus*, Godron, each with varieties, some of which include "forms." These are defined, and their distribution is indicated. Of the British types the following are indicated by him from Scotland:—

1. *R. divaricatus*, Schranck, var. *communis*, world-wide. Var. *eradicatus* (Læstad.), in British Isles found only in lochs of Fingask in Perth and of Rescobie and Balgavie in Forfar, flowering and fruiting two to five feet under water, recorded as *R. trichophyllus*, var. *demersus*.—N. E. Brown ("Eng Bot.," ed. 3, supp. 1891).

2. *R. trichophyllus*, Godron, var. *communis*.—"In Scotland it extends north of the Caledonian Canal as far as the Orkney Islands. South of the Caledonian Canal it is recorded in nine counties"—Dumfries, Kirkcudbright, Ayr, Lanark, Stirling, Perth, Angus, Dumbarton, and Buteshire. Var. *terrestris*, Godron, Nairn.

The Prehistoric Flora of Scotland.—There are many problems with regard to the origin of the flora of every country which cannot be solved by the most careful study of its existing condition. It is frequently not possible to ascertain with confidence from what source, and when, and in what manner certain species immigrated; and this is peculiarly the case where man has long been a dweller, and has effected great changes, as has been the case even in Scotland. Any light from early sources is most welcome; and among the more important sources of light are the investigations of the tertiary and more recent deposits. Mr. F. J. Lewis has been doing admirable work in his study of the peat mosses in several districts of Scotland from the south to the Shetland Islands and the Hebrides, the results of which are published in memoirs noted in this issue under "Botanical Literature." Mr. Lewis has been able to show the very wide occurrence of two forest-beds in the South of Scotland, of which the lower gave place to an arctic flora, followed by the upper forest deposits, which in their turn were succeeded by the existing covering of moors and swamps. In the north he has not found the lower forest-bed; the other strata are present in the same order, except that the single upper forest-bed of the south is represented by two, between which is Sphagnum peat, from one to three feet thick, from which wood is quite absent. The upper of the two layers usually shows *Pinus sylvestris*, the lower *Betula alba*; and the intermediate peat yields *Salix Arbuscula*, *Betula nana*, and other plants characteristic of a climate unsuited to the growth of trees. No corresponding true forest-bed was found by Mr. Lewis in the Hebrides and in Shetland, although *Betula alba*, *Alnus*, and *Corylus* occurred in a layer probably corresponding to the lowest forest-bed of Southern Scotland.

From the investigations of the past three years Mr. Lewis finds that the following stages are represented in Scottish peat mosses:—

1. Recent peat. 2. Upper forestian, including in Northern Scotland an upper and a lower forest-bed separated by from one to three feet of Sphagnum peat with subarctic plants, the upper forest-bed being the earliest to show extensive Vaccinium-Calluna deposits. 3. Upper peat bog, of existing species of peat bogs and marshes. 4. Second arctic bed, with remains of arctic plants, now existing on our hills in a few localities only, along with others that indicate that the climate was not so extremely cold as might have been supposed from the presence of the arctic alpine plants. 5. Lower peat bog containing remains of plants like those of present time, except in absence of *Calluna*. 6. Lower forestian containing remains of *Betula alba*, *Alnus*, and *Corylus*, along with numerous herbs indicating a mild climate. 7. First arctic bed containing remains of *Betula nana*, *Salix*, *Arbuscula*, and other plants of a cold climate. In a summary, with comparative diagrams of the limits about the sea-level,

it is shown that while the elevation of 2000 feet above the sea may be taken at present as the normal lower limit of the characteristic arctic alpine flora, and as the normal upper limit of trees in Scotland, in each of the two arctic beds the arctic flora practically reached the sea-level, while in the lower Forestian period the deciduous trees ascended to *at least* their present limit, and in the upper Forestian to over 3000 feet above the sea. Mr. Lewis has not found in the peat any species that is not still existent in Scotland, but points out that *Salix polaris* has been found in deposits in the Southern Lowlands that can hardly be younger than the lower arctic bed of the upland peat. His work is a very valuable contribution to the early history of the flora, and to the more recent geological history of Scotland.

Calamagrostis strigosa, *Hartm.*—Mr. Druce, at page 40 of the last number of the "Annals," says, the "Messrs. Groves describe this plant as *cæspitosa*. On referring to the last edition of "Babington's Manual" I find this is so. Wahlenberg in his original description of the plant as *Arundo strigosa*, "Fl. Lapponica" t. 2. 29 (1811), makes no mention of such a habit, nor does Fries, "Sum. Veg. Scand." 240, 1846; while Anderson in his "Gramin. Scand." 82, 1852, says, "Rhizoma longe repens, articulatum, stolones foliatos agens"; while of *stricta* he says, "Rhizoma brevissime repens." Blytt, "Norges Flora" 86, 1861, actually describes it with longer rhizomes than *stricta*, which he says has "Rodstoken kort." So I think whether the plant is *strigosa* or not it disposes of that objection.

S. Almquist, who described the genus for Hartman's "Skand. Fl.," ed. of 1879, remarked on a specimen I sent to him, "*C. strigosa*, very near the Norwegian form." I have had the plant from Caithness growing for some years, and it behaved exactly as did *Hierochloe borealis*, as its rhizomes crept extensively in the soil and it would not flower unless grown in a pot. It may possibly be *C. Hartmanniana*, Fries, "Summa Veget. Scand." i. 241 (1846).—ARTHUR BENNETT.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—January-March 1908.

[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.

EIGHTEEN NEW EUROPEAN VOLES. By Gerrit S. Miller. *Ann. and Mag. Nat. Hist.*, February 1908, pp. 194-206. Microtus

sandayensis westræ, subsp. n., from Westray, North Orkney, and Microtus agrestis exsul, subsp. n., from North Uist, are described in this paper.

Birds observed during Winter of 1906-7. *Trans. and Proc. Perthshire Soc. Nat. Sci.*, vol. iv. pt. vi. (1907) pp. 202-203. A list given (no author's name) of twenty species, with localities and dates.

On some Bird Remains from the Beach of Ayre, Orkney. By N. F. Ticehurst, F.R.C.S. *Brit. Birds*, March 1908, pp. 309-311. The remains found consisted of those of the Gannet, Cormorant, Shag, Great Northern Diver, Whooper, Gull sp., Shearwater sp., and the Great Auk (lower half of a tibia).

Half a Day on Tentsmuir. By Wm. Whyte. *Trans. and Proc. Perthshire Soc. Nat. Sci.*, vol. vi. pt. iv. (1907) pp. 200-202. Notes on bird-life.

Glossy Ibis in Aberdeenshire. George Sim. *Zoologist*, 1908, p. 113. An immature bird shot at "harvest time" in 1907, at Watermill, Fraserburgh.

Land-rail in Scotland in Winter. "P. C." *The Field*, February 22, 1908, p. 320. Specimen picked up dead, but quite fresh, near Edinburgh, in February.

White-Ringed Plover. J. Whitaker. *Zoologist*, 1907, p. 387. One added to Mr. Whitaker's collection was shot at Westray, Orkney.

On the Age of the Reptile Faunas contained in the Magnesian Conglomerate at Bristol and in the Elgin Sandstone. By Friedrich Baron Huene, D.Sc. *Geol. Mag.*, March 1908, pp. 99-100.

Large Fish caught in 1907. *Zoologist*, January 1908, pp. 39-40. A Salmon weighing 61½ lb. caught in the Tay below Perth, one weighing 50 lb. from the Awe at Taynuilt, and one weighing 47 lb. caught in the Earn, are mentioned.

Deliphrum crenatum, Grav., in Dumbartonshire. George W. Chaster, January 1908, p. 16. Four specimens (determined by Mr. Champion) obtained near Helensburgh.

Phoridæ in Dumbartonshire; with Description of a New Species. By J. R. Malloch. *Ent. Mo. Mag.*, January 1908, pp. 11-13. Thirty-three species recorded, including P. pubericornis, which is described as new to science.

A Revision of some Carboniferous Corals. By R. G. Carruthers. *Geol. Mag.*, January, February 1908, pp. 20-31, and 63-74, plates iv. and v. Zaphrentis omaliusi recorded from Greenfoot Quarry, near Glenboig, Lanarkshire, and var. densa of the same species from Crosshouse.

BOTANY.

Botanical Excursions made by Professor John Hutton Balfour, in the years from 1846 to 1872 inclusively, in *Notes of the Royal Botanic Gardens, Edinburgh*, 1908, pp. 21-497. This consists of extracts from the "Excursion Diary" of Professor Balfour, but with the names of the plants in the several lists arranged as in the "London Catalogue." These lists are drawn from many counties of Scotland (72, 73, 75, 77, 79-90, 92, 99, 100), and contain numerous additions to the lists of some of these, especially near Edinburgh.

Critical Study of Ranunculus aquatilis, L., var. γ. By Frederic N. Williams, F.L.S. (*Journ. Bot.* 1908, pp. 11-22, 44-52.) A full discussion and analysis of the forms under var. γ, and of their distribution.

The Subsection eu-caninæ of the Genus Rosa. By Major A. H. Wolley-Dod. (*Journ. Bot.* 1908, supplement, pp. 1-16.) An important discussion of this difficult group.

The British Species of Thymus. By K. Domin and A. Bruce Jackson. (*Journ. Bot.* 1908, pp. 33-37.) This also is a critical paper of importance, four types being recognised, viz. *T. ovatus* Miller, *T. Serpyllum*, L., *T. præcox*, Opiz, and *T. glaber*, Miller, all described here.

Helleborine, Hill, *v.* Epipactis, Adans. By G. Claridge Druce, M.A., F.L.S. (*Journ. Bot.* 1908, pp. 8-10.) A statement of reasons why *Epipactis* must give place to *Helleborine*; and a note of the names that the British species must in future bear.

Sur le Plancton des Lacs Écossais. By H. Bachmann. (*Arch. Sc. Phys. Nat. Genève*, 1906, pp. 63-65.)

The Plant Remains in the Scottish Peat Mosses, Part III., The Scottish Highlands and the Shetland Isles. By Francis J. Lewis, F.L.S. (*Trans. Roy. Soc. Edinb.*, xlvi., 1907, pp. 33-70, plates.) Describes results of investigations in valleys in West Sutherland, in upland districts of the North Esk valley and on Rannoch Moor, and in Lewis and the Shetland Islands.

The Peat Moss Deposits in the Cross Fell, Caithness, and the Isle of Man District. By F. J. Lewis. (Report to meeting of Brit. Assoc. at Leicester, 1907, 8 pp.) Describes results of sections in the basins of the Halladale, Strathy, and Armadale.

On the Pre-glacial Flora of Britain. By Clement Reid, F.R.S., and Eleanor M. Reid, B.Sc. (*Journ. Linn. Soc.*, No. 265, Jan. 1908, pp. 206-227, plates 11-15.) An enumeration of the plants (147) determined from deposits of the Norfolk and Suffolk coasts, with photographs of fruits and seeds.

BOOK NOTICES.

A Vertebrate Fauna of North Wales. By H. E. Forrest. With twenty-eight plates and a map. London: Witherby and Co., 1907. Price 17s. 6d. net.

Those who are interested in the biological survey of the British Islands, which has been making steady progress since the days of Gilbert White, thanks to the voluntary services of field naturalists, must often have wondered why such a natural and singularly attractive area as Wales should be lacking a comprehensive work devoted to any section of its fauna. Even the birds, that fascinating group in which almost every one is more or less interested, have not been more fortunate than the other Orders, and one has had to fall back upon the work of Thomas Campbell Eyton, whose "Attempt" to ascertain the fauna of the northern portion of the Principality was written seventy years ago, for collected information on any section of the Welsh Vertebrates.

Though British Zoologists have waited long, they have, fortunately, not waited in vain, for Mr. Forrest's book is an excellent one in all respects. The author has the necessary wide personal knowledge of his area and its animals; and to this he has added, through research, a thorough acquaintance with the scattered literature of his subject. With these essential data at his command he has built up a comprehensive book on a well-considered plan, and the result leaves little, if anything, to be desired.

The Vertebrate Fauna of North Wales is a rich one, especially in native forms. It comprises 40 species of mammals, 251 birds, 4 reptiles, 6 amphibians, and 150 fishes; all of which are very adequately and judiciously treated of. The book also includes sections devoted to the Zoologists of North Wales, the physical features of the area, bird-migration, etc.; and the whole forms a well-got-up volume of 610 pages, which is appropriately illustrated and provided with a good map.

Mr. Forrest has proved himself to be such an able and painstaking author, that we would fain hope that he may be induced to give us a companion volume on the Vertebrate Fauna of South Wales: a work which has now more than ever become a *desideratum*.

The Moths of the British Isles. Series I. By Richard South, F.E.S. ("Wayside and Woodland Series.") London: Frederick Warne and Co., 1907. Price 7s. 6d. net.

This is a delightful little volume, uniform with that on the Butterflies issued some few months ago. Although small enough ($6\frac{1}{2}$ by $4\frac{1}{2}$ inches) to be carried in the pocket, the book contains 343 pages and 159 plates, the latter giving no fewer than 671

accurately coloured examples, natural size, of every species and many varieties, together with carefully executed drawings of the eggs, caterpillars, chrysalids, and food-plants of the most important. The text, as we should expect from the authorship, is carefully and accurately written, and altogether there is a wonderful amount of information given in such a small compass. Of the figures, which are most excellent examples of the three-coloured process, we can only speak in terms of the highest praise. The present volume deals with the Families Sphingidæ to Noctuidæ, and is to be followed by a second series, devoted to the remainder of the "Macrolepidoptera." It would be difficult to imagine a more charming gift-book for the schoolboy naturalist, and we can cordially recommend it as a most beautiful, convenient, and reliable account of our native Moths.

Wild Bees, Wasps, and Ants, and other Stinging Insects. By Edward Saunders, F.R.S. London : George Routledge & Sons, Ltd. Price 3s. 6d.

This little book, by our recognised authority on the Insects of which it treats, consists of a series of short essays, "only for the non-scientific." Since, however, reliable information on the habits of the Aculeate Hymenoptera is not easy to find, we venture to think that the book appeals also to the scientific reader who, though not a specialist, desires to know something of this exceptionally interesting group of Insects. The essays are good and full of accurate information, though perhaps a little unequal. The best, perhaps, are those towards the end of the book, on "The Distribution, Rarity, or Abundance of various Species," on "The Development of Insects from the Egg," and on "Colour." The book is embellished by four plates, executed in the best "three-colour" style, from drawings which are unusually beautiful and accurate.

The Annals
of
Scottish Natural History

No. 67] 1908 [JULY

REPORT ON SCOTTISH ORNITHOLOGY FOR 1907

By JOHN PATERSON

IF the report on the ornithology of Scotland for 1907 lacks some of the distinction of its predecessors, it is still happily full of interest. The conditions that obtained during the year are easy to remember. The first months maintained the boreal traditions which they inherited from the end of the preceding year, although the last week of March, a critical time for the appearance of the first of our summer visitors, proved to be one of the finest of the year. April did not bear out the promise of this burst of fine weather, however, and the same may be said of May, except the week from the 11th till the 18th. June proved no better than its immediate predecessors, and while July was distinguished by the glorious weather of its second half, the conditions again became unpleasant with the advent of August. September gave us the halcyon conditions we like to associate with it, but the last months did not repeat the harsh conditions of the same months in 1906.

The conditions obtaining were reflected to some extent in the ornithological phenomena of the year. The great numbers of our winter visitors which distinguished the

closing months of 1906 continued with us to add a spice to observation; the Brambling, for instance, remaining in the west (Gareloch) till 24th April, and in the east until the 1st of May—the last a later date than any previously recorded in these reports. The fine weather in the end of March is connected with the many early dates to be found reported in the following pages; and though April left a good deal to be desired, the conditions were not such as to discourage our visitors who came in large numbers, Swallows, Sandmartins, Yellow Wagtails, Common Sandpipers in force enlivening our streams in the west at any rate, at a time when in the present year not a single example of the species named was to be seen. There was one exception, however, as the Willow-Wren did not appear in great numbers till May. The boisterous weather of June, it will be found, is claimed to have led to an increase in the number of Swallows in the Outer Hebrides. The absence of abnormal conditions in the last months of the year probably deprived us of the great immigrations which distinguished the same period in 1906. The Fair Isle, thanks to the investigations which Mr. Eagle Clarke has continued there, again supplies us with much important and curious matter. We may have to wait some time before we get at the rationale of the occurrence of Far Eastern and South-eastern species there; but the regular appearance of Northern species like the White Wagtail, Lapland Bunting, and several species of the Finch tribe, we are not unprepared for, and other blanks in our knowledge which these investigations have filled up relate to the passage of such species as the Whinchat, Tree-Pipit, etc., almost or entirely unknown hitherto in the Shetlands.

Statements have frequently been circulated about the variation in the numbers of certain species of our summer visitors from year to year, but the opportunities which this annual report presents for supplying students with a useful and connected body of data on these interesting but obscure phenomena have not been fully or systematically taken advantage of. It will be found in the present report that there are some statements on this subject which seem to be naturally connected. Further evidence is desired, but care should be taken by observers not to trust to memory

entirely, and to see that the terms of their comparisons are sufficiently parallel to make the comparisons of value.

In regard to additions to our knowledge of the birds breeding within our limits, great interest attaches to what has been published relating to the Great Spotted Woodpecker and Pied Flycatcher,[1] and further information will be looked for with eagerness. It may be pointed out in this connection that the phrase "extension of range" is often misapplied, and that it is necessary to distinguish carefully between this and "addition to our knowledge," which is another matter.

It would be invidious to mention names in acknowledgment of special services rendered in supplying information to make the following report possible, but certain localities are named so often as to make it plain from what quarter most help is being received. To all contributors cordial thanks are given for the assistance so kindly rendered. It is hoped that the report will prove that there is reason for pride in the loyalty and enthusiasm shown throughout the country.

TURDUS VISCIVORUS (Mistle-Thrush). — In song (Edinburgh) before the end of December 1906. In pairs, 9th March. Lays, 9th April (Kirkliston). Young nearly fledged at Edinburgh on 23rd April. Young away near Glasgow, 4th May. Last in song, 10th May (Arisaig). Flock of between thirty and forty at Port Ellen, Islay, 24th July. In N.W. Mull twenty or so were observed on 1st August, twenty on 19th, a dozen very wild on 9th September, and four on Iona on 11th and 12th. Seen on the spring and autumn passages at the Fair Isle where it is "probably an annual visitor" (p. 82).

T. MUSICUS (Song-Thrush).—Before end of December 1906, singing at Edinburgh. First in song in N.W. Mull on 13th January, and again at daybreak daily from 17th to 21st. Pairing at Edinburgh, 17th February. Singing at Crosswood Reservoir (950 feet elevation) on 25th February, where first fledgling seen, 3rd May. Building at Edinburgh, 18th March. Young newly hatched, Caldwell, April 16th. Ceases singing between 10th and 20th July, thus last heard Edinburgh 10th, Glasgow 17th, Kirkliston 20th. In the Outer Hebrides, Bahr (A.S.N.H., 1907, p. 209) found none on islands where gulls breed, and all seen were of the dark variety. Song only once heard by

[1] A paper upon this subject is now ready for press, by Harvie-Brown. Records are wanting of any summer occurrences anywhere in Clyde, Wigtownshire, East Fife, and Forfarshire.

him, and this attributed to the deterring effect of execrable weather. In passage at Isle of May in numbers, 18th September till 5th October (p. 13). Regains song, Kirkliston, 28th August. In song in N.W. Mull on 11th and 12th December; very many in the Glasgow district in mid-December, which is unusual. Four singing at Camphill, Glasgow, on 22nd December (John Robertson).

T. ILIACUS (Redwing).—Last Glasgow record in spring about thirty at Frankfield, 13th April. Last report from Edinburgh, 14th. At Skerryvore, on 8th May, a rush with other species from shortly after sunset till sunrise, very few striking. First mainland observations, 6th October, Caldwell (Renfrew); 10th, Carmichael (Lanark), in very large flocks, and at Kirkliston on same date. Much less abundant at last named than last year, and the same is true of the Glasgow district. A continuous stream on 19th October in N.W. Mull, which on 20th simply swarmed. By end of week they had melted away. At Tarbetness (Dornoch), when thousands were flying round light on 18th, out of 270 birds killed 247 were Redwings. Great numbers at lantern at Sule Skerry during night on 20th, with a fresh easterly breeze and haze, and on the 21st thousands with fog. There were vast numbers in the end of October in Dumfriesshire. At Tiree a great scarcity, not half a dozen where they used to have thousands in November (p. 117).

T. PILARIS (Fieldfare).—No spring observations call for notice. It is reported from five localities in May, the latest, on sure authority, a laggard at Mearns (E. Renfrew) on 26th. On 2nd October a rush at the Flannans. On 10th, following an east wind, a great rush at Skerryvore with other species; several hundreds killed. Earliest mainland observations, Beith (Ayr), five flying S.W. on 9th October. Carmichael (Lanark), 10th. At Sule Skerry on 20th and 21st, great numbers. The main arrival at Kirkliston was on 25th October, whence they passed on S.W.

T. MERULA (Blackbird).—Singing at Crossmyloof, Glasgow, 7th January; pairing at Edinburgh, 24th February; building there, 4th March; laying, 4th April, Gilston (Fife); 8th April, Edinburgh; 9th April, Kirkliston; 13th April, Bressay, pair has three eggs. Sings till 13th July, Kirkliston; 17th, Glasgow; 20th, Saltcoats (Ayr); 29th, Edinburgh, "very late." Heard again at Kirkliston, 17th September, and Caldwell, 6th October, "in fine song for half an hour." A female with a white hood, sparingly speckled with brown, and a small white spot in the centre of the upper breast, seen at Gilston (Fife) in February. Pied blackbirds are usually cocks.

T. TORQUATUS (Ring-Ouzel).—25th February, one seen by Dr. Fullarton at Lagg, Arran, which was said to have passed the winter there. 7th April, one in N.W. Mull; two on 8th, in song on 10th, on which date Dr. Fullarton says it was numerous at Levencorrach, Arran. By 7th July, in Mull, young had left adults—one brood. At Mull on 19th August six observed; on 29th at Swordale (E. Ross) three to four, evidently migrating, flushed on moors. Two going S.E. in Mull on 8th September, a dozen at Sule Skerry on 21st October with other species in great numbers. Passing Isle of May till 14th October (p. 14).

SAXICOLA ŒNANTHE (Wheatear).—19th March, Dumfries; 21st, Lendalfoot (Ayr); 24th, Dalry (Ayr); 27th, Balcomie (Fife); and five other localities till 31st. 7th to 10th May, a large migration with finches, etc., at Pentland Skerries; 8th, a rush with other species at Skerryvore. 1st October, Bell Rock (1); 7th October, Kirkliston (1); and Isle of May (1 or 2); 20th October, Mull (1). One at Balcomie (Fife), pursuing a weasel.

S. LEUCORRHOA (Greater Wheatear).—Northern passage began in the Fair Isle in first week of April, where they were seen abundantly on return throughout September (p. 81).

S. OCCIDENTALIS (Black-throated Wheatear). At the Fair Isle on 25th September a fine male (p. 81).

PRATINCOLA RUBETRA (Whinchat).—Said to be scarcer at Lendalfoot (Ayr) than usual. 5th May, Mull (1) (♂); 11th, Lugton (Ayr); 12th, Beattock. On eight days in May and early June at Fair Isle (p. 82). 13th September, Kirkliston; 21st, Mull; 22nd, Frankfield (Glasgow). A dozen at Largo, 26th August; one at Isle of May, 3rd October; and a young male on 9th at Fair Isle (p. 82).

P. RUBICOLA (Stonechat).—Five pairs observed in S. Uist (A.S.N.H., 1907, p. 209). Young flying at Arisaig, 11th May.

RUTICILLA PHŒNICURUS (Redstart).—8th April, one in garden at Pentland Skerries; 10th, Spiggie, numbers; 21st, Hillfoot (Glasgow); 8th May, Mull, "a fairly common summer visitor" (A.S.N.H., 1907, p. 247). Lots in Isle of May on 26th September, when the passage continued till 4th October (1). 5th, 6th, 7th, 8th, 9th October, a rush each day, and on 10th a lot, all at Lerwick.

R. TITYS (Black Redstart).—An immature one in April and a female on 8th November, on the Fair Isle, to the fauna of which it is an addition. It has not been recorded for the Shetland Isles (p. 82).

CYANECULA SUECICA (Arctic Bluethroat).—Two on 7th and 9th October, at Fair Isle (p. 82).

ERITHACUS RUBECULA (Redbreast).—Singing at Edinburgh on 13th January; recording its song at Clarkston (Glasgow), 10th February; 22nd March, laying in Perthshire; 7th April, in numbers, Pentland Skerries; many at Spiggie and numbers at Pentland Skerries, 10th. At Caldwell, nest in top of yew hedge is nicely domed. October 22nd, rush at night at Lerwick; 27th, Bell Rock (1); 29th, Flannans (1).

SYLVIA CINEREA (Whitethroat).—9th May, Lamlash; 11th, orchard country (Lanark) several; also in Bute and Mull same day, and numerous at last locality, 12th. On last-named date several east of Glasgow, one recording its song. 21st May, laying at Kirkliston. At Lendalfoot (Ayr), more numerous than for many years. In the Outer Hebrides, where Bahr had seen but one in the previous years, three males came under observation singing (A.S.N.H., 1907, p. 209). Last nesting, Kirkliston, July 26th; last in song, 29th. Last in song at Patterton (Glasgow), 4th August—"a low twitter." Last appearances—22nd September, Fairlie; 23rd, Isle of May.

S. CURRUCA (Lesser Whitethroat).—7th April, Spiggie (1); this most elusive of Scottish birds as a nesting species is stated (A.S.N.H., 1907, p. 185) to have nested at Forfar in the year now under review, but the narrative published has left some readers of these pages unconvinced. The writer need only say that for the past twenty years he has continued, till the present year, to be beset with reports of a similar nature, none of which has been adequately supported or proved correct upon examination. The last argument indicated in support of such possibilities, based on its occurrence regularly at the periods of passage, involves so many obviously dangerous parallels as to reduce it to futility. 29th and 30th September, and 10th October, single birds at the Isle of May.

S. ATRICAPILLA (Blackcap).—Single birds at the Isle of May on 27th September, 2nd October, and 5th November (p. 15). 18th October, two out of 270 birds killed at Tarbetness (Dornoch), and single birds at Lerwick, all females, on 19th October (found dead), 21st (which flew into a shop) and 22nd October.

S. HORTENSIS (Garden-Warbler).—16th May, Lake of Monteith; 19th, Rouken (Glasgow). About 28th May, one brought in by a cat at Pentland Skerries, and occurred on five dates during vernal migration at the Fair Isle (p. 79). 26th September, two at the Fair Isle (p. 15).

S. NISORIA (Barred Warbler). 24th September, Isle of May, a female (p. 15).

REGULUS CRISTATUS (Golden-crested Wren).—In song, Kirkliston, 25th February; 9th April, great numbers, Lerwick; 10th, many at Spiggie. Conspicuous by its absence at Fair Isle this year (p. 79), and with the two exceptions above quoted the references in the reports to the species are always to trifling numbers.

P. SUPERCILIOSUS (Yellow-browed Warbler).—29th September, one at the Isle of May (pp. 15, 16). Single birds on 13th, 22nd, and 29th October, and two on 21st, at Fair Isle (p. 80).

P. RUFUS (Chiffchaff).—2nd April, Dumfries; 3rd, Lendalfoot (Ayr). 24th May, one at Fair Isle (p. 80). 19th October, several, one of which came down a chimney of Symbister House, Whalsay.

P. TRISTIS (Siberian Chiffchaff).—Four females secured at the Fair Isle in the last week of October, and others seen (p. 80). One sent from Kirkwall early in February 1908 (*l.c.*).

P. TROCHILUS (Willow-Wren).—Reported on 5th April from Lendalfoot (Ayr); 14th, Beith (Ayr); 19th, Saltoun; 20th, Kirkliston; 23rd, Dumfries, "a great rush the last two days"; but it was not till 7th May that full numbers were reported from Kirkliston, and in the Glasgow district it was only common everywhere after the 4th of that month. A nest at Beith in ivy four feet from ground, and one at Kirkliston at end of a spruce branch fully nine feet from ground (A.S.N.H., 1907, p. 247). Last nesting, Kirkliston, 19th July. Last occurrences, 10th October, Isle of May (1), and 19th, Flannans (1).

P. SIBILATRIX (Wood-Wren).—12th May, Bute; 13th, Arisaig; 14th, Mull, where it was in usual numbers in 1907. Single birds early in June and in August at the Fair Isle (p. 79).

ACROCEPHALUS PHRAGMITIS (Sedge-Warbler).—One is reported at Loch Lebo, Caldwell, on 23rd April,—an exceptional appearance, however. 10th May, Kinross; 11th, Bute; Caldwell again, "exceedingly abundant this season," 12th; Frankfield Loch and Bishop Loch east of Glasgow, same date; "crowds" at Kilconquhar Loch on 13th. These dates show conclusively that the main body arrived 10th to 13th May. Said to be scarce at Lendalfoot. Nests with four and three eggs respectively, Caldwell, 6th June. Last in song, Kirkliston, 29th July. Last mainland observation, 7th September, Beith, one young bird. On 10th and 13th September at Isle of May, single birds.

LOCUSTELLA NÆVIA (Grasshopper-Warbler).—On 8th May at Skerryvore, one, and another at the Fair Isle, 29th (pp. 80, 81).

ACCENTOR MODULARIS (Hedge-Sparrow).—At Edinburgh sings on 21st January, builds 31st March, lays 7th April, young hatched 23rd. Still in nest, 6th August. "Any quantity" at Spiggie anterior to 10th April, and mentioned in Mr. Clarke's Fair Isle paper (p. 82) on account of the numbers appearing on several occasions in April, especially the 9th, when hundreds were observed in all parts of the island.

CINCLUS AQUATICUS (Dipper).—26th February, N.W. Mull, visits old nest. 16th March, Caldwell, nest and four eggs; 14th April, Caldwell, five eggs taken from a nest which on 30th had again five eggs. On 20th May young were nearly full grown. On 22nd August began singing in Mull, same date as last year.

ACREDULA ROSEA (Long-tailed Titmouse).—23rd March, Perthshire building; 7th April, Waulkmill Glen (Glasgow), nest almost completed; 15th April, has eggs in Perthshire; 15th May, on Inch-marnock, a nest with two holes, at each of which young were being fed by their parents simultaneously.

PARUS MAJOR (Great Titmouse).—At Edinburgh, sings 10th January; pairing, 17th March.

P. PALUSTRIS (Marsh-Titmouse).—7th April, one at Darnley Glen (Glasgow); 21st August, one or two near Alford, Aberdeenshire (p. 49); 1st November, one at Giffnock (Glasgow).

P. CÆRULEUS (Blue Titmouse).—At Edinburgh, sings 17th January.

TROGLODYTES PARVULUS (Wren).—In song, Glasgow, 3rd March; Mull, still in song, 21st August.

CERTHIA FAMILIARIS (Tree-Creeper).—In song, Kirkliston, 14th March; eggs highly incubated, Lake of Monteith, 16th May.

MOTACILLA BOREALIS (Grey-headed Wagtail).—In fair numbers in latter part of May and early June at the Fair Isle, and noticed again in September (p. 78).

M. LUGUBRIS (Pied Wagtail).—In Mull one at least wintered, and two arrived in full plumage 1st March. Singing at Possil (Glasgow) on 3rd; reappears at Beattock, 21st; one late in March and two in the end of May at Fair Isle (p. 78); nest and three eggs, 1st May, Largo; laying at Kirkliston, 30th April; seen at Pentland Skerries on 7th May (2) and 9th (2 or 3); 29th August, six at Swordale in passage; 11th September to 1st October in passage at Isle of May; two, 28th September, and two, 6th October, at the Bell Rock.

M. ALBA (White Wagtail).—In passage, Glasgow district, 24th March till 4th May; 6th, Mull, two; 8th June, Roer Water Burn (Orkney?) a pair (p. 4). On coast of North Ayrshire 3rd-14th September; swarming on east and south sides Iona, September 11-12th. Clyde, east of Glasgow, half a dozen on 8th; Flannans, 6-21st, on four dates in small numbers. Last seen, 4th October, Mull.

M. MELANOPE (Grey Wagtail).—A few wintered in Mull: back in nesting haunts, Kirkliston, 21st; Caldwell, 25th March. At Swordale on 12th April, nest and five eggs. Several came in at Mull about 25th October.

M. RAII (Yellow Wagtail).—On the Kelvin near Balmore on 21st April, several (♂). At Beith, pair feeding young on 15th June. Last seen, Beith, 29th September (1).

ANTHUS TRIVIALIS (Tree-Pipit).—8th April, Caldwell (1), and again on 11th (1); two Daldowie (Glasgow), 28th; Mull, 1st May; Kirkliston, 2nd. Last in song at Kirkliston 7th July, and last seen there 24th August. Occurring at the Fair Isle, where it is a bird of double passage, till fourth week of October (p. 78).

A. PRATENSIS (Meadow-Pipit).—Arrive on Moors, Mull, on 27th February, but scarce till 31st March, when large numbers seen. By this date, singing in Glasgow district and East Neuk of Fife. Many on the Kelvin (Glasgow), 21st April. Between 11th and 16th May reported from Arisaig, Bute, and Fife to have eggs. At Iona on 12th September, with change of wind to S.E., foggy, large numbers seen, "fourteen resting on top of cathedral tower." "Parachuting" and trying song at the Isle of May, 25th September. Large numbers seen in Mull going south on 27th to 28th October and 7th November. Constantly in passage at Isle of May, 9th September–8th October.

A. OBSCURUS (Rock-Pipit).—Nests with three and four eggs respectively on 11th and 14th May in Bute. Isle of May 9th September–8th October, there being great crowds on 17th September (p. 16).

LANIUS EXCUBITOR (Great Grey Shrike).—In Mull on 20th January, one, which created consternation among smaller species of birds. March 9th, one in Mull in snow. Thrice seen in April at Fair Isle, and several times last week of October till second week November there (p. 79). At Pentland Skerries one shot 24th September; fifteen to twenty miles off the Shetlands one flew on board a boat on 26th September. It was sent to Mr. Charles Berry, Lendalfoot. One at North Berwick on 12th October. One seen at Gilston (Fife) 4th November, and one (♂) procured there 28th. Two others reported about this date from Colinsburgh, one being shot. One was picked up

dead on 2nd December at Auchnasheen, where it had dashed against a dining-room window.

L. COLLURIO (Red-backed Shrike).—Several in May and a few young birds in September at the Fair Isle (p. 79), and an abnormally coloured young one on the Isle of May on 27th September (p. 16).

MUSCICAPA ATRICAPILLA (Pied Flycatcher).—Added to the fauna of Kirkcudbrightshire as a nesting species (A.S.N.H., 1907, p. 183 and *l.c.* 1908, p. 118), and also to that of Ayrshire (A.S.N.H., 1907, p. 247). One on the 11th, and several on 26th September, at Isle of May (p. 17).

M. GRISOLA (Spotted Flycatcher).—11th May, Bute; 15th, Lahill (Fife); 17th, Mull (2), and it "appeared to be more numerous as a nesting species this year" there. Laying at Kirkliston 12th June, and still nesting there 5th August, where it was last seen 18th September.

M. PARVA (Red-breasted Flycatcher).—On 27th September an immature one observed at the Fair Isle (pp. 82, 83). One at the Bell Rock on 25th October (pp. 49, 50).

HIRUNDO RUSTICA (Swallow).—30th March, Lendalfoot (Ayr); 31st, Dumfries; 5th, 6th, and 7th April, at Dalry (Ayr); 7th, at Beith and Duddingston. For a fortnight thereafter no records, but from 20th April till 14th May, reported from sixteen localities. More numerous in Mull as a nesting species than last year, and "seems to have been especially numerous this year" in the Outer Hebrides, which is attributed to the stormy weather blowing them out of their course (A.S.N.H., 1907, p. 210). On the day (5th May) they arrived Lahill (Fife), they were collecting material for nesting. Second brood left nest in Mull on 13th September, but young still in nest at Kirkliston 21st. Left Caldwell during night of 25th-26th. A brood which left the nest in Mull on 27th September left the locality on 6th October. After middle of October, reports are 19th, Thornliebank (E. Renfrew) (2); 23rd, Lerwick, "rush"; 7th November, Suleskerry (1).

CHELIDON URBICA (House-Martin).—2nd April, Lendalfoot; 3rd, Duddingston; 14th, Rescobie Loch, and thereafter a break till 30th, when it appears at Samuelston on Tyne and Lamlash. In numbers at Fairlie (Ayr), 1st October, and last seen Kirkliston, 3rd. One found dead under telegraph wire on 16th October, at Dalry (Ayr). Single birds at the Flannans on the 3rd and 4th November. More than usually abundant in spring at the Fair Isle, and observed for first time in autumn (p. 83).

COTILE RIPARIA (Sand-Martin).—1st April, Dumfries and Kilbirnie Loch; 2nd, Lendalfoot; 3rd, Duddingston; 7th, Beith and Common on the Kelvin, and Clyde 21st-24th. Latest date observed, 14th September, Fairlie.

LIGURINUS CHLORIS (Greenfinch).—Several large, sombre-coloured birds wintered; on 27th February, in Mull, a dozen brighter coloured and smaller arrived. In song in Edinburgh 28th February. Laying at Kirkliston 9th May, and last nesting there 11th August. At Caldwell in song till 4th August; 21st September, a hundred, Mull; 9th October, at Lerwick in numbers; 4th November, three in Mull at seeds of *Arctium Lappa*.

COCCOTHRAUSTES VULGARIS (Hawfinch).—On 18th March one shot at Touch, Stirlingshire (A.S.N.H., 1907, p. 182), and on 25th April one picked up dead at Smeaton-Hepburn, East Lothian (*l.c.* p. 181).

CARDUELIS ELEGANS (Goldfinch).—One in Mearns (E. Renfrew), 22nd December.

C. SPINUS (Siskin).—18th April, Kirkliston (1); 30th September (1); 1st October (4); Isle of May (p. 17); 25th November, Swordale (a pair), and 6th December (6).

P. MONTANUS (Tree-Sparrow).—"Decidedly on the increase hereabouts [Largo and Colinsburgh]. We constantly see them in places where we have not known them heretofore." Several on the Isle of May in September and October (p. 19); 11th May, South Bute, two pairs.

(*To be continued.*)

FOOD OF THE BLACK-HEADED GULL.

By T. G. LAIDLAW, M.B.O.U.

DURING a considerable number of years I have watched the Black-headed Gull (*Larus ridibundus*) in order to ascertain of what its food was chiefly composed. This is not such an easy matter to decide as one might imagine, as its food is extremely varied, and, like several of its congeners, it may be said to be omnivorous. Nothing in the way of animal matter that it is capable of swallowing seems to be rejected —whether it be in the form of worms, larvæ, flying insects, fish, or mice, all seem to be greedily taken.

In the spring, when the fields are being ploughed, worms constitute a large proportion of its diet, together with various grubs, etc., which the operation serves to unearth.

Later, when grain is being sown, some, at least, take to a graminivorous diet. On several occasions, at this period, I have examined specimens that have been shot, and found every one to contain more or less corn in their crops.

Flying insects constitute a considerable portion of its food during summer. Many times I have seen them gorged with crane flies which had just emerged from the pupa stage in haugh-land or fields of coarse grass. The good they do in this respect is very great. A large number of moths are also taken. The gulls may be seen for hours in the evening hawking over the fields, and they are quite expert at capturing even the swiftest flying insects. It is capable of exerting considerable wing power. Several years ago I was much interested in watching it feeding on the caterpillar of a moth which was exceedingly numerous on the birch trees along the shores of Loch Shin in Sutherlandshire. The gulls kept flying round and round the trees, and were continually picking the caterpillars from the twigs or from the threads by which many were hanging suspended in mid-air. Their evolutions while so engaged were exceedingly interesting and graceful, and in a manner suggested the flight of the nightjar.

During a "rise" of Ephemeridæ on a river or stream the Gulls levy a considerable toll on the insects, and where they are numerous and the hatch of fly small, not many of the latter escape. On the Tay I have seen more than a hundred Gulls, common and black-headed, all busily engaged during a rise of duns and yellow-sallies, and also at other places have witnessed numbers taking May flies and March Browns. Anglers have a distinct grievance against them in this respect.

The injury in this way to fishing, however, is not so serious as in the actual destruction of the fish themselves. On a certain stream in the south of Scotland, which contains quantities of parr and small trout, numbers of Gulls may be seen any day during the spring and summer industriously hawking up and down, backwards and forwards, over the shallows, and ever and anon making a dash at a fish. If the

water be of any depth the fish very often escapes, but still I have seen a number caught, and during a season the quantity destroyed must be considerable.

The Black-headed Gull is not to be compared with the Tern as a capturer of fish. A good place to observe its powers, or limitations, of diving is afforded on the Tay at Perth. A considerable stream runs in a covered drain under the South Inch, and enters the river a short distance south of the railway bridge. As the stream is constantly carrying down kitchen and other refuse, a large number of Gulls congregate at the outlet, and at a distance of a few yards it is amusing to watch the efforts they make to secure food that may be floating a foot or so below the surface of the water. They plunge down like a Tern, and as they strike the water the wings are extended vertically over the back, and although their bodies may be quite submerged, there is always a portion of the wings, usually from the carpal joints to the tips, above the surface. I have never seen them go completely under the water, and an object a couple of feet down is quite beyond their reach.

There is a trait in the habits of the Gull that I do not remember to have seen recorded. During the winter and early spring they consistently rob the Lapwings of their food. A Gull will take up a position close to a feeding Lapwing, and when the latter picks up a worm or grub, the former immediately flies towards it, and forces it to drop the morsel, which is then appropriated by the robber. This is a very common habit of the Gull in this district.

The Black-headed as well as other varieties of Gulls have increased enormously in many districts, owing to protection ; and it has become a question whether that protection should not now be relaxed. There is a danger when a species becomes too numerous for its natural food-supply, that it may be forced to adopt some undesirable habit, and to avoid such a risk it appears desirable that it be removed from the list of protected birds. As it has few natural enemies, there is no danger of its numbers being very materially reduced.

In conclusion, I consider it, on the whole, to be an extremely useful as well as an extremely beautiful bird.

DISTRIBUTION OF THE WOODCOCK IN THE CENTRAL DISTRICTS OF THE FORTH AREA IN THE SPRING OF 1908

By J. A. Harvie Brown, F.R.S.E., F.Z.S.

During this spring of 1908 a careful eye as usual has been kept upon the numbers of Woodcock nesting in our coverts in Central Scotland. Nothing abnormal occurred or was reported until the 16th May. *Then*, it was told: Woodcock appeared in quite exceptionally large numbers in several of the woods usually frequented by the birds in the nesting season. Gamekeepers searching for and "lifting" pheasants' eggs, reported unusual numbers of Woodcocks rising singly or in pairs, as was the case also in 1902, after similarly severe spring weather, and when, it may be remembered—when repeated,—that quite an abnormal quantity were discovered nesting. In 1903 and 1904 only the usual number of pairs were found nesting, but in 1905 again still larger numbers were known to have nested all over the central counties of Scotland, and especially in the west of the county of Stirlingshire and also within the "Clyde" area.

No fewer than 65 nests were found on one property, and 45 on the next, and quite a number even on the island of the Lesser Cumbrae. The statistics for all the Clyde area have been most minutely worked out and plotted on large scale maps by the Messrs. Buchanan for that year, viz. 1905.

The first phenomenal, or unusual, appearance of the birds in the central districts of Stirlingshire was in May 1902, and at the same time equally great numbers of Snipe nested in favourable localities within the same area. The Woodcocks succeeded in hatching off and rearing their late broods of young ones, as they had better shelter in the coverts; but the Snipe sustained great losses, and many young were found dead within a few feet of the broken egg-shells in the open.[1] That year 1902—it should be remem-

[1] These birds not having availed themselves of better shelter, but principally occupying dry ground of a knoll facing the north-east.

bered—there were 17° of frost recorded on the night of 2nd-3rd May over the greater part of Scotland from Sutherland and Caithness southward: and thereafter long-continued and persistent blizzards of sleet and snow and dreadfully inclement weather, and with winds equally cold from the north-east and from the south-west over the Atlantic, continued right on into late June, as I pointed out at the time.

How far the results of crowding of these species to the milder central districts of Scotland in that year is due to such a widespread and antagonistic state of affairs at and after the critical time of the nesting operations, or is purely due to *mere local* influences, is not proved to full satisfaction by the records of one year only. But as regards the facts themselves there can be no doubt. Nor can doubt remain that there is natural truth in the "storm driven theory," whether the driving occurs at the initial start of a movement, or during its progress at intermediate stages, or at the localities of arrival, or by a combination of all these circumstances. There may be one other "deduction," viz. that, due to the same conditions which prevailed over *north and south* of *the central districts of Scotland* the birds delayed their northward flight; and when they did arrive, found the conditions *in Central Scotland* more favourable. But this meets with the very pertinent criticism: But would a delayed movement *nearly two months after its regular time take place at all*?—*i.e.* would such a movement—even if first nests were destroyed or early broods sacrificed *further south*,—*i.e.* would the homing impulse still act two months late, or induce a still further flight northward? I fancy not, but rather the reverse![1]

Coming to the present season, we are well aware that this spring of 1908 many Grouse and also Pheasants' eggs have been found frozen and addled at the time of the great frosts in April. Forty Grouses' eggs were found in one day on one of our low-lying mosses in the county, and on higher lying ground on my own hill there is good evidence that

[1] The spring movement is from S.W. or S. to N.E. or N. But a "homing impulse" would scarcely act in a *further direction to the north* after destruction of their first eggs or broods, but *would act in the reverse direction.*

many Grouse lost their early (April) layings; and in a particular well-heathered hollow many Grouse were put up singly and in pairs, where they had evidently taken shelter. They were sprung *without the aid of dogs*—a sign easily read by experienced people that things were abnormal, and not as they should be. It is patent to the most ordinary practical observers that *phenomenal results have taken place* due to the unseasonable severity of our spring of 1908. Even the most superficial observers, and those whose opportunities of outdoor field observation are not as good as they were formerly—like my own,—cannot escape coming to the conclusion and expressing it with many variations something like this: "This season is very late; *everything is struggling for life*"; and notes having equal significance are referred to generally by others (*vide* "Zoologist," May 15, 1908, p. 192, by Mr. Julian G. Tuck for an example).

I think field observers may have noticed that Woodcocks frequent woods most abundantly, both in autumn and in the nesting season, which have *something of north in their exposure*—and our best covers in Central Scotland have N.E. exposures,—to which rule, however, there are exceptions due to other favouring circumstances, such as age and kind of cover growth. But *it has been observed also* that it has been only in exceptionally cold N.E. blizzards and snow and frost storms occurring late in April and May, and continuing cold and ungenial far into the season, that Woodcocks have been unusually abundant and *nesting* on exposures facing the south and south-west. Whilst such covers may hold a regular number of nests in normal seasons, these same covers will be (*have been*!) found to hold four or five times as many nesting pairs in abnormally cold seasons, such as 1902, 1905, and in the present spring of 1908. This has been clearly and unmistakably the case, and fully ascertained to be so over a considerable tract of Central Scotland.

Such records and relations of facts may not be considered of much value or usefulness by superficial observers. That is, however, *no reason* why they should not be placed on record provided they have been carefully and accurately ascertained, and always allowing that sufficient care has

been taken to put their accuracy beyond doubt, and credit given that that has been the case. Deny the credit, or fail to read any significance in the facts, then their importance is forgotten, and the facts themselves relegated to the "waste-paper baskets of the brain"; or otherwise they may be wilfully ignored.

Since the above was written (May 18) further information has been conveyed to me. Thus, a neighbour tells me that while "no actual count has been made, or precise estimates arrived at" on the properties of Duchray in the north-west of this county or at Torwood, which latter is immediately to the north of this place, "there can be no hesitation in recording that this season has been a great year for nests; but so far I have not seen a young one, so conclude the eggs were all spoilt." The principal nesting grounds on Torwood face the north and north-east.[1]

Here follows an interesting note from my friend Mr. W. E. Frost of Crieff. He writes: "From Ferntower or the 'Knock of Crieff' much *fewer* than last year [the italics are mine.—J. A. H. B.], when they were especially abundant. The best covers face the south. *Strowan*, which comprises the north side of Tirleum Hill, and the Strath from Monzievaird to Comrie, in extraordinary numbers this year —so Captain Stirling, the laird, told me on Saturday" (May 23). *These remarks, however, relate to February.* "When he was out shooting rabbits he put up a bird almost every thirty yards, but he did not shoot." He tells me that he once saw a Woodcock carrying two young at one time.[2]

My next letter in chronological sequence has much of interest, one from Mugdock Castle in the south-west of the district where the favourite Woodcock covers face the south and south-west, and where the observations given are exactly parallel with those made *here* in 1902, 1905, and again in

[1] A nest of Golden Plovers' eggs was watched for some time by my hillkeeper; and when at last he felt convinced they were deserted, on examination he found them cracked by the frost and useless, *only one instance of many similar experiences.*

[2] "Now," Mr. Frost continues, "the author of 'Woodcock' in 'Fur, Feather, and Fin' series, records an instance of this, but adds: 'I believe this is the only record in which the parent bird has been seen carrying two young ones at the same time'" (*in lit.* May 26, 1908).

1908. But I am holding this and later correspondence over during the course of further inquiry, and because this paper has already reached so great a length to date of going to press.

AN AMBICOLORED TURBOT WITH EYES APPROXIMATELY NORMAL IN POSITION.

By James Ritchie, M.A., B.Sc.

At an early stage in their life-history Flat-fishes give up the symmetrical mode of swimming possessed by their larval forms and, toppling to one side or the other, adopt the peculiar habit which characterises the adult. Normally in the horizontally swimming adults the upper surface is pigmented and bears both eyes, while the under surface is both colourless and eyeless. But occasionally specimens are found of which both sides are coloured; and where the pigmentation of the under surface is *complete* it is generally associated with deformities in the dorsal fin and in the position of the eyes. So well known, indeed, is this association between complete pigmentation and eye-abnormality that Couch, referring to the Common Flounder, says that such a variation has "occurred so frequently in some districts as to have raised the suspicion of its being truly a distinct species."[1]

In the Turbot, however, examples of complete two-sided pigmentation are rather unusual, although a partially coloured under surface is by no means so rare. The present example, kindly sent me for examination by Mr. Tom Cook, fishmonger, Edinburgh, was caught, in May of the present year, off the Berwick Bank at a depth of some twenty fathoms. It is a moderately-sized male Turbot (*Rhombus maximus*), 492 mm. in length from tip to tip, and 306 mm. in greatest breadth (excluding the fins). The body proportions and the number of fin-rays are normal, but both sides are completely pigmented. The upper surface is of a very dark olive-brown with slightly paler, irregular patches half-

[1] Couch, J., "Fishes of the British Islands," vol. iii. p. 198.

way between the lateral line and the anal fin. The under side is of the same colour as the upper, but the dark portion, which spreads as a continuous patch over the greater part of the surface, is bordered by paler bands running close to the bases of the dorsal and anal fins, and coming to an end 3 and 6 cms. respectively from their hinder terminations. The posterior margin of the operculum also is distinguished by a paler border stretching for a short distance above and below the right pectoral fin; and that fin itself, as in a specimen described by Messrs. Cunningham and MacMunn,[1] has on its outer surface a narrow edging of white 5 mm. in breadth. The inner surface, that turned towards the body, is without pigment. Except for the pectoral fin no portion of the fish is colourless, but we cannot affirm that the colour on both sides is symmetrically distributed, unless, indeed, the paler shades whose distribution has been noted above are due to *post-mortem* changes. On both upper and under surfaces dermal denticles are scattered with similar frequency, but those on the under surface are much worn—an evidence that the fish had long adopted the mode of swimming common to its kind.

Only a slight notch separates the anterior portion of the dorsal fin from the head, the free ray-bearing portion measuring but 11 mm. The dorsal eye, instead of lying on the top of the head, has crossed over the ridge, its position approaching that assumed in a normal specimen. The interorbital distance, however, is greater than usual, for, taking as a standard the transverse diameter of an eye, the eyes are almost two diameters apart, while the normal space, according to Day,[2] is only one diameter. Further, the upper eye lies, not in line with the notch, but opposite the attached portion of the fin, which is adnate for 6 mm. in advance of the anterior border of the eye (see Fig.).

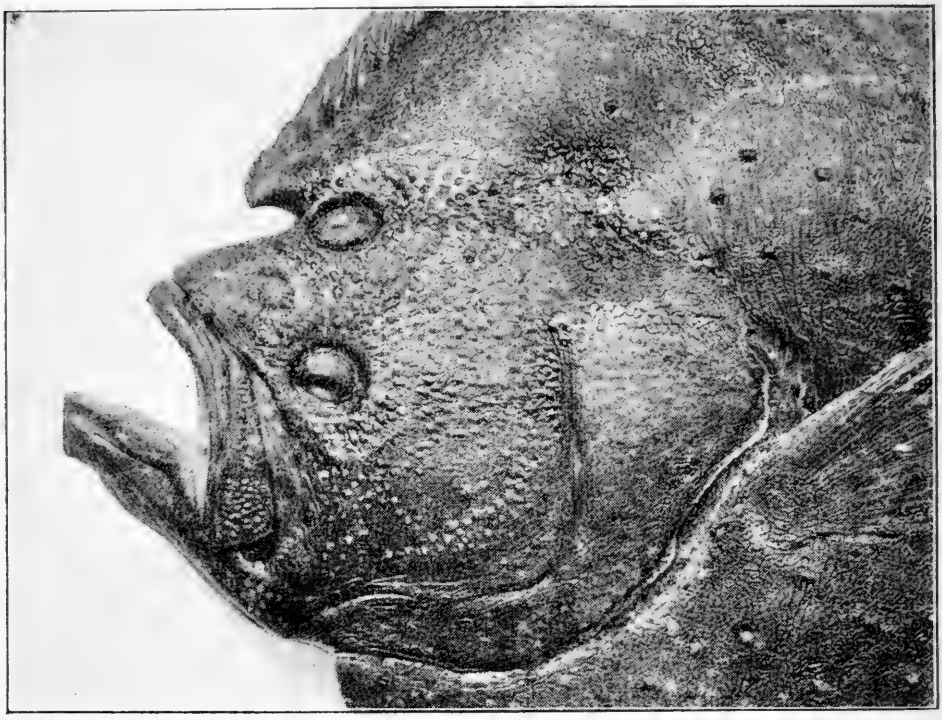
Of those cases of which I have been able to see descriptions, this resembles most closely that of a Brill recorded by Cunningham and MacMunn[3] from notes supplied them by

[1] Cunningham, J. T., and MacMunn, C. A., "On the Coloration of the Skins of Fishes"; Phil. Trans. 1893 (London, 1894), p. 803.

[2] Day, F., "Fishes of Great Britain and Ireland," vol. ii. p. 12.

[3] Cunningham and MacMunn, *l.c.*, p. 80.

Mr. Holt. But there the under side was almost colourless. A Turbot seemingly similar to the present one was described and figured by Duhamel du Monceau in 1777,[1] but I have been unable to refer to the original account. According to Prof. Bateson's summary, however, both sides were coloured, a slight notch was present at the anterior end of the dorsal fin, and the upper eye was "*figured as in its normal place.*"[2]



HEAD AND ANTERIOR PORTION OF DORSAL FIN OF AMBICOLORED TURBOT.

But in sketching such a specimen as appears in our text-figure, it would be a simple matter for the artist unintentionally to lessen the interorbital space, thus creating a close likeness to normality so far as the eyes are concerned. And some such explanation may account for the apparently normal position in Duhamel's figure.

In typical "cyclopean" malformation, excellent figures of which are given by Traquair,[3] Cunningham,[4] and

[1] Duhamel du Monceau, "Traité général des Pesches," 1777, iii. sect. ix. p. 262, pl. iii. figs. 3 and 4.

[2] Bateson, W., "Materials for the Study of Variation," London, 1894, p. 470.

[3] Traquair, R. H., "On the Asymmetry of the Pleuronectidæ," Trans. Linn. Soc. (I.), xxv. pl. 31, figs. 8 and 9.

[4] Cunningham and MacMunn, *l.c.*, pl. 54, figs. 1 and 2.

Filhol,[1] and of which an example is shown in a stuffed Turbot in the Royal Scottish Museum, the anterior attachment of the dorsal fin ends *behind* the eye, while the eye itself lies on the top of the head, overhung by the free projection of the fin. In such cases it has been argued by those and other writers that the fin has become detached owing to the detention of the eye on the top of the head ; and such an explanation would seem to apply to the present case, in spite of the doubt cast by Prof. Bateson upon its validity in the case described by Duhamel.

That the movement of the right eye from the under to the upper surface was in some measure delayed, is indicated by the fact that, in a well-grown fish, it has not reached its normal proximity to the left eye. It is reasonable to assume either (1) that the eye was temporarily arrested on the top of the head (it has been arrested there so frequently in other cases), and that thus it became impossible for the fin to continue its growth and still to retain its attachment to the head ; or (and I suggest this as the more probable explanation, since it avoids postulating an arrestment followed by a resumed migration) we may assume (2) that the eye commenced its migration at a period later than usual in the development of the fish, that the fin had already extended so far forward that it abutted against the eye migrating across the top of the head, and that, continuing to grow forward, it was compelled to separate from the head. If we suppose that the fin had extended still further forward, the migrating eye may even have been forced to pass *underneath* its anterior portion, which, thus detached, would be unlikely at a subsequent stage to regain its attachment. In either case the eye, once over the ridge, continued its migration, and the attached portion of the fin, freed from obstruction, was pushed forwards by the increase of the elements of which it was composed.

Another possible explanation—which, however, fails to account for the abnormal distance between the eyes—is that the separation of the fin is an isolated variation, a phenomenon comparable to the detachment, occasionally found in the Skate,[2] of the anterior portions of fins.

[1] Filhol, "Description d'un cas de monstruosité observé sur un *Rhombus vulgaris* (Cuv.)," Bull. Soc. Phil., p. 55. Paris, 1890.

[2] See Traquair, R. H., "Note on an abnormally developed Thornback," Ann. Scot. Nat. Hist., i., 1892, p. 29.

As regards the association between complete ambicoloration and arrested migration of the eye, little is known. That the former depends directly on the latter is far from obvious, although it is possible that both may be correlated with a tendency in such forms to retain their vertical mode of swimming for a longer time than usual. This combination of characters may indicate a "throw-back" to some unknown ancestral form, but such a supposition cannot fully explain the phenomena, and it would seem more satisfactory to adopt Bateson's view,[1] that, associated with the reversion, is another phase of discontinuous variation, tending, by a process of symmetrical repetition, to reproduce on the under the characters of the upper surface.

Since this note was written Mr. Cook has informed me that a second ambicolored Turbot from the Berwick Bank, and one forwarded from Aberdeen, have been exhibited at the Newhaven Fish Market. Each of those, my informant states, had completely pigmented under surfaces, associated with a notched dorsal fin; and in them, as in the example I have described above, the dorsal eye had passed distinctly over the ridge of the head and lay opposite an attached portion of the fin.

NATURAL HISTORY DEPARTMENT,
THE ROYAL SCOTTISH MUSEUM.

THE OAR-FISH, OR KING OF THE HERRINGS, *REGALECUS GLESNE* (ASCAN.)=*R. BANKSII* (CUV. AND VAL.), ON THE COAST OF EAST LOTHIAN.

By WILLIAM EVANS, F.R.S.E.

THE occurrence of an Oar-fish in Scottish waters, or indeed anywhere, is an ichthyological event of no ordinary interest. It is therefore a real satisfaction to me to be able to record the occurrence of one 13½ feet in length

[1] Bateson, W., *l.c.*, p. 472.

on the coast of East Lothian, at the mouth of the Firth of Forth, in May of the present year. The circumstances are as follows :—

About mid-day on Saturday, 23rd May 1908, three hours or so after full tide, a fisherman gathering bait came upon this specimen lying among the rocks about a mile east of Dunbar, close to where the stream which issues from Broxmouth Park enters the sea. Though, according to my informant, dead, and, unfortunately, considerably mutilated about the head, it was quite fresh, and could only have been a very short time stranded. In all probability it had come in with the morning tide in a dying state, and sustained the injuries referred to by being tumbled about on the rocks. Never having seen anything like it before, and thinking they had secured a prize, the fisherman and two of his mates, to whom he had reported his discovery, carried the creature into Dunbar, by means of cords fastened round its long silvery body. In the evening it was exhibited in the Corn Exchange Hall at a nominal charge, when hundreds of people went to see it. Sunday intervening, it was not till Monday morning that news of the fish reached me. On arriving at Dunbar by the forenoon train, I learned from Mr. D. Bruce that it had been removed to a shed at the harbour, where I soon had the pleasure of inspecting an undoubted Oar-fish measuring, as already stated, 13½ feet in length. Preparations for carting it to Haddington and other places for exhibition were being made; but these were fortunately arrested by the arrival, during the afternoon, of Mr. P. H. Grimshaw from the Royal Scottish Museum, for which institution it was purchased by him, and dispatched the same evening to Rowland Ward, Ltd., London, to be preserved and mounted.

Unfortunately, the specimen, like practically all the others that have been described, is imperfect as regards those remarkable appendages about which precise information is so much needed. Nevertheless the following description of it, based on my own examination, supplemented by some further details kindly supplied by the taxidermists, may perhaps prove useful :—

Sex, male; this was determined by the taxidermists.

Total length, 13 feet 6 inches, of which about $7\frac{1}{2}$ inches represents the head.

Greatest depth (height)—at about 4 feet from head—$9\frac{1}{4}$ inches, exclusive of dorsal fin, which is about 3 inches high.

Greatest thickness not measured, but, I should say, about $2\frac{1}{2}$ inches when I saw the fish.

Vent about 5 feet from tip of nose.

Diameter of eye $1\frac{1}{2}$ in.; iris silvery white.

Dorsal fin, continuous (?) from top of head to within about $2\frac{1}{4}$ inches of the caudal extremity, and consists, the taxidermists tell me, of 301 rays; this includes the long rays of the occipital crest, of which very little remains, but the fishermen assured me that when found the animal had "horns" a foot and a half long on its head; these, it is to be regretted, they did not take pains to preserve.

Caudal fin, apparently none, but the caudal extremity, though wonderfully good, was not entirely free from damage; it corresponded in outline with that given in the best figures. Of course there was no anal fin.

Ventral fins (the long "oars") broken off at 3 to 4 inches from their bases, and looking like quills with the web stripped off.

Pectoral fins also considerably torn, but apparently consisting of about a dozen rays.

Colour, all over (dorsal fin excepted), at first of the brightest silver, "just like a new shilling," I was told; but by the time of my visit it had dulled considerably. Hancock and Embleton's comparison with "bright tin-foil or white Dutch metal" suits it very well. Only the very faintest traces of a few darker streaks and spots could be detected, and the men said they had never noticed any. The rays and upper edge of the dorsal fin were crimson tinted.

Nothing was found in the stomach.

The men kindly allowed me to take a photograph of the fish, but it is not very suitable for reproduction. I give, however, an outline copy of it with the missing parts of the crest and oars indicated by dotted lines.

Some twenty-five specimens of the Oar-fish are reported to have occurred in Britain, about one-half of them on the

north-east coast of England. Eleven or twelve, it would appear, have been obtained in Scottish waters, but the present is the first authentic example from the Firth of Forth. The Scottish records given in Day's "British Fishes" (1884) are as follows :—

One 12 ft. 9 in. long, exclusive of head, which was gone, Moray Firth, 12th November 1821 (not 1812); *cf.* Fleming's "Brit. Anim." p. 205.

One 12 ft., Crovie, near Macduff, March 1844.

One 11 ft. 10 in., Bay of Cromarty, 17th September 1851.

One 15½ ft., cast ashore at Keiss, near Wick, 14th December 1853 (the date is taken from the minute-book of the Royal Physical Society).

One 12⅓ ft., came ashore alive at Dunnet Bay, Caithness, July 1877.

One 12 ft. 9 in., found dead, but quite fresh, on sands at the mouth of the Eden, St. Andrews, 21st August 1880; stuffed and now in St. Andrews University Museum. An earlier example, however, 7 ft. 2 in., but imperfect, occurred at the West Rocks, St. Andrews, in April 1861. (R. Walker, "Ann. and Mag. Nat. Hist.," 1862, p. 13.)

To the above, Sim in his "Vertebrate Fauna of Dee" (1903) adds four as under. Two Aberdeen newspapers are cited for the records, but the author of the "Fauna" does not say whether he saw any of the specimens himself, and no descriptions are given, which seems a pity :—

One 11 ft. 4 in. long, caught at Fraserburgh, 8th February 1884.

One 17 ft. 1 in., got in a stake-net near Buckie, April 1884; sent to Aberdeen University, but not preserved.

One about 12 ft., washed into Sandhaven harbour 25th January 1891.

One 16 ft. 3 in., captured in the estuary of the Findhorn, April 1896, and sent to the British Museum.

According to a statement made to Mr. Eagle Clarke a few years ago, by the harbour-master at North Berwick, it seems probable that a specimen "about 15 feet in length" was washed ashore to the east of that town many years ago —say 1840 to 1845. No contemporary record, however, of the occurrence appears to exist (*cf.* Eagle Clarke, "Ann. Scot. Nat. Hist.," 1900, p. 13).

The fullest description of any British specimen is that given by Hancock and Embleton, in the "Annals and Magazine of Natural History" (iv. N.S. 1849, p. 1, with 2 plates), of one which was captured off Cullerecoats in Northumberland on 26th March 1849. The best all-round account and figure of the species are probably those to be found in Prof. F. A. Smitt's edition of "A History of Scandinavian Fishes," published in 1893. Several supposed species, including *Regalecus glesne* (Ascan.), *R. grillii* (Lindr.), and *R. banksii* (Cuv. and Val.), are there united under the first-mentioned name. The discrepancies between them as regards ratio of depth to length, number of rays in dorsal fin, etc., have been variously accounted for. A suggestion of M'Coy, that the more slenderly built ones are males, receives some support from the Dunbar specimen, which is a male, a fact of much interest, seeing that hitherto only females have been noted from the Atlantic region.

"The King of the Herrings," says Smitt, "lives in very deep water, its species being perhaps identical in all the oceans; but of its usual manner of life we know nothing. Occasionally it appears at the surface, and in the superstitious imagination of the sailor takes the form of 'the great Sea-serpent.'" It seems probable that those which come to the surface do so as the result of sickness or disease.

This notice, it should be said, has been drawn up at the suggestion of Mr. Eagle Clarke, Keeper of the Natural History Department of the Royal Scottish Museum.

THE FALSE-SCORPIONS OF SCOTLAND.

By Robert Godfrey, M.A.

(*Continued from p.* 100.)

Modes of Distribution.

The various methods of distribution remain one of the many interesting problems requiring investigation in this group of creatures. Being destitute of wings, False-scorpions lack the means of transit employed by many other creatures, and, having no organs that can perform the function of wings, they are forced to be to a great extent sedentary in their habits, and any marked extension of their range must take place with their passive concurrence rather than through their active agency.

Probably the wind plays an important part in the distribution of these creatures. This was first suggested to me by an unusual action on the part of a *Chthonius rayi*; this species when tampered with generally avoids smartly the cause of annoyance, but, on the occasion referred to, the individual with which I was experimenting did not run off as usual, but simply drew its pedipalps close to its fore-body, and assuming as compact a position as possible, allowed me even to roll it over, and led me to infer how readily it might, in a listless position of this kind, be carried by the wind a considerable distance.

On a later occasion, March 31, 1904, I actually saw a false-scorpion carried off by the wind. I had opened a tenanted nest of *Chthonius tetrachelatus*, and was preparing to examine the creature more carefully with my lens, when to my chagrin I saw it—in the motionless attitude which it was still assuming—gently caught up and carried away by a gust of wind.

In the case of our commonest species, *Obisium muscorum*, there can be no doubt that it makes assisted passages from one locality to another on leaves blown about by the wind.

The method in which *Chernes nodosus* is carried on flies' legs to new quarters shows how one species may accidentally

extend its range. In the few recorded cases where specimens of *Chernes nodosus* have been found in a book or among papers, it is quite likely that they have reached such positions after having slipped from the leg of their carrier.

Man unwittingly takes a large share in the distribution of False-scorpions. Through his agency, species which dwell among plant-mould and in the refuse of mills and of stables are carried from place to place. Species also which live in wood—whether on the natural tree or on the finished article of joinery—are also to some extent indebted to him for their extension of range.

Scottish Distribution.

The number of Scottish species (July 1907) is twelve, a number which ought to be considerably increased as interest in the group extends. In this number not a single species of the forest group—the tree-haunting *Chernes*—is included, but it is unlikely that such a gap exists in our native fauna. A careful examination of the old trees that are left to us as relics of the ancient Scottish forests ought to result in the discovery of several species of False-scorpions not as yet on the Scottish list. The sifting of the materials of ant-heaps ought in Scotland as elsewhere to lead to the detection of False-scorpions living there as guests, and the careful examination of refuse in our granaries and stores at seaport towns would very probably lead to the discovery of several exotic species living and thriving in Scotland.

Much work remains to be done in tracing the distribution of the species in Scotland. From "Forth," "Clyde," and "West Ross" eight species are known; "Argyle" and "Tay" have five each; "Solway" has four; "Tweed" has three; "Moray" and the "Inner Hebrides" have one each; while the five faunal areas of "Shetland," "Orkney," "Outer Hebrides," "Sutherland," and "Dee" are wholly unrepresented. These facts are sufficient to show how comparatively unworked Scotland still is in this particular branch of natural history.

Table of Distribution.

In the following Table of Distribution the faunal area is given first, in small capitals, as West Ross; under this the counties are arranged in italics, as *Ross*; and under the counties are given the various localities in each, in ordinary type.

Chernes nodosus (Schrank).

Forth . . *Midlothian*—Edinburgh Botanic Garden, Aug. 27, 1895 (J. F. Jeffrey). Shop in Edinburgh, Aug. 1900 (Alex. Baxter).

Chernes dubius, Cambridge.

West Ross . *Ross*—Balmacara, two, Aug. 27, 1906 (R. B. Whyte).

Tay . . . *Fife*—Balcomie, common, Sept. 1905.

Forth . . *Fife*—St. David's to Aberdour, abundant, March 22, 1902, etc. Kilminning, Sept. 1905.
West Lothian—Bonnytoun Hills, and quarry near Northbank, April 12, 1901, etc.
East Lothian—North Berwick Law, five, May 19, 1903.

Chernes panzeri (C. L. Koch).

West Ross . *Ross*—Balmacara, abundant in byres, Aug. 1907.

Clyde . . *Lanark*—Stable in Walls Street, Glasgow, June, July, Sept. 1907.

Tweed . . *Peebles*—Haswellsykes, Sept. 24, Oct. 1, 1907 (A. Urquhart).

Chelifer cancroides (Linn.).

Clyde . . *Lanark*—Stable in Emily Street, Glasgow, abundant, April 1907. Stable in Walls Street, adult male, June 28, 1907; three adults, one immature and three very young, Sept. 14, 1907.

Chelifer latreillii, Leach.

Forth . . *Fife*—Rosyth Castle island, five, Nov. 11, 1905. Elie, July 1905 (Evans), and over twenty, Sept. 14, 1905. Kilminning, abundant, Sept. 1905.
East Lothian—Gullane Point, many, Oct. 14, 1905, etc. North Berwick, thirteen, May 23, 1905.

Cheiridium museorum (Leach).

WEST ROSS . *Ross*, Balmacara, Aug. 26, 1907 (G. A. Whyte).

CLYDE . . *Ayrshire*—Toft's Meal Mill, Dalry, June 29, 1907.

TAY . . . *Fife*—Stravithie, Sept. 25, 1905.

FORTH . . *Fife*—Kirkmay, Crail, abundant, Sept. 1905, etc. Dunfermline, common, Oct. 1905 (Evans).
West Lothian—Bo'ness, one, June 20, 1901.
Midlothian—House in Edinburgh, common, June 21, 1905.
East Lothian—Smeaton, E. Linton, in old trunk, March 1906. Dunbar, Newhouse Farm, May 1906.

TWEED . . *Peebles*—Haswellsykes, four, Sept. 18, 1907 (A. Urquhart).

Ideoroncus cambridgii (L. Koch).

WEST ROSS . *Ross*—Balmacara, Aug. 1906.

ARGYLL . . *Argyll*—Oban, April 1906. Maiden Island and Kerrera, April 1906. Ben Cruachan, April 23, 1903 (James Waterston). Barbreck, three, June 30, 1900. Cantire, Ronachan, Dec. 1905 and Jan. 1906.

CLYDE . . *Argyll*—Loch Fyne, Shirvan, common, Aug. and Sept. 1904.
Bute— Island of Arran, Aug. 1906 (R. S. Bagnall).
Ayr—Portincross, eighty-two noted from Nov. 1903 to April 1904.

SOLWAY . . *Kirkcudbright*—Kippford and Rough Island, Jan. 1907.

Obisium maritimum, Leach.

WEST ROSS . *Ross*—Balmacara, one, Aug. 27, 1907.

ARGYLL . . *Argyll*—Loch Fyne, Shirvan, Sept. 1904.

Obisium muscorum, Leach.

WEST ROSS . *Ross*—Stromeferry and Balmacara, Aug. 1906.
Skye—Ben Cailleach, common, Aug. 16, 1906.

ARGYLL . . *Argyll*—Taycreggan, Loch Nant, Oban, July 1901. Maiden Island, April 10, 1906. Connel Ferry, Black Lochs, April 17, 1906. Cantire, Ronachan, Dec. 29, 1905.

CLYDE . *Argyll*—Loch Fyne, Shirvan, common, Sept. 1904. Island More, Sept. 14, 1904.
Dumbarton—Balloch, Dec. 21, 1906. Dumbreck, Feb. 14, 1907. Kilpatrick Hills, July 20, 1906.
Renfrew—Parklee, March 12, 1907. Erskine, July 30, 1906. Balgray Dam, July 7, 1906.
Lanark—Bothwell, July 5, 1906. Hamilton, Low Park, July 9, 1906.
Ayr—Portincross, etc., winter of 1903-4.

SOLWAY . . *Kirkcudbright*—Kippford, common, Jan. 1907. Rough Island, Jan. 7, 1907 (R. B. Whyte).

MORAY . . *Inverness*—Rothiemurchus Forest, common, Aug. 1904.

TAY . . . *Perth*—Bonskeid, April 1901. Glen Ogle and Lochearnhead, July 1903, etc. Crieff, April 1903.
Fife—Balcomie, Newhall, Boarhills, Sept. 1905.

FORTH . . *Fife*—St. David's to Aberdour, March 1902, etc. Isle of May, April 1908 (Evans).
Dumbarton—Castlecary, May 25, 1907.
West Lothian—Abercorn, April 8, 1899. I have noted it practically everywhere in this county, —Dalmeny, S. Queensferry, Carriden Glen, Bo'ness, Kinneil, River Avon, Linlithgow Bridge, Preston, Woodcockdale, Crawhill, Livingstone, Ecclesmachan, River Almond.
Midlothian—Hailes Quarry, Nov. 1, 1898. Also at Edinburgh Castle Rock, Dreghorn, Oxenford, Kirknewton, and Pomathorn.
East Lothian—Boglehill, Kilspindie, Luffness, and Canty Bay, 1903.

TWEED . . *Berwick*—Grant's House, five, May 10, 1907 (James Waterston).

Chthonius tetrachelatus (Preyss.).

WEST ROSS . *Ross*—Balmacara, wooded hillside, common, Aug. 1907 (G. A. Whyte).

ARGYLL . . *Argyll*—Oban, several, April 1906. Maiden Island, adult in nest, April 10, 1906.

CLYDE . . *Argyll*—Loch Fyne, Shirvan, common, Aug., Sept. 1904. Loch Riddon, Ormidale, Aug. 1906 (R. S. Bagnall).

Renfrew—Parklee, two immature, in nests, March 12, 1907.
Ayr—Portincross, Jan. and March 1904.

SOLWAY . . *Kirkcudbright*—Kippford, common, all in nests, Jan. 1907.

TAY . . . *Fife*—Balcomie, Sept. 1905.

FORTH . . *Perth*—Stronvar, fourteen, July 21, 1904.
Fife—Culross, two, April 26, 1901 (W. Evans). Crail, very abundant, Sept. 1905.
West Lothian—Kinneil, six, August 17, 1901 (W. Evans).
Midlothian—Edinburgh Botanic Garden, common, August 1904, etc.
East Lothian—Dunbar, Newhouse Farm, May 28, 1906.

Chthonius rayi, L. Koch.

WEST ROSS . *Ross*—Balmacara, in great abundance, Aug. 1906.

ARGYLL . . *Argyll*—Oban, one, April 1894 (W. Evans).

CLYDE . . *Argyll*—Tighnabruaich, one, June 11, 1907.

SOLWAY . . *Kirkcudbright*—near Dalbeattie, adult in nest, Jan. 3, 1907 (G. A. Whyte).

TAY . . . *Fife*—Kinkell, two adult and two young, Sept. 25, 1905.

FORTH . . *Fife*—St. David's to Aberdour, very common, May 16, 1902, etc. Crail, in tomato frame, in vinery, and by the shore, Sept. 1905. Kincardine-on-Forth, six, April 27, 1901 (W. Evans).
West Lothian—Kinneil, one immature, June 24, 1901.
Midlothian—Muirhouse, two, Oct. 5, 1903; four, April 1907 (G. A. and R. B. Whyte). Edinburgh Botanic Garden, two, March 30, 1907 (G. A. and R. B. Whyte).
East Lothian—Kilspindie, five, Sept. 26, 1903. Dunbar, Newhouse Farm, two in stackyard, May 27, 1906.

Chthonius orthodactylus (Leach).

FORTH . . *Midlothian*—Morningside, one, Sept. 1897 (W. Evans).

	Ross.	Skye.	Inverness.	Argyll.	Dumbarton.	Bute.	Lanark.	Renfrew.	Ayr.	Kirkcudbright.	Dumfries.	Wigtown.	Perth.	Fife.	West Lothian.	Midlothian.	East Lothian.	Berwick.	Roxburgh.	Selkirk.	Peebles.	Stirling.
Cheiridium museorum	×								×					×	×	×	×				×	
Chernes nodosus																×						
dubius	×													×	×		×					
panzeri	×						×														×	
Chelifer cancroides							×															
latreillii														×			×					
Ideoroncus cambridgii	×			×		×			×	×												
Obisium maritimum	×			×																		
muscorum	×	×	×	×	×		×	×	×	×			×	×	×	×	×	×				
Chthonius rayi	×			×						×				×	×	×	×					
tetrachelatus	×			×				×	×	×			×	×	×	×	×					
orthodactylus																×						

(*To be continued.*)

HYDRACHNIDS FROM THE ISLAND OF TIREE.

By Wm. Williamson.

During a few days' stay in the Island of Tiree in August 1907, I obtained some specimens of Hydrachnids in the neighbourhood of Scarnish. The collection embraced only three species, of which two, *Thyas longirostris*, Piersig, and *Tiphys liliaceus*, Müller, have not been recorded before for Scotland.

Thyas longirostris, Piersig.—This species was briefly described by Piersig in 1895 in the "Zoologischer Anzeiger;" a more complete description is given in his work on the German Hydrachnidæ—"Zoologica," Heft 22, 1897-1900. *T. longirostris*, Piersig, may be recognised by the shape of the piece of chitin which accompanies the unpaired median eye. In the species already recorded as occurring in Scotland, viz. *T. venusta*, Koch, and *T. extendens*, George, the chitin takes the form of a small ring in the centre of which the median eye is placed. In *T. longirostris*, however,

the chitin lies along the median line and is pointed at both ends. The entire edge is thickened so that the median eye appears to lie in a space surrounded by a ridge. The pigment body resembles a double star in shape. *T. longirostris* has already been recorded for England and Ireland.

Tiphys liliaceus, Müller.—This species was mentioned by Müller in his "Prodromus," and in his treatise in 1781 on the Danish Hydrachnids, he gave it the name of *Hydrachna liliacea*. The only other species of Tiphys on record for Scotland are *T. ligulifer*, Piersig, which constituted a new British record, and *T. cassidiformis*, Haller, both found near Oban.

In 1835, Koch, who is responsible for some complication in Hydrachnid nomenclature, used the generic name Tiphys, which he replaced in 1837 by Acercus. Haller in 1881 changed the name to Forelia. Oudemans in 1897 reverted to Tiphys. In the same year Piersig adopted the name Acercus, which he discarded in 1900 for Tiphys. In 1906 Koenike adopted Haller's name of Forelia for the genus.

Dr. Sig Thor in Norway, Dr. F. Koenike in Germany, and Dr. R. H. Wolcott in Nebraska, U.S.A., have reviewed the evidence for the correct name for this genus. Thor holds that the names Tiphys and Acercus are properly referable to species other than those embraced in the genus under consideration, and that consequently Haller's name Forelia, with *F. cassidiformis* as type, must take precedence. Koenike also upholds Forelia, but he has changed the specific name from *cassidiformis* to *parmata*. Wolcott, on the other hand, rejects the claims of Acercus and Forelia, and supports the use of Tiphys, designating *T. liliaceus* as the type species. In this connection it is interesting to note the opposite views in regard to Koch's work of two such authorities as Sig Thor and R. H. Wolcott.

Sig Thor, in the "Nyt Magazin for Naturvidenskaberne" for 1903, says, "Die Gattungen Acercus und Tiphys waren schon früher von Koch hinreichend charakterisirt." Wolcott in "Studies from the Zool. Lab. of the University of Nebraska," No. 66 (also "Trans. of Amer. Micro. Soc.," xxvi. 214), says, "Koch in 1835 described and figured

several species under the generic name Tiphys, *neither characterising the genus* nor specifying a type.[1] In 1837 he substituted Acercus for Tiphys, which he thought pre-occupied, but in this he was in error, as has since been shown ; here he designated no type, but used *T. sagulatus*, a species not since recognised, to illustrate the genus."

At present I cannot say anything in support of either of these opinions, as I have not yet been able to see the descriptions and plates published by Koch from 1835 to 1841. However, the name Tiphys is used here, as I find it convenient to follow the nomenclature of "Das Tierreich," Lief. 13, 1901.

Hydryphantes ruber, De Geer.—This species along with varietal forms has already been recorded for Scotland. I found several specimens of it near Scarnish. Like Thyas, Hydryphantes possesses a median eye accompanied by a characteristic chitinous plate, but it differs from Thyas in the absence of the dorsal chitinous plates with which the latter is more or less equipped.

4 Meadowbank Terrace, Edinburgh.

THE HIGH ALPINE FLORA OF BRITAIN.

BEING A LIST OF THE FLOWERING PLANTS AND FERNS FOUND AT A THOUSAND METRES AND UPWARDS ON THE MOUNTAINS OF THE BRITISH ISLES, WITH AUTHENTIC REFERENCES AND CRITICAL NOTES.

By Frederic N. Williams, F.L.S.

The present List is intended to be a basis for an account of the High Alpine Flora of the British Isles. The altitudinal range of British plants has not, in its varying aspects, been studied with the fulness and scientific method which have been brought to bear on the mountain-plants of Central Europe. This is due to several causes. The Flora of the Alps has always excited the interest of

[1] The *italics* are mine.

botanical travellers and of alpinists who have been through a course of scientific studies; and John Bell's tabular scheme of the distribution and range of the plants of the Alps, a model of its kind, has unfortunately not found imitators in other countries, with the exception, perhaps, of the exhaustive and critical study of the Arctic Flora of Norway by J. M. Norman, Royal Commissioner of Norwegian Forest-lands — a masterly digest of phyto-geographical research and investigation.

The List here given includes those plants only which are found to occur at 1000 metres and upwards (that is, beyond 3280 ft.). A list is given below of the 67 peaks which attain this height in Scotland, with 3 in Caernarvonshire and 2 in Kerry, with heights given in metres and in English feet. The heights here given are taken from the ordnance maps and from the most recent topographical statistics. There is no hill in England itself which reaches a height of 1000 metres, the highest summit being Sca Fell Pike, in Cumberland, which is 977.2 metres. There will therefore be no reference in this List to any altitudinal range in the English counties. In six only of the Scottish counties are there mountain peaks which exceed 1000 metres—Argyllshire, Perthshire, Aberdeenshire, Banffshire, Inverness-shire, and Ross-shire. These are the only Scottish counties in which localities and heights are cited. Three counties are excluded whose highest summits fall a little short of a thousand metres—Sutherland, in which Ben More of Assynt rises to 997.6 m.; Stirlingshire, in which Ben Lomond rises to 973 m.; and Angus in which the highest point is Driesh, one of the Braes of Angus, 947 m. The Snowdon range in Caernarvonshire exceeds the limits at three points, the actual summit of the chain, known as Ur Wyddfa, Carnedd Llewelyn, and Carnedd Dafydd; the peak of Glyder Fawr falls short of it by little more than a metre.

The following is a list of the 67 summits in the British Isles which exceed a thousand metres, drawn up as far as possible from examination of the official ordnance maps. They are given in two series in parallel columns. In the first column, grouped under counties, the heights are given

in English feet; in the second column, the series begins with the loftiest summit, then in descending order until a thousand metres is reached, the heights being given in metres. Where, as in several cases, the mountain forms part of a county boundary, it is included for the purpose of this List in the larger county. Thus, several peaks on the Perthshire border are included in Argyllshire, and most of those on the Banffshire border are included in Aberdeenshire or Inverness-shire. The greater part of Ben Macdhui is in Aberdeenshire, but as Corrie Etchachan, high up on the northern slope (frequently mentioned as a locality for Alpine plants), as well as the actual summit of the mountain, are in Banffshire, it is for convenience included in the latter county. Ben Lawers, on account of the accessibility of all points of its area, is probably the best known mountain in the Highlands. The portion of it that comes within the scope of the present flora begins at 700 ft. (perpendicular) below the summit; and the earliest records of plants gathered near the top are those of James Dickson, J. T. Mackay, W. MacRitchie, Robert Brown, and Don, from 1789 to 1794. Some indication of the limited scope of this high Alpine flora may be illustrated from the case of Perthshire. The area of Perthshire is given as 2588 square miles, but the area of the county above 3000 ft. is estimated at only 16 square miles. Those mountains are starred (*) which are specifically mentioned in the following pages. It is thus evident that much remains to be done in working out the distribution of plants on the higher parts of the Scottish mountains.

ABERDEENSHIRE.

*Cairn Toul, 4241 ft.
*Ben-na-Bourd, 3924 ft.
*Ben Avon, 3843 ft.
*Cairn Gorm of Derry, 3788 ft.
*Loch-na-gar, 3786 ft.
Cairn-na-Glasha, 3484 ft.
Ben Iutharn, 3424 ft.
Cairn Bannoch, 3314 ft.
Sgurr Soch, 3300 ft.

*Ben Nevis, 1342.9 m.
*Ben Macdhui, 1309.4 m.
*Braeriach, 1294.8 m.
*Cairn Toul, 1292.7 m.
*Cairn Gorm, 1245.6 m.
*Aonach Beag, 1238 m.
*Aonach Mor, 1219 m.
*Ben Lawers, 1214.3 m.
*Ben-na-Bourd, 1196 m.

BANFFSHIRE.

*Ben Macdhui, 4296 ft.

FORFARSHIRE.

*Glas Maol, 3502 ft.

INVERNESS-SHIRE.

*Ben Nevis, 4406 ft.
*Braeriach, 4248 ft.
*Cairn Gorm, 4084 ft.
*Aonach Beag, 4060 ft.
*Aonach Mor, 3999 ft.
Ben Mheadoin, 3883 ft.
Sgurr-na-Lapaich, 3773 ft.
*Ben Alder, 3757 ft.
Creag Meaghaidh, 3700 ft.
Cralich, 3673 ft.
*Sgor an Dubh, 3658 ft.
*Ben Alder Forest, 3569 ft.
Sgurr-na-Cichie, 3410 ft.
Ben Attow, 3383 ft.
Ladhar Beinn, 3343 ft.
Meall Thionail, 3338 ft.

ROSS-SHIRE.

Carn Eige, 3877 ft.
Mam Soul, 3862 ft.
Sgurr Mor, 3637 ft.
*Ben Dearg, 3547 ft.
An Teallach, 3483 ft.
Ben Luighach, 3456 ft.
Sgurr a' Chaoruinn, 3452 ft.
Ben Wyvis, 3429 ft.
Ben Eay, 3309 ft.
Ben More, 3305 ft.

ARGYLLSHIRE

*Bidean-nam-Bian, 3768 ft.
Ben Veedan, 3766 ft.
Ben Lui, 3708 ft.
Ben Cruachan, 3689 ft
Clach Leathad, 3602 ft.
Stob Chabhair, 3563 ft.
Ben Starav, 3541 ft.
*Ben Creachan, 3540 ft.
*Ben Dorean, 3523 ft.
*Ben Dothaidh, 3425 ft.

Ben Mheadoin, 1184 m.
Carn Eige, 1182.5 m.
Mam Soul, 1178 m.
*Ben Avon, 1172 m.
*Ben More, 1172 m.
*Ben Ein, 1167 m.
*Cairn Gorm of Derry, 1155 m.
*Loch-na-gar, 1154.7 m.
Sgurr-na-Lapaich, 1151 m.
*Bidean-nam-Bian, 1149.2 m.
Ben Veedan, 1148 m.
*Ben Alder, 1144 m.
Ben Lui, 1131 m.
Creag Meaghaidh, 1128 m.
Ben Cruachan, 1125 m.
Cralich, 1120 m.
Ben-y-Gloe, 1119.3 m.
*Sgor an Dubh, 1115.4 m.
Sgurr Mor, 1109 m.
Clach Leathad, 1098 m.
*Snowdon, 1088.1 m.
*Ben Alder Forest, 1088 m.
Stob Ghabhair, 1086 m.
*Schiehallion, 1081 m.
*Ben Dearg (Ross-shire), 1081 m.
Ben Starav, 1080 m.
*Ben Creachan, 1080 m.
*Ben Heas-garnich, 1076 m.
*Ben Dorean, 1074 m.
*Glas Maol, 1068 m.
Cairn-na-Glasha, 1062.3 m.
*Carnedd Llewelyn, 1062 m.
An Teallach, 1062 m.
Ben Luighach, 1054 m.
Sgurr a' Chaoruinn, 1052 m.
*Glas Thulachan, 1049.9 m.
Ben Wyvis, 1045 m.
*Carnedd Dafydd, 1045 m.
*Ben Dothaidh, 1044 m.

*Ben Achallader, 3399 ft.
Ben Avere, 3362 ft.
*Buchaille Etive Mor, 3345 ft.
Ben Ime, 3318 ft.

PERTHSHIRE

*Ben Lawers, 3984 ft.
*Ben More, 3843 ft.
*Ben Ein, 3827 ft.
Ben-y-Gloe, 3671 ft.
*Schiehallion, 3547 ft.
*Ben Heas-garnich, 3530 ft.
*Glas Thulachan, 3445 ft.
Carn Mairg, 3419 ft.
*Meall Ghaordie, 3407 ft.
Chabinn, 3354 ft.
Ben Udlaman, 3306 ft.
*Creag Mhor, 3305 ft.
Ben Dearg of Atholl, 3304 ft.

CAERNARVONSHIRE

*Snowdon, 3571 ft.
*Carnedd Llewelyn, 3482 ft.
*Carnedd Dafydd, 3430 ft.

KERRY

*Carn Tual, 3414 ft.
*Beenkeragh, 3314 ft.

Ben Iutharn, 1044 m.
Carn Mairg, 1042 m.
*Carn Tual, 1041 m.
Sgurr-na-Cichie, 1040 m.
*Meall Ghaordie, 1039 m.
*Ben Achallader, 1036 m.
Ben Attow, 1031 m.
Ben Avere, 1025 m.
Chabinn, 1022 m.
*Buchaille Etive Mor, 1020 m.
Ladhar Beinn, 1019.6 m.
Meall Thionail, 1019 m.
Ben Ime, 1013 m.
*Beenkeragh, 1011 m.
Cairn Bannoch, 1011 m.
Ben Eay, 1009 m.
Ben More (of Ross-shire), 1008 m.
*Creag Mhor (of Perthshire), 1008 m.
Ben Udlaman (of Perthshire), 1008 m.
Ben Dearg of Atholl, 1007.7 m.
Sgurr Soch, 1006 m.

None of the three British Gymnosperms ascend to 1000 m., nor do any of the Dicotyledonous trees. The following notes on the limits of sallow, birch, and aspen in Scotland may be of interest. The birch and the sallow (earliest flowering of the British willows) both ascend to 610 m. on hills of the Atholl district of Perthshire, and no higher elsewhere in the Highlands; though Dickie says that, at 670 m., on the summit of the ridge north from Mount Keen in Aberdeenshire he saw "the dead remains of birches, far larger than any growing at lower altitudes on other mountains of the district." Watson also says, "On Ben Nevis, under the snow-rocks of the northern precipice, I observed a seedling almost at the upper limit of *Empetrum nigrum*, there, in consequence of the cold, humid, sunless situation, failing between 2700 and 3000 feet." On hills of

the Atholl district also, the aspen does not get higher than 640 m., though the tree is common in the Highlands.

As compared with Scotland, alpine plants descend to lower levels in Ireland. So, as a matter of contrast in the following List as regards altitudinal range, the descending level reached by those Scottish alpine plants which occur in Ireland is given, and is taken from the second edition of "Cybele Hibernica." In the matter of bibliography, the five works subjoined are frequently cited, and to save space in reference are quoted in the abbreviated form appended to their titles :—

H. C. Watson, "Cybele Britannica," vols. i-iv (1847-59)—"Cyb. Brit."

N. Colgan and R. W. Scully, "Cybele Hibernica," ed. 2 (1898).—"Cyb. Hib."

G. Dickie, "Botanist's Guide to the Counties of Aberdeen, Banff, and Kincardine" (1860).— Dickie.

"Scottish Naturalist,"—continued (after 1890) as "Annals of Scottish Natural History"(1871-1908).—"Ann. Scot. Nat. Hist."

F. B. White, "Flora of Perthshire" (edited by Prof. J. W. H. Trail, 1898).—"Fl. Perthsh."

Among British county-floras Dr. White's work occupies an unique position, not only in many features associated with its compilation which are far in advance of previous local floras, but in the admirable series of observations of the altitudinal range of plants made personally by means of the aneroid barometer, which considerably enhance the value of the work as a contribution to British Geographical Botany. It is this feature of the flora which not only suggested the preparation of the present paper, but supplied data for comparing the details of altitudinal range of plants in other Highland counties, and has provided the basis for the present contribution to the subject. Watson's altitudes must be accepted with some misgiving, and only where more recent observations are not available. Many of those which he vouched for personally were made more than seventy years ago, before Vidie's invention of the aneroid barometer ; and the information which he received second-hand was frequently from unreliable sources. Watson used an old-fashioned

sympiesometer, a barometric instrument ill adapted for measurements on mountain ascents, which, even when adjusted for temperature at each stage of ascent, is not suited for exact observation. As an illustrative instance it may be mentioned that in his time Ben Macdhui was reputed to be the highest mountain in Scotland. The arrangement here followed is that of Torre and Harms's Index to Engler and Prantl's "System" for families and genera, and the last German edition of Koch's "Synopsis" (1892-1907) for species—for the most part; but in the reverse order, beginning with the highest groups of flowering plants, as is usual in British floras. A good deal remains to be done in working out the distribution of the high alpine plants on the Scottish mountains, as the unstarred names in the list of summits show. It is hoped that the present outline of recorded data may serve as a basis for botanical alpinists, who may combine the exercise of climbing with field-study, considerably to enlarge its scope.

(*To be continued.*)

ADDITIONS TO THE FLORA OF THE ORKNEYS.

By Arthur Bennett, F.L.S.

Mr. M. Spence, a resident on the islands, has lately sent me numerous specimens of Orkney plants to look over, among which I have found a few additions to the recorded species. With these I have added some others which have accrued since the Supplement to "Top. Botany," ed. 2.

Ranunculus Steveni, Andrz., *Trail.*
R. sceleratus, L., *Dr. Grant, ex* Spence !.
Fumaria purpurascens, Pugsley, *Trail.*
Trifolium dubium, Sibth., *Spence, sp.*

In rounded brackets in "Top. Bot."; but Mr. Spence says certainly wild.

†Lupinus nootkatensis, Donn, *Trail.*
Alchemilla filicaulis, Buser, "Ann. Scot. N. Hist" (1906), 122.

A. pratensis, Schmidt, "J. Bot." (1895), 111.
Spergula arvensis, L., *var.* sativa, Boenn., *Syme*, herb. !
Thymus eu-Serpyllum, Fr., *Marshall*, *sp.*
Salsola Kali, L., *Spence*, *sp.*
Orchis ericetorum Linton, "J. Bot." (1901), 272.
Carex muricata, L., *Spence*, *sp.*
C. rigida, Good, *Fortescue* in List.
Bromus racemosus, L., *Trail.*
Equisetum pratense, Ehrh., *Spence*, *sp.*

Deerness, in the Mainland, 1907. An interesting addition to the Orcadian Flora, not yet gathered in Shetland by Mr. Beeby; but occurs in Caithness ! and the Outer Hebrides !. Also in the Faroes (Rostrup) and Iceland ! (Groenland).

In Northern Europe it occurs throughout Finland and Russian Lapland to 69° (Wainio). In arctic Norway to 71° 7′ (Th. Fries), but does not seem to reach the extreme north in Russia proper.

Since the publication of the "Comp. Cyb. Brit.," 1869, wherein the highest altitude for this species given is 1200 feet, it has been found at 2500 feet (Ben Lawers, *Macvicar*, *sp.*), 2700 feet in Mid Perth (*Marshall*, "J. Bot." 1891, 118), and at 3100 feet in Mid Perth (*Macvicar*). In Norway it is found at 2500 feet (*Norman*).

Goodyera repens, Brown. "One plant found on hilly ground near Stromness. Do not think it an escape."—*Spence.*

The finding of a single specimen cannot be considered as admitting the plant as an Orcadian species. Still there is no reason why it should not grow as far north, as it occurs throughout Sweden, up to Lapland; in North and South Norway; and is distributed through Finland, and Lapland, except the four northern provinces, in which few stations are on record. It occurs in West Ross, East and West Sutherland, but is not on record for Caithness or the Outer Hebrides. [In Scotland, so far as I have seen, it is almost absolutely restricted to woods of conifers; hence its occurrence in Orkney is unexpected.—J. W. H. T.]

Archangelica officinalis, Hoffm. "In considerable numbers growing on the roadside in the village of Pierowall, Westray."—*Spence, sp.*

In the Faroes this species is not only found in the cultivated parts, but in large masses, and very fine in the talus of the Bird-cliffs, and also grown in small gardens (Kvan-yards) near the houses.[1] It also occurs in Iceland "here and there," where it is also cultivated. It is said to be abundant in the northern parts of that island.[2]

[1] Ostenfeld, "The Land-Vegetation of the Faroes," 1908, p. 1004.
[2] Babington, 'Revision Fl. Iceland,' "Lin. Soc. Journ." xi., 1871, 30.

Ostenfeld calls the Faroese plant *A. officinalis*; but Nyman and others refer it to *A. norvegica*, Rupr. I thought the Orkney plant might be this, but Ruprecht[1] says, "*A. sativa* similis, sed semina rotundiora." Then there is *A. litoralis*, Ag. in DC. = *Angelica litoralis*, Fr.; which Fries says in his "Flora Scanica," 1835-1856, has "fructu inflato, nucleis liberis." These two seem native, while the other seems to belong to a cultivated race, which may be indigenous in East Europe and Russia. Mr. Spence writes that the scent is very strong, and clings to the hands and clothes for some time. He suggests the probable origin of the plant in Westray as seeds from the Faroes, a fish-merchant in Pierowall importing salted cod from these islands, which is brought in smacks direct to Westray.

NEW AND RARE MOSSES.

By James Stirton, M.D., F.L.S.

In continuation of my researches into the minute structure of mosses, mostly in a barren state, wherein I attach much greater importance to their areolation than has hitherto been done, I have to record several which show, in this respect, peculiarities of sufficient importance to warrant their separation from those already known. As an illustration of this I shall describe here a curious moss. In this instance the areolation of the leaf serves as the most important factor in its discrimination, more especially as the general colour and, to a less extent, the habit of the plant would lead one, at first blush, to associate it, if not to identify it, with *Rhacomitrium heterostichum*.

Grimmia fuliginea (*n. sp.*)—In laxly aggregated tufts, at first of a greenish yellow above, quickly assuming a tawny-yellow colour, but of a dirty brown below; stems upright from a half to one inch in length, simple or dichotomously divided, but occasionally emitting short irregular branches; leaves closely arranged around stem, somewhat incurved in a dry state, straight and nearly upright but flaccid when moistened, narrowly ovate lanceolate, terminating in a long, nearly entire, hyaline hair, about half the length of the leaf proper; nerve also of a tawny-yellow colour, narrow near base, latit., .04 to .05 mm., broadening somewhat

[1] "Flora Samojed, Cisural," 1845. 37.

upwards to middle, thence narrowing to summit, margin smooth; reflexed in the lower two-thirds, reflexed near middle as much as .035 mm., plane in upper third, and there thickened by one or two transverse couples of cells; cells at central base detached, bluntly oblong, with smooth, straight walls and granular contents having besides large, pellucid nuclei, .04-.055 by .009-.012 mm., outwards broader and becoming attached, as well as from three to six short longitudinal marginal basal rows of cells, slightly tawny, and having clear homogeneous contents, .035-.04 by .011-.014 mm.; upper cells near middle of leaf irregularly oblong or oval with dark granular contents, separated from one another by considerable intervals, also tawny, .013-.018 by .006-8 mm., a little shorter near apex. All the upper cells have somewhat irregular lateral walls, but are not sinuose. This moss clearly belongs to the genus *Grimmia*, although it still bears traces of its origin from *Rhacomitrium* in the irregular outline of the upper cells, etc.

I have hitherto found this plant only in two places near Arisaig, viz., on stones slightly covered with earth, but have failed to detect *inflorescence* of either kind.

GRIMMIA INÆQUALIS (*n. sp.*)—In widely spreading flattish tufts of a deep or dark green colour above, dark or nearly black below; stems from a half to nearly an inch long, slender, simple or fastigiately branched above; leaves spreading a little when moistened, nearly upright or only slightly incurved when dry, dark green, ovate lanceolate with slightly blunt apices (latit., .05-.07 mm.), hair-point short, denticulate, at times apex muticous; nerve narrow, .04-.05 mm., broad near base, becoming a little broader upwards, then tapering to apex, from pale turning soon to brown; pagina unistratose in lower half, thereafter one marginal transverse couple of cells, upwards two such couples, and not unfrequently an additional detached couple nearer nerve; margin of one side just above pellucid base, broadly reflexed from .03 to .045 mm., narrowing upwards until the reflexed part is only the breadth of two cells, when it joins on to the posterior row of the duplicate or bistratose part of margin; the other margin plane throughout; cells at central base oblong, granular, ultimately pellucid .035-.05 by .008-.012 mm.; outwards cells broader and shorter, about one-fifth of the lowest part of leaf pellucid; upper cells roundish darkly granulose, separate, .006-9 mm., diam. On stone walls, Garscube near Glasgow; near Forth Bridge at Dalmeny (J. M'Andrew).

I cannot recall another instance of such a peculiarity as this where one margin is plane and the other broadly reflexed, and, near apex of leaf, where this narrow reflexed margin is joined on to the thickened portion of margin.

Propagula have been seen on the nerve, near the base, slightly stalked, single or in clusters of two and three, spheroid or some-

what irregular in outline, about .035 mm., diam., at first *dark green*, then brown.

In July of 1863, on almost the first occasion of a visit to the summit of Ben Lawers, I picked up a small *Mnium* whose leaves are almost an exact counterpart in size and shape, as well as in the abbreviated nerve, of those of the pretty little *M. hymenophylloides* from Norway; but as the upper margin of the leaf has double spinulosities this moss must be classified under a different section, and near *M. orthorrhynchum*.

MNIUM GRACILENTUM (*n. sp.*)—In laxly aggregated tufts or scattered, stems about half an inch long, mostly simple, of a deep red colour, slender, bare below, or with a few minute scale-like leaves, while above, the leaves are rather closely aggregated and somewhat crisped when dry, spreading a little when moist, broadly rotundato-ovate, much narrowed at the base, bluntish at the apex with a short acute mucro, length, .02 mm.; margin in the lower half or thereby plane, entire, composed throughout its length of two, rarely three longitudinal rows of long narrow cells with thin walls, .08-.1 by .006-.008 mm., while the upper margin has a double row of short, bluntish, one-celled spines; the rest of the cells of the pagina are nearly uniform throughout, viz., bluntly or roundly quadrate with thickish walls, .016-.022 mm. across, a very little larger near the base; nerve slender, latit. near the base .05-.06 mm., tapering upwards, and ceasing below apex by about .08 mm.; margin, spine, and nerves become ultimately a deep red colour. Average dimensions of leaf, 1.6 by 1.1 mm. On the ground near *the summit of the* mountain.

The species of the genus *Philonotis* have throughout a series of years exercised my ingenuity to discriminate them. Amongst those of later years that have attracted my attention is the following. It was found in 1867 near the summit of Ben Lawers, and although its peculiarities were noted at the time it was laid aside and only rediscovered the other day. It is evidently allied to *Ph. adpressa* (Ferg.), but the differences between the two are manifest and very peculiar.

PHILONOTIS HETEROPHYLLA, *n.sp.*—Tufts lax and often extruding its stems through other mosses. Not unfrequently the upright stems were seen to arise from a horizontal stock thickly covered with red radicles. These upright secondary stems are from one to two inches long, either simple, or sparingly and shortly branched, or occasionally dichotomously divided. In the lower half of the stem the leaves are laxly disposed around it, but closely appressed both in a wet and dry state, broadly ovate, concave with either sharp or bluntish apices, rounded at base as well as narrowed at point of insertion, margins only narrowly reflexed near

base, otherwise plane, thereafter spinuloso-serrate to apex; usually one-plied on each side of nerve near the base. Upper leaves are quite different. They are still slightly concave and broad below as well as appressed to stem, but are prolonged in a narrow, acute, slightly spinulose or rather nodulated acumen which becomes longer in leaves towards the apex of stem, length from .12 to .3 mm.; this acumen is slightly recurved, with a bias to one side, constituted almost entirely of extended nerve, while the upper part of leaf proper is spinuloso-serrate; margin of one side narrowly reflexed (.016 mm.) to near apex of leaf, while the other side is very broadly reflexed in lower two-thirds to the extent, in middle of reflexed portion, of .07 to .1 mm.

The areolation of the upper part of the *lower blunt* leaves approaches that of *P. adpressa* in size and shape, viz., cells oval or bluntly oblong, .027-.035 by .012-.015 mm., while the corresponding cells in the upper leaves are similar to those of *P. fontana*, viz., slightly bent, linear, .03-.038 by .006-8 mm. The large bluntly triangular, hyaline papillæ usually arising from the centre of the nearly hyaline basal cells, are in an exaggerated degree, viz., .02 mm. broad at base and height—from .01-.015 mm., while the upper papillæ are of usual size or a little longer, .004-6 mm., and arise usually from the lower extremities of cells. The nerve is thick near base, .08-.11 mm. broad, and tapers rapidly.

Taking into account the size of the leaf, I have never seen the margin so broadly reflexed on one side as in this moss, and, I may add, in any moss of whatever size. The reflexed portion is constant and shows best the large papillæ. This broad reflection is evidently the cause of the long acumen being dragged back as well as to the same side. Barren. *Ph. seriata* was also got in 1867, near the base of *the mountain.*

Amblystegium compactum (Sulliv.) is certainly present in two localities in the West of Scotland, viz., Loch Killisport and Cardross on the Clyde; and the specimens approach more closely the originals from America than the others sent to me from the North of Scotland. Besides, those from Cardross have a few capsules, while in other three instances I have found archegonia and antheridia in apposition in the same bud; in other words the species is synoicous.

On almost every occasion of a visit to the West Coast of Scotland I have come across a small, pretty moss, but as it was invariably barren I refrained from giving a description of it. My hopes in this direction never died out, as on three separate occasions I found inflorescence in the shape of compact, rather elongated buds containing archegonia and antheridia. It was noticed, however, that the antheridia were small, pale and entire, while the archegonia were much larger, of a deep red colour throughout,

and the usual trumpet-shaped apices were open. Has the unequal development, as to time, of these so-called organs of generation anything to do with the invariably sterile condition of this moss? According to the Darwinian theory the answer might well be in the affirmative.

AMBLYSTEGIUM GEOPHILUM, *n.sp.*—Tufts dense, extended, green above turning to a yellowish green through time, abruptly and continuously rufous below; stems upright, pale, from half an inch to nearly one inch long, slightly branched below, as a rule irregularly pinnate above, leaves almost always slightly secund, spreading a little, and straight when dry, scarcely changing direction when moistened, rather broadly ovate lanceolate, longly and slenderly acuminate, average length of entire leaf (acumen included) one mm., length of acumen from .25 to .4 mm., margin plane entire, but in the upper part slightly incurved, so as to render the leaf concave there; nerve very slender, composed of very narrow, elongated cells which soon turn *yellow*, often reaching half-way, but not unfrequently these narrow cells are only to be detected near the base; cells at base bluntly cylindrical, detached and separate, with thickish walls, .025-.04 by .004-5 mm., varying little outwards to margin, but upwards longer and a little broader, as well as assuming a bluntly fusiform shape, while the cells nearer apex are sharply fusiform, separate, longer, .04-.055 by .0045-.007 mm., Aler spaces well defined, of oval or slightly oblong, separate, granular cells which also soon turn yellow, .012-.017 × .006-8 mm.

The tendency of the nerve to become yellow would seem to argue in favour of association with *A. filicinum*. The margin shows at times minute irregularities arising from the protrusion of individual cells, but otherwise it is quite entire. This moss is singularly constant in its characters and appearance as well as size. It grows almost invariably on sandy earth mixed with the *débris* of sea-shells.

Often growing closely associated with the preceding I have found in three localities another very minute moss which I cannot identify with any other. It almost rivals in size the two smallest of the genus, viz., *Amblystegium Sprucei* and *A. confervoides*, and yet it presents peculiarities which mark it, in my opinion, as a distinct species. Unfortunately it has hitherto been found only in a barren condition.

AMBLYSTEGIUM PERMINIMUM, *n.sp.*—In dense, at times widely extended, rather convex tufts, pale green above with here and there indications of a reddish tint, abruptly and continuously red below; stems filiform, reddish, procumbent at the margins of the tuft, nearly erect, and about one-quarter of an inch long in the centre; simple, dichotomously divided below or irregularly and shortly

branched in the upper half; leaves very minute, on an average .2 by .08 mm., erect and closely appressed when dry, spreading a little when moistened, concave and broadly ovate, almost cordate below, so as to give a beaded or rope-like appearance to the whole stem much as in *Grimmia torquata*; shortly and rather broadly acuminate, with a bluntish rounded apex; cells of the pagina roundly oblong, or merely oval with thickish walls, distinct and separate, small, .011-.016 by .006-9 mm. marginal cells in one or two rows, smaller, oval, .008-.011 mm. in the long diameter, in upper half of leaf cells a little longer (·018 mm.), margin plane, but as a rule shortly incurved quite at base, entire or occasionally rendered slightly irregular by protruding marginal cells; nerveless, except rather frequently a middle row or two of narrow cells in lowest fourth (.024 by .004 mm.), soon turning yellow, may be said to constitute a nerve.

This moss differs widely in its areolation from the two mentioned above, in the breadth of the leaf below, in the broader and shorter acumen, as well as in the concavity of the lower half. On sandy earth close to the sea.

CYNODONTIUM GRACILESCENS (Web. and Mohr.), which has long been looked for, has at last been found, but only with young fruit. The papillæ, which give a distinctive character to this moss, are on both sides of the pagina, are broad at base, bluntly conical, and from .003 to .005 mm. in height. They are also seen on the back of the nerve although more sparingly. They are apt to collapse as my continental specimens indicate. Near Balmaha, Loch Lomond, 30th March, 1907 (L. W. STIRTON).

ADDITIONS FOR 1907 TO CENSUS OF SCOTTISH HEPATICÆ.

By SYMERS M. MACVICAR.

THE present paper contains 97 records of species examined. Most of the specimens were found in 1907, but a few were collected in previous years. *Scapania obliqua* (Arnell) Schiffn., a plant perhaps too nearly related to *S. uliginosa* to be considered specifically distinct, is an addition to the Britannic flora. *Lophozia Baueriana*, which was previously recorded as a variety of *L. Floerkii*, is now given as a species.

72. Dumfries.

Lophozia badensis, *S. M. Macvicar.*

75. Ayr.

Microlejeunea ulicina. *Miss K. B. Macvicar.*

78. Peebles.

(*S. M. Macvicar.*)

Marsupella aquatica.
Lophozia Muelleri.
Sphenolobus minutus.
Anastrepta orcadensis.
Plagiochila spinulosa.
Bazzania tricrenata.
Lepidozia Pearsoni.
Scapania subalpina.
S. gracilis.

79. Selkirk.

(*S. M. Macvicar.*)

Nardia obovata.
Lophozia excisa.
L. barbata.
Lophocolea heterophylla.
Chiloscyphus polyanthos.
Cephalozia lunulæfolia.
C. curvifolia.
Cephaloziella byssacea.
C. bifida.
Scapania nemorosa.
Madotheca rivularis.

80. Roxburgh.

(*S. M. Macvicar.*)

Aneura multifida.
Aplozia crenulata, var. gracillima.
A. pumila.
Lophozia Muelleri.
L. ventricosa.
L. bicrenata.
L. excisa.
L. incisa.
L. quinquedentata.
L. Floerkii.
Sphenolobus exsectæformis.
Chiloscyphus polyanthos.
Cephalozia lunulæfolia.
C. curvifolia.
Cephaloziella byssacea.
C. myriantha.
Kantia Trichomanis.
Scapania purpurascens.
S. undulata.
S. irrigua.
S. curta.
Lejeunea cavifolia.
Anthoceros lævis.

82. Haddington.

(*J. M'Andrew.*)

Riccia Lescuriana.
Lophozia badensis.
Scapania compacta.

87. West Perth.

Lophozia inflata. *J. Hunter.*

88. Mid Perth.

(*S. M. Macvicar.*)

Marsupella Pearsoni.
Lophozia badensis.
Lophozia Baueriana.
Scapania obliqua.

89. East Perth.

Gymnomitrium alpinum. *J. Fergusson.*

90. Forfar.

Pellia Neesiana, *G. West* and *Miss H. Ogilvie.*
Nardia Breidleri, *P. Ewing* and *W. Young.*
Lophozia badensis, *A. Croall.*

91. Kincardine.

(*J. Sim.*)

Metzgeria conjugata.
Gymnomitrium alpinum.
Marsupella Funckii.
M. aquatica.

92. South Aberdeen.

Lophozia longidens. *J. Sim.*

93. North Aberdeen.

Lophozia Baueriana, *J. M'Andrew.*
Kantia Sprengelii, *D. Lillie.*

96. East Inverness.

Marsupella Jörgensenii, Diplophyllum ovatum } *S. M. Macvicar.*

97. West Inverness.

Lophozia Baueriana, *Miss K. B. Macvicar.*
Scapania obliqua, *S. M. Macvicar.*

98. Argyll.

Harpanthus scutatus, *W. West.*
Scapania obliqua, *S. M. Macvicar.*

99. Dumbarton.

Scapania obliqua, *S. M. Macvicar.*
Radula aquilegia, *C. Scott.*

108. West Sutherland.

D. Lillie.

Lophozia incisa.
Saccogyna viticulosa.
Lepidozia Pearsoni.
Ptilidium ciliare.

109. Caithness.

Lophozia badensis, L. barbata } *D. Lillie.*

110. Outer Hebrides.

Lophozia badensis, *P. Ewing.*
Chiloscyphus polyanthos, *J. Waterston.*

111. Orkney.

(*D. Lillie.*)

Jamesoniella Carringtoni.
Lophozia Muelleri.
Sphenolobus minutus.
Chiloscyphus pallescens.
Cephalozia lunulæfolia.
Bazzania tricrenata.
Ptilidium ciliare.

112. Shetland.

Pallavicinia hibernica, Blepharostoma trichophyllum } *J. Sim.*
Nardia compressa, *W. H. Beeby.*

(*D. Lillie.*)

Conocephalum conicum.
Marchantia polymorpha.
Blasia pusilla.
Lophozia Muelleri.
L. alpestris.
L. quinquedentata.
Radula aquilegia.

ZOOLOGICAL NOTES.

The Birds of Dumfriesshire: A Contribution to the Fauna of the Solway Area.—We are informed that a book on this subject is in course of preparation by Mr. Hugh S. Gladstone, M.A., F.Z.S., etc.

Any information regarding the birds of this county that any of

our readers may have, would be much welcomed by Mr. Gladstone; and should be addressed to him at Lannhall, Thornhill, Dumfriesshire.

Prosecution under the Wild Birds Acts.—In Stranraer Sheriff Court on May 14th, Thomas Inglis, gamekeeper, Barnoorkrie, was charged with a contravention of the Wild Birds' Protection Act by having in his possession five Ravens which had been recently taken. He pleaded guilty. The Fiscal asked that the birds should be forfeited and disposed of. Ravens were in much request as pets, and a good market could be found for them. No good object would be gained in liberating them, for he was told that after a considerable period of captivity they would be incapable of providing for themselves. Accused said he took the birds in ignorance. He had always been accustomed to destroy them. Sheriff Watson imposed a penalty of 6s. for each bird, 30s. in all, with the alternative of seven days, and ordered that the birds should be forfeited and sold.

Bird Notes from Fife.—A Golden Oriole ♀ was got at Markinch about May 10th. Its plumage is in very fine condition, but the bird was very emaciated. The head is greenish yellow; back, yellowish green; wings, blackish brown with a faint green sheen and a yellow speculum; tail feathers, black with yellow tips, the latter colour extending some way up the inner webs of the feathers, the two centre tail feathers dark greenish and rather acuminate. Underparts greyish white, striated longitudinally with dark grey; flanks yellowish, under tail-coverts yellow, bill red-brown.

We are enabled to report a Scops-Owl ♀ through the kindness of Mr. Harry Gilmour, who informed us of its capture. It was got at Montrave on the 16th May.

A Great Grey Shrike was seen at Gilston on the 22nd April.—Leonora Jeffrey Rintoul and Evelyn V. Baxter.

Increase of Goldfinches in Central Scotland (Forth) and Siskins' Nesting.—A correspondent informs me *in lit.*, April 30th, 1908, of the increase of Goldfinches which have been so rare of late years in the district. He writes: "I have seen one every day feeding for some eight days regularly at one locality in 1900." Also at another locality in Forth, "two feeding on thistle-tops in September." At a third, "one passed me quite close last season." He also speaks of their former comparative abundance at several localities he was personally acquainted with on the south side of the Firth of Forth, when he was a boy—*e.g.* Preston Hall estate: a nest of young got away at Gorebridge, and "I caught two of them; and in 1885 I caught one near Cockpen Church. In 1888 my father got a nest in an alder tree near Crichton Castle, and the old birds (also caught) brought up the young ones in the house."

Siskin.—The same correspondent writes: "I also got the Siskin's nest—the only one I ever knew to breed hereabout. It was in a Scots fir about 20 feet up on a branch. I caught the old ones, and they brought all the young up in the house." He proceeds to give a bad account of the loss in eggs of Pheasants and Grouse caused by the cold spring of this year—frost and snow. "Forty-five eggs of Grouse were picked up in one day all spoiled. Such as were *sitting* were not so bad."—J. A. Harvie-Brown, Dunipace.

Occurrence of Wild Canary in the Forth Area.—A wild Canary (*Serinus canarius*) was captured by Mr. Robert Johnstone in company with Linnets at Springkerse, near Stirling, at the end of November 1907. Bird still in his possession, alive and healthy (May 29th, 1908), at No. 11 Randolph Road, Stirling. No appearance of previous confinement, and bird remains still rather wild or untamable. Seen alive and identified by me.—J. A. Harvie-Brown, Dunipace.

White Wagtail in Orkney.—On March 17th I saw a specimen of the White Wagtail (*Motacilla alba*) on the telegraph wires near Stromness, Orkney, close to where the Sandwick road joins the main road from Kirkwall to Stromness. Mr. Eagle Clarke mentions the species as occurring abundantly on both passages in Shetland, but I think this is the first time it has been recorded for Orkney.—H. W. Robinson, Lancaster.

Breeding of the Tree-pipit in the Glenshee district.—I am sending you a note to record the breeding of the Tree-pipit with me here some 800 to 900 feet above sea-level in the Glenshee district. The nest contained six yellowish-brown eggs, very strongly marked at the thick end. From the bird's behaviour I fancy the young will be hatched very shortly. As this is the first nest I have found here, though I have seen the birds during each of the last three years, I am unable to say if the colour and marking is the usual type hereabouts or not. The Greater Whitethroat is also breeding with me. I am recording the Tree-pipit simply because Mr. A. H. Evans, who is with me, thinks that a record of its breeding at this altitude may be of interest.—J. M'L. Marshall, Blairgowrie.

An Invasion of Cuckoos.—Usually, and as far back as I can remember, this was not a great resort of Cuckoos. I could always find Cuckoos in the season, and knew where to look for them on the open moor or fields. This year, however, they are everywhere, and most uproarious; and, from whatever cause, most discontented and restless—and anxious-minded. All I can *think* is "no wonder!"; but perhaps some one can "put his finger on the spot" and account for such an invasion, and so late in the

season, who does not mind being charged with treason to Baconian principles. It will be interesting also to ascertain whether this multiplication of "Cuckoo! Cuckoo!" is common to this with other areas north and south. I can well remember, without referring to notes, that in 1905 Cuckoos were also superabundant, noisy, and restless on the open grounds up Glen Dochart of Tay as late as the 22nd May—a season of very backward nature, though not so severe as this 1908 opening has been.—J. A. HARVIE-BROWN, Dunipace.

Turnstone in Scotland in June.—When on Luinga Bheag, off Arisaig, on 8th June, Mr. Duncan M'Naughton, Perth, and I saw six Turnstones, *Strepsilas interpres*, L. We first of all put up four, while later on we disturbed another pair. The birds were by no means shy, and we got within short distance of them on more than one occasion.—J. B. DOBBIE, Edinburgh.

[When Mr. Wm. Macgillivray of Eoligary, Barra, was paying me a visit a few weeks ago, he informed me of the residence of a flock of from ten to twelve to fifteen Turnstones at a certain reach of shore in the Outer Hebrides. He had told me before of their remaining all summer there after putting on the full summer dress. This was some three years ago. Since then the same flock, or varying slightly in number, has frequented the same reach of shore persistently both during winter and summer. It is by no means unusual to find these birds in almost or quite perfect summer dress amongst our Western Isles, and even at certain localities nearer to the west coast of the mainland. During many years' personal acquaintance with the West generally I have scarcely ever missed a season without seeing these birds singly or in pairs, or in small flocks, well on in June and sometimes even after midsummer.—J. A. HARVIE-BROWN.]

Snowy Owl in South Uist.—A fine specimen of this noble Arctic bird was shot at the farm of Milton, South Uist, in October 1907, and is now in the collection of Outer Hebridean birds in the possession of Sir Reg. Cathcart, Bart.—J. A. HARVIE-BROWN, Dunipace.

The Scops-Owl in Forth.—Slowly but surely the list of "Forth" birds increases. The latest addition is the Scops-Owl (*Scops giu*), a specimen of which was obtained in a small wood called "The Fluthers," on the estate of Lundin, near Largo, Fife, the property of Sir John Gilmour, Bart. of Montraive, on 16th May last (1908). The head keeper on the estate was walking through the wood when the bird flew over his head and he shot it. A few days afterwards I had the privilege of examining it in the bird-stuffer's shop in Edinburgh. It proved to be a female, and was in good plumage; length about $7\frac{1}{2}$ inches, wing from flexure $6\frac{1}{8}$ inches, base of bill

to tip of ear-tufts $1\frac{3}{4}$ inch. For the facts connected with the capture of this specimen I am indebted to Sir John Gilmour, who has also kindly asked me to record it for him.

In the second edition of Saunders' "Manual" (1899) only five occurrences of this pretty little Owl in Scotland are mentioned, namely: one in Sutherland in May 1854, two near Perth in May 1864, one in Aberdeenshire in September 1891, and one in Orkney in June 1892. Since then three have been reported from Shetland —two in April 1900, and one in August 1905; but only one of them can be said to have been identified with certainty (*cf.* "Annals," 1900, p. 184, etc.—WILLIAM EVANS, Edinburgh.

Greenland Falcon at the Flannan Islands.—On the 8th of March a Greenland Falcon visited Eilean Mor, and raided the Guillemots until it was shot. The bird, a fine adult, is now in the collection of British animals in the Royal Scottish Museum.—W. EAGLE CLARKE.

Osprey, etc., in Shetland.—Mr. T. Henderson writes me he saw a pied Flycatcher, an Osprey, and any number of Fieldfares "lately"—*i.e.* in May—around Spiggie. This appears to be good evidence of the lateness of arrival of some species. He adds: "There has been a lot of the smaller migrants about lately during the east winds. The Osprey has frequented (Loch) Spiggie for a week now, and the other day he was seen to capture a large trout, and wing his way toward Fitful."—J. A. HARVIE-BROWN, Dunipace.

Bitterns in East Lothian.—My friend F. G. Thatcher sent me on 24th April the head and wing feathers of a Bittern (*Botaurus stellaris*) which he had found lying dead on Gullane Links. From the state of the head the bird must have been dead at least a month, probably more. This makes the third Bittern which has occurred in East Lothian this year, as Mr. Geo. Clark of Luggate, on 29th February, flushed a bird from the same spot where he secured the wounded one mentioned by Mr. W. Evans in the April "Annals." He writes me that he is absolutely certain of its identity, and when he saw it he believed that it was the wounded Bittern which he had taken to Mr. G. Pow to be cured of its wound, as it had been determined to release this bird whenever it was able to take care of itself. But on communicating with Mr. Pow he replied to Mr. Clark that the Bittern had just died. The fact that two birds should have occurred in the same spot within a few weeks is somewhat remarkable. Of course there is a possibility that the Gullane Bittern may be the same bird as the second one seen by Mr. Clark.—H. N. BONAR, Saltoun, Pencaitland.

[Mr. H. Geoffrey Thatcher informs us that the Bittern men-

tioned in the above note was found by him on the 6th of April at the side of a large marsh at Aberlady. It appeared to him to have been dead about two months, though it was in a fairly perfect state, most of the feathers being intact.—EDS.]

Gadwall in Aberdeenshire.—As the Gadwall (*Anas strepera*) seems to have been only once obtained in "Dee," it may be of interest that we saw two birds of that species in the estuary of the Don at low-tide on 1st September 1907. The birds were close to the bank when we first saw them, and we had ample time to note the distinguishing points of their plumage as they swam slowly to midstream. One (if not both) of the birds had the "under tail-coverts spotted black on white" characteristic of the female.—LEWIS N. G. RAMSAY and A. LANDSBOROUGH THOMSON, Old Aberdeen.

Pintails Increase in Shetland.—It may be remembered that Mr. T. Henderson of Spiggie found Pintails nesting in the south of Shetland, and retained some young birds he captured at the nesting-place ("Annals S. N. Hist." 1907). Mr. Henderson now writes me regarding an increased number of nesting pairs there. He writes: "There are four or five pairs to be seen. They seem to be increasing."—J. A. HARVIE-BROWN, Dunipace.

Protection of the Woodcock in the S.-W. of Scotland.—May I call the attention of the readers of your magazine to the fact that, under their Wild Birds' Protection Order for 1908 to 1911, the three County Councils of Wigtownshire, Kirkcudbrightshire, and Dumfriesshire have combined in prohibiting the taking or killing of the Woodcock between the first day of February and the first day of October in each year. Their eggs were, of course, already protected. The Woodcock has shown of late years such an increased tendency to nest in the south-west of Scotland, and is such an early breeder, that this extension of "close-time" for the month of February was most called for. As regards the extension from 1st August to 1st October, it is generally agreed that home-bred birds migrate from where they are bred before 1st October, and I think that in coming to their decision to protect the Woodcock as they have done, the three County Councils have considered the welfare of the bird at the expense of local sportsmen. But they would gladly see the "order" made applicable to *every* county in Great Britain and Ireland, and if possible to the whole of Europe!!! With similar protection throughout the kingdom there can be no doubt that the numbers of Woodcock would increase proportionately; and is it too much to hope that the good example now set by Wigtownshire, Kirkcudbrightshire, and Dumfriesshire may be followed generally elsewhere in a similar broad-minded and unselfish manner?—HUGH S. GLADSTONE, Thornhill, Dumfriesshire.

Black Tern on the Tweed.—While walking down Tweedside on 30th May I saw a Black Tern (*Hydrochelidon nigra*) flying backwards and forwards over the river just above Peebles. The bird was an adult in full summer plumage, and was, as far as I could see, alone. It frequented a quiet and smooth part of the river, and made frequent swoops towards the surface of the water, appearing to take flies on the wing.—R. Preston Donaldson, Edinburgh.

Little Auk in the Firth of Forth in March.—On 9th March last a female Little Auk (*Mergulus alle*), evidently newly dead, was picked up on the shore at Gullane Point, Haddingtonshire, and taken to Mr. J. Lamb, who kindly forwarded it to me the same day. Though thin in the body its plumage was in excellent condition, and showed some approach towards the summer dress.—William Evans, Edinburgh.

Large Assemblage of Great Northern Divers and a Moulting Bird.—On 6th March a flock of over forty Great Northern Divers (*Colymbus glacialis*) was observed in Hoy Sound, Orkney, such a large assembly being somewhat unusual, as they are generally seen singly or in pairs, eight being the largest number I had previously seen together, namely, during the same week in March three years ago. Possibly as the time for their departure draws near they collect thus into flocks. On Sunday 5th April there was a specimen in Stromness harbour almost in full summer plumage, the head alone being not quite perfect. On the following day, the 6th, I saw large numbers of them off the south end of Graemsay, considerably over a hundred altogether. The largest lot was a flock of twenty-four or twenty-five, but these I could not get near enough to see the colour of their heads properly. I saw another flock of thirteen, another of eleven, another of eight, two of six, four of five, and a number of lots of three, a few pairs, and several single birds. With the exception of the large flock, I was near enough to see the colour of the plumage of all the others with the glasses, and only one bird was in full summer plumage, one of the flock of eight, none of the others seen having the head changed at all. The large assemblage seen on 6th April seemed to almost melt away, so mysteriously did they disappear, as after sailing among them for about half an hour the last had vanished, and during the rest of the day we only saw one other, and that four or five hours later. All the birds seen were within half a mile of one another, and their disappearance was all the more remarkable as the sea was comparatively calm at the time, with only a ruffle on its surface, thus allowing birds to be seen at a great distance.—H. W. Robinson, Lancaster.

Four-bearded Rockling in the Sound of Mull.—A fine specimen of *Enchelyopus cimbrius* was captured on the 25th of March

about three-quarters of a mile off Ardmore Head, Sound of Mull, in from forty to fifty fathoms. The fisherman who brought it to me said that he had never met with one like it previously. The first ray of the anterior dorsal fin was unusually developed, being 2.25 inches in length. I am indebted to Mr. Eagle Clarke for naming the specimen, which is now preserved in the Royal Scottish Museum, Edinburgh.—D. MACDONALD, Tobermory.

[Though this fish is common in the Clyde area it has not often been detected elsewhere on the west coast north of that district.—EDS.]

Quedius longicornis, *Kr.*, **in Forth.**—Among some Coleoptera which I collected at Callander in the spring of 1900, I find there is a specimen, taken on 20th April, of this rare Staphylinid. The only previous Scottish records seem to be from Solway, where a very few examples have been taken, and a doubtful one from Clyde. Unfortunately, I have no note of the *habitat* of the Callander specimen.—WILLIAM EVANS, Edinburgh.

Death's Head Moth, in Kirkcudbrightshire.—The occurrence of this fine species on the Scottish side of the Borders is always of interest, owing to the fact that it has, I think, a very uncertain status as a native species, although, of course, there is no doubt at all that from time to time native-laid and native-hatched specimens are occasionally in some numbers. But I believe these are in all cases the produce of immigrant females, and that all such die out without founding a native race. On 22nd May I had a fine female sent me, captured on that date at Carsethorn in Kirkcudbrightshire upon the sails of a small schooner that had entered the harbour there. It was alive, lively, and in very fair condition when I received it.—ROBERT SERVICE, Maxwelltown.

BOTANICAL NOTES AND NEWS.

Sagina Reuteri, *Boiss.*—The recent discovery of this pearl-wort in several counties in England, in situations where it is most unlikely that it owes its occurrence to human agency, seems to leave no room for doubt that it is native in Britain, and that it has escaped notice owing to its resemblance to allied forms. It is treated in Babington's "Manual" (ed. ix.) and in Druce's list as a variety of *S. apetala*, but in the "London Catalogue," ed. x., as a distinct species. It was first found near Madrid by Reuter, in 1841, and described by Boissier as a native of Spain; but it has not apparently been observed elsewhere in Southern Europe. When first detected in Britain it was observed only near railways, or in other

places that suggested a casual origin; but, as mentioned above, it has recently been found where there is no reason to suppose it an alien. All the plants observed were covered more or less with hairs and glands, as in Boissier's type. In the *Journal of Botany* in April 1908 (pp. 109-111) there is described and figured a new variety, named *glabra* by Messrs. W. Ingham and J. A. Wheldon, who found it on Skipwith Common in Yorkshire and Strensall Common. This variety is quite eglandular.

S. Reuteri has not been detected in Scotland, but, in view of its distribution in England, it seems likely to occur here. Its resemblance to the species of *Sagina* related to *apetala* makes it advisable to examine these carefully both in herbaria and in the living state.

It was first noted as British in the Botanical Exchange Club Report for 1892, Boissier's original description being quoted; but there is no good description readily accessible in British floras. It differs from *S. apetala* in its erect sepals appressed to the ripe capsule and its shorter peduncles; from *S. ciliata* in its blunt short sepals; from *S. procumbens* by its central stem elongating and flowering, and by its peduncles of the capsules being often erect.

The usual form has the peduncle short and densely glandular, and is so described in Babington's "Manual"; but the var. *glabra* is eglandular, and often has the peduncle curved as in *S. procumbens*.

A Simple Method of recording Local Distribution.—Experience soon proves the advantage of using methods that give accurate records in brief space, with little trouble, and that are not liable to be rendered useless by loss of the key to the method. One that I have made use of for some time with good effect may prove useful to others. It is based on the use of the Ordnance maps on the scale of an inch to a mile. I have these ruled with narrow lines of "waterproof ink" along each minute of latitude and along the even numbers of the minutes of longitude. Thus the map is divided into parallelograms nearly $1\frac{1}{4}$ mile from east to west and $1\frac{1}{6}$ from south to north. Along the sides of the map the spaces are lettered with capitals from A to P, beginning at the south. So along top and bottom, beginning at the east, the spaces are lettered from *a* to *u*. Thus to record the occurrence of any plant in a space, all that is required is the official number of the map and two letters. A more exact record is given by adding a small parallelogram with a dot in the relative position. Relative abundance is indicated by the letters α, β, γ, δ, ϵ, these being used to denote frequency of localities and frequency in the localities, the first letter referring to number of localities, the second to frequency in these. Thus α denotes in only one locality, or once in each locality; β, in few localities or rare in the localities; γ, not common, yet not rare; δ,

common to plentiful; and ϵ, abundant and more or less excluding other species. A single one of these letters denotes that it applies to both localities and frequency in these. The date of observation is noted in the usual short way. Taking an example, *Rubus idæus*, L., var. *obtusifolius* (Will.), 76 Hd, αγ, 17.9.4, denotes that I found the plant in one locality, in several examples, on 17th September 1904; and a reference to the map shows the locality to be on the borders of the parishes of Kemnay and Kintore in South Aberdeen. —J. 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 1908.

[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.

Common Shrew in Skye. P. A. Buxton. *Zoologist*, May 1908, pp. 189 and 190. Female trapped at Sligachan on September 18, 1907.

Notes on the Birds of West Renfrewshire (Caldwell District), 1907. T. Thornton Mackeith. *Zoologist*, June 1908, pp. 230-233.

Great Spotted Woodpecker at Bridge of Allan. Frank J. Pullar. *The Field*, May 2, 1908, p. 748. Specimen found dead on April 21.

Tengmalm's Owl in Shetland. Erik Hamilton. *The Field*, April 4, 1908, p. 583. An adult female taken on January 4.

Large Assemblage of Northern Divers. H. W. Robinson. *The Field*, April 25, 1908. A flock of over forty seen on Hoy Sound, Orkney, on March 6, and one of over a hundred on April 6 off Houton Head.

Lepidoptera of East Sutherland. M. A. Rollason. *Entomologist*, May 1908, p. 131. Nine species recorded, supplementary to those published in the same journal, vol. xl. p. 40.

Anthrocera achilleæ, Esp., added to the British List. By E. A. Cockayne, F.E.S. *Ent. Record*, April 15, 1908, p. 73. A colony of this species discovered by Mr. Renton near Oban.

Anthrocera achilleæ, Esp., as a British Species. By J. W. Tutt, F.E.S. *Ent. Record*, April 15, 1908, pp. 73, 74. Gives

as an additional locality for this new British species the mountains in Glencoe district, and notes the probability of its occurrence in Cornwall.

Biston hirtaria at Forres. J. W. H. Harrison, B.Sc. *Ent. Record*, May 15, 1908, p. 120. Several larvæ obtained.

Dysstroma concinnata, Steph., a valid Species. By Louis B. Prout, F.E.S. *Ent. Record*, June 15, 1908, p. 143. By the examination of the genitalia of the Arran forms of the so-called "truncata" the author has been enabled to satisfy himself as to their specific distinctness.

Notes on British Braconidæ. By Claude Morley, F.E.S. (*continued*). *Entomologist*, June 1908, pp. 148-150. In this instalment the following records appear: Meteorus abdominator, Golspie, August 26, 1900; M. melanostictus and versicolor, Galashiels.

Some New British Myrmecophilous Proctotrupidæ. By H. St. J. K. Donisthorpe, F.Z.S., F.E.S. *Ent. Record*, May 15, 1908, p. 106. Records Polynema albitarse, Kieffer and Platygaster sp., from a nest of Formica rufa at Rannoch.

Notes on Scotch and other Proctotrypidæ. By the late Arthur J. Chitty, M.A., F.E.S. (edited by Claude Morley, F.E.S.). *Ent. Record*, May 1908, pp. 99-102. This paper is chiefly a criticism of that published in the "Annals" by Mr. Cameron, but contains many valuable notes.

Diptera in Dumbartonshire in 1907. F. R. Malloch. *Ent. Mo. Mag.*, June 1908, pp. 137 and 138. Forty-nine species recorded, including five new to the British list. Several of the identifications are due to Mr. J. E. Collin, who gives a note on the new British species.

Notes on certain Mycetophilidæ, including several Species new to the British List. By F. Jenkinson, M.A. *Ent. Mo. Mag.*, June 1908, pp. 129-133. Mycothera semifusca, Mg., taken at Logie, on the Findhorn, September 14 and 15, 1905.

Two New British Diptera: Pegomyia esuriens, Mg., and P. univittata, v. Ros. By A. E. J. Carter. *Ent. Mo. Mag.*, June 1908, pp. 128 and 129. Examples of both species were taken at Comrie, Perthshire, in July 1907.

Notes from the Gatty Marine Laboratory, St. Andrews. No. xxix. By Prof. M'Intosh, M.D., LL.D., F.R.S., etc. Ann. and Mag. Nat. Hist., May 1908, pp. 373-387, pl. xvii. This instalment includes an account of the British Opheliidæ, Scalibregmidæ, and Telethusæ, with references to Scottish occurrences.

BOTANY.

Scottish Mosses, by David Lillie (*Journ. Bot.*, 1908, pp. 172-173), enumerates additions to the records of Northern counties. —West Sutherland (108), one variety; Caithness (109), five species; Orkney (111), four species and two varieties; Shetland (112), nine species and three varieties.

The Subsection Eu-caninæ of the Genus Rosa. By Major A. H. Wolley-Dod. (*Journ. Bot.*, 1908, Appendix, pp. 1-64.) A very full discussion of the various forms, British and foreign.

BOOK NOTICES.

List of British Plants: Containing the Spermophytes, Pteridophytes, and Charads, found either as Natives or growing in a Wild State in Britain, Ireland, and the Channel Islands. By George Claridge Druce, M.A., F.L.S. (Oxford, Clarendon Press, January 1908. 2s. 6d. in wrapper, 3s. 6d. in cloth, interleaved.)

The London Catalogue of British Plants: Tenth edition. (London, February 1908. George Bell and Sons. 9d. in wrapper, 1s. 3d. in cloth, interleaved.)

Of these two lists we may refer first to the familiar London Catalogue, which has so long been a help to British botanists, but in recent years had been left behind by the results of critical study of the flora, especially in certain genera. Comparing this edition with the ninth, which was issued in 1895, one finds many new names, some of which are additions to the list, while others have been rendered necessary by the labours of systematists during recent years in the effort to arrive at a generally valid nomenclature. The new edition has 2075 numbered as species, while the ninth had 1958; but the apparent increase is largely due to the separation as species of forms treated in the earlier issue as named varieties, *e.g. Papaver Lecoqii*. In *Rubus* the numbers are raised from 99 to 116; in *Rosa* from 20 to 31, *mollis* and *tomentosa* being now replaced by 12 numbers; in *Hieracium* from 104 to 113; *Euphrasia officinalis*, L., has been replaced by 15 numbered "species"; and *Rhinanthus Crista-galli*, L., by 7. These examples must suffice to show how the mass of additions is largely accounted for by the critical study of certain genera. Besides the increase in the numbered forms there is a large addition to the named varieties and forms, *e.g.* under *Viola* of the *tricolor* group. Several hybrids also find a place in the new edition that were not noticed in the last one. The actual list occupies 44 pages, or 4 more than previously. To its preparation the services of specialists have been freely given, and are acknow-

ledged by the editor, Mr. F. J. Hanbury. An attempt has been made to sift the British flora, distinguishing those that are native aliens well established, and such as are "casual or only planted," but there is no mention of many other casuals that have been put on record, but are of rare occurrence. All such attempts are certain to show many cases of different conclusions as to the grades in which species should be ranked from this standpoint, every list giving the benefit of the doubt to many old weeds of cultivation, while excluding others that might be almost equally correctly included. In respect of appearance the highly glazed paper and lighter type render the tenth edition much less pleasant to the eye than the preceding editions.

Mr. Druce's "List" is framed on more comprehensive lines than the "London Catalogue," as it aims at including every species, native or alien, ranging from the most absolute native to the mere "ballast waif," that has been recorded from any part of the area defined on the title-page. It thus includes almost 3000 numbers, besides a very large number of varieties, "made as catholic as possible." An abstract gives the following analysis of the numbered forms:—Native species, 1390; native subspecies (numbered asspecies), 401; species somewhat doubtfully native, 89; aliens now well established, 144; aliens more or less fugitive, 940. A short appendix adds several, mostly to the last division. While many botanists object to the inclusion of fugitives, aliens, or casuals, their exclusion is carried out in a more or less arbitrary way; and the more logical method appears to be the admission of all species found growing as if wild, but noting, as this "List" does, which are aliens. A comparison of this "List" with the "London Catalogue" shows wide divergences in several places, apart from the large number of aliens in it and not in the "Catalogue." One of the most important of these divergences is that the "nomina conservanda" of the Vienna Congress of 1905 "are deliberately ignored when other generic names which appear to be properly diagnosed have priority." But leaving out of account questions of nomenclature and the knotty questions that are involved in them, this "List" will be found very useful by students of local floras who desire a guide to the names and places of the numerous aliens often encountered, especially near seaports or railways, and of which no account is given by British floras.

Both "List" and "Catalogue" will be found very useful by botanists interested in the British flora, and both bring into very clear view the urgent need there is for a new work to take the place so long and usefully filled by Hooker's "Student's Flora," and Babington's "Manual."

A Monograph of the British Annelids. Vol. II. Part I. —Polychæta: Nephthydidæ to Syllidæ. Eight coloured and Four-

teen uncoloured Plates. By Prof. W. C. M'Intosh, M.D., F.R.S., etc. Ray Society, 1908.

It is with genuine pleasure that we call attention to the issue of a further part—the second dealing with the Polychæta—of Prof. M'Intosh's great Monograph. Needless to say, the high standard of excellence which characterised its predecessors has been fully maintained. Clear and ample descriptions of the families, genera (29), and species (75, several of them new), together with an extensive synonymy, information as to habitats, distribution, reproduction, etc., occupy the 232 quarto pages of text. Consideration of the classification of the Polychæta is reserved for the summary. The author claims that amongst the marine bristle-worms are to be found some "of the most beautifully ornamented invertebrates; indeed, many vie with the gaudy tints of butterflies and birds or the burnished splendour of beetles," a dictum which, we think, no one who looks at the beautiful plates will dispute. The paucity of localities cited, while due to some extent, no doubt, to a reluctance on the part of the author to accept records which he is unable to verify, shows how much there is still to be done in working out the distribution of this group of animals on our coasts. The publication of the Monograph, the next part of which, it is gratifying to learn, "lies ready for printer and lithographer," will, let us hope, lead to a rapid accumulation of data on this aspect of the subject.—W. E.

The Annals
of
Scottish Natural History

No. 68] 1908 [October

REPORT ON SCOTTISH ORNITHOLOGY FOR 1907

By John Paterson

(*Continued from p.* 139.)

Fringilla cœlebs (Chaffinch).—Observed Lerwick several dates from 29th January till 21st March. Sings at Kirkliston, 23rd February. In numbers in garden and over island at the Pentland Skerries on 7th April, with S.E. wind. Many present anterior to 10th April at Spiggie (Shetland). Builds at Kirkliston 22nd, lays 29th. On May 20th at Lahill (Fife) one observed "pale grey all over except for white on wings which was very distinct." Last in song, Kirkliston, 14th July. First autumn movement reported is at the Flannans on 4th September (12). Singing at Beith (Ayr) on 29th September and 13th October. At the Bell Rock on 15th October (5); 19th, Mull, large numbers passing with Redwings; 20th, quite a lot, chiefly males, at Lerwick; 23rd, several at the Bell Rock. No movements reported in last two months of year.

F. montifringilla (Brambling).—The report for 1906 showed that we had in the winter of 1906-7 a great Brambling season (A.S.N.H., 1907, pp. 132 and 140). No details can be given of the numerous notices of occurrences between January and April 1907; it must suffice to say that the species was widely and generally reported. I saw a party of 20 to 30 on 21st April, in Cadder Wilderness near Glasgow, but Mr. Alex. Ross

saw two at Row (Gareloch) three days later (24th). The Rev. H. N. Bonar, Saltoun, who sends an interesting narrative of his experience of this species in the early part of the year in nine or ten parishes, was fortunate to see a "flock of about eighty feeding in a newly sown field near Humbie House, males in splendid plumage" on the 1st of May. First autumn appearance, 26th September, Isle of May. Generally reported throughout October and November, but nowhere in remarkable numbers. In Mull, observed feeding on seeds of *Spiræa Ulmaria*, *Polygonum Persicaria*, and *Centaurea nigra*.

LINOTA CANNABINA (Linnet).—Nest and five eggs, Bute, 14th May, and nest with eggs, Lake of Monteith, 18th. A few in autumn till 21st October, on Fair Isle (p. 76).

L. LINARIA (Mealy Redpoll).—At Inverbroom, 22nd February (2); Lerwick on 12th and 28th April (1); at the Flannans, 4th July (1, and 2 later same day); at Sule Skerry, 30th October (1).

L. ROSTRATA (Greater Redpoll).—A small party at the Fair Isle on 21st September (p. 76).

L. RUFESCENS (Lesser Redpoll).—In Mull on 11th April, in song, the first seen for four or five months. A newly acquired habit of eating sown seed described (A.S.N.H., 1907, p. 112).

L. FLAVIROSTRIS (Twite).—At Edinburgh on migration, 27th March; flock on Sule Skerry, 3rd May; in Bute, 13th to 16th May, four nests, three with five eggs, one with three; five nests, two with six eggs on 5th June in the Outer Hebrides and four in stunted Sycamores on 27th there (A.S.N.H., 1907, p. 210). Flock at Lerwick, 29th September, and numbers on 9th October.

PYRRHULA EUROPÆA (Bullfinch).—At Swordale, East Ross, our correspondent found a nest with pale pink eggs spotted with brown and observed "a pair building and the female did all the work, the male merely looking on." In Mull, 31st October, four at seeds of *Scabiosa succisa*, and on 7th December four at seeds of *Senecio Jacobæa*.

P. ERYTHRINA (Scarlet Grosbeak).—One procured on the Isle of May on 25th September, the second Scottish occurrence (p. 18).

EMBERIZA MELANOCEPHALA (Black-headed Bunting).—One at the Fair Isle on 21st September (p. 76).

E. PUSILLA (Little Bunting).—One on 14th April and a number between 10th October and 5th November, at the Fair Isle (p. 76).

E. MILIARIA (Corn Bunting).—Sings, Possil near Glasgow, 3rd March; one in song, a passing migrant in Mull on 20th May; flocks in Lerwick on 9th, and 15th-16th June; not as previously supposed a resident on Fair Isle, though occurring at the seasons of passage (p. 77). In Iona, where it is a common nesting species, only one family observed on 12th September.

E. CITRINELLA (Yellow Bunting).—Sings at Kirkliston, 23rd Feb., Edinburgh 4th March; nest and eggs 15th August, Kirkliston, and last in song there, 25th. In song in Mull on 11th and again on 28th October. In the general movements at both passages in Fair Isle (p. 77).

E. HORTULANA (Ortolan Bunting).—Late in spring and in September at the Fair Isle (p. 77).

E. SCHŒNICLUS (Reed Bunting).—A sporadic visitor as well as a nesting species in Mull. A *male* incubating in Wigtownshire, and on being disturbed going through the pantomime of feigning cripple (p. 49).

PLECTROPHANES NIVALIS (Snow Bunting).—In varied numbers here and there till 22nd April. On the Flannans, on eleven dates, between 27th September and 15th November. The first to appear on the Isle of May in autumn was on 15th September (p. 18).

CALCARIUS LAPPONICUS (Lapland Bunting).—From 25th August till 29th October, at the Fair Isle (p. 77). One seen on the Isle of May on 1st October (p. 18). Frequent on the Flannans 3-14 September.

STURNUS VULGARIS (Starling).—At Glenorchard near Glasgow where many had left their winter quarters on 19th January; all had gone by 9th March. At Barrhead (Renfrew) on 22nd January, eight to ten thousand flew overhead. First seen about Crosswood Reservoir (Midlothian) for season on 26th February. Reported to be laying at Edinburgh and Kirkliston on 24th April. More numerous than last year in the Outer Hebrides (A.S.N.H., 1907, p. 210). At Swordale (E. Ross) in flocks on 6th August, and on 6th December there the fields quite black with Rooks and Starlings.

PASTOR ROSEUS (Rose-coloured Starling).—One shot at in the company of Starlings at Dunbeath (Caithness) on 11th July. Early in autumn one found dead at Bonawe (Argyll), according to the "Oban Times" (p. 49).

PICA RUSTICA (Magpie).—Eggs at Edinburgh, 16th April. On 11th May at Largo one seen to come down twice to a Mistle-Thrush's nest and carry off a young bird in spite of the chattering and swooping of the parents.

CORVUS MONEDULA (Jackdaw).—At Caldwell (Renfrew) nests in Spruce Firs visited on 3rd May, were very large and flat, roofed with sticks leaving only a round hole to admit bird. Two nests had six and two four eggs. One of the clutches of six was fresh laid, the other in a nest quite open to the sky was highly incubated. There were great numbers at Spiggie (Shetland) on 10th April, and many arrived in Fair Isle on 15th (p. 75).

C. CORAX (Raven).—Has young in Perthshire 15th April, and young flying at Arisaig 14th May.

C. CORONE (Carrion-Crow).—Added to the Fair Isle avifauna this year, one being seen for some time in autumn (p. 75).

C. CORNIX (Hooded-Crow).—One in the Fair Isle in September showing a tendency to albinism (p. 75). Eggs hatching at Arisaig 14th May. A lot at Swordale on 22nd.

C. FRUGILEGUS (Rook).—In 1904 a pair built their nest in a chimney-can at Beith. The nest was pulled out and another was started, but the shooting of one of the birds put an end to the experiment for that year (A.S.N.H., 1905, p. 209). In 1907 another attempt was made, but the birds themselves changed their plans and carried the sticks they had gathered to a tree near by. Was one of the 1907 birds the survivor of the 1904 experiment?—Mr. Craig asks. Builds at Kirkliston 26th February, Edinburgh 28th. Lays at Kirkliston 23rd March. On 6th April at Lugton (Renfrew) one nest with two eggs, three with three each, seven with four, twelve with five, two with six, one with young. Great numbers at extreme northern localities (Pentland, Lerwick, Spiggie) 8th to 10th April. At Swordale 24th August, large flocks; Lerwick, 29th October, flocks; Swordale, 6th December, enormous flocks with starlings. One pale grey at Gilston (Fife) on 24th May.

ALAUDA ARVENSIS (Skylark).—On 10th February a hundred passing west in snow at Glasgow; 14th sings Kirkliston, 18th Glasgow; nesting in the Outer Hebrides seven miles from the nearest cultivated land (A.S.N.H., 1907, p. 210). A mimic of the notes of the Dunlin, Ringed Plover, Oyster-catcher, and Redshank (*l.c.*). Last in song Kirkliston, 15th July, and resumes song there 10th September. Seven in Mull on 11th October (wind S.E.). Marked scarcity there on autumn migration.

CALLANDRELLA BRACHYDACTYLA (Short-toed Lark).—One at the Fair Isle, 11th November (pp. 77, 78).

OTOCORYS ALPESTRIS (Shore Lark).—Some in March and again in October at the Fair Isle (p. 78). One on 11th October at the Isle of May (p. 19).

Cypselus apus (Swift).—First reports Lagg (Arran) 6th May; Kirkliston and Peebles 7th; Forfar 10th, and numerous there 12th, on which date it is reported from North Berwick and Hogganfield (Glasgow). On 14th some were seen at Largo going into a nesting hole under the tiles of a house. At time of and after arrival of Swifts at Pentland Skerries a cold east wind prevailed, and during this period some were seen to drop down benumbed. Local birds left Kirkliston 11th August, in passage there almost daily 18th August till 7th September. On 22nd August a very large gathering observed at Otterston (Fife), (Evans). On 8th, 19th, 20th, numerous in Arbroath and Forfar. Last occurrences single birds at Skerryvore, 19th, and Fairlie (Ayr) 22nd September.

Caprimulgus europæus (Nightjar).—Two eggs in the last week of May in Mull, "earliest here." One dead at Lerwick, 20th October.

Dendrocopus major (Great Spotted Woodpecker).—Reports from Perth, Stirling, Argyll (A.S.N.H., 1907, pp. 182 and 247) regarding the nesting of this species. The reference (*l.c.* p. 182) to the circular holes in the Wellingtonia stems believed to be the work of this species has caused me to refer to my notes of a visit to Glendoune, Girvan, on 22nd April 1905, to call on Mr. Symon the gardener there. Here I find it stated that "The Tree-creeper, Mr. John Symon pointed out to me, has found the dry spongy bark of the Wellingtonia useful, presumably for nest building, and I found many—say 9-10—places in the trunks where the birds had hollowed out spaces, some as neatly rounded as if a body like a hen's egg had been half-pressed into the soft bark." May this not explain the Loch Awe and Loch Fyne Wellingtonia holes?

Alcedo ispida (Kingfisher).—Three pairs on a public part of the river east of Glasgow on 31st March, one picked up dead at Cardross about this date, and on 1st April observed at Rouken Glen near Glasgow. This species appears to have been moving freely about these dates. Lays at Kirkliston 21st May.

Upupa epops (Hoopoe).—One on Fair Isle, 9th September (p. 83).

Cuculus canorus (Cuckoo).—Lendalfoot (Ayr), 27th April; Dalry, 30th; Beith, 2nd May; Beattock, 3rd; Auchencairn (Arran) and Thornhill, 4th; Caldwell and Giffnock (both East Renfrew) on 5th; Mull, 7th; all on the west, comparatively speaking. On the east at Teasses (Fife), 7th; and at Crosswood Reservoir, at Dunbar (where a female was shot as it came in from the sea), and at Swordale (E. Ross) all on 10th. A bad year for Cuckoos in the Outer Hebrides, only two seen where they were common last year (A.S.N.H., 1907, p. 211). Last heard calling June 30th, Lugton.

Asio otus (Long-eared Owl).—Several from late October till December in the Fair Isle (p. 83). Laying at Kirkliston 19th March.

A. accipitrinus (Short-eared Owl).—Though comparatively plentiful in summer of 1906 in Outer Hebrides not one observed in summer of this year (1907). First autumn observation 28th September, Fair Isle, where later forty to fifty observed on two occasions (p. 83). Frequently reported for north-east localities till 5th November.

Syrnium aluco (Tawny Owl).—Nest with two eggs, 12th April, Swordale. One with young, 29th April, Colinsburgh.

Nyctea scandiaca (Snowy Owl).—One 26th October on Fair Isle (p. 83).

Circus cyaneus (Hen-Harrier).—A female and a young bird were all that were seen by Mr. Bahr this year (1907) in the Outer Hebrides, where last year males were plentiful (A.S.N.H., 1907, p. 211).

Buteo vulgaris (Buzzard).—On May 14th at Arisaig, eggs highly incubated.

B. lagopus (Rough-legged Buzzard).—One in November at North Berwick. One shot at Dirleton, East Lothian, beginning of December.

Accipter nisus (Sparrow-Hawk).—Builds at Kirkliston 18th April, lays 30th.

Falco candicans (Greenland Falcon).—One seen 21st January, Scaliscro, in Lewis ("The Field," 23rd February 1907, p. 307). One seen in Argyll but exact locality not specified ("The Field," 26th January 1907, p. 149). One shot at the Flannans early in April.

F. æsalon (Merlin).—From 19th August till 30th September at the Flannans, single birds reported seven dates. One at Isle of May 15th September, one at Skerryvore 18th, and one at Bell Rock 27th.

Pandion haliaëtus (Osprey).—One seen on the Berriedale River, Caithness, 10th July.

Phalacrocorax graculus (Shag).—A "wholly white one" in N.W. Mull (A.S.N.H., 1907, pp. 247, 248). Note on early nesting in Orkney, first eggs found on 24th February (p. 51).

Sula bassana (Gannet).—Appear at Lamlash (Arran) 30th March. Very numerous on west side of Mull and Sound of Iona 11th-12th September. At Wick on 26th September, a lot flying north in twos and threes. Young in down still on ledges at Bass Rock on 8th October. One in first year's plumage fed

wholly on mice for a fortnight at Loch Broom, where were seen more mature birds than in any previous year (p. 51).

ARDEA CINEREA (Common Heron).—On 21st February, Alan Fowler counted sixty-three by the side of Loch Broom. Extremely common this year on fresh- and sea-water lochs in Outer Hebrides (A.S.N.H., 1907, p. 212).

A. PURPUREA (Purple Heron).—One (♂ *juv.*) on Thrumster Estate, Caithness, on 16th September.

ARDETTA MINUTA (Little Heron).—One found with a wing broken at Lentran near Inverness on 9th June (A.S.N.H., 1907, p. 248).

BOTAURUS STELLARIS (Bittern).—One (♀) caught alive, Elliot Valley near Arbroath, on 21st January (A.S.N.H., 1907, p. 184).

PLEGADIS FALCINELLUS (Glossy Ibis).—A flock of about twenty at Sandwick, Orkney, on 24th September. Half of them were destroyed. The victims were all immature (p. 50). One was shot on the Lein Burn, Speymouth, date not stated (*l.c.*). One at Irvine (Ayr) in mid-September (p. 119). One is recorded in the "Zoologist," 1908, p. 113, as shot in harvest time 1907, at Watermill, Fraserburgh.

PLATALEA LEUCORODIA (Spoonbill).—Two obtained in November from Island of Canna and Loch-na-keal respectively, recorded in "Oban Times" (p. 50).

ANSER CINEREUS (Gray-Lag Goose).—By 28th May all in Outer Hebrides had hatched off. On one loch there 147 adults counted, showing that numbers not diminishing (A.S.N.H., 1907, p. 212). Flock of Wild "Geese" (sp. ?) at Balcomie (Fife) 27th March, large flock went north at Largo on 10th April, and "Geese" went north at Inverbroom on May 5th and 19th. On 5th October at Kirkliston; 6th, Inverbroom; 7th, Kirkliston again; same date Beattock, and again there on 8th "Geese" were going south.

BERNICLA LEUCOPSIS (Barnacle Goose).—Hundreds at the Flannans on 15th October, two on 17th, and about a hundred on 21st.

B. BRENTA (Brent Goose).—At Fairlie (Ayr) on 1st January from 150-200. On 16th February at same locality, fifty.

CYGNUS MUSICUS (Whooper Swan).—Reported on half-a-dozen dates from 30th March till 15th April from Græmsay, Lerwick, and Spiggie. On 13th December, eight at Kilconquhar (Fife).

C. BEWICKI (Bewick's Swan).—Remained Bishop Loch, near Glasgow till end March. First reappearance there 14th November, one bird shortly after joined by two others.

C. OLOR (Mute Swan).—A dozen arrived Tiree early in July and were joined by other two later (p. 117). These birds, unless one pair, do not remain in winter.

TADORNA CORNUTA (Common Sheld-Duck).—Bute, May 12th, nest and nine eggs. Few seen with young broods in Fife this season.

ANAS BOSCAS (Mallard).—Bute, nest and nine eggs, 12th May.

A. STREPERA (Gadwall).—One shot Dougalston (Stirling), December (p. 119).

SPATULA CLYPEATA (Shoveler).—On the increase in the Outer Hebrides where a nest of eleven eggs was hatched off by 17th June. A Mallard drake was seen in company with a Shoveler Duck, and in a collection there a hybrid appears to be between these species (A.S.N.H., 1907, p. 213).

DAFILA ACUTA (Pintail).—Four or five on Loch Talla, 4th June (p. 119). Two shot Glenorchard near Glasgow, 23rd October.

NETTION CRECCA (Teal).—Abundant this year in Outer Hebrides where females seen with young, 20th June. Nest with sixteen eggs mentioned on the authority of a keeper (p. 213).

QUERQUEDULA CIRCIA (Garganey).—Baltasound, 14th April, one (♂).

MARECA PENELOPE (Wigeon).—Seven observed through April at Swordale (E. Ross) till 22nd May. Bunch in eclipse plumage there on 31st August, increasing 6th September, great flocks 23rd. Appeared Fairlie (Ayr) 12th September "rather early."

M. AMERICANA (American Wigeon).—One shot Benbecula, 3rd January (A.S.N.H., 1907, p. 116).

FULIGULA FERINA (Pochard).—At Loch Libo (Renfrew) about 120 on 2nd March, last seen there 23rd. Reappeared 3rd September (1) and continued in varying numbers, maximum about fifty on 6th November. One (♂) in Luss Straits, Loch Lomond, 1st June.

F. CRISTATA (Tufted Duck).—At Mearns (E. Renfrew) on 26th May nests with four, six, and seven eggs respectively. Nesting in West Lothian for the past ten years (A.S.N.H., 1907, pp. 185, 249). Only one pair seen in Outer Hebrides where four times that number previous year. Eggs hatched off there by 17th June (*l.c.* p. 213).

CLANGULA GLAUCION (Golden-Eye).—Two pairs remained in Outer Hebrides till 8th June (A.S.N.H., 1907, p. 213). At Watten Loch, Wick, several on 24th October. Added to Fair Isle fauna, two being seen in October and November respectively (p. 84).

HARELDA GLACIALIS (Long-tailed Duck).—St. Andrews, 19th April, a few. One off the mouth of the Kenly (Fife) 29th May.

SOMATERIA MOLLISSIMA (Eider Duck).—Very few seen with broods in Fife this season. Getting common at North Berwick, 9th February. On the shores of Colvend, Solway, April till end August two pairs (p. 119). At North Berwick young swimming on 30th June. Flock of 150 at Machrie, Islay, 2nd August. Five on 8th June off Outsta Ness where they are comparatively scarce.

ŒDEMIA NIGRA (Common Scoter).—Two nests found in Sutherlandshire ("The Field," 13th July, 1907, p. 53, and 31st August 1907, p. 435). A pair on 20th and 25th June in the Outer Hebrides (A.S.N.H., 1907, p. 214). Large flock, St. Andrews, 25th June. Single adult males in Fair Isle on 5th and 9th September, an addition to the fauna (p. 84).

Œ. FUSCA (Velvet Scoter).—Five in the Orkneys on 12th June (p. 5). One on Fair Isle, 17th September (p. 84).

MERGUS SERRATOR (Red-breasted Merganser). — On Mishinsh Lochs, Mull, where a pair or two nest, one (♂) seen 4th April. Several in pairs Swordale, 25th April. Nest with two eggs Bute, 17th May.

M. ALBELLUS (Smew). — Young female from Kirkconnel sent to Mr. Service on 2nd January. Another in its company when first seen (A.S.N.H., 1907, p. 113). Immature male, near Dunbar, 8th January, (*l.c.* p. 183).

COLUMBA PALUMBUS (Ring-Dove).—Lays at Kirkliston, 5th April. Large flocks near Boarhills (Fife) on 29th May. Large flocks at Swordale, 10th August. Young, last in nest, 13th October, at Kirkliston. Enormous flocks at Swordale, 24th December.

C. ŒNAS (Stock-Dove).—Lays at Kirkliston, 26th March. One shot at Beith, 8th April, first for district; Bute, 12th May, nest with young; Lendalfoot (Ayr), 15th July one shot, first for district. Kirkliston, 7th October, young in nest.

TURTUR COMMUNIS (Turtle-Dove).—A few, 9th to 25th May, at Fair Isle, and again mid-September (p. 84). Single birds, 11th, 15th, and 29th September, at the Flannans.

TETRAO UROGALLUS (Capercaillie).—Nine shot near Alford on the Don on 9th September (p. 120).

LAGOPUS LAGOPUS (Willow Grouse).—Attempt to acclimatise at Craigellachie, Moray, announced (A.S.N.H., 1907, p. 117).

L. SCOTICUS (Red Grouse).—Nest with ten eggs, Caldwell (Renfrew), on 29th April, and one with eight eggs in Bute on 16th May. Eggs highly incubated and young running at Lake of Menteith, 17th May.

Coturnix communis (Quail).—Nesting in East Lothian (A.S.N.H., 1907, p. 248).

Crex pratensis (Corn-Crake).—Beith, 21st April; New Cumnock, 22nd; Lendalfoot and Dalry, 25th; Caldwell, 28th; Siskin (Arran), 7th May; Mull, Lugton, and Bute, 11th May. All these localities are in the west and south-west. The sole record from the east coast prior to 18th May is 11th May, Largo, which is accompanied with the observation, "Very few hereabouts this season." Very noisy on night of 9th to 10th August at Port Ellen, Islay.

Rallus aquaticus (Water Rail).—Nest with seven highly incubated eggs at Loch Libo (Renfrew), 16th May. Spiggie, 9th April (1); Skerryvore, 18th September (1); 10th October (1); Isle of May, 26th October (1) (p. 20); Mull, 28th November (1).

Gallinula chloropus (Moor-Hen).—One in Dumfriesshire swimming under water for about fifty yards (p. 53). At Swordale on 6th April, nest six feet from ground in fir tree with six eggs. At Caldwell (Renfrew), 19th April, nest with eight newly hatched chicks, "early."

Fulica atra (Coot).—Laying at Kirkliston last week of March. Eggs hatching at Lake of Menteith, 15th May.

Œdicnemus scolopax (Stone-Curlew).—A pair at Lerwick on 20th May.

Eudromias morinellus (Dotterel).—Two shot at Gullane on 17th May—a confounded shame! A pair in passage in Mull, 19th (A.S.N.H., 1907, p. 249).

Ægialitis hiaticola (Ringed Plover).—At Bute on 11th May, nest and four eggs; 12th, one with three eggs; 13th, two with three and four eggs respectively; 16th, two with four and two eggs respectively. Owing to inclement weather, three eggs was the full complement in several instances in the Outer Hebrides, where "it would appear, from an experience during this and last season, that nesting is not commenced till the end of May" (A.S.N.H., 1907, p. 214).

Charadrius pluvialis (Golden Plover).—Arrived on Erray Moors, Mull, on 13th March. At Swordale (E. Ross) a few returned to breeding grounds, 31st. At Skerryvore, May 8th, a rush with other species.

Squatarola helvetica (Grey Plover).—Two at Fairlie (Ayr), 2nd February. Passed the winter at Spiggie (Shetland), "very unusual" (A.S.N.H., 1907, p. 118). On 14th June (3-4) and 2nd July (15) at Edenmouth. Fairlie, October 1st (1); Dornoch (4-5), 12th October.

VANELLUS VULGARIS (Lapwing).—Spring call, Clarkston, Glasgow, 10th February. Several in pairs 16th February, Fairlie (Ayr). A few seen daily since 20th February, and arrived in numbers at Pentland Skerries by 4th March. Abundant and vociferous on Mearns Moor (E. Renfrew) 23rd March. Laying at Kirkliston 4th April. Seen in flocks at Lake of Menteith, 19th May. At Swordale 20th June in small flocks, 5th July large flocks. At Bridgend, Islay, 400-500 on 18th July. At Swordale again on 23rd September in enormous flocks. Observed on the Isle of May 11th September till 7th October, the greatest number on 30th September (p. 20). One at Dumbarnie Links (Fife) with two white primaries in each wing.

STREPSILAS INTERPRES (Turnstone).—On 13th May a dozen in Bute; 17th June, Broad Bay, Stornoway, six. On August 1st, half-a-dozen at Laggan Bay (Islay); flock at Sule Skerry, 11th August; twenty-five (adult) in Mull, 15th August; and a great many at Barra, 28th to 31st August.

HÆMATOPUS OSTRALEGUS (Oyster-Catcher).—May 11th in Bute, nest with two eggs; 12th, one with four; 13th, three with one, two, and three eggs respectively. Flock of fourteen on 6th June in Outer Hebrides when all others were engaged incubating (p. 23). On 14th June at Edenmouth, large flocks.

PHALAROPUS HYPERBOREUS (Red-necked Phalarope). — Females arrived Outer Hebrides 28th May till 10th June, and were followed later by the males (p. 23). One shot Powfoot on the Annan, the first Solway specimen (p. 120).

SCOLOPAX RUSTICULA (Woodcock). — Two to three hundred at Touch (Stirlingshire) on 10th March (A.S.N.H., 1907, p. 144). More than usually plentiful in Dumfriesshire this season, "and already (1st September) many have been shot" (*l.c.* p. 249).

GALLINAGO CŒLESTIS (Common Snipe).—Drumming at Loch Libo (Renfrew) on 26th February. In pairs Edinburgh, 17th March; numerous on 14th April at Mearns (Renfrew); two nests with four eggs each, one incubated the other fresh, at Loch Libo on 30th April. Unusual numbers nesting near Sorn and Muirkirk. At Loch Libo on 20th October Mr. M'Keith counted 80, on 24th November 247, and believed there were more, and on 9th December 180. On one day in November or December, fifteen and a half brace got at Girlsta, ten miles from Lerwick. Although the ground was in capital order they were not at all plentiful in Tiree (p. 118). Reported bleating in the evening at Glenorchard near Glasgow, on 21st November and 14th December.

G. GALLINULA (Jack Snipe).—One with two heads reported from Arbroath, 10th to 15th January. "Despite this abnormality [it

must evidently have survived for several months at least," and it may also be added crossed "the faem." On September 1st one shot, Glenorchard, near Glasgow. The first shot at Swordale was on 26th October—"very few this autumn."

TRINGA ALPINA (Dunlin).—A few heard on Mearns Moor (Renfrew) on 14th April; two at Crosswood Reservoir, 24th. Two pairs in Mull on 15th May, nest and four eggs Loch Libo (Renfrew) 17th, two nests with four eggs each 26th, and nesting at Swordale 29th. Arrived in the Outer Hebrides end of May and early in June, first nest there had four eggs on 5th June (p. 24).

T. STRIATA (Purple Sandpiper).—Elie, 10th April (1); Balcomie, 6th August (1); 14th September to 7th October on Isle of May (p. 21).

T. CANUTUS (Knot).—Edenmouth, 9th January, enormous flocks; same locality, 14th June, flocks. Fairlie (Ayr), twenty on 2nd September, "scarce all autumn." A few in Fair Isle in autumn, an addition to its fauna (p. 84); Edenmouth, enormous flocks, 5th December.

CALIDRIS ARENARIA (Sanderling).—Edenmouth, 21st May (2); Sands of Tong, flocks of fourteen and six birds respectively on 13th June, and these or others were again seen on 14th and 17th. At Barra, 28th to 31st August, very large flocks (p. 8). Eighteen at Edenmouth on 27th August.

TOTANUS HYPOLEUCUS (Common Sandpiper).—Dalry (Ayr), a pair on 13th April; Caldwell (Renfrew), 24th, and thereafter between 27th to 30th, pretty generally reported.

T. OCHROPUS (Green Sandpiper).—Single birds on five occasions between 31st July and 22nd August at the Fair Isle (p. 84).

T. CALIDRIS (Redshank).—Returned to nesting quarters at Caldwell on 2nd March; Crosswood Reservoir (950 feet) on 18th (1); coming into the Glasgow district, 24th; numerous on Mearns Moor (E. Renfrew) on 14th April. Nest and four eggs, 29th April, Fife. In Bute on 11th May nest and four eggs; 13th, nests with four and two eggs respectively; 16th, nest with four young.

T. CANESCENS (Greenshank).—Fairlie (Ayr), 17th August (1); near Salen, Mull, 18th September, (3); Lerwick, 28th October, several; Cromarty Firth, 23rd November (1); Swordale (E. Ross), 6th December (1); Ryat Dam (E. Renfrew), 15th December (1); Cromarty Firth, 24th December, one still there.

LIMOSA LAPPONICA (Bar-tailed Godwit).—At Edenmouth on 14th June, large flocks in winter plumage and very noisy. A flock of about 200 remained all summer near to Carsethorn far

down the estuary of the Firth (p. 86). A great many at Barra, 28th to 31st August (p. 8). Many remained in Solway through the winter of 1907-1908 (p. 7).

L. BELGICA (Black-tailed Godwit).—Near Glasgow on 4th May (3) (A.S.N.H., 1907, pp. 184-5). One on 17th June in Outer Hebrides (p. 25). Eoligary, Barra, 7th September (1) (*l.c.* p. 250). One at St. Andrews, 5th December (p. 53). One shot on the Beauly Firth in November ("The Field," 23rd November 1907, p. 937).

NUMENIUS ARQUATA (Common Curlew).—Heard for first time for season at Caldwell on 3rd March; in considerable flocks in West Forfarshire on 8th; large influx to moors in Mull on 11th; has eggs at Leadburn, 4th May; Bute, 19th; and has young at Caldwell on 27th. On 26th June large flock by the shore, Swordale. Near Glasgow on 27th October, passing on emigration N.E. to S.W.

N. PHÆOPUS (Whimbrel).—On 8th May at Skerryvore a rush with other species. Four in Bute on 12th; eight at the Flannans, 28th. Extremely belated in the Outer Hebrides where a flock of thirty remained as late as 17th June (p. 25).

STERNA CANTIACA (Sandwich Tern).—Largo Bay going W. to E., three or four on 7th May. At Swordale, 7th September, a few; Isle of May, 10th, 19th, and 22nd September, several (p. 21).

S. FLUVIATILIS (Common Tern).—First reported North Berwick, 4th May. Largo Bay passing W. to E. in parties up to twenty on 7th May. A few "Terns" at Pentland Skerries on 12th May and large parties settle for nesting, 20th-21st. Over 400 nesting at Tarrsgeir, off Islay, in July. Leaving Sule Skerry daily about 9th August. Very few nests about Largo this year.

S. MACRURA (Arctic Tern).—First appearance, Lerwick, 25th May. Arrived late Outer Hebrides, first egg on 8th June (p. 25). Two large colonies in Rousay Sound on 4th June (pp. 2-3). A large colony on Damsay island on 12th June (p. 5). Disappeared from Lerwick, 2nd September.

S. MINUTA (Lesser Tern).—At St. Andrews, 10th May, three or four. Increasing in Outer Hebrides where they were extremely late in arriving, the first egg being found on 20th June (p. 25).

XEMA SABINII (Sabine's Gull).—One off Elie on 31st August (p. 53). One at Skerryvore on 30th November.

LARUS RIDIBUNDUS (Black-headed Gull).—Assumes hood Glasgow and Kirkliston, 24th February. Arrive Mull with hoods on 9th March; local birds not hooded. At Lake of Menteith all had

eggs, 18th May. Seemed to be more at the great gullery at Harelaw Dam (Renfrew) than formerly. Increasing in the Outer Hebrides but great mortality in young, as on tenth day after hatching only one in five were alive.

L. CANUS (Common Gull).—Pair returned to breeding-ground, Swordale, on 3rd April. Two nests with two eggs each, Bute, 13th May. The "most destructive and the blackest thief of the genus," judged by its depredations among the eggs of other species in the Outer Hebrides (p. 27).

L. FUSCUS (Lesser Black-backed Gull).—First pair for season in Glasgow Harbour, 20th March. First seen in Mull on 22nd April, which is later than usual. Large colonies of this species and the Herring Gull breeding on the Green Holm early in June (p. 3). Seen until 20th September, and a single bird 10th October, at the Fair Isle (p. 84).

L. MARINUS (Great Black-backed Gull).—Much scarcer than the Lesser Black-backed Gull in the Shetlands (p. 3). A great colony in the Outer Hebrides described, sixty-two old birds being counted on one island and thirty-four young being killed and four eggs taken (p. 28).

L. GLAUCUS (Glaucous Gull).—Seen on Fair Isle 28th October, and remained off the island all winter (p. 84).

L. LEUCOPTERUS (Iceland Gull).—One at Skerryvore, 8th March. One North Berwick, 3rd April. A young one at the Flannans on 12th September.

RISSA TRIDACTYLA (Kittiwake Gull).—At Unst on 9th June, great numbers were flying down the Sound in one continuous stream, while on 11th at Barra Firth they were flying up similarly, one hundred being counted in less than a minute (p. 5).

MEGALESTRIS CATARRHACTES (Great Skua).—One seen about two miles north of Lendalfoot (Ayr), by Mr. Charles Berry, on 22nd October—new to "Clyde." Forty-two nests on Hermaness (p. 4).

STERCORARIUS CREPIDATUS (Arctic Skua).—On 30th August at St. Andrews, 30-40. One seen diving on Isle of May (p. 22). Several in the Firth of Forth, 8th October.

ALCA TORDA (Razor-Bill).—In great numbers at Sule Skerry on 15th May. Bass Rock, young, 30th June. A few young off Staffa, only species off nest on 18th July. Seen frequently on the Isle of May till 3rd October (p. 22). On 26th October a few off Barra (p. 9).

URIA TROILE (Guillemot).—Very numerous at Sule Skerry on 17th May. On 26th October a few off Barra (p. 9).

U. GRYLLE (Black Guillemot).—At Pentland Skerries a number in summer plumage, "winter birds are grey." Far less abundant in the Shetlands than the Orkneys (p. 3).

FRATERCULA ARCTICA (Puffin).—One immature in a dying condition came into the courtyard at Pentland Skerries on 7th January. Returned to Craigleith on 7th April, the same day as last year. Numbers swimming about at Pentland Skerries, none yet in rocks, 11th April. Great numbers off Sule Skerry on 9th, and landed on 16th April. Sitting on rocks at Pentland Skerries, 13th. Getting scarcer at Sule Skerry, 9th August.

COLYMBUS GLACIALIS (Great Northern Diver).—Bute, 14th April (1). Three at St. Andrews on 19th April. On 26th October off Barra, very numerous (p. 9).

C. ARCTICUS (Black-throated Diver).—One shot off the mouth of the Don, Aberdeenshire, 30th January (A.S.N.H., 1907, p. 250). Nest with usual complement of eggs on 29th May in Outer Hebrides (p. 29).

C. SEPTENTRIONALIS (Red-throated Diver).—Arisaig, 14th May, laying. One hurtling down to sea with incredible speed in the Outer Hebrides, "and the noise made by the air rushing through the primaries sounded like the roar of an express train" (p. 30).

PODICIPES CRISTATUS (Great-crested Grebe).—One at Spiggie (Shetland) on 11th January, "the first seen here." Pairing at Harelaw Dam (Renfrew) on 23rd March.

P. AURITUS (Slavonian Grebe).—At Arisaig on 13th May in full summer plumage. Two at St. Andrews, 5th December.

P. NIGRICOLLIS (Eared Grebe).—One (♂) at Dunbar, 3rd January (A.S.N.H., 1907, p. 183).

P. FLUVIATILIS (Little Grebe).—One at Mishnish, Mull, 28th February. Lays at Kirkliston, 14th April. Has eggs at Lake of Menteith, 15th May. In "song" at Hogganfield, Glasgow, 22nd September. "Undoubtedly on the increase" in the Outer Hebrides (p. 30).

PROCELLARIA PELAGICA (Storm Petrel).—Heard among stones and holes, 23rd May, Sule Skerry. One found on the shore at Kilnaughton, near Port Ellen, Islay, 4th August. One just able to fly caught at Skaddan Lighthouse, Fair Isle, 2nd October (p. 85).

PUFFINUS ANGLORUM (Manx Shearwater).—Flying about the lantern at Skerryvore on 20th April. Appeared within the Sound of Mull, opposite the entrance to Loch Sunart, on 10th August, in unprecedentedly large numbers—several hundreds. "There is not much contraction of the wings when this species dives or rather plunges in at an acute angle. It emerges with wings outspread and usually proceeds to flight at once, so that the instant cannot be definitely stated when progress in the one element has ceased and commencement made in the other" (D. Macdonald). On 1st August at least a hundred in Firth of Forth (Fife). On 31st August a good many as far up as Inchkeith and close to Leith.

CORRECTIONS.—P. 135, under P. RUFUS insert "Lerwick" before "district"; p. 137, under A. PRATENSIS for "fourteen nesting" read "fourteen, nestling."

Acknowledgments for assistance are due to the following among others:—In the Northern group of localities—The Lightkeepers, Sule Skerry; John B. Henderson, Tarbetness Lighthouse; J. R. Lawrence, Pentland Skerries; John S. Tulloch, Lerwick; T. Henderson, jun., Spiggie. On the East of Scotland—Annie C. Jackson, Swordale; Lewis Dunbar, Thurso; the Lightkeepers, Bell Rock; Thos. F. Dewar, M.D. D.Sc., Forfar; W. F. Little, Crosswood Reservoir, West Calder; Wm. Evans, Edinburgh; William Binnie, Edinburgh; S. E. Brock, Kirkliston; Rev. W. Serle, Duddingston; Rev. H. N. Bonar, Saltoun; Leonora Jeffrey Rintoul, Lahill, Largo; Evelyn V. Baxter, Gilston, Colinsburgh; W. M. Inglis, North Berwick. In the West and South-West—Robert Anderson, Flannan Islands; James Tomison, Skerryvore; D. Macdonald, Tobermory; Hugh S. Gladstone, Capenoch, Thornhill; Robert Service, Dumfries; Lady Fowler and family, Inverbroom; James Bartholomew, Beattock; T. Thornton Mackeith, Caldwell and Loch Libo; John Robertson, Robert Wilson, Thomas Wilson, Alexander Ross, Glasgow; John Craig, Beith; Chas. Berry, Lendalfoot; Dr. Niel Fullarton, Lamlash; Rev. J. D. W. Gibson, Carmichael.

1150 CATHCART ROAD, GLASGOW.


SHETLAND ISLES
WINTERS
Unst
Yell
OF
1861
1866
Mainland
SF
Shetland Isles
60 Miles NE of Orkney
Fair I.
WINTERS
Westra
Sanda I.
OF
Stronsa
ORKNEY ISLES
Pomona
1861
1868 - 9
1886
Hoy
Pentland Firth
Prevailing
SE Winds
ATLANTIC
OCEAN
1899
SUTHERLAND
CAITHNESS
NORTH
SEA
1861
1868-9
1886
1898-9
S.E. Winds
SUTHERLAND
1903
Lewis
The Minch
Dornoch Firth
Moray Firth
Harris
Little
Minch
North Uist
ROSS & CROMARTY
ELGIN
NAIRN
BANFF
ABERDEEN
1861
1868-9
1886
1898-9
Benbecula
South Uist
Skye
Canna
Barra
Rum
Eig
Muck
INVERNESS
KINCARDINE
ARGYLL
1861
1868
FORFAR
1886
1898-9
Coll
Tiree
PERTH
Firth of Tay
Staffa
Mull
1902
Iona
ARGYLL
FIFE
Firth of Lorn
Scarba
1840
1875
CLACKMANNAN
KINROSS
Colonsay
Oronsay
Jura
FORTH
Firth of Forth
1861
1868-9
1886
1898-9
STIRLING
1877
HADDINGTON
LINLITHG.
EDINBURGH
Islay
1898
RENFREW
1898
1898
Bute
1861
1869
BERWICK
1886
1898-9
1891
Gigha
LANARK
PEEBLES
Arran
1894
1868
AYR
TWEEDDALE
SELKIRK
ROXBURGH
North Channel
1889
DUMFRIES
SOLWAY
KIRKCUDBRIGHT
WIGTOWN
Solway Firth
IRISH SEA
ENGLAND
MAP OF
SCOTLAND
TO ILLUSTRATE
G. SP. WOODPECKERS'
RESUSCITATION IN
SCOTLAND
SINCE 1841 - 51
For previous
Acct of EXTINCTION
See
Zoologist, 1880, pp. 85-89
Ann. S.N. Hist., 1892, pp. 4-17
J Bartholomew & Co Edinr
N.B. Large immigration to Ireland
generally, but not in E. of Scotland.
Faunal Areas thus
County Boundaries thus
Scale of English Miles
0 10 20 30 40 50 100

THE dates on the East Coast, viz., 1861, 1868-9, 1886, 1898, show the principal autumn-winter irruptions.

Crosses—X X—show the extensions to the west in autumn and winter.

⊕—indicates reported summer occurrences at or within the old nesting range. But none have occurred since Mr. Robert Gray wrote.

⊞—shows formerly occupied areas in the nesting season (see papers on EXTINCTION).

O?—indicates Reports of occurrences in N. of England or doubtful records elsewhere.

O—represent accredited summer records.

⊙—give actual records of nesting for which I hold authority.

I do not attempt to plot all details of autumn and winter occurrences in the east, because that appears unnecessary, and besides the scale of the Map does not permit it. But I give those on the west side marked by crosses.

The Kilmarnock record, 1894, is quoted from "The Annals Kilmarnock Glenfield Ramblers," No. 5.

The earliest actual records are on the extreme south in 1888 (*auct.* H. A. Macpherson, Solway).

SUMMER RECORDS.

1888—Nested in SOLWAY. (H. A. Macpherson, "Zool." xviii. 344.)

1893—Nested at Duns, TWEED.

1894—Nested again, same place. (*v.* "Ann. Scot. Nat. Hist.".)

1896—Nested at (O?) Dalmeny, FORTH. Seen by Mr. Chas. Campbell's father. ("A.S.N.H." p. 19.)

1898—(O) seen at Halmyre, TWEED. ("A.S.N.H." p. 182), *auct.* Mr. T. G. Laidlaw, who adds that 2 birds were seen in Castle Craig woods, "about two years ago"—say 1896.

1899—(X) One shot at Inverlael, N.W.H. ("A.S.N.H." p. 110, and my vol. on that area.)

A series of autumn and winter records is given by Mr. W. Evans, who fully reviews the subject to date, and speaks of the irruption of 1868, when Mr. Robert Gray states that he had handled no less than 60 specimens. These include the above record at Inverlael, and two occurrences in Shetland are at Scotscalder and Auchengill, PENTLAND Area.

1901—Nested and took off young near Penicuik, FORTH.

1901—Nested in Selkirkshire, TWEED, where there is good reason to credit that this was not the first season they nested there (*auct.* Chas. Campbell).

1901—O Seen and heard for first time at Presmennan Loch, by Mr. C. C. Tunnard, when fishing, and also the first for many years at any season. But Mr. Evans gives evidence that it probably bred in E. Lothian for a considerable time prior to this date.

1902—One shot (X) Inverawe, ARGYLL, Mr. Bisshopp of Oban says the first he has had sent in for fourteen years.

1903—Nested and took off young in East Lothian, FORTH, and the same birds again probably in 1904 took off young.

1904—Nested and took off young in Roxburghshire, TWEED. Young bird caught in August.

1904—Lewis, OUTER HEBRIDES. A bird seen climbing a telegraph pole at the side of the road which crosses the island of Lewis in the direction of Loch Roag.

[1906—Loch Awe, ARGYLL. (O) Borings distinct, and again fresh ones in 1907.]

1907—Two winter records of birds obtained at Inverary in 1841 and 1875. Both birds are, or were, in the possession of the late duke.

1907—Polmaise, FORTH. Two pairs reported as having frequented the woods for at least two years, and again reported in 1908.

1907—Crieff, TAY,[1] and Drumtochty, and between Crieff, Methven, and Perth.

1907, 1908—Callander, FORTH. Nested and hatched off young both seasons.

As already mentioned I have very full particulars from many of my correspondents in Forth, Tay, and also from the southern areas.

[1] Since my volume on TAY appeared, I had a letter from Mr. J. B. Dobbie, in which he writes as follows:—"From the accuracy of the information of my friend Mr. MacNaughten, now resident in Perth, I am sanguine that he will be able to procure useful information. He told me the Great Spotted Woodpecker regularly nested at Murthly." This would be prior to the date of 1906. J. A. H.-B.

THE GREAT SPOTTED WOODPECKER'S RESUSCITATION IN SCOTLAND SINCE 1841 OR 1851.

By J. A. Harvie-Brown, F.R.S.E., F.Z.S.

Introduction.

In the following paper I have given merely a summary of carefully sifted information, which I hold is sufficient for the purpose of tracing the steps of advance of the species under treatment.

For all the records plotted on the accompanying sketch map, I hold authority, as communications from my correspondents. But these are too long (however interesting many are) and too diffuse for publication here.

Indeed, I have prepared and originally intended for press, the whole subject duly chronicled down to date, from which the accompanying map was worked up. The paper I now offer is much shorter, and has been written from the results plotted on the map, and, as I have already indicated, will suffice to show the lines of the advances made by the species during the past twenty years from the south to the north. I do not in this place enter into the question of what species or subspecies the present invaders belong to, nor into the cognate question of what species or subspecies or geographical race formerly populated the North of Scotland beyond the Grampians. I am content to await developments; and my interest lies in the former of the two questions, and whether they will occupy the old northern haunts, or leave them to a more northern geographical race. Therein I consider the true interest lies at the present time, and allied to that, of course, the other question also. Students of geographical distribution of European birds will understand what is left unsaid in this place; and perhaps also realise that we are on the verge of a new philosophy, as shadowed forth in the prospectus of yet another book of British birds, with more of the aspects of sport and commerce, and perhaps socialism, than pure science.[1]

As a sort of text to this paper and in further illustration,

[1] So there is less pleasure in 'sowing pearls' than formerly.

I give the facsimile of one of the forms used by me for registration, as perhaps some people might desire to use them for the sake of uniformity and comfort in filing. This I give only as an example, as I am reminded that there is expense connected with printing such in running type. They are, however, not intended for universal printing, but for private usefulness. I have used them myself for a number of years now, and can truly say I have personally found them useful. I do not know whether others have adopted their use or not. All I can say is what I have said; and as it is said here, it is now public property generally, to do with it what the public chooses; or leave it alone if not of sufficient interest to them.

Though I cannot here mention all of my correspondents to whom I am indebted for these data and all others which are plotted on the map, yet I cannot omit to thank those who have specially interested themselves. Amongst these are the factor at Duns Castle, Mr. J. Ferguson; and Mr. A. H. Evans; Mr. W. Evans; Mr. H. S. Gladstone and Mr. Service for Dumfriesshire and Solway; Miss Baillie Hamilton, Callander; Her Grace the Duchess of Bedford, Mr. W. E. Frost, and others for south of Tay, and up the Tay valley.

If I do not mention all by name, I trust they will believe me when I assure them that they are not omitted for the reasons given—elsewhere referred to—as that is a system with which I cannot feel the slightest sympathy.

Taking the accompanying sketch map as our reference sheet, it will be seen that the Great Spotted Woodpecker has in its advances covered a broad area of wooded and suitable country between the Solway Firth and the East Coast. Abundance of evidence of summer occupations, o, and of actual nesting records, ⊙, showing from the river Nith eastward to Berwickshire, and thence reaching north through Tweed counties into those of Forth upon the south shore of the Forth.

It will be seen also that these birds appear to have shunned the country to the west of the Nith, but few summer records reaching us from Kirkcudbright, and none at all from Wigtown or northward through Ayr, or to any of

the Clyde counties south or north of the Clyde Firth. This negative evidence therefore seems to extend to all the western portions from Solway to Clyde inclusive.

On arriving in summer at the Firth of Forth, we find the Lothians all being populated well up to the roots of the Lammermoors and round the eastern end of the range by Haddington, and they then follow the wooded and suitable country westward, and pass on north through central Scotland—Forth to Tay.

But, on the other hand, we have no account of any summer visitants to any localities whatever in Fife, Kinross, or anywhere on the east side of the Firth of Forth, even at its narrower parts—say from Kincardine Ferry to Stirling. Although we do have clear enough evidence of their summer presence, only just across the water at Dunmore.

From central Scotland the advance can be easily traced through the wooded tracts of Torwood (?), Polmaise, Touch, and Sauchie (?), and as far up as the roots of the hills at Callander. The only evidence of any overflow from east to west is at Loch Awe, where, two summers in succession, at least 'borings' have been found,—but see square brackets *ante*.

From Stirling *via* Airthrie Castle grounds at the root of the eastern spur of the Ochils, we hold evidence again of the wooded and low-lying ground being followed—to Callander, as already shown, and also to the finely timbered slopes between Crieff and Comrie, and Methven and Perth.

It may be remembered that we clearly showed that Capercaillies found their way out of Tay *via* Glen Dochart to Inverary and Loch Awe, but even yet these birds are not to be called firmly established, though it is undoubted that birds have bred there of late years. It would appear similarly, that the winter Woodpeckers at Loch Awe have come by the same route.

From the south slopes and wooded tracts between Crieff and Perth, the birds have reached well up into the Tay valley, and by 1908 may be said to have got right up to the roots of the Grampians, at least as far as Murthly and Dunkeld; and it is believed about seven or eight pairs are present in the upper reaches of the Tay. But again, a dearth of summer

records is found east of Perthshire; and so far as I have ascertained from several correspondents who are capable observers, summer records are almost, if not quite absent, until, in 1904, one pair of birds was reported to have remained all summer in Drumtochty Glen, near Auchenblae, which lies right up to the eastern spurs of the Grampians.

It will be perhaps remembered that I ventured to prophesy that Capercaillie would reach into DEE—through the low passes across this eastern spur or ridge, and descend by Glen Dye valley, and so down the Feugh Water to Banchory, DEE,—which they eventually did. It is reasonable here again to predict that the Great Spotted Woodpeckers, when they do penetrate farther north—if they do—will follow the self-same route.

But, when we consider the absolute absence, or great scarcity of summer records, as yet, through Forfarshire, and also find a solitary pair right away up in the north-east corner of Kincardine, this gives us pause.

The question appears to arise—Will these birds eventually push up and across into DEE; or will DEE be populated by an independent influx from oversea; or will there be a double influence exerted in such population of the old haunts in DEE and in MORAY? It will be interesting to watch for what may happen.

Or again—Will these birds finally face the open moors across the lower watershed at Drumouchter and Dalwhinnie, and so go down the Truim Water to Spey, after the areas south of the Grampians become congested, and all the available wooded and suitable areas be taken up as far as the older timber growth reaches—or say to Blair Athole, and perhaps to Struan? Many new plantations are springing up along the route of the Highland Railway, but it will be long before these are of an age suitable to the bird's requirements. Another (unlikely) pass is up Glen Tilt to DEE.

There is much ground also to fill up both along the Tummel and Garry, and the Tay and Loch Tay, Glen Lyon and Taymouth, etc. whether the main advance be *via* the junction of Tay and Tummel at Ballinluig, or (which may participate also) *via* the Pass of Leny from Callander,

or from Crieff and Comrie up the Earn, and so on into the watershed of Dochart and Tay.

We do not now go into MORAY or DEE on this opportunity; but it is well to relate here that all our replies to inquiries from any localities north of the Grampians are strongly negative locally, and collectively so as regards summer visitants.

Now we have traced the advance along the lines of least resistance (or most favourable routes) for the birds, it may be well to speak shortly of the autumn and winter influxes, or irruptions, and annual visitations from over-sea, which have taken place at very regular intervals, beginning about 1861, and recurring, with more or less migration annually, in smaller quantities, about every seven to eight to twelve or fifteen years—*e.g.* 1861, 1868-9, 1886-7, 1898-9, and so on. We have broadly indicated these by dates in red ink on the eastern divisions of Scotland from Shetland southwards. Now, by far the largest bulk of the regular migrations are recorded from localities south of the Grampians; and only when the septennial (or at longer intervals?) irruptions—caused by congestion at continental centres—take place with prevailing south-east winds, do the birds on flight lose control of their powers. And then the farther isles in the north, even as far as Faroe, receive unwonted visits, and some numbers of the wanderers. How many perish far out at sea—*i.e.* what proportion utterly fail to "catch up" to land-shelter first of our mainland west coast, and then of our outer isles—must in great measure remain a mystery, until simultaneous observations be carried out by capable observers at many stations.

The stations I would select (were I able to be in all at once) I have often indicated before,—Isle of May, Pentland Skerries, Fair Isle, Flannen Isles, Monach Isles, and perhaps north-west Mayo in Ireland. Then, Barra, Tiree, St. Kilda, Skerryvore, Ross of Mull, north coast of Ireland perhaps at Rathlin Island? and Isle of Man.

These recommendations are selected from experience gained by the returned schedules of the British Association Committee's correspondents, and much other experience in the field, during the larger part of a lifetime devoted to out-door

observation and careful collating of information. If they are erroneous, that has yet to be proved; and there is little use, I fancy, disputing them until proof or disproof be obtained, which has not yet been achieved by other collections of facts.

Finally, it is not without some interest to find distinct negatives of summer appearances at any localities on the western watershed except those bracketed ones for Loch Awe-side (ARGYLL). It is also interesting to receive negatives from the following districts—Wigtonshire, a great part of western Kirkcudbright, and the whole area of CLYDE, both north and south of the waterway or firth; and to observe how few records of even autumn and winter occurrences have turned up—and that notwithstanding the fact that there are active and capable observers located there. And it is also interesting to know that, according to Mr. W. Evans and other local observers in Fife, no summer records are forthcoming in the east of that "kingdom."

It would be of use also if our ornithologists of England would likewise map off the advances along the length and across the breadth of that and the adjoining country of Wales — both as regards nesting, distribution, and autumn and winter migrations and irruptions.

SPECIMEN SCHEDULE ONLY; WHICH I ADVOCATE.

Copied from Original Record which I retain.

Date and Number of Record-form.	Locality and District.	Species.	Age, Ad. or Young.	Sex.	Alone or in company.	With its own or other Species.	Comparative Numbers.	Flying in which direction when seen or shot.	If caught or killed at light, on which side —N., N.E., N.W., S., S.E., or S.W.	Direction of Wind at the time and strength, and weather.	Prevailing Wind for past.....days past.....weeks.
Tuesday, 21st April 1908.	FORTH Airthrie Mine Woods, Bridge of Allan	Great Spotted Woodpecker	ad.	♂	×	...	...	Found dead	...	E. Very cold	East

NOTES AND REMARKS.

If along with other Species, mention the names of the latter here:—"The specimen was found by me on Tuesday, 21st April 1908, lying on a walk dead. It

was quite warm and had apparently died from natural causes." The bird was forwarded to Mr. Macleay, Inverness, for preservation.

Destination of Specimen.—In collection of the recorder, Frank J. Pullar, Ellend House, Bridge of Allan.

Recorded in "Annals Scot. Nat. Hist." July 1908.

FOOTNOTE.—"Remarks" may consist of further Field Dissection or Cabinet Notes of Recorder.[1]

[1] These Manifold Books, containing 50 leaves Thick Cream Paper, Printed, and 50 leaves Manifold Paper in each, forwarded to any address upon receipt of remittance of 1s. 3d. for each book; or Pads containing 24 leaves each, all Thick Cream Paper, Printed, 6d. each.—A. MEGSON & SONS, Manufacturing Stationers, Bank Street, Leeds.

ON THE ORIGIN OF THE PRESENT COLONY OF SCOTTISH GREATER SPOTTED WOODPECKERS.

By WILLIAM EVANS, F.R.S.E.

NOW that the Greater Spotted Woodpecker has become thoroughly established as a breeding species in the southern half of Scotland, the interesting question arises, Is it to England or to Scandinavia that we owe our present native stock? In other words, Have we here an instance of English birds extending their breeding range northwards into Scotland, or of Scandinavian visitants settling down in their winter quarters? To me the former of these alternatives seems the more likely, and I believe I have found substantial evidence in support of it.

Dr. Ernst Hartert has shown ("Novitates Zoologicae," December 1900) that the English bird is smaller, and has a more slender bill than the typical *Dendrocopus major* inhabiting Scandinavia and other parts of Northern Europe, and he has consequently described the former as a subspecies under the name of *Dendrocopus major anglicus*. "Its wing," he states, "is considerably shorter, the whole bird smaller, the bill much slenderer, and the underside, as a rule, much more brownish buff." The wings (carpel joint to tip) of English males before him measured 128, 129, 131, 132 mm.; those of females 128, 130, 131 mm. The wing measurement of *D. major major* he gives as 143-145 mm. in

Sweden, and 138-142 mm. in East Prussia; the bill being very thick, blunt, and comparatively short; underside "white, slightly tinged with buff in freshly moulted plumage, and frequently stained." The real points of difference are the wing measurement and the shape of the bill, the colour of the under parts not being constant.

Did, then, the material exist, *i.e.* had we a sufficient series of specimens obtained in Scotland in the breeding season, there would apparently be no difficulty in deciding whether our birds are of English or of Scandinavian origin. But the Woodpecker is a protected bird in this country, and very properly so, and I should be the last to do or say anything that might lead to the destruction of a single pair. It so happens, however, that three breeding birds recently killed in the south-east of Scotland have come under my notice, and, having made a careful examination of them, I find all are clearly referable to the English race. The particulars are briefly these: A beautiful, and—as would appear from the condition of the reproductive organs—breeding male, killed near Ormiston, East Lothian, on 18th May last, has a short wing (5.1 inches = 130 mm.) and the comparatively slender bill of *D. m. anglicus*; and though the under parts are whiter than usual and there is a narrow red pectoral band, Dr. Hartert, who has seen the specimen, says it is undoubtedly one of the English race (*in lit.* 11 vi. '08). To this race also belong a male and a female shot at their nest, in which were four well-fledged young, a few miles from Haddington, on 18th and 16th June 1903, respectively. They differ from the Ormiston bird only in wanting the pectoral band and being more buffy below. In both the wing measurement is little more than five inches. I examined this pair and their brood a few days after they were killed, and had a good look at them again a couple of months ago.

The May 1908 bird is of further interest on account of the well-defined pectoral band to which reference has been made, no such specimen having, so far as I know, been previously recorded from the British Isles. Dr. Hartert, however, tells me he has examined several in Germany, including the specimen erroneously referred by Altum to the

Algerian form (*D. m. numidus*) in which a red breast-crescent is normally present.

Besides the examples mentioned above, I have seen an adult female also assignable to the English race (wing 132 mm.), which was killed in December 1907, in a wood a few miles from Dunbar, where the species is known to breed.

Another adult female, shot in the west of Berwickshire about the beginning of March 1906, is a larger bird, with a stouter bill and a longer wing (144 mm. = 5.6 inches.) Dr. Hartert, to whom I have shown the specimen, pronounces it to be a "most typical Swedish bird," and I take it, therefore, to have been a winter visitor from Scandinavia. So, doubtless, were also two specimens in the Perth Museum, of which Mr. A. M. Rodger has kindly given me the following particulars:—Ad. ♂, Dron, 12th October 1891, wing $5\frac{5}{8}$ inches. ♂ ?, imt., near Arbroath, 12th November 1892, wing also $5\frac{5}{8}$ inches.

The Greater Spotted Woodpecker is now, as has been said, thoroughly established as a breeding species in south-east Scotland. Since 1887, when the first brood was detected in Duns Castle woods, many instances of its nesting there and in other parts of the country have been observed. I have myself seen several occupied nesting-holes in the Tweed and Forth areas, and at the present time I am aware of six localities in East-Lothian and three in Mid-Lothian in which it breeds.

A LIST OF SCOTTISH HERONRIES, PAST AND PRESENT.

By Hugh Boyd Watt, M.B.O.U.

Introduction.

The annexed list is based upon material which has been collected by the writer towards a history of Scottish Heronries. The list is compiled upon inclusive principles; places where only one or two nests have been recorded are taken into count, but no locality is given without

authority, either from published works or upon personal knowledge. The publications mostly drawn upon are the two "Statistical Accounts of Scotland" (1791-7 and 1845); the various volumes of the "Vertebrate Fauna of Scotland" by Mr. J. A. Harvie-Brown and other writers; local avifaunas and histories; Transactions and Proceedings of learned societies; and Mr. J. E. Harting's "British Heronries" in the "Zoologist" (1872, p. 3261). The number of Scottish Heronries given by Mr. Harting is under fifty, including some extinct. More particular knowledge and information enable over 230 places to be now named, but it would be erroneous to assume that this means an increase in the number of nesting birds. All evidence is to the contrary, but it may be some gratification to know that, so far as can be judged, the Heron is at the present time as generally distributed throughout Scotland as it has ever been, even although no large or populous Heronries now exist. I do not know that anything can now be seen in Scotland similar to what is reported of Shaw on the Dryffe at the end of the eighteenth century, where it is said of the Heron, "some hundreds are bred yearly" ("Statistical Account," 1795, xii. p. 580).

The present communication is advisedly restricted to an unannotated list, but a brief analysis of the "Clyde" section may be instructive as showing the recent *status* there, and indicating what probably prevails in the other areas. There are 51 nesting-places named in "Clyde," of which 29 were unoccupied and 4 doubtful in the year 1899. Of the 18 places remaining, 12 contained 6 nests or more, the largest number in one place being 35,[1] and the aggregate number of nests in the whole area was approximately 230.

In the list the * indicates that the heronry is not now in existence, but undoubtedly some other places, the names of which are not thus marked, are not occupied at present. Definite information is awanting as to their *status*, and would be gladly received by the writer.

[1] During a visit to this place in August 1908 I was informed that there are now 50 to 60 nests.

LIST, UNDER FAUNAL AREAS.

SHETLAND.

"One place" (Saxby).

ORKNEY.

Black Craig, Stromness.
Glimpsholm.
Hoy.
Lyre-geö (Heron-geö).
Rothisholm, Stronsay.
Sandwick.

PENTLAND.

Clett, Holborn Head.
Combe Island, Bettyshill.
Ord of Caithness.
Syre (near), on the Naver.

MORAY.

Altyre, Findhorn.
Alvah, Montcoffer Woods.
Carnacnuic, Abernethy.
Cromarty, Bay of.
Darnaway.
Drumin, on the Avon.
Fiag Burn.
Findhorn.
Glen Affric.
Glen Garry.
Glen Moriston.
Golspie (south of).
Gordonbush.
Kirkmichael, Glen Avon.
Kennethmont (Leith Hall).
Loch Alsh.
*Loch Brora.
Loch Knockie.
Loch Mhuilinn, Glenstrathfarrar.
Loch Shin.
Loubcroy, River Okyel.
Moy.
Netherdale (Log Wood).
Skibo.
Skuggan Bridge, Carr Bridge.
Swordale.
Tomatin.
Tomdoun.
Tomvaich.
Turriff (Hatton).

DEE.

Blackhall, Banchory.
Edinglassie, Strathdon.
Haddo House.
*Gight.
Parkhill, Aberdeen.
*Scoltie Hill, Banchory.

TAY.

Airdrie Wood, Crail.
Arbuthnot.
Blair Castle.
*Clunie Castle.
Earlshall.
Feteresso.
Hill of Tulloch, Atholl.
Inglesmaldie, Fettercairn.
King's Seat, Dunkeld.
*Kinnaird Castle.
*Lochaine, Glentilt.
Loch Iobhair, Glen Dochart.
Loch Luydon, Rannoch.
*Longforgan (Castle Huntly).
Monteathmont Moor.
Monzie (?).
Strathearn.
Strowan, Comrie.
*Taymouth.

Forth.

Alloa Woods.
Blair Drummond.
Binning Wood.
Callander, Falkirk.
*Cambusmore.
Dalkeith Palace.
Dollar.
Donibristle.
Dunglass Dean, Cockburnspath.
*Dunipace.
*Dunmore.
*Gargunnock (Micklewood).
Gartmorn Dam.
Loch Chon.
Loch Leven.
Menteith, Lake of.
Old Polmaise.
Saltheugh, Cockburnspath.
Siccar Point, ,,
Tulliallan Castle.
Yester.

Tweed.

Buncle.
Calroust, Swindon.
Cardrona.
Castle Wood, Duns.
Circle Plantation, Westruther.
Clarabad Dam, Paxton.
*Dawick.
Dodburn, Allan Water.
Duns Castle.
Foulden.
Hendersyde Park, Kelso.
Lithtillum Loch, Eccles.
Marchmont, Polwarth.
March Wood, Longformacus.
Mertoun House.
Minto.
Mount Teviot.
Nesbit, Edrom.
Ormiston House, Teviotdale.
Paxton.
Pennilheugh House.
Pistol Plantation, Whitsome.
*Portmore Loch.
*Swindon, Bowmount Water.
The Haining, Selkirk.
The Hirsel, Coldstream.
Thirlestane Castle, Ettrick.
Thirlestane Castle, Lauder (two places).
Tweedsmuir.
Wells House, Rule Water.

Outer Hebrides.

Lewis, west side.
North Uist.

North-West Highlands and Skye.

Applecross.
Dundonell.
Fionn Loch.
Gairloch.
Glen Elchaig.
Killilan.
Knoydart.
Loch Awe, Assynt.
Loch Bad a' Ghaill, Coigeach.
Loch Beannoch, Stoir.
*Loch Cama, Assynt.
Loch Hourn.
Loch Lory.
Loch Torridon (outer).
Loch-na-clash-fearn, Edderachyllis.
Raasay.
Shieldaig Island, Loch Torridon.
Skye:—
Dalville Wood, Armadale.
Dunvegan.
Kyleakin.

Argyll and the Inner Hebrides.

Ardimersy, Islay.
Ardnamurchan.
Ards, Mull.
Arinagour, Coll.
Arisaig.
Benderloch.
*Burgh or Gribun Cliffs, Mull.
Earraid, Mull.
Eigg, west side.
Glen Finnan, Loch Shiel.
Glenmore, Oban.
Inverlussa, Jura.
Kinlochmoidart.
Kintarbet.
Largie Castle, Kintyre (?).
Loch a Bhaillidh, Blackwater.
Loch Doire a Gherrain, Ardnish.
Loch Guirm, Islay.
Loch Scridain.
Loch Shiel, head of.
Loch Sunart, south shore and on island.
Loch Swen.
Loch Ternate, Morven.
Morar.
Morven. (? additional to Loch Ternate.)
Pennyghael House.
Ulva House.

Clyde.

Ardgartan, Loch Long.
Ardgowan, Inverkip.
*Balglass.
Ballimore, Loch Fyne.
Brodick Castle, Arran.
Buchanan Castle.
Bute, North.
*Caldwell House.
*Caprington.
Castle Semple.
*Corbeth.
*Craigallian.
*Craigengillan.
*Craigie, Kilmarnock.
Crawford (two places).
*Doonside.
Douglas Castle.
Eglinton Castle.
Erskine.
*Forrestfield.
Fullarton, Troon.
*Gartshore, Kirkintilloch.
*Gilkerscleuch, Crawfordjohn.
*Girvan Water.
*Glenapp.
*Glenfruin.
*Glespin Wood, Douglas.
Hafton, Holy Loch (?).
*Hamilton.
*Holy Island, Arran.
Houston House (?).
*Inchinnan.
Inverary.
Johnstone Castle (?).
Kelburn Castle, Fairlie.
*Kennox, Stewarton.
*Kilkerran.
*Killearn.
*Kilmory.
*Kilmun.
Kintyre, Mull of (?).
*Lanfine, Newmilns.
*Loch Fergus (Loch Martnaham).
Loch Goil (two places).
*Loch Lomond, Inch Connachan, and Elan-a-Vow.
*Massan Bridge, Holy Loch.
*Monkcastle.
Mount Stuart, Bute.
Rosneath.
Saddle, Kintyre.

SOLWAY.

Brunt Fir Wood, Dumfries.
Castle Kennedy, Stranraer.
Castlemilk, Lockerbie.
Compton, Kirkcudbrightshire.
Craigmuie, Glencairn.
Dalry, Kirkcudbrightshire.
Dalswinton.
Dumcrieff, Moffat.
Haleaths, Lochmaben.
Jardine Hall.
Langholm.
*Loch Goosey.
Monaive, Dalwhat Water.
St. Mary's Isle.
Shaw, Dryfe Water.
Shaws, River Nith (?).
Southwick.
White Loch of Myrton.

3 WILLOW MANSIONS, WEST HAMPSTEAD,
LONDON, N.W.

A HUMP-BACKED TROUT FROM STRANRAER.

By JAMES RITCHIE, M.A., B.Sc.

PLATE IV.

THAT the normal structures of fishes are frequently departed from is a fact not unfamiliar to the angler and to the casual observer of a fish-market's supplies. The more noticeable of those deviations, such as come under the general description of "malformations," fall into two groups according to the manner in which they have arisen. Some are plainly due to the action of environment, to disturbance by some external factor of the regular growth of the fish. Take, for instance, a case recorded by Barrington in 1768,[1] of certain Welsh trout which possessed a vertebral column markedly crooked near the tail. These trout were found in the river Eynion in Cardiganshire, and in that river "only in a small bason of perhaps eight or nine feet deep, which the river Eynion forms after a fall from the rocks." It seems highly probable that the crooked tails were in some way due to the falling water, to injuries caused either by débris dashed into the pool, or by rock-fragments set in motion by swirling eddies. It is seldom, however, that effect can be so aptly linked with cause.

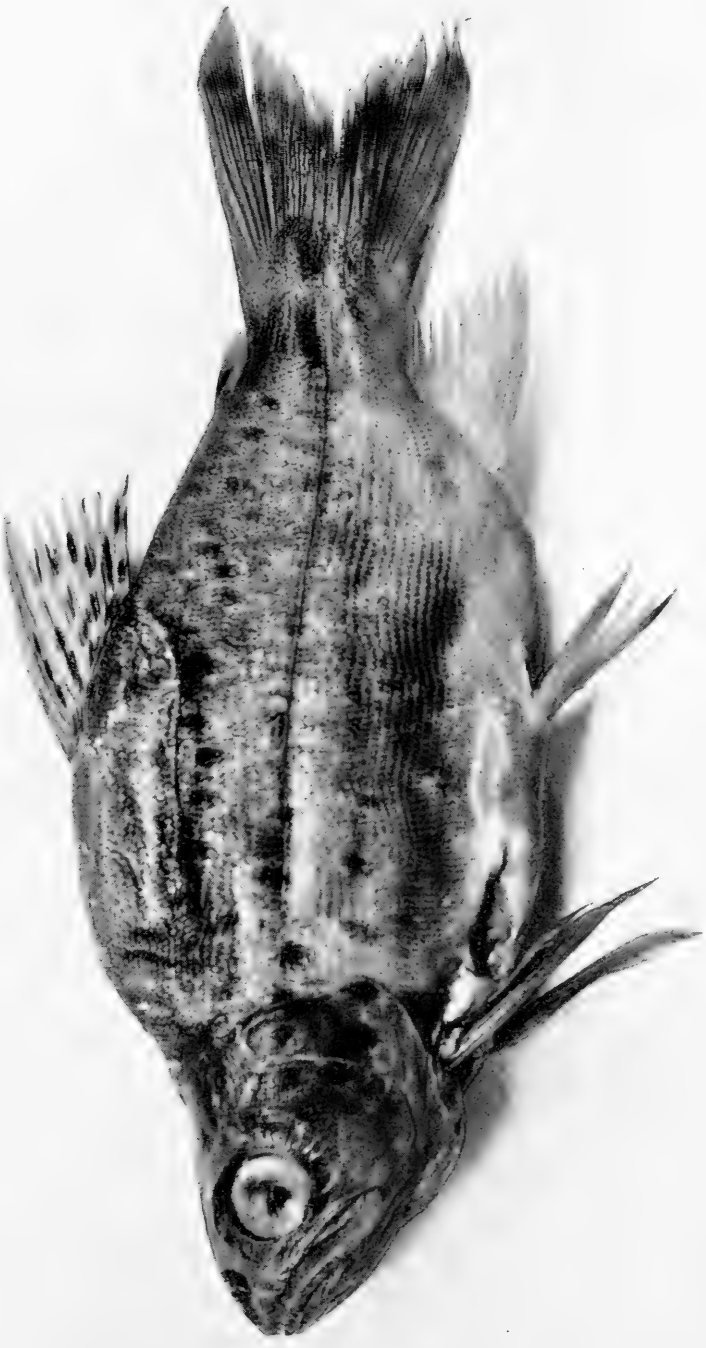
[1] "A Letter to Dr. William Watson, F.R.S., from the Hon. Daines Barrington, F.R.S., on some particular Fish found in Wales."—"Phil. Trans.," vol. lvii. p. 204, London, 1768.

On the other hand there are malformations whose origin we cannot trace. They seem to develop so naturally that they are said to have been preordained from the very egg. Such are "congenital variations," and to this group the case which forms the subject of the present notice appears to me to belong.

The specimen was caught in the neighbourhood of Stranraer, Wigtownshire, in July 1908, and was presented to the Royal Scottish Museum by Dr. C. McNeill. It is a common trout (*Salmo fario*, Linn.), small in size, and differing from a normal specimen in possessing a short thick-set body, with a depth much greater than fair proportion would allow. To this disproportionate depth and to a consequent bulging of the contour behind the head is due the hump-backed, perch-like appearance of the specimen. The following measurements give some idea of the more important dimensions :—total length (tip of snout to centre of tail), 120 mm. ; length of body (tip of snout to base of tail), 112 mm. ; length of head, 35 mm. ; breadth of body in front of dorsal and ventral fins, 46 mm. ; distance between base of adipose fin and base of tail, 9 mm. But a better notion of the significance of those numbers will be obtained by comparing the proportions with those of average specimens. Thus, while Day[1] gives the total length of the body as from $4\frac{1}{2}$ to $4\frac{3}{4}$ times that of the head, in our specimen the numerical relation is only $3\frac{1}{2}$. And whereas, according to the same author, the length of body ought to vary between $4\frac{1}{2}$ to 5 times the breadth, our proportion is $2\frac{3}{5}$. A glance at the specimen shows further that the head and fins are in fair proportion, and that they are of a size suited to a longer individual. It would appear, then, that the disproportions are due to an actual shortening of the body.

This conclusion was confirmed on dissection, for, the vertebral column having been exposed, it became clear that in it lay the apparent cause of malformation. Instead of the usual number of from 56 to 60 vertebræ only 40 could be distinguished. And yet the full complement of neural spines was present, and agreeing with them were equivalent

[1] F. Day, "Fishes of Great Britain and Ireland," vol. ii. p. 101. London, 1880-1884.



HUMP-BACKED TROUT FROM STRANRAER (SLIGHTLY OVER NATURAL SIZE)

numbers of hæmal arches in the caudal, and ribs in the abdominal regions. For convenience, lest the use of the term "centrum" should be misleading in so abnormal a specimen, I shall call that portion of the backbone between two divisions or nodes an internode. Further, since there is meristic agreement between the dorsal neural spines and the ventral spines and ribs, I shall refer simply to the former, it being understood that such remarks, so far as numbers and position are concerned, apply equally to the ventral elements.

Since, then, neural spines are more numerous than internodes, it must happen that in many cases crowding of the spines has taken place; and, indeed, the bases of as many as three sometimes rest on a single internode. The distribution of the spines on the internodes is as follows:— Reckoning from the anterior end of the vertebral column the nodes which are normal vertebræ, bearing each a single spine, are 1 to 4, 6, 7, 9 to 12, 14 to 17, 21, 24, 26, 28, 29, 31, 33, 36 to 40. Of the remainder, two spines are borne by 5, 8, 13, 18, 19, 20, 23, 25, 32 and 34; three spines by 22, 27, 30, and 35. The normal vertebræ call for no remark. The other internodes, those on which two or more neural spines are borne, are characterised in general by being slightly longer than normal internodes. They show no trace of segmentation, but, on the larger, hints of lateral projections occur, corresponding in number and position with the neural spines, and marking the places to which the muscles were attached.

It is also worthy of note that the muscle segments correspond with the neural processes, with which also the spinal nerves agree. The segmentation of the body, then, is normal. The fin-rays too fall within the limits of variation recorded for the species, for the dorsal possesses 13 rays (12-15),[1] the pectorals 15 (13-15), the ventrals 9 (9), the anal 10 (10-12), and the caudal 19 (19). So that abnormality occurs in the vertebral column and there only.

It is difficult to account for the origin of such abnormality. In the only paper which I have seen referring to a similar

[1] The numbers in brackets show the variability in fin-rays as given by Day, *l.c.*

case,[1] the author simply states that in his example there occurred "an extreme abrogation of the spinal column, resulting from the coalescence of numerous vertebral 'centra.'" His idea of the mode in which the coalescence took place is developed in another sentence, where he states that the "sixteenth and seventeenth [vertebræ] are likewise anchylosed." Dr. Cobbold apparently regarded ankylosis, or the pathological adhesion of the ends of the centra, as the cause of the abnormal internodes. And as such—as the result, say, of inflammation—the malformation must be regarded simply as an accident in the development of the individual, in other words as an environmental variation.

But this view is untenable, for not only are no traces of morbid secretions of ankylosing bone observable, but there is no reason to suppose that the abnormal internodes were ever separate bodies, for certainly they show no traces of any pre-existing segmentation. It would, however, be impossible in the course of this short notice to discuss the probable causes of the aberrancies. It will suffice to state that "centra [the arch-centra of bony fishes] are absolutely and directly dependent upon the existence of arcualia, and the cartilage of these arcualia themselves is produced by and in the skeletogenous layer,"[2] and that it was in those earlier parts which foreshadowed the existence of centra, and not in the centra as fully developed, that the derangement occurred. Further, since the full complement of neural arches is present, the full complement of arcualia may be assumed. Therefore the possibilities seem to range themselves round these alternatives :—(1) That certain of the arcualia did not give rise to the usual skeletogenous tissue within which the ossification of the centra proceeds, and that, therefore, certain of the potential centra never actually existed; that is to say, each of the abnormal internodes in the vertebral column of our specimen is a true centrum to which one or two neural arches, properly belonging

[1] T. S. Cobbold, 'Description of a Malformed Trout, with Preliminary Remarks,' "Edin. New Phil. Journ.," vol. lxxiii., pp. 238-242, and plate. Edinburgh, 1855.

[2] H. Gadow and E. C. Abbot, 'On the Evolution of the Vertebral Column of Fishes,' "Phil. Trans. B.," vol. clxxxvi., 1895, p. 190. London, 1896.

to missing centra, have become attached. The deficiency in the internodes would in this case be due to the actual absence of centra. (2) The alternative is that—the skeletogenous tissue of the future centra having been completely formed—a compression in certain regions took place succeeded by continuous ossification, uninterrupted by nodes. Such an interpretation would mean that in the Stranraer specimen, the abnormal internodes contain the elements of as many centra as they bear neural spines, but that those elements had not the opportunity of developing into separate centra. In the case of either of these alternatives it seems likely that the origin of the malformation lay deeper than environment, that it must be referred back to congenital variation.

Natural History Department,
The Royal Scottish Museum, Edinburgh.

NOTES ON NUDIBRANCHIATE MOLLUSCS.

By Richard Elmhirst, F.L.S.,
Superintendent of the Marine Biological Station, Millport.

The following notes contain some records of new localities in the distribution of Nudibranchs in the Clyde sea area, and two species, *Doto pinnatifida* and *Lamellidoris luteocincta*, new to the Clyde list as given in the "Fauna, Flora, and Geology of the Clyde Area," 1901; also some observed times of spawning.

The following abbreviations are used :—sp. = spawn found under natural conditions; sp. cap. = spawned in captivity.

Eolis papillosa (L.), sp.—Feb. to May.

Cuthona nana (A. and H.).—Kyles of Bute. Mating and sp. cap. —Sept.

Eolis olivacea (A. and H.).—Off Keppel Pier, Cumbrae.

Tergipes despectus (Johnst.).—Near the Marine Station.

Embletonia pulchra (A. and H.).—One specimen dredged off the station had none of the usual red colour, but was marked with the normal opaque white spots. The cerata were unusually large.

Coryphella rufibranchialis (Johnst.), sp. cap.—May.

C. lineata (Lov.), sp. cap.—June. This species is usually found attached to Hydroids by its tail in an erect position. A case of supposed mimicry common among Eolids.

C. Landsburgi (A. and H.), sp. cap.—June.

Lomanotus genei (Vér).—This species is recorded from Lamlash Bay in the "Fauna and Flora of the Clyde Area." In 1905 Mr. E. S. Russell took one specimen nearly 2 inches long near this station. I have taken two small specimens in 18 fathoms off the Farland Point, Cumbrae, which I think should be assigned to this species.

Doto pinnatifida (Mont.).—One specimen dredged in June 1907 off the station.

Doto fragilis (Forb.) and *coronata* (Gmel.), sp.—Among Hydroids throughout the year.

Tritonia Hombergi (Cuv.).—Skelmorlie Bank (E. S. Russell).

Archidoris tuberculata (Cuv.), sp.—Jan. to Mar.

Acanthodoris pilosa (Müll.), sp.—Oct.; sp. cap.—Feb.

Lamellidoris aspera (A. and H.), sp.—Jan. to Mar., often on Laminaria.

Lamellidoris luteocincta (M. Sars).—First taken in the Clyde in Feb. 1907, when several specimens occurred in each of two hauls of the dredge just off Keppel Pier, Cumbrae, on hard ground in 15 fathoms. One of these lived in the tanks until May. This species is figured by Farran as *Doris Beaumonti* in the "Irish Fisheries Ann. Rep.," 1901-2.

Lamellidoris bilamellata (L.).—During Feb. to May this species occurred abundantly on the piles of Millport Pier. Its spawn was also very abundant. The colour varied greatly, one white specimen being found, others were nearly white, being slightly shaded with the normal brown colour. They seem to feed on Alcyonidium and in turn are fed on by *Portunus puber*. Sp. cap.—Feb. and Mar.

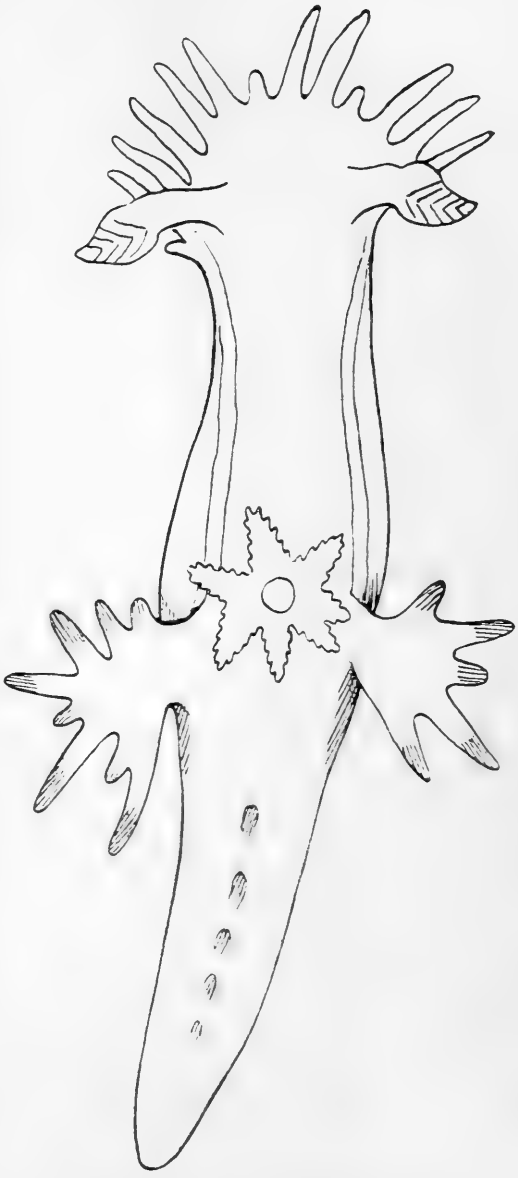
Goniodoris nodosa (Mont.), sp.—Jan.

Polycera quadrilineata (Müll.).—This species occurs frequently round the Cumbraes and is subject to considerable variation in colour and the form of the external parts. Taking as the normal form that figured by Alder and Hancock in their monograph of the "British Nudibranchiate Mollusca," we find that the greatest variation occurs in the number and size of the velar processes and in the shape of the pair of dorsal papillæ or cerata.

The latter have a tendency to develop into epipodial flaps like those of Ancula, and at the same time there appears a tendency to have the normal trace of an epipodial ridge very marked (see Herdman, "Fauna of Liverpool Bay," Report III. p. 133).

The extent to which these variations may occur can be seen in the following description of a specimen dredged in about 20 fathoms near the Farland Pt. during Oct. 1906 (see fig.):—

Length 18 mm., a rather pale-coloured specimen. *Velar processes* 3 on right side, followed by a very small one which was hardly more than a tubercle, then 2 long ones, 1 short one and 5 long ones and a tubercle on the left; *i.e.* 10 well-developed, slightly contractile, yellow-tipped processes of normal size, and 3 uncoloured small ones (see Garstang, "Journal M.B.A.," vol. i. new series, p. 455). *Rhinophores* short and thick with a few closely set laminæ, yellow tipped. *Branchiæ* 7 small, tipped with yellow among which was a little black pigment. *Cerata* large, palmate, consisting of 5 or 6 yellow-tipped lobes. *Coloured tubercles* absent, except the median dorsal row posterior to the branchiæ. *Eyes* very indistinct; the left anterior angle of the foot coloured yellow, the right being white.



P. QUADRILINEATA, SHOWING VARIATION IN THE CERATA AND VELAR PROCESSES.

This specimen, which was healthy and active, lived and spawned in captivity for nearly two months; the spawn was destroyed by Infusorians.

Two days later we dredged three more specimens of *P. quadrilineata* in the same locality. The first was quite a normal

form with a little black pigment on the rhinophores and branchiæ. The second had a small tubercle on both the cerata and one extra velar process. While in the third the cerata were situated almost behind the branchiæ and were joined at their base. A specimen taken a week later had a large amount of black pigment on the body; the tubercles coloured bright orange as in Triopa and the branchiæ almost black, tipped with pale lemon. One of the cerata bore two small processes. After noticing these variations I examined all the Polyceras we found; out of 26 examined 17 had yellow and black pigment on the angles of the foot and rhinophores, the others having only yellow pigment, except one which had no pigment. The branchiæ varied in number from 5 to 9, 7 being the usual number; in 8 the cerata were branched or bore small processes, in 10 the cerata differed from each other in size or shape; the velar processes varied from 4 to 11, 4, the normal number, occurring 19 times; the tubercles varied in size, number, and colour.

In June 1907 several specimens taken near Farland Point were very pale, had few coloured tubercles, cerata developed into slightly branched flaps and several extra velar processes.

From specimens examined at Plymouth and Millport, I think specimens from the laminarian waters show least variation, this being their typical habitat. Sp.—Sep. on Laminaria.

I am indebted to Mr. Wm. Smith for the excellent figure of the variant form described above.

ON THE SCOTTISH SPECIES OF *OXYURA* (*PROCTOTRYPIDÆ*).—PART III.

By P. Cameron.

(*Continued from p.* 161, *No.* 63, *July* 1907.)

Proctotrypinæ

The British species of *Proctotrypinæ* were monographed by A. H. Haliday in a small pamphlet published in London in 1839, under the title "Hymenoptera Britannica Oxyura," fasc. i., 15 species being recorded from Britain including 2 from the neighbourhood of Edinburgh, namely, *P. longicornis*, p. 9, and *fuscipes*, p. 13, neither of which have been identified by Dr. Kieffer among my specimens.

The species are parasitic on fungus-feeding coleopterous and dipterous larvæ.

Marshall records in his Catalogue of *Oxyura* published by the Entomological Society of London in 1873, 15 species of *Proctotrypes*, 1 of *Disogmus*, and 1 of *Codrus*. As will be seen Dr. Kieffer employs three additional generic names, namely *Exallonyx*, K., *Cryptoserphus*, K., and *Serphus*, Schr.

CODRUS, Jur.

1. *apterogynus*, Hal., Clydeside at Cambuslang, 1 example.
2. **bethyliformis*, K., Inverness-shire, 1 example.

PROCTOTRUPES, Latr.

1. *calcar*, Hal., Kingussie, Glen Morriston, Inverness-shire.
2. *viator*, Hal., Rannoch; Cadder Wilderness, near Glasgow.
3. *pallipes*, Hal., Rannoch, near Dumfries.

SERPHUS, Schr.

1. *gravidator*, Lin., Possil Marsh, near Glasgow, 1 black specimen. The type form has been taken by Mr. C. G. Champion at Tilgate, Sussex.

   *var., *petiolaris*, K., Clyde at Newton; Thornhill, Dumfriesshire.

   S. bicolor, Hal., has been taken by Mr. C. G. Champion at Deal, and *S. brevipennis*, Latr., at Cobham.

EXALLONYX, K.

1. *lignatus*, Nees, Kilsyth. Also taken at Caterham by Mr. C. G. Champion.
2. *niger*, Nees, Clydesdale.
3. **leviventus*, K., Craigton Wood, Dumbartonshire.

CRYPTOSERPHUS, K.

1. *laricis*, Hal., Rannoch; Kenmuir, near Glasgow; Kelvinside, near Glasgow; Cadder Wilderness; Bonar Bridge, Sutherlandshire.

DISOGMUS, Foer.

1. **nigricornis*, K., Manuel. I have two English specimens of this named by the late Mr. Francis Walker "*areolator*, Hal."

In addition to the above recorded species I have over 100 specimens of *Proctotrupes*, *Serphus*, and *Exallonyx*

which are returned by Dr. Kieffer without names, and which are reserved for a supplementary paper as soon as I can get leisure to examine them with the aid of Dr. Kieffer's monograph. Among them is an example named by the Rev. T. A. Marshall, *P. longicornis*, Hal., from Cadder Wilderness, and which certainly agrees with Haliday's description. As will be noticed, *l.c. supra*, Haliday records this species from Edinburgh. The species new to the British Fauna are marked *. With *P. fuscipes* and *P. longicornis*, recorded by Haliday from the Edinburgh District, this makes a total of 13 Scottish species, of which 3 species and 1 named variety are additions to the British Fauna.

Addendum to CERAPHRONINÆ, *ante*, p. 159, July 1907.

To LAGYNODES add :—

4. *furcifer*, Marsh.

Triogmus furcifer, Marshall, "Ent. Annual," 1874, p. 134.

Lagynodes furcifer, Kieffer, "Ann. d. l. Soc. Scientifique de Bruxelles," xxx. (2) 148. Cadder Wilderness, one male.

Kieffer is probably correct in suppressing Marshall's genus *Triogmus*; certainly the presence of 3 short spines on the metathorax can hardly be regarded, as Kieffer properly points out, *l.c.*, as a point of generic distinction. My specimen is a male, as was also Marshall's type, from North Devon. The species would, therefore, appear to have a wide distribution in Britain.

Microps, Halid., and *Hadroceras*, Foer., are other generic synonyms of *Lagynodes*.

ON THE BRITISH PLANT LISTS AND THEIR DISCREPANCIES.

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

THREE lists of British Plants have recently been issued, and in your kindly review you alluded to some discrepancies to be found in them. On the whole there is more agreement between the "London Catalogue" and my "List," than might have been expected considering they were approached from different standards of nomenclature. In order to save space

I will first treat of the British Museum Catalogue, published under the title "List of British Seed-Plants and Ferns," by Rendle and Britten in 1907.

In this list the Vienna rules of nomenclature are said to be followed, but there is some lack of consistency since *Alsine* is used instead of *Spergularia*, which is one of the *nomina conservanda*; so too are *Corynephorus* (*Weingærtneria* is used in the List), *Erophila* (the Whitlow grass is called *Draba* in the List), *Calystegia* (*Convolvulus* in the List), and *Cirsium* (*Carduus* in the List).

In the preface we are told that the "extensive consultation of botanical literature, which could only be possible in a library such as that possessed by the Department of Botany" led to some "corrected citations" and "a few alterations in spelling, *e.g. Teesdalea*," but although the references are in most cases extremely accurate, they are only given for the specific names and not for the orders or genera. The authorities given for the genera are very inaccurate, some indeed being pre-Linnean, and a large number are attributed to Miller instead of Hill. Even the corrected spelling *Teesdalea* is given up by Mr. Britten in the same year ("Journ. Bot.," p. 445). The limitation of genera and species follows, we are told, the last edition of Babington's "Manual"; but there are many inconsistencies —*e.g. Atriplex erecta*, Huds., is given full specific rank in the "Manual," but is omitted in the List (a footnote by the editors, Messrs. Groves, says, species 1 and 2 are usually included under *patula*), while *Rumex maximus* is given full rank although Babington says "perhaps not distinct" from *Hydrolapatheum*. *Viola calcarea* is accorded full rank; in the "Manual" it is given as a variety, while *Rosa hibernica* (*R. involuta*, also a hybrid, is given), *Betula intermedia*, *Saxifraga elegans*, *S. hirsuta*, *Poa laxa*, *P. Balfouri*, *P. Parnellii*, *Potamogeton Griffithii*, *P. decipiens*, *P. longifolius*, and *Zannichellia polycarpa*, which are full species in the "Manual," find no place in the List. In many cases the "Manual" is too blindly followed with curious results, since some recent additions to our flora, *e.g. Fumaria occidentalis*, *F. purpurea*, and *Schlerochloa festuciformis* (which are not in the "Manual"), and *Ranunculus confusus*, *R. penicillatus*, *R. lutarius*, *R. scoticus*, *Thlaspi*

virens, *Ballota ruderalis*, *Pyrus rupicola*, *Tragopogon minor*, *Stellaria neglecta*, *Silene dubia*, *Juncus nigritellus*, *Agrostis nigra*, etc., have full specific rank; but other plants with as strong or stronger claim to specific rank are omitted, *e.g.* *Fumaria Boraei*, *Polygala austriaca*, *Viola lactea*, *Prunus insititia*, *Pyrus minima*, *Cratægus oxyacanthoides*, *Potentilla procumbens*, *Quercus sessilis*, *Valeriana sambucifolia*, *Zannichellia maritima*, *Carex Pairæi*, *Bromus interruptus*, *Deschampsia alpina*, *Lastrea uliginosa* (*L. remota*, also supposed to be a hybrid, is given), etc.

The view (in the preface we are told that naturalised plants are printed in italics) of Mr. Britten respecting the indigenity of certain plants is very remarkable, and so far as I know unique since, I believe for the first time, plants such as *Barbarea verna*, *B. intermedia*, *Melilotus Petitpierreana* (better known as *arvensis*, and unfortunately again changed by Mr. Britten ("Journ. Bot., *l.c.*) to *M. officinalis*), *Coronilla varia*, *Poterium polygamum*, *Pyrus communis* (*P. cordata*, which has more claims to indigenity, is omitted), *Galium spurium*, *Mentha spicata*, *Silybum Marianum*, *Echium plantagineum*, *Urtica pilulifera*, *Populus alba*, *P. canescens*, *P. nigra* (the commoner *P. deltoides*, var. *serotina*, is omitted), *Naias graminea*, *Allium carinatum*, *Digitaria linearis*, *Avena strigosa*, *Serrafalcus arvensis* and *S. secalinus*, and *Lolium temulentum* are given as native species. On the contrary *Tilia platyphyllos*, which is almost certainly native by the Wye, is italicised. Mr. Britten also admits as British plants *Ophioglossum lusitanicum* (although the Irish plant has been shown to be only a form of *O. vulgatum*), *Statice Armeria*, *Carex vitilis*, *Rumex aquaticus*, and *Triticum acutum*, DC., although there appears to be no satisfactory evidence for their occurrence in Britain. On the other hand a Benthamic and Babingtonian species *Ononis reclinata*, which is certainly native on the Devon coast, is unaccountably omitted.

Among other numerous omissions, even as italicised species, may be instanced *Brassica Cheiranthus*, *Lonicera Caprifolium*, *L. Xylosteum* (the latter said to be native in Sussex), *Astrantia major*, *Carum Carvi* (said to be native in Hereford, etc.), *C. Petroselinum* (Benth. and Hook., absolutely

naturalised in Cornwall and elsewhere), *Campanula Rapunculoides*, *Pulmonaria officinalis* (native or naturalised in Essex and Oxon), *Euphorbia Cyparissias* (thought by Babington to be native at Whitbarrow, while *E. dulcis* is included), *Pinus Pinaster*, etc.

Rosa villosa, L., is given in the Vienna rules as an instance of a specific name which has been used in such varying ways as to be doubtfully applicable to any one species (I do not, however, entirely concur in this); it is however retained in the "Seed-Plant List."

To come to the two more recent lists, namely my own "List of British Plants," published in January, and the tenth edition of the "London Catalogue," issued in February of this year under the editorship of the Rev. E. S. Marshall and Mr. W. A. Clarke, one may acknowledge the existence of some important differences, the first being that I have endeavoured to follow the law of priority of publication, and to reject the Vienna list of *nomina conservanda*, when the name does not follow that law. I have explained this more fully in the preface, and it is a plan which is adopted by a large and increasingly influential number of botanists. The second point of difference is that while I have included a great number of aliens, often quite of a fugitive character, the "London Catalogue" professes to include those only which are more or less established. There is much to be said for and against either method. This is not the time for me to make a special plea for my own plan. I may say, however, that I first intended to keep the indigenous and introduced plants in separate parts, but the difficulties that arose were considerable, and I thought a truer idea of Systematic Botany would be obtained by keeping them in proper sequence in one list; but I think its consecutive numbering to be a mistake, since additions are sure to be numerous, although for Exchange Club purposes consecutive numbers have advantages.

The rejection of the *nomina conservanda* of the Vienna laws is responsible for the following discrepancies in the two lists so far as the genera are concerned, and I have given dates of the establishment of these genera in order to show how inconsistent and unfair are the Vienna rules; the second column being the *nomina conservanda*. Those with

an asterisk are used in the last edition of Babington's "Manual" by Messrs. Groves :—

*Cammarum, *Hill*, 1756 = Eranthis, *Salisbury*, 1807.
*Capnoides, *Adans.* 1763 = Corydalis, *DC.* 1805.
*Bursa, *Weber*, 1780 = Capsella, *Medic.* 1792.
*Apinella, *Necker*, 1790 = Trinia, *Hoffm.* 1814.
Prionitis, *Adans.* 1763 = Falcaria, *Host*, 1827.
*Mariana, *Hill*, 1756 = Silybum, *Gærtn.* 1763.
*Cervicina, *Delile*, 1813 = Wahlenbergia, *Schrad.* 1814.
*Boretta, *Neck.* 1790 = Dabœcia, *D. Don.* 1834.
*Pneumaria, *Hill*, 1764 = Mertensia, *Roth*, 1797.
Volvulus, *Medic.* 1791 = Calystegia, *Br.* 1810.
Dondia, *Adans.* 1763 = Suæda, *Forsk.* 1775.
Unifolium, *Adans.* 1763 = Maianthemum, *Weber*, 1810.
*Pubilaria, *Rafin.* 1836 = Simethis, *Kunth*, 1843.
*Juncoides, *Adans.* 1763 = Luzula, *DC.* 1805.
*Homalocenchrus, *Mieg.* 1760 = Leersia, 1788.
Savastana, *Schrank*, 1789 = Hierochloe, *Br.* 1810.
*Weingærtneria, *Bernh.* 1800 = Corynephorus, *Beauv.* 1812.
*Capriola, *Adans.* 1763 = Cynodon, *Pers.* 1805.
Dryopteris, *Adans.* 1763 = Lastrea, *Presl*, 1836.

From this it will be seen that the names used in my List conserve (for the greater part) the generic names used in the last work on British botany.

I may now come to some special cases of discrepancies ; first the census numbers of the species. Unfortunately a paper in the "Irish Naturalist" on 'Additions and Corrections to Irish Top. Bot.' was not brought to my notice until a part of the work had been printed off. Hence some records taken from "Irish Top. Bot.," etc., require correcting, *e.g. Fumaria capreolata*, 40 H12, *F. purpurea*, 24 H9, *F. Borœi*, 61 H16, *F. muralis*, 5 S., *F. Bastardi*, 37 H27.

I have kept my "Top. Bot." posted up, and it includes a considerable number of unpublished records which I have personally made, therefore in many cases my numbers are somewhat higher than in the "Lond. Cat."

The genus *Thalictrum* is not critically understood in Britain at present, and further correlation with continental types is most desirable. The "Lond. Cat." gives two additional varieties to *minus*, namely *odoratum* (Gren. and Godr.) and *pubescens* (Schleicher), but omits N. E. Brown's var.

capillare of *T. majus*, which is found on the north bank of Loch Tay ("Supp. Eng. Bot.," p. 4). According to Mr. N. E. Brown the *T. minus* of the "Linn. Herb." is *T. Kochii*, Fries; but I have followed Groves and Babington in putting *Kochii* as a var. of *majus*.

Under *Ranunculus acris* the "Lond. Cat." adds *Friesianus*, Rouy and Fouc. and *rectus* (Jord.); but omits *parvulus* (Wahl.), a distinct looking plant from Cairngorm, and var. *Nathorstii* (Berl.), which is an alpine Scottish form, named for me by Herr Freyn, and said by him to be identical with the foreign plant from northern latitudes. I await authoritative identification of the first two varieties as distinct from our British named forms. Boreau, not Jordan, appears to be the author of *R. rectus*. I see Crantz named *R. sardous* in the first edition of the *Stirpes*; hence it should be written (if we are certain *sardous* is synonymous with *hirsutus*, Curtis) = *R. sardous*, var. *parvulus* (L.), as in the "Lond. Cat." The "Lond. Cat." omits any reference to the submerged flowering *Batrachium* from Rescobie Loch, which I have put under *Drouetii* (following the "Manual") as *aspergillifolius* (Hiern), but which Mr. Williams has recently named *eradicatus* (Læstad.). I have omitted under *R. peltatus*, var. *quinquelobus*, Koch, and the hybrid of *peltatus* with *trichophyllus*. There is also a hybrid *Baudotii* with *heterophyllus* given in the "Manual," which should be added to the List.

I do not understand the references under *Barbarea* being cited Br., while the species is *B. vulgaris*, Ait. They both date from the same page of the same publication, and if we write Aiton for the species why not for the genus? but I prefer in common with most authorities to use Brown as the authority, since it is now a matter of common knowledge that he established that and many other genera and species in Aiton's "Hortus Kewensis." To be consistent we might as well attribute to Sowerby the species established by Smith in "English Botany," and many names now attributed to Brown would have to be cited as of Aiton.

In writing *Arabis ciliata* var. *hirsuta*, Koch, I followed N. E. Brown in "Suppl. to Eng. Bot." Nyman, however, only gives Ireland for *ciliata*, Br.; so that Mr. Marshall may probably be correct in writing var. *hispida*, Syme. In

"Eng. Bot." i. 167, Syme refers to the continental *ciliata* being, according to Godet, *A. arcuata*, "Shuttleworth"; but Mr. N. E. Brown must have had this before him, when he said var. *hirsuta*, Koch, must replace *hispida*, Syme. The Rev. E. F. Linton "Bot. Exch. Rep." 1899, is my authority for the name *propinqua* (Jord.) for Mr. Marshall's plant from Uist, which he says M. Rouy named *A. Retziana*, var. *hispida*. Nyman puts *Retziana* as a sub-species of *hirsuta*, occurring in Norway, Sweden, etc.

Is the var. *hispida*, Syme, Irish only, as given in "Lond. Cat."?

Erophila inflata is cited as of Watson in Hooker's "Students' Flora," ed. 3, p. 35, 1884; but it is there as a sub-species only.

Bentham and Hooker are followed in separating *Conringia* from *Erysimum* in my list. Nyman does the same in the "Conspectus."

As Mr. White points out Jordan wrote *Thlaspi occitanicum*. I follow Syme in giving the three varieties which he, however, treated as sub-species. The petals of the Derbyshire *virens*, he says, differ from those of authenticated specimens as named by M. Jordan.[1]

V. odorata, var. *imberbis*, Leighton, is a slight, though permanent, variety in which a tuft of hairs situate at the inner base of the lateral petals is wanting. It was named from the white-flowered plant by Leighton, and is more frequently to be found of that colour; but the blue-flowered plant also exhibits the same hairless variation. Leighton first named it as a species, and subsequently as a variety.[2]

Under the Violets, as elsewhere, I have tried to omit mere colour forms. There is considerable divergence in the two lists in treating the *Melanium* group. Even the more matured views of Dr. Drabble are scarcely, I expect, final; and I prefer to keep the plants under one or other of two super species. I would add to my List var. *Provostii*, Bor., and var. *vivariensis* (Jord.) under *V. tricolor*.

Frankenia lævis, L. The comital distribution is twelve.

[1] Babington in introducing this plant to our flora misspelt it *occitanum*.

[2] Dr. Stokes in "With. Nat. Arr." ii. 955 (1787) first describes this variety, but he did not name it.

Silene dubia, Herbich, which I place as a var. of *nutans*, for as such I still prefer to keep it, is often of casual origin. A solitary plant appeared at Wellington College (see *S. nutans*, L. "Fl. Berks," p. 85), from which a few others seeded; I think the wind in some cases is the means of the seed dispersal. I should have liked to separate *Moenchia* as a distinct genus, and many others also, *e.g. Alsine*; but I follow Bentham and Hooker in their generic limitations, and they merge *Moenchia* with *Cerastium*.

Cerastium arcticum, Lange. Ostenfeld in "Additions and Corrections to the List of the Phanerogamæ and Pteridophyta of the Faroes," p. 848, says that, as pointed out by him and Dr. Murbeck, "Bot. Notiser," 1898, pp. 246 and 60), the oldest name must be *C. latifolium*, var. *Edmonstonii*, Wats. ("Bot. Soc. Cat. Brit. Pl.," 1844), because Lange's name, dating from "Flora Danica," 1880, fasc. 50, p. 7, is later, and also because Lange has mixed two distinct species together, as his descriptions and drawings are based partly on *Edmonstonii* from East Iceland, partly on *C. alpinum* (a condensed form) from Greenland. They therefore write *C. Edmonstonii* (Watson), Murb. and Osten. The first reason, however, will not weigh with those who follow the absurd rules of the Vienna Congress, which has one rule for genera, another for species, and a third for varieties since, according to these rules, permanence in a *varietal* name is not compulsory (although it is in a specific name), and it may be varied at pleasure; and I am afraid the second reason may not be sufficient to allow us to use the excellent name suggested by the Scandinavian authors, since the description of *arcticum* may be held to cover '*Edmonstonii*.' I think, however, there are good reasons for choosing the name *C. nigrescens*, Edmonston. Edmonston ("Phyt." pp. 497-500, 1843) describes and figures the Baltasound plant under the name *C. latifolium*, L., and gives figures of its allies to contrast with it. Subsequently ("Phyt." p. 96, 1845) Edmonston sent specimens to the Botanical Society of London, labelled *C. nigrescens*, Edmond. "Fl. Shetl." ined.; and the point is whether the printing of this in the "Phyt." *l.c.*, is a valid publication. Here certainly we have the first description of the plant in 1843;

and then the correction in 1845 from the erroneous or supposed erroneous reference of *latifolium* to a new name *nigrescens*, which is characteristic of the plant, and a name which Syme ("E. B." ii. 87) quotes in synonymy, and indeed utilises for the varietal name there used.

Since writing the foregoing I have seen Edmonston's "Flora of Shetland," published in 1845, where in the preface, p. xv, the author alludes to it under the name *C. nigrescens*, which is I think a valid publication; since in the text (p. 29) under the name *C. latifolium*, var. *nigrescens*, Edmonston says "Mr. Watson, after an investigation of numerous specimens, still considers this plant (the *C. nigrescens* from Balta-sound) as not truly distinct from *C. latifolium*, and from deference to his authority I give up the point." But the fact remains that Edmonston first described it as a species, and the name as a species is given in "Flora of Shetland," whence its publication dates; if indeed its exhibition at the Botanical Society, and the reference in the "Phytologist," *l.c.* is not valid. Our British species therefore should be *C. nigrescens*, Edmonston ("Fl. Shetl." p. xv, 1845), with var. (or forma *arcticum*) (Lange) for the more generally distributed plant, if indeed the latter is considered to be worth distinction.[1]

Cerastium vulgatum, L., var. *alpinum*, Hartm., I think, covers var. *fontanum*, Baumg. The var. *longirostre*, Wich., has longer capsules, I believe.

Arenaria Sedoides. Kittel's name should be bracketed; he called it an *Alsine.*

Sagina maritima, Don. The var. *alpina*, Syme, is accidentally omitted from my List. I was doubtful about its identity. My plant from the Cairngorms identified by Mr. Bennett with it has, as Messrs. Groves point out, a central rosette; Don's specimen in Miss Palmer's herbarium from summit of Ben Nevis has not.

S. Reuter, Boiss. Somewhat reluctantly I followed the "Manual" in making this a variety of *S. apetala.* I think

[1] I am assuming that botanists for the most part agree in considering our British plant distinct from the continental *C. latifolium.* Watson in "Top. Bot.," 1873, p. 95, calls it *C. nigrescens* from Shetland. The Lond. Cat. name was a *nomen nudum*, but it is described in the second edition of Babington's "Manual," p. 56.

perhaps it had better be kept distinct as in the "Lond. Cat." As a variety of *S. apetala*, Messrs. Groves are the authors.

Hypericum quadrangulum, L. I differ from both "List" and "Catalogue" in considering this to be synonymous with *dubium*, Leers. The *quadrangulum* of the "Linnean Herbarium" is not *tetrapterum* (= *quadrangulare*). The description in "Sp. Pl." and "Fl. Suec." refers to *dubium*; but Linnæus adds a synonym taken from Bauhin, which Crantz probably correctly considers to refer to *tetrapterum* (= *quadrangulare*, called by Crantz *quadrangulum*); but it appears certain that Crantz acted wrongly in naming the type *H. quadrangulum* as *H. maculatum*, and in giving Linnæus's name *quadrangulum* to a plant cited by Linnæus in synonymy. In fact Crantz's name appears to be still-born.[1] Therefore I prefer to follow the "Index Kewensis" and continental botanists in retaining *H. quadrangulum* for *dubium*, and rejecting Crantz's name *maculatum*. If *acutum*, Mœnch, be really synonymous with *H. quadrangulum*, L., as Mr. Britten asserts ("Journ. Bot.," p. 436), although Schinz and Thelling use it as representing *H. tetrapterum*, Fries, that name is unavailable. In any case, however (supposing *H. quadrangulum* is used in the manner I have suggested) the oldest name for our square-stemmed St. John's Wort with pellucid dots appears to be *H. quadrangulare*, Stokes (in "With. Nat. Arr.," ii. p. 813, 1787), but he cites Curtis ("Fl. Lond.," iv. p. 38), who calls it *quadrangulum*.

Geranium Raii, Lindley. I followed Babington ("Manual," p. 78) in putting this as a var. of *lucidum*, as is done in the last edition of "Lond. Cat."; but there is little doubt from the description and its position in the "Synopsis" that Lindley considered it to be allied to *Robertianum*, indeed the synonym quoted from Ray, "Synopsis," refers to var. *purpureum* of *G. Robertianum* (see "Dillenian Herbaria," p. 110). We may therefore either omit *Raii* or place it under *Robertianum* as a var. differing from *purpureum* by the more shaggy stem and calyx.

[1] A somewhat similar instance is that of Hudson's treatment of aggregate *Epilo ium hirsutum*, L. He gives the name *E. hirsutum* to the plant we know as *parviflorum*, and re-names *E. hirsutum* as *ramosum*.

Tilia ulmifolia, Scop. I use this name because Mr. E. G. Baker ("Journ. Bot.," p. 319, 1898) says, that Miller's type *cordata* is *platyphyllos*, and he considers the description ("Gard. Dict.," No. 1, 1768) answers better for *platyphyllos* than *ulmifolius*. I hesitated to use *T. cordata* for *platyphyllos* on account of the confusion which must arise when a name is transferred from one species to another; for that reason I have retained *Melilotus officinalis* for *M. altissima*, Thuill., and not for *M. arvensis* (*Petitpierreana*), since in "Journ. Bot." (1887, p. 181), *M. officinalis*, Lam., was made to replace *M. altissima*, Thuill. The "Index Kewensis" evades the difficulty by making the two species of Melilot synonymous. Eventually, if it is proved beyond doubt that *M. arvensis* = *officinalis* and *Tilia cordata* = *T. platyphyllos*, we may have to use the names in this sense.

Medicago lupulina, L., var. *Willdenowiana*, Koch, is the correct name. Var. *scabra*, Gray ("Nat. Arr." ii. p. 605, 1821), has "legumen slightly compressed, rough with many tubercles"; there is no mention of glandular hairs. This might be added as var. c, *scabra*, Gray, to my List.

(*To be continued.*)

THE HIGH ALPINE FLORA OF BRITAIN.

BEING A LIST OF THE FLOWERING PLANTS AND FERNS FOUND AT A THOUSAND METRES AND UPWARDS ON THE MOUNTAINS OF THE BRITISH ISLES, WITH AUTHENTIC REFERENCES AND CRITICAL NOTES.

By Frederic N. Williams, F.L.S.

(*Continued from p.* 169.)

CLASS I. DICOTYLEDONES.

Fam. 1. Asteraceæ.

1. *Hieracium alpinum*, L.—Summits of Loch-na-gar, Ben Nevis, Ben Lawers, and Meall Ghaordie (Don, Herb. Brit. fasc. 1, n. 18, in Herb. Brit.). Dubh Loch on Loch-na-gar, from 915 to

1067 m. (E. G. Baker, 1893). Loch-na-gar (Backhouse, 1855), Cairn Gorm from 915 to 1067 m. (E. S. Marshall, 1898),—these also in Herb. Brit. Corrie Ardran, on Ben Ein, at 1000 m. (E. S. Marshall, as *H. holosericeum*). Loch-na-gar (herb. Syme, — but wrongly labelled *melanocephalum*).

Var. *melanocephalum*, Zahn.—Ascends to 1190 m. near the summit of Ben-na-Bourd (Backhouse, 1851, in herb. Watson).

2. *Hieracium Halleri*, Vill.—Cairn Gorm, above 915 m. (E. S. Marshall, 1898, n. 2160, in Herb. Brit.)

Var. *calenduliflorum*, Williams, "Prodr. Fl. Brit." 99. This grows on grassy slopes and rocky ledges at from 780 to 1200 m. It occurs sparingly on the mica slate, and more abundantly on the granite. According to Backhouse, it is "abundant on the granite precipices of Dhu Loch and Loch-na-gar, and scattered among the grass over the region lying between the ridge of Loch-na-gar and the northern part of the Clova district." The drawing in Mr. Hanbury's unfinished monograph, p. 23, t. 9, is from a Dhu Loch example.

3. *Hieracium nigrescens*, var. *gracilentum*, Hook. f.—Corrie Etchachan, Banffshire, on the north slope of Ben Macdhui, 1884 (Linton fratt. in "Journ. Bot." 1893, 145; E. S. Marshall, 1898, in Herb. Brit.). Loch-na-gar, from 915 to 1067 m. (E. G. Baker, 1893, in Herb. Brit.) It occurs on grassy slopes and rocky ledges of granitic and porphyritic cliffs up to nearly 1200 metres also in Aberdeenshire, as on Ben-na-Bourd (Backhouse, 1855, in Herb. Brit.).

Var. *gracilifolium*, Hanbury, in "Journ. Bot." 1892, 166.—This is the usual form assumed by *H. nigrescens* throughout the Breadalbane range; especially on rocks above Loch-na-Chait, Ben Lawers (Linton fratt. in "Journ. Bot." 1893, 146; White, "Fl. Perthsh." 195). Hooker f. ("Student's Flora," ed. 3, p. 233) says of this species that it "ascends to 4500 feet,"—but there is no Scottish mountain that attains this altitude.

4. *Hieracium globosum*, Backh.—Corrie Etchachan, Banffshire, on the north slope of Ben Macdhui, in crevices of the granite cliffs, 1897 (Linton, Hier. exs. n. 54).

5. *Hieracium petiolatum*, Elfstrand.—Corrie Etchachan, Banffshire (Linton, Hier. exs. n. 53), Cairn Gorm, from 915 to 1070 m. (E. S. Marshall and W. A. Shoolbred, 1898, in Herb. Brit.).

Var. *ciliatidens*, Elfstrand.—Cairn Gorm, at 1000 m. (E. S. Marshall, 1898, in Herb. Brit.). No other Scottish locality recorded for this variety, which is not mentioned in the late Mr. W. R. Linton's "British Hieracia," 15 (1905).

6. *Hieracium Backhousei*, Hanbury.—First collected by Messrs. Hanbury and Marshall in 1886, near the Dhu Loch, in Aberdeenshire, along the broad bed, formed by flat shelving rocks, of the burn

flowing from Loch-na-gar into the head of the Dhu Loch. It thrives in crevices of the rocky beds and margins of mountain streams, and on the stony shores of alpine lakes, up to 1000 metres in Aberdeenshire. Corrie on Ben Dorean, above Glen Lyon, at 1000 m. or higher (W. A. Shoolbred, 1891).

7. *Hieracium senescens*, Backh.—Ben Nevis, Aonach Beg, above 915 m. (E. S. Marshall, 1896, in Herb. Brit.), on grassy mountain ledges and in crevices of the rock. Probably high up on other mountains, but no definite heights are given.

8. *Hieracium chrysanthum*, Backh.—It occurs on grassy slopes and ledges, the stony margins of lakes and by rocky burns, at 600-1000 m., and appears to grow equally well on either granite, mica-schist or hornblende. Dubh Loch, Loch-na-gar, 915-1070 m. (E. G. Baker, in Herb. Brit. 1893), and also on Cairn Gorm, at the same height (E. S. Marshall, 1898, in Herb. Brit.)

Var. *microcephalum*, Backh.—On the precipitous ledges and in the high gullies of the great chasm on the north face of Loch-na-gar, and also above the Dubh Loch,—up to 1070 m. (F. J. Hanbury, herb. propr.; E. G. Baker, 1893, in Herb. Brit.; Backhouse, 1855, herb. propr., and in Herb. Brit.).

9. *Hieracium flocculosum*, var. *Bakeri*, Williams, "Prodr. Fl. Brit." 118.—On the cliffs of Ben Ein, up to 1000 m. (E. S. Marshall, 1889, in Herb. Brit.).

Var. *insulare Williams*, "Prodr. Fl. Brit." 119.—On the cliffs of Ben Ein, up to 1000 m., where the plant was found by Messrs. Hanbury and Marshall in July 1889, "and is doubtless to be found in other high mountain glens of that neighbourhood" (F. J. Hanbury in "Journ. Bot." 1892, p. 368).

10. *Hieracium callistophyllum*, var. *cremnanthes*, Hanbury.—Meall Ghaordie (E. S. Marshall, in "Fl. Perthsh." 197).

11. *Hieracium pictorum*, var. *breadalbanense*, Williams, "Prodr. Fl. Brit." 130.—Rocks above Loch-na-Chait, Ben Lawers ("Fl. Perthsh." 198).

12. *Lactuca alpina*, Hook. f.—Ascends to 1070 m. on Loch-na-gar (F. B. White in "Scot. Nat." i. 121 [1871]). "Discovered on the Aberdeenshire mountain of Lochnagore by Mr. G. Don, Sept. 1801," and figured in the first edition of "English Botany," t. 2425 (1812), under the name of *Sonchus cæruleus*, which is also the name under which it was first described and figured in Camerarius' "Epitome" (1586).

13. *Taraxacum officinale*, Weber.—Ascends to 1190 m. in the Breadalbane district ("Fl. Perthsh." 192), as on Ben Lawers. The dandelion descends to sea-level in Cork.

14. *Saussurea alpina*, Cand.—Ascends to 1175 m. on Ben Lawers ("Fl. Perthsh." 186). White does not specify Ben Lawers, but states that the plant ascends to 3850 ft. in the Breadalbane district; and Ben Lawers is the only mountain in Perthshire which attains this height (Ben More is 7 ft. lower). Ben Lawers (Meugh, *ex* herb. Carroll, in Herb. Brit.). "On the Rockes on the highest part of Snowdon" (Johnson, "Merc. Bot." ii. 18 [1641],—first record as a British plant). Smith, in "English Flora," iii. 384, says that it occurs in the fissures of alpine rocks on Snowdon (*Serratula alpina*, var. *β*). First recorded in Scotland in 1777, from near the top of Ben Creachan ("Cruipen," in Breadalbane,—Lightfoot, "Fl. Scotica," 448). Descends to 305 m. in Donegal.

15. *Tussilago farfara*, L.—Ascends to 1070 m. on waste and bare places in the Breadalbane district ("Fl. Perthsh." 176). Descends to sea-level in Cork.

16. *Achillea millefolium*, L.—Ascends to the summit of Ben Lawers ("Fl. Perthsh." 180),—mountain not specified, but see under *Saussurea alpina*). Descends to sea-level in Cork.

17. *Gnaphalium supinum*, L.—Ascends to the summit of Ben Lawers in alpine, damp, rather bare places ("Fl. Perthsh." 179). Ben Lawers (R. Brown, 1793, in Herb. Brit.—but height not specified). By the cairn on the summit of Ben Macdhui (Watson, 1832). Summit of Ben-na-Bourd (Watson, 1844). On the table-top of Ben-na-Bourd at 1130 m. (Watson, 1832).

18. *Erigeron alpinum*, L.—On alpine rock ledges up to 1070 m. in the Breadalbane district ("Fl. Perthsh." 176). Ben Lawers (White). Ben Lawers (W. Wilson, 1829 and 1837, n. 3, in Herb. Brit.).

19. *Solidago virgaurea*, L.—Near the summit of Ben Lawers, 1834 (Herb. Brit. *ex* herb. Greville). Ascends to 1100 m. on Ben Dearg (in Ross-shire)—there are four Scottish mountains bearing this name—on rocks (G. C. Druce, in "Ann. Scot. Nat. Hist." 1903, 230).[1] Ascends to 1006 m. in rocky places on Carn Tual (More in "Cyb. Hib." ed. 2, 176). Descends to sea-level in Cork.

Fam. 2. Campanulaceæ.

20. *Campanula rotundifolia*, L.—The harebell, "wilde in most places of England," as Gerard says, ascends to the very summit of Ben Ein (E. S. Marshall, in "Journ. Bot." 1890, 181). Descends to sea-level in Kerry.

Fam. 3. Adoxaceæ.

21. *Adoxa moschatellina*, L.—Ascends to 1070 m. on alpine rocks in the Breadalbane district ("Fl. Perthsh." 167). The alpine

[1] Ascends to 1144 m. on Cairn Toul (Dr. J. W. H. Trail, 1902).

form is much smaller, and has less divided leaves, than the lowland. Descends to sea-level in Antrim.

Fam. 4. Rubiaceæ.

22. *Galium boreale*, L.—Ascends to 1050 m. on alpine rocks in the Breadalbane district ("Fl. Perthsh." 169). Descends to sea-level in Antrim.

23. *Galium saxatile*, L.—Ascends to 1220 m. on Ben Macdhui (White, in "Scot. Nat." i. 121 [1871]). Summit of Ben Lawers ("Fl. Perthsh." 170). Summit of Carn Tual (Hart, in "Cyb. Hib." ed. 2, 166). Descends to sea-level in Antrim.

Fam. 5. Gentianaceæ.

24. *Gentiana nivalis*, L.—Grassy alpine rock ledges on Ben Lawers from 730 to 1050 m., where it was first found by James Dickson about 1792 ("Trans. Linn. Soc." ii. 290 [1794]). It is very local, and only in a few places on Ben Lawers and the Carn Chreag range. Near the summit of Ben Lawers (Don, *ex* Smith, "English Fl." ii. 30). Ben Lawers (W. Gourlie, 1841, in Herb. Brit.). Ben Lawers, on micaceous soil (J. Whitehead, 1875, n. 860, in Herb. Brit.). Ben Lawers ("Fl. Perthsh." 219). Near the summit of Ben Lawers (R. Graham, about 1830). Authentic example from J. Dickson in Herb. Kew.

Fam. 6. Asperifoliaceæ.

25. *Myosotis pyrenaïca*, Pourr.—First recorded as a British plant, under the name of *Myosotis alpina*, by Don, fasc. ix. n. 205 (1804):—"This beautiful plant adorns the rocks on the summit of Ben Lawers, producing its flowers during the greater part of the summer." The figure of *Myosotis rupicola*, Smith, t. 2559 (Sept. 1813), was drawn from a plant collected by Borrer who found it abundant on the rocks of Ben Lawers (these specimens are in his herbarium). In herb. Watson (also at Kew) are specimens from rocks above the lakes on Ben Lawers, and smaller specimens from the summit (Watson, 1841, W. W. Gardiner, 1842, H. M. Balfour, 1847). It occurs on ledges of mica slate and limestone rocks on the west slope of Ben Lawers right up to the summit, and on Stuchd-an-Lochan, further to the east of that mountain. White states ("Fl. Perthsh." 223) that it grows on damp alpine rock ledges on mountains of the Breadalbane district from 730 to 1050 m., but that is very local. "Rocks on Ben Lawers at great heights, even on the summit" (R. Brown, 1794, in Herb. Brit.—this is the earliest actual recorded gathering as a British plant). Ben Lawers (W. Christie, 1849, *ex* herb. Forster, 1849, J. Carroll, 1864, W. Wilson, 1864, F. Stratton, 1870, all in Herb. Brit.). Smith,

"English Fl." i. 253, says that the plant is "plentiful on the summit of Ben Lawers and other lofty Highland mountains," where it was found growing by G. Don and J. Mackay. In Scotland the plant is not found beyond the Breadalbane district of Perthshire. I have compared Perthshire specimens of *Myosotis alpestris* with specimens of *M. pyrenaïca* from the French side of the Pyrenees, and, in spite of the trifling differences alleged by Grenier and Godron, I fail to see any points of distinction between them. The solitary flower in the fork of the two terminal flowering branches, which is given as a distinctive character of *M. pyrenaïca*, is present in Perthshire specimens, and the nucules are exactly alike in both. The alleged difference of their being slightly keeled on the face in one plant, and not keeled at all in the other, is not apparent to the eye. A source of error is that Reichenbach figures both *M. alpestris* and *M. pyrenaïca* ("Ic. fl. Germ. Helv." xviii. t. 121, f. 2, and t. 123, f. 2), and though the differences on the plate are quite apparent, the latter does not really represent the plant cited, but agrees rather with *M. Olympica*, Boiss. (=*M. nana*, Smith). In "Fl. Scotica," Borrer and Hooker report it from Schiehallion and Meall Ghaordie, but it has not been found recently on these two mountains.

Fam. 7. Scrofulariaceæ.

26. *Veronica fruticans*, Jacq.—First recorded as a British plant "in rupibus, Ben Lawers" (James Dickson, fasc. ii. 29 [1790]; "Trans. Linn. Soc.," ii. 288 [1794]). Ascends to 1100 m. on alpine rock ledges on Ben Lawers ("Fl. Perthsh." 231). Rocks above the loch on Ben Lawers (R. Brown, 1793, in Herb. Brit.).

27. *Veronica alpina*, L.—First recorded as a British plant "in montibus prope Garway Moor et in Ben Nevis." (James Dickson, fasc. ii. 29 [1790]; "Trans. Linn. Soc." ii. 287 [1794]. Ascends to 1160 m. on damp alpine places in the Breadalbane district ("Fl. Perthsh." 230).

28. *Veronica serpyllifolia*, L.—Ascends to 1070 m. in the Breadalbane district ("Fl. Perthsh." 230). Descends to sea-level in Cork.

Var. *tenella*, All. (sp.).—Ben Nevis, between the upper end of the ravine and the spring, at 1026 m. (J. Sadler in "Trans. Proc. Bot. Soc. Edinb." xii. 50-54 [1878]). On the northern side of Braeriach, at 1160 m. (G. C. Druce in "Journ. Bot." 1889, 203). Syn.—*V. humifusa*, Dickson, in "Trans. Linn. Soc." ii., 288 (1794). —I have compared the plant of the Italian Alps with Dickson's authentic Scottish specimens, and find them alike, hair for hair. Allioni's name is nine years earlier.

29. *Euphrasia officinalis*, L.—Ascends to the summit of Ben Lawers ("Fl. Perthsh." 234); and to 1146 m. on Loch-na-gar

(White in "Scot. Nat." i. 122 [1871]). Descends to sea-level in Cork.

30. *Euphrasia Rostkoviana*, var. *borealis*, Towns.—Ben Lawers and Ben Ein, between 1070 and 1130 m. ("Fl. Perthsh." 234). Ben Lawers (W. Gardiner, 1842, in Herb. Brit.—but no height given). Dwarf specimens.

31. *Euphrasia Foulaensis*, Towns.—On Cairn Gorm up to 1070 m. (E. S. Marshall, 1898, in Herb. Brit.). Mr. Townsend does not give any limits of height for these species in his monographic revision.

32. *Alectorolophus crista-galli*, Bieb.—Ascends to 1022 m. on mountains of the Breadalbane district ("Fl. Perthsh." 234). Neither Rev. E. S. Marshall nor Mr. G. C. Druce indicate any heights above 1000 m. for segregates of this species; so that I leave Dr. White's statement as I find it,—"the altitudinal range of the lowland form usually stops far below the height at which the alpine variety begins to appear." Descends to sea-level in Cork.

Fam. 8. Lamiaceæ.

33. *Thymus serpyllum*, L.—Ascends to 1130 m. on rocks in the Breadalbane district ("Fl. Perthsh." 239). Descends to sea-level in Cork.

Fam. 9. Plumbaginaceæ.

34. *Armeria pubescens*, var. *planifolia*, Nyman, Consp.—Summit of Ben Lawers (W. Gardiner, 1842), and of Snowdon (J. F. Young, 1839), and of Carn Tual (H. N. Ridley, 1883)—all three specimens in Herb. Brit. At 1130 m. on Ben-na-Bourd (Watson, 1832). Cliffs of Ben Dearg (in Ross-shire) up to 1100 m. (G. C. Druce in "Ann. Scot. Nat. Hist." 1904, 171).—Syn. *Armeria vulgaris*, var. *planifolia*, Syme, "Engl. Botany," ed. 3, vii. 158, t. 1153 (1869). Syme's variety is not at all a satisfactory one, being founded on cultivated specimens in Watson's garden, and not on the original high alpine plant, which was not described at the time. All the three specimens mentioned above seem to me to be distinct from *Armeria pubescens*, and severally agree with Spanish specimens of *Armeria alpina*, W. Syme mentions also this plant, but he certainly does not clearly distinguish his variety from it, and adduces only the most trivial separating character (and this might readily have been modified under cultivation). Gardiner also must have had this in mind, since he labels his specimen "Armeria maritima, *var.* alpina, *Hoppe*." Unless more definite evidence is forthcoming, I should be very much disposed to consider these high alpine examples as true *Armeria alpina*, W. All three of the specimens are much nearer to the latter than to *A. pubescens*, Link,

and Wilkomm's excellent description very fairly covers these British examples, which agree in the ribs of the calyx being hairy with bare intercostal spaces. Mr. G. C. Druce goes into many details in his critical remarks on the sea-thrift in a paper in "Journ. Linn. Soc." xxxv. 66 (1901), but does not clinch the crucial fact nor solve the puzzle of Syme's var. *planifolia*. Linnæus is so inconsistent and indefinite in his use of the generic names of *Statice* and *Armeria*, that most botanists will prefer to follow Willdenow who separated the thrifts from the sea-lavenders and called them *Armeria*, And as Boissier in his monograph follows Willdenow, the common-sense view is on their side.

Fam. 10. Ericaceæ.

35. *Calluna vulgaris*, Salisbury.—Ascends to 1005 m. in Aberdeenshire (Watson, "Cyb. Brit." ii. 151), and to the same height on Been-keragh, though very stunted in growth at this level—on the neighbouring Carn Tual it struggles up to 990 m. (Hart, 1881, in "Proc. Roy. Irish Acad." 1882, 577). Descends to sea-level in Cork.

Fam. 11. Rhodoraceæ.

36. *Azalea procumbens*, L.—Near the top of Ben Lawers (R. Brown, 1793, in Herb. Brit.). Top of Ben-na-Bourd, "sides and top of Ben Bourde about eight miles from Invercauld" (R. Brown, 1794, in Herb. Brit.). "On the heathy summits of most of the mountains of Scotland" (Smith, "English Fl." i. 283). At such elevations it is found on dry stony ridges.

Fam. 12. Siphonandraceæ.

37. *Vaccinium myrtillus*, L.—Ascends to 1280 m. on Ben Macdhui (Dickie, 105); and to 1190 m. on the mountains of the Breadalbane district ("Fl. Perthsh." 211), as on Ben Lawers (which is the only mountain in Perthshire which attains this height). Summit of Schiehallion (White). Ascends to 1130 m. on Ben-na-Bourd, on the table-top (Watson, 1832). On the summits of Carn Tual and Beenkeragh (Hart, 1881, in "Proc. Roy. Irish Acad." 1882, 577). Descends to sea-level in Cork.

38. *Vaccinium vitis-idæa*, L.—Ascends to 1080 m. on the mountains of the Rannoch district ("Fl. Perthsh." 211), as on Schiehallion. Descends to 30 m. in Armagh.

Fam. 13. Pyrolaceæ.

39. *Pyrola minor*, L.—Ascends to 1130 m. on alpine rock ledges in the Breadalbane district ("Fl. Perthsh." 215). Descends to sea-level in Londonderry.

Fam. 14. Oxalidaceæ.

40. *Oxalis acetosella*, L.—Among rocks and stones up to 1160 m. in the Breadalbane district ("Fl. Perthsh." 96). Descends to sea-level in Cork.

Fam. 15. Empetraceæ.

41. *Empetrum nigrum*, L.—On upland moors; ascends to the summit of Schiehallion ("Fl. Perthsh." 97). Ascends to 1250 m. on Ben Macdhui (Watson, "Outlines Geogr. Distrib. Brit. Plants," 1832, p. 270,—"I saw a specimen at an elevation of 4100 feet"). Ascends to 1067 m. "on the western declivity of the Ben Nevis Range" (Watson, *l.c.*); and to 1037 m. on Ben-na-Bourd (Watson, 1844, in Herb. Kew.). Ascends to the summit of Beenkeragh (Hart, 1881, in "Proc. Roy. Irish Acad." 1882, p. 578). Griffith ("Fl. of Anglesey and Carnarvon," 126) says that it is "common along the Snowdonian range in many places," such as the summit of Glyder Fawr, whose peak is two metres short of a thousand: there is also a specimen from Snowdon in Herb. Brit. (Mitford), but the height is not stated. Descends to sea-level in Kerry.

Fam. 16. Euphorbiaceæ.

42. *Mercurialis perennis*, L.—Ascends to 1006 m. in stony places on the mountains of the Breadalbane district ("Fl. Perthsh." 263). Descends to sea-level in Antrim.

Fam. 17. Violaceæ.

43. *Viola palustris*, L.—Ascends to 1174 m. on Ben Lawers ("Fl. Perthsh." 71), in marshy places. Ascends to 1037 m. on Ben-na-Bourd (Watson, 1844, in Herb. Kew.); and to 1220 m. on Ben Macdhui (Dickie, 18). Descends to sea-level in Cork.

44. *Viola lutea*, var. *amœna*, Henslow, subvar. *insignis*, Baker f. in "Journ. Bot." 1901, 222.—"Rocks, somewhat moist, at very considerable heights on Ben Lawers" (R. Brown, 1794, in Herb. Brit.). Cliffs of Ben Lawers (G. C. Druce, 1888). According to Dr. White the var. *amœna* is found on alpine rock-ledges of the mountains of the Breadalbane district up to 1052 m. ("Fl. Perthsh." 73). He also says: "The petals vary much in shape. In the most alpine plants the lower petal is apiculate; in those from a somewhat lower altitude the lower petal is repand-crenate, thus resembling the description of the var. *sudetica*, Koch (*V. sudetica*, Willd.)."

The following characters distinguish this plant from the typical form of *V. lutea*, var. *amœna*:—Caulis 5-15 cm. Lamina foliorum infimorum orbicularis petiolo multoties longior basi rotundata vel subcuneata, margine crenato-serrata; lamina foliorum superiorum

ovato-oblonga vel oblonga, apice obtusa; foliis omnino plus minus pilosis. Stipulæ palmatim pinnatifidæ; lobo terminali paullum majore. Pedunculus 5-6 cm. Bracteolæ infra curvaturam sitæ. Sepala subacuminata. Petala superiora divergentia anguste obovata, 18 × 8-9 mm., lateralia repanda, inferiore 13 × 17 mm. Calcar appendicibus calycinis sublongius. Capsula sepalis brevior.

(*To be continued.*)

SOME ADDITIONAL BOTANICAL RECORDS TO SCOTTISH COUNTIES.

By Arthur Bennett.

Elatine hexandra.—East Loch Fada, Isle of Colonsay (102), Mr. M'Neill, *sp.*, 1908. Sent by Miss E. Vachell from V.C. 103, last year.

Cornus suecica.—Island of Hoy, Orkneys (111). Found by Dr. Grant, who sent specimens to Mr. Spence of Deerness. Occurs in Shetland (Beeby, sp.); but is not on record for Caithness, or the Outer Hebrides.

Scutellaria galericulata.—N. Ronaldshay in the Orkneys (111). Rev. Mr. Macpherson, *teste* Prof. Trail.

Utricularia neglecta.—East Loch Fada, Isle of Colonsay (102). Mr. M'Neill, *sp.*, 1908. Recorded from the N. Ebudes (V.C. 104).

Polygonum viviparum, L.—Braes near Buchollie Castle, Freswick, Caithness (109), July 1908; *leg.* G. Stalker, *sp.* A dwarf form tending towards the var. *alpina*, in which form it occurs in Shetland (Beeby, *sp.*). Recorded from Orkney, and Outer Hebrides (Duncan, *sp.*).

Naias flexilis, Rostk. and Schmidt.—East Loch Fada, Isle of Colonsay (102), July 1908. Mr. M'Neill, *sp.* This loch, which is about 2 miles long, is nearly in the centre of the island, about 124 feet above O.D. It here grows in deepish water (dredged up), associated with *Callitriche autumnalis*, *Utricularia neglecta*, *Myriophyllum alterniflorum*, DC., *Potamogeton pusillus*, L., *P. heterophyllus*, Schreb., *P. nitens*, Weber, *P. perfoliatus*, L., *Juncus supinus*, var. *fluitans*, *Chara fragilis*, *C. aspera*, and *Nitella opaca*, Ag. Its previous records are for E. Perth (Sturrock, *sp.*) and Mid Perth (Dr. B. White, *sp.*). It will probably be found in some of the numerous lochs of Jura and Islay. On the borders of the loch occurs also

Elatine hexandra, and in deeper water *Sparganium minimum* apparently (but the leaves are more pellucid and narrower than usual and no fruit or flowers were seen), and with it *Utricularia minor*.

Carex limosa, L.—On deep peat in the Isle of Colonsay (102). Mr. M'Neill, *sp.* This occurs in the Mid Ebudes (103). (Fingland, *sp.*) and in the N. Ebudes (104), (Druce, *sp.*).

In another part of the island Mr. M'Neill gathered *C. præcox*, which is also an additional record for V.C. 102; and he has also added many others; but as he is engaged on a List of the Plants of Colonsay, and as they are of less interest from the distribution point of view, I will leave them to him.

ZOOLOGICAL NOTES.

Notes from Tiree.—LAPWINGS have been comparatively scarce as breeding birds this year. I do not think there have been more than one for every ten that use to breed here. None were shot here in winter; neither was there any protracted storm of frost or snow to kill them. They simply did not come to breed in their usual numbers. SHOVELLERS are increasing yearly as a breeding species, although comparatively few stay in winter. WHIMBRELS and WHITE WAGTAILS were numerous on their migration north in the end of April and beginning of May. The White Wagtails take this route regularly on their way south in the end of August and beginning of September. But very few Whimbrels appear to take their route on their way south in the autumn. MUTE SWANS.—There are (10th August 1908), 17 Mute Swans on Loch Vasapol. They came here in the beginning of June. However they will probably leave before the winter.—P. ANDERSON.

Hawfinch in Berwickshire.—Two Hawfinches (*Coccothraustes coccothraustes*) were seen by me in the manse garden, Lauder, an old and a young bird, on the first day of this month (August). The old one, a female, flew several times between high trees that surround it and rows of peas. On the bare branch of a birch tree both were seen quite clearly through binoculars. As they flew from one side to another of the garden the young bird uttered a querulous *cheeing* note, and when alarmed later the other made a tsip-tsipping noise among the trees. They had done a great deal of damage to two pea-rows, and indications pointed to their being two or three days in the garden. After disappearing for a week they returned to the peas and attacked another ripening row. Mr. Wm. Evans, Edinburgh, visited the garden on 15th August, and from a sheltered spot saw one of the birds. They were not

observed again, though traces of fresh damage done by them still continued. The ruined pods presented quite a different appearance from others beside them attacked by Tits and Sparrows, some of them hanging in shreds. Generally the birds visited the garden in the early morning and from five to seven at night.—Wm. M'Conachie, The Manse, Lauder.

The Hawfinch in Galloway.—As a Galloway species the Hawfinch has long had a place, but the records are few and far between. It was got near Newton-Stewart about 1868 or 1869. Another one was procured in the same locality in 1878. A third specimen was found in Cally Park on the morning of 12th December 1883, having been whipped down by the branches of a fallen tree overthrown by the great gale of the previous night. A Hawfinch was seen in the park opposite Kirkconnell about six years ago. In the same parish a couple were seen by a most capable observer at the end of last October. And now it is a great pleasure to record the capture of a fine example at The Grove Gardens on 9th April. It was trapped in an ordinary spring trap quite accidentally, and sent to me same day. It is a fine large brightly plumaged specimen, and looked like a male, but dissection proved it to be a female. In Dumfriesshire the bird is no better known, and has only occurred singly in the same casual way. Outside our area, at localities not very far off, it is showing a strong tendency to increase in numbers and extension of range.—R. Service, Maxwelltown.

Probable nesting of the White Wagtail in N. W. Highlands.—In the middle of July, while staying at Killilan I saw two White Wagtails (*Motacilla alba*). One of them had food in its bill as if it were going to feed its young. It was sitting on the ridge of a house and was quite close to me. The other was seen close to the school-house.—P. Anderson, Tiree.

Probable breeding of Blue-headed Wagtail near Aberdeen.—It may interest ornithologists to hear that a pair of Blue-headed Wagtails (*Motacilla flava*) frequented some links not far from Aberdeen, this summer. I saw one of them, the male, first on 30th May, near the mouth of a burn that flows across the links a few miles north of here. I was able to get a very good view of it, and the following is the description as I wrote it down on the spot :—

"Crown and nape blue-grey, a light streak over-and-behind eye, wings brownish with two light bars on the coverts, and light margins to quills, tail black or dark with conspicuous white edges, back greenish olive, greener on rump, under-parts yellow tinged with green. Bill and legs dark." On subsequent occasions I watched both the birds with a better field-glass, frequently at a distance of only a very few yards, and noticed that the two outer pairs of tail-feathers in the male were white, the rest black, while the light

eyebrow was chiefly behind the eye, and not so distinct in front. The female was mostly olive-brown above, with a distinct light eyebrow, a darker streak through the eye, below that a pale streak (not well marked), and all the rest of the underparts yellow, paler than in the male, and the two wing-bars were not so distinct. Altogether I visited their haunt ten times between 19th May and 31st July, and found them always about the same part, by the banks of the burn.

From the very first their behaviour seemed to show that they had a nest, but I never succeeded in finding one, though time and again I thought I had located it. Although very tame, the birds were very wary, and I really cannot be sure that they actually had a nest. On 8th July, however, the female was certainly carrying food in her bill when I first saw her. It is not likely that the nest would have been disturbed by anybody else, as the place is a lonely one.

I have given pretty full particulars, in the belief that the birds were the Blue-headed Wagtail.—Lewis N. G. Ramsay, Aberdeen.

Nesting of the Lesser Whitethroat in Tay: a Correction.—I deem it right to say that, in view of the doubt expressed by Mr. Paterson in the July issue of the "Annals" as to the nesting of the Lesser Whitethroat in "Tay" ("Annals" 1907, p. 185), I submitted the egg taken by me last June to Mr. Eagle Clarke, and that he has quite definitely expressed the opinion that the egg is that of the Common Whitethroat.—Thomas L. Dewar, Cupar.

Wood and Garden Warblers at Loch Awe.—When at Loch Awe in June I heard the Garden Warbler (*Sylvia hortensis*) and the Wood Warbler (*Phylloscopus sibilatrix*) there, the former on Inchconnan. The Wood Warbler is a sufficiently common bird, and so I think the Garden Warbler may be, but Mr. Harvie-Brown wishes me to have these notes recorded in the "Annals of Scottish Natural History."—James S. Dixon, Fairleigh, Bothwell.

Gadwall in Scotland in the Breeding Season.—From the middle of May till the end of June this year, I had two pairs of Gadwall (*Anas strepera*) under observation on a certain loch in the east of Scotland, under circumstances which left no doubt in my mind that they were nesting there.—William Evans, Edinburgh.

Black Tern in Tweed and Forth.—In the beginning of May last I examined an adult male Black Tern (*Hydrochelidon nigra*), which was obtained at Hoselaw Loch, near Kelso, on 28th April. It was accompanied by another bird of the same species, and they were seen to be taking flies off the water.

On 29th August I came upon what I have no doubt was an immature Black Tern on the east side of Aberlady Bay. It was a wounded bird, unable to fly any distance, and allowed me to get quite close to it several times; indeed, I followed it for a while with the idea of catching it.—William Evans, Edinburgh.

The Black-headed Gull as a Persecutor of the Lapwing.—In his paper on the food of the Black-headed Gull (*Larus ridibundus*) in the "Annals" for July last, Mr. T. G. Laidlaw refers to a trait in the habits of this species, namely its persecution of the Lapwing during the autumn and winter months, about which one would like to know more. The points requiring elucidation are the length of time this skua-like habit has been observed, and whether it is widely practised, or as yet only in certain districts. If the habit is of long standing and wide occurrence, it is certainly strange that no allusion is made to it, so far as I know, in any of the many works on British Birds. The manner in which the gulls wait upon the Peewits and give chase the moment one of the latter unearths a worm or grub, is well described by the Rev. H. N. Bonar in his recent pamphlet on the Lapwing.

Mr. Laidlaw says, "This is a very common habit of the gull in this district," *i.e.*, about Perth, I presume, and Mr. Bonar's observations were, one gathers, made in East Lothian within the last few years. In the fields about Edinburgh I first took notice of this skua-like action on the part of the Black-headed Gull about twenty years ago—there are definite entries in my note-books for fifteen —and I have often witnessed it in East Lothian during the same period, and in Fife (near Falkland, etc.) within the last few years.

In *The Scotsman* of 28th April 1905, I mentioned in reply to a correspondent who attributed the habit to the Herring Gull in Aberdeenshire, that in the neighbourhood of Edinburgh the Black-headed Gull and, occasionally, the Common Gull (*Larus canus*) were the species in which I had observed it. From a letter in *The Scotsman* of 14th September, 1908, it would appear that at Muir of Ord, East Ross, this trait has been observed in "the common seagull" for the past three years.

It would be interesting to hear if the habit has been noticed in the west of Scotland and in England.—William Evans, Edinburgh. [On 11th October I witnessed the habit at Stromness, Orkney.—W.E.C.]

Arctic Skua choked by a Gurnard.—A rather curious thing came under my observation on 24th August while going along the sea-shore at Heinish, Tiree. I found an Arctic Skua (*Stercorarius crepidatus*), lying dead. The bird had been choked by a Gurnard which it had been unable to swallow, and there were about two inches of the tail-end of the fish sticking out of the bird's mouth, while the body of the fish was firmly fixed in the bird's gullet, which was extended to its utmost capacity. On pulling out the Gurnard I found it about the size of a medium herring.—P. Anderson, Tiree.

Extension of the Nesting of the Woodcock in the Clyde Area.—There has been a wonderful addition to the numbers of Woodcock breeding hereabouts. This district is very populous,

and scattered over with collieries and mining villages. Yet in the midst of these the Woodcock is now breeding in considerable numbers. In searching for wild Pheasants' eggs this spring, three Woodcocks' nests were found in one day, and several more afterwards. A week ago I saw four young ones well grown but unable to fly. This is unique in my experience.—JAMES S. DIXON, Fairleigh, Bothwell.

Pratincole at the Flannan Islands.—The occurrence of an example of *Glareola pratincola* at such an out-of-way spot as the Flannan Islands, affords another remarkable instance, among many, of the appearance of migratory birds at places far removed from their accustomed seasonal haunts and on the routes followed to reach them. The bird referred to was an adult female, and the date of its visit was 13th July. This is the third recorded occurrence of this Pratincole in Scotland.—WM. EAGLE CLARKE.

The Oar-fish (*Regalecus glesne*).—Referring to my paper on the Oar-fish in the previous number of the "Annals" (*antea*, p. 150), Professor M'Intosh, St. Andrews, tells me that the Buckie example (April 1884), was partly preserved in spirit by Prof. Sir J. Struthers, and that there is a section of it in St. Andrews Museum. In stating that it had not been preserved, I simply quoted from Sim's "Vertebrate Fauna of Dee." The Findhorn specimen sent to the British Museum in April 1896, is, Mr. Boulenger informs me, still there, where it also is preserved in spirit.—WILLIAM EVANS, Edinburgh.

Meta menardi, *Latr.*, **in Perthshire.**—Mr. Arthur S. Reid, M.A., Trinity College, Glenalmond, sent me two egg-cocoons for identification of the above species taken on 29th June. The specimens were found, eight in all, hanging under a raised hollow stone platform in the grounds of Trinity College. The largest nest measures 2.1 c.m. diam. the length of the suspending thread 12.5 c.m. and the nest = 14.8 c.m. Mr. Reid hopes to secure specimens of this interesting and rare Scottish spider. — ALEX. M. RODGER, The Museum, Perth.

Palloptera ustulata, *Fln.*, **in Edinburgh.**—On 19th September I took from a window here a female *Palloptera* which on examination proved to be *P. ustulata*, Fln. The species is new to the district and possibly to Scotland, for I do not find it on the half dozen local lists to which I have had access.—JAMES WATERSTON, Edinburgh.

Ceratophyllus borealis, *Rothsch.*, **in Berwickshire.**—From a single female taken in July 1906, by Mr. Joy in St. Kilda, Mr. Rothschild described the above species (*Ent. Mo. Mag.*, Jan. 1907, p. 11). Since then no additional examples have occurred, but Mr.

Rothschild refers to this name a male and two females of a *Ceratophyllus* taken on 28th May of this year, from a nest of *Cinclus aquaticus* on the Eye, near Grantshouse. The male is now in Mr. Rothschild's collection and will be described shortly. —James Waterston, Edinburgh.

BOTANICAL NOTES AND NEWS.

The High Alpine Flora of Britain.—Dr. Williams ("Annals" 1908, p. 164) says he gives a list of peaks to the number of 67. But surely this is too low an estimate. In the "Scottish Mountaineering" Journal, No. 6, Sept. 1891, Mr. H. J. Munro gives "Tables of all the Scottish Mountains exceeding 3000 feet in height."

Allowing for the tops that may be repeated when differently named, there seem to be at least 100 summits (exclusive of double or treble summits on one mountain). Mr. Munro's paper is very interesting to botanists as he gives the "position, county, best ascended from, etc." In a second section he gives "The 3000 feet tops arranged in order of altitude" from Ben Nevis 4406 feet to Creag á Bhragit 3000 feet. I went roughly through Mr. Munro's list and took only those tops over 3300 feet in height, and it seems the estimate of 67 is too low.

Dr. Williams stars those mountains "that are specifically mentioned," and refers to Ben Lawers as probably "the best known mountain in the Highlands," and I suppose all will agree with him, but strange to say he does not star Ben Laoigh = Ben Lui, which I suppose most Scottish botanists will agree with me is the next best known one. Full lists have been published (twice at least) of its flora, and very full lists too.—A. Bennett.

The Flora of Dumfriesshire.—In the *Journal of Botany* (1908, pp. 212-215) is a paper by Messrs. W. R. Linton and E. S. Marshall on the plants observed near Moffat in July 1907. Among these are several varieties not previously noted from the county, viz.—*Cerastium vulgatum*, L., var. *fontanum* (Baumg.), by alpine rills on Black's Hope, at about 2000 ft.; *Rubus villicaulis*, Koehl., Moffat and near Raehills; *Hieracium sagittatum*, Lindeb., var. *philanthrax*, Dahlst., near Kinnel Burn; *Jasione montana*, L., var. *major*, Mert. and Koch, about two miles from Moffat; *Euphrasia Rostkoviana*, Hayne, not uncommon in low ground meadows; *E. brevipila*, Burnat and Gremli, common; *E. scottica*, Wettst., frequent in boggy ground; *E. curta*, Wettst., var. *glabrescens*, Wettst., probably general on the hills; *Rhinanthus borealis*, Druce, sparingly on the cliffs of Black's Hope and Corriefron; *Melampyrum pratense*, L., var. *hians*, Druce, abundant in Raehills Glen, and

Midlaw Burn; *Pinguicula vulgaris*, L., var. *bicolor*, Nordstedt, Black's Hope, Midlaw Burn, etc.; *Orchis ericetorum*, Linton, common; *Habenaria conopsea* × *Orchis maculata*, one specimen was found, with the parents, in a bog near Capelgill; *Carex Œderi*, Retz., var. *œdocarpa*, And., common, "the only form of aggregate *C. flava*, L., which we observed"; *Glyceria fluitans*, Br., var. *triticea*, Fr., apparently frequent in marshy land, *G. declinata*, Breb., Frenchland Burn, Kinnelhead; *Festuca rubra*, L., var. *grandiflora*, Hackel, Black's Hope, Beeftub; var. *barbata*, Hackel, Corriefron, etc.; var. *fallax*, Hackel, shaded wall tops; *Equisetum sylvaticum*, L., var. *capillare* (Hoffm.), Raehills Glen.

"*Saxifraga hypnoides*, L.,—the plant of Black's Hope, Midlaw Burn, Corriefron, and Craigmichen is this species, often somewhat luxuriant; we could see no *S. sponhemica*, and believe it was recorded in error." "We saw nothing of *Hieracium nigrescens*, *callistophyllum*, *langwellense*, *nitidum*, *ciliatum*, or *angustatum*, which have been reported."

Radicula palustris, *Moench* (*Nasturtium palustre*, DC.) **in Kincardineshire.**—About the middle of August I found a vigorous plant by the Luther Water in the parish of Laurencekirk. It has not previously been recorded from this county (91), though known from Forfarshire (90) and doubtfully native near Aberdeen (92).—James W. H. Trail.

Goodyera repens, *Brown.*—No doubt, as Prof. Trail remarks, this plant has its usual habitat in woods of conifers, but Mr. Barclay of Perth in a recent letter writes me that he found "two or three plants of it, however, on a moor close by the sea-side about two miles west of Portsoy, near a place called Redhythe Point. That moor showed no traces of ever having been planted. Probably there were more on the moor, but I did not examine through want of time. At the time I thought it strange to find the plant in such a place." This is in Banffshire.—A. Bennett.

Floral Variation in the Genus Veronica.—The usual structure of the flowers in the Speedwells is familiar, and is remarkably constant, consisting of 4 almost free sepals, 4 petals united in a short tube (the posterior being larger and the anterior smaller than the other two), two stamens attached to the tube of the petals between the posterior and lateral petals, and two united carpels. This structure does not closely resemble that of the other genera associated with *Veronica* in the Figwort family. From the usual type in the family it differs in the non-development of the posterior sepal, the very close union of the two posterior (upper-lip) petals to form one plate (which looks like a single petal, only slightly larger than one of the lateral petals), and the reduction of the stamens to two.

A reference to the literature of variation in flowers shows records of a number of deviations observed in the flowers of certain species. Among them, more numerous sepals and petals have been recorded by several botanists, but with no apparent tendency to any definiteness of structure. In the course of investigations on variations of floral structure I occasionally found deviations in flowers of Veronica, but not very often on the whole. The most frequent was the more or less complete division of the apparent posterior petal, so as to resemble the type of the family. Occasional only in *V. Chamædrys* and *V. serpyllifolia*, and rare in the most of the species, it occurs with great frequency in *V. Anagallis*. The plant is very local in the north-east of Scotland; but wherever it occurs this variation may be found, sometimes on almost every plant, and on some to nearly 20 per cent of all the flowers. The other parts of the flower seldom vary from the normal structure of the genus.—James W. H. Trail.

Agropyron Donianum, *F. B. White*, **on Ben Lawers.** This rare species (of which I have one of Don's original specimens) was re-discovered by Mr. J. Melvill and Mr. F. J. Hanbury in 1878. This year it has again been gathered by my friend Mr. F. F. Laidlaw on the same mountain.—G. Claridge Druce.

Festuca ovina, *L.*, var. alpina, *Gren and Godr.*—In my paper in the "Annals" (1908, p. 109), I recorded this from Inchnadamph. I find, however, it is not that variety but a form of *F. ovina* which simulates it. See *Rep. Bot. Exch. Club*, 1907, p. 322.—G. Claridge Druce.

Scottish Roses.—Among some roses which the Rev. A. Ley has examined in my herbarium he identifies the following:—

Rosa omissa, Déségl., var. *resinosoides* (Crepin), Beauly, 1884; Lawers, Mid-Perth.

R. mollissima, Wild., var. *pseudo-rubiginosa* (Lej.) [= *R. omissa* Déségl., var. *pseudo-rubiginosa* (Lej.)], Lawers, Mid-Perth.

var. *Andrzeiovii* (Steven), Achnashellach, E. Ross.

var. *suberecta* (Woods) [= *suberecta*, Ley], a very distinct rose. Lawers, Mid-Perth; Applecross, Kinlochewe; Ullapool, W. Ross; Dingwall, East Ross; Beauly, E. Inverness.

R. villosa, L., var. *recondita* (Puget) [= *R. mollis*, Sm., var. *recondita* (Puget)], Speyside, Easterness; Lawers, Mid-Perth; Ullapool, W. Ross.

var. *submollis* (Ley) [= *R. omissa* Déségl., var. *submollis* (Ley)], Brodie, Nairn; Kinlochewe, W. Ross.

R. pomifera, Herrm. By the Dee, Ballater.—G. Claridge Druce.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—July-September 1908.

[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.

Rose-coloured Pastor in Caithness. A. Hughes-Onslow, *The Field*, July 11, 1908, p. 91.—Specimen seen on 2nd July, about half-a-mile east of Reay.

Shells at High Altitudes in Scotland. Frank F. Laidlaw, *Journ. of Conchology*, July 1908, p. 192. Notes on three species found on Ben Lawers at 3000 and 3800 feet.

Some further Records of Collembola and Thysanura from the Forth Area. William Evans, *Proc. Roy. Phys. Soc., Edin.*, vol. xvii., No. 5 (August 1908), pp. 195-200.—Refers to twenty-five species, several being additions to the British list.

Butterflies and Neuroptera in Perthshire. By Kenneth J. Morton, F.E.S., *Ent. Mo. Mag.*, July 1908, pp. 149-151.—Notes on species taken in July 1907, in the vicinity of Blair Athole, Rannoch, and Glen Garry.

Help-Notes towards the Determination of British Tenthredinidæ, etc. (22). Selandriades (*continued*), Selandria to Stromboceros. By the Rev. F. D. Morice, M.A., F.E.S., *Ent. Mo. Mag.*, August and September 1908, pp. 189-194.—The following Scottish records are given: Selandria wustnei, Ben Nevis; S. furstenbergensis, Arrochar; and Thrinax mixta, Edinburgh (?).

Notes on the British Dragonflies of the "Dale" Collection. By W. J. Lucas, B.A., F.E.S., *Ent. Mo. Mag.*, September 1908, pp. 198-203.—Several Scottish specimens are referred to.

Notes on certain Mycetophilidæ, including several Species new to the British List (*continued*). By F. Jenkinson, M.A., *Ent. Mo. Mag.*, July 1908, pp. 151-154.—The following Scottish records are included: Phthinia sp., near Dunphail; Gnoriste bilineata, Ztt., Nethy Bridge; Polylepta undulata, Winn., Logie; Hertwigia marginata, Dziedz., Logie and near Dinnet; Empheria pictipennis, Hal., Logie; and Diadocidia valida, Mik., Logie.

Clunio marinus, Haliday, in Scotland. William Evans, *Ent. Mo. Mag.*, September 1908, p. 207.—A colony found near Dunbar on 27th June 1908.

Hyadina nitida, Mcq., a Species of Diptera new to the British List. By J. R. Malloch, *Ent. Mo. Mag.*, September 1908, pp. 205-206.—Specimen obtained at Bonhill in September 1907.

Eccoptomera microps, Mg., and Agromyza bicornis, Kalt., two Diptera new to the British List. By J. R. Malloch, *Ent. Mo. Mag.*, August 1908, pp. 180-181.—Both species found in the Clyde district.

On the British Species of Phora (Part II.). By John H. Wood, M.B., *Ent. Mo. Mag.*, September 1908, pp. 215-216.—Records the following: P. sexopinosa, Nethy Bridge, and P. picta, Logie.

Notes on Phoridæ in Dumbartonshire, with Description of a new Species. By J. R. Malloch, *Ent. Mo. Mag.*, September 1908, pp. 203-205. P. urbana, thoracica, curvinervis, abdominalis, and vitripennis recorded, and P. intermedia described as a new species.

BOTANY.

Plants observed near Moffat, Dumfries, July 1907. By W. R. Linton and E. S. Marshall. *Journ. Bot.*, 1908, pp. 212-215.—A good many varieties not previously recorded from the county are noted, also new localities, heights above sea, etc.

Forfarshire Records. By R. H. Corstorphine. *Journ. Bot.*, 1908, p. 299.—From N.E. Forfarshire records Fumaria confusa, Coronopus procumbens, C. didymus, and Linaria minor.

Notes on the "London Catalogue," Ed. 10. By Rev. E. S. Marshall, M.A., F.L.S. *Journ. Bot.*, 1908, pp. 281-289.—Comments on the entries in the Catalogue as far as *Euphrasia*, based on recent information.

The Genus Rosa in the "London Catalogue," Ed. 10. By W. Barclay. *Journ. Bot.*, 1908, pp. 278-280.—A criticism of the forms enumerated by Rev. A. Ley in place of the former mollis and tomentosa. Rev. E. S. Marshall replies (p. 280), briefly to some of the criticisms.

The Subsection Eu-caninæ of the Genus Rosa. By Major A. H. Wolley-Dod. *Journ. Bot.*, 1908, Supplement.—This very exhaustive paper, 110 pages in length, is concluded in the September issue.

Notes on Potamogeton. By Arthur Bennett. *Journ. Bot.*, 1908, pp. 247-251.—Notes P. nitens, Weber, from Loch Oss on Ben Oss, in Perthshire, at 2084 feet.

Sclerotinia baccarum (Schröt.) Rehm in Stirlingshire.—By D. A. Boyd. *Journ. Bot.*, 1908, pp. 299-300.—The mature ascophores found, in May, for the first time in Britain.

List of Wild and Naturalised Flowers found in St. Mary's Isle, Kirkcudbright. (*Tr. and Proc. Dumf. and Gall. N. H. Soc.* xviii. 1907-8, pp. 46-47).

BOOK NOTICES.

Birds of Britain. By J. Lewis Bonhote, M.A., etc., etc. With 100 illustrations in colour, selected by H. E. Dresser from his "Birds of Europe." London, Adam and Charles Black. 21s. net.

This handsome volume forms one of Messrs. Black's "Beautiful Books," and both pictorially and in its general get up is worthy of a high place among the series. These books, it should be remarked, are intended for the general reader. We make special reference to this because the author of the volume under notice does not appear to have realised this fact, and this has led him to include in its pages every unit in the vast army of feathered waifs and strays that has been known to visit our shores: birds that are not likely to come under the notice of, and have little or no interest for, the ordinary lover of nature. By so doing Mr. Bonhote has deprived himself of much valuable space which might with advantage have been devoted to affording fuller information on habits, distribution, and descriptions of plumage of our numerous native birds, and of the many migrants which annually visit our shores. Thus the letterpress is disappointing. It affords the ornithologist nothing that he does not know, and it unfortunately brings the work into competition with other books which are its superior; while it leaves a reliable book on strictly popular lines still a *desideratum*. Apart from these shortcomings, which are after all matters of opinion, the book has much to commend it, and the excellent reproductions of Mr. Dresser's beautiful plates are both useful and attractive.

Three Voyages of a Naturalist: being an Account of many little-known Islands in the three Oceans visited by the "Valhalla," R.Y.S. By M. J. Nicoll, M.B.O.U. With an Introduction by the Right Hon. the Earl of Crawford, K.T., F.R.S. With 56 plates, 4 sketch maps, and text illustrations. Witherby & Co., London. Price 7s. 6d. net.

It has been Mr. Nicoll's great good fortune to accompany, as naturalist, the Earl of Crawford, during three voyages in His Lordship's yacht "Valhalla," one of the finest ocean-going yachts

afloat. All these voyages were of surpassing interest, inasmuch as they afforded opportunities for visiting lands, especially islands, which are among the least known and remotest spots on the face of the three great oceans. During one of these voyages, Africa was circumnavigated, and St. Paul's Rocks, Fernando de Noronha, South Trinidad, Martin Vas, Tristan da Cunha, Dassen Island, the Comoro Islands, Madagascar, the Seychelles, etc., etc., were visited. Another voyage was made to the West Indies, including Martinique, the Grand and Little Cayman Islands; and finally we have a description of a voyage round the world, with special references to Monte Video, the Straits of Magellan, Easter Island, Pitcairn Island, and the Society and Samoan Islands. Incidents of interest inseparable from such voyages are pleasantly related, but the main object of the book is devoted to a graphic description of the places visited, with an account of their natural history. Special attention is paid to bird-life, and much information is afforded regarding the habits of a number of little-known species, while among the specimens collected were several belonging to species new to science. It is a book that we have perused with much pleasure and also profit; indeed, it is so good that we have only one fault to find with it, namely, that Mr. Nicoll has not written at greater length on the singularly interesting isles, etc., and their wild life, about which he discourses so pleasantly and so well. This, we trust, he will make amends for in a new edition, which we feel sure will be called for, wherein he will draw more liberally from those stores of knowledge he so carefully garnered during his visits to lands that very few can ever hope to see. The book is well got up, and the numerous illustrations, taken direct from photographs, are excellently reproduced.

A Book of Birds. By W. P. Pycraft, A.L.S., F.Z.S. With 30 full-paged coloured plates and many illustrations in the text. London, Sydney Appleton, 1908.

This is a companion volume to the "Book of Mammals," recently noticed in our pages. It affords a useful, reliable, and popular introduction to a knowledge of the Birds of the World, and includes an interesting chapter on their structure, etc. The book deals with the various orders into which birds are subdivided by naturalists, giving in a pleasant manner a great amount of information relating to their habits, distribution, and peculiarities. It is an excellent book for a beginner, or for any one generally interested in a most attractive and beautiful section of the animal kingdom. The coloured plates are many, and each depicts a considerable number of species, and while many of them are good, others do not commend themselves for their accuracy, but one must not expect too much, for we are dealing with a well-got-up book selling at the moderate price of six shillings.

THE SENSES OF INSECTS. By Auguste Forel. Translated by Macleod Yearsley, F.R.C.S. London, Methuen & Co., 8vo., xiv and 324 pp., 2 plates. Price 10s. 6d. net.

After the numerous systematic treatises on insects which have been recently published, and which must be mainly used as books of reference or merely for the identification of specimens, it is refreshing to take up a volume which can be read with interest from beginning to end. Such a work is that which lies before us, and the entomological public owes much to the enterprise of the publishers and the energy of the translator, through whose efforts we can with ease learn the latest views on a difficult but fascinating subject, and read a detailed account of the experiments of one who is regarded as an authority on the various senses and instincts of insects. The twelve chapters into which the work is divided contain a lucid and detailed account of experiments conducted by the author in confirmation of, or refuting, the views of others, and the various theories are summarised in careful fashion, so that we possess in these pages a valuable historical account of the investigations made and suggestions advanced by the chief workers and thinkers of all ages and nationalities. The senses of vision, smell, taste, hearing, and touch, as well as the instincts of direction and orientation in space, the faculty of communication, memory, and judgment, all have their place. Altogether this is a delightful and most instructive volume, which at such a moderate price should be in the possession of all thinking naturalists who aspire to something more than the mere collecting and naming of specimens.

BRITISH BUTTERFLIES. Vol. ii. By J. W. Tutt, F.E.S. London, Eliot Stock. Price 21s. net.

The entomological reader must now be quite familiar with the maroon masterpieces which are following one another in rapid succession, and which go to form the most complete account of British Lepidoptera that has ever been published. It is almost superfluous on our part to recommend the closely-printed volume of nearly 500 pages which has recently been completed. Suffice it to say that to all appearance the work is as thoroughly done as ever, the seven species dealt with as in Part ii., occupying, with the accounts of the groups to which they belong, over 400 pages. The first part of this important work is devoted to a most welcome account of the habits of butterfly larvæ. This section of the volume will be read by entomologists with the most intense interest. It is thoroughly up-to-date, and contains the observations of practically all the best-known investigators in Britain, the continent of Europe, and North America. The work is embellished with twenty-seven plates, which are chiefly micro-photographs of various larval and pupal structures.

INDEX

END OF VOL. XVII.

Printed by R. & R. CLARK, LIMITED, *Edinburgh.*

No. 65] 1908 [JANUARY

The Annals of Scottish Natural History

A QUARTERLY MAGAZINE

WITH WHICH IS INCORPORATED

"The Scottish Naturalist"

EDITED BY

J. A. HARVIE-BROWN, F.R.S.E., F.Z.S.
MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION

JAMES W. H. TRAIL, M.A., M.D., F.R.S., F.L.S.
PROFESSOR OF BOTANY IN THE UNIVERSITY OF ABERDEEN

AND

WILLIAM EAGLE CLARKE, F.R.S.E., F.L.S.
KEEPER OF THE NATURAL HISTORY DEPARTMENT, ROYAL SCOTTISH MUSEUM, EDINBURGH

EDINBURGH
DAVID DOUGLAS, CASTLE STREET
LONDON: R. H. PORTER, 7 PRINCES ST., CAVENDISH SQUARE

Price 2s. 6d. Annual Subscription, payable in advance, 7s. 6d., Post free.

The Annals of Scottish Natural History.

All Articles and Communications intended for publication, and all **Books, etc.,** for notice, should be sent to MR. EAGLE CLARKE, ROYAL SCOTTISH MUSEUM, EDINBURGH; except those relating to **Botany,** which should be addressed to PROF. TRAIL, THE UNIVERSITY, ABERDEEN.

Subscriptions and Advertisements should be addressed to the Publisher, MR. DAVID DOUGLAS, 10 CASTLE STREET, EDINBURGH.

Authors of General Articles will receive 25 Reprints (in covers) of their Contributions gratis. Additional copies, in covers, may be had from the Printers, at the undermentioned rates, provided such orders accompany the Manuscript.

	25 Copies.	50 Copies.	100 Copies.
4 pages	3/6	4/6	7/–
8 „	4/6	5/6	8/6
12 „	6/–	7/–	11/–
16 „	7/6	8/6	13/6

BOOKS ON NATURAL HISTORY.

THE VERTEBRATE FAUNA OF SCOTLAND.

Edited by J. A. HARVIE-BROWN and T. E. BUCKLEY.

"We receive few books that are so grateful alike to the eye and sense as the sage-green octavos of Scottish zoological geography which come to us, one after another, from Mr. Douglas. In welcoming this delightful *Vertebrate Fauna of the Orkney Islands*, we feel but one regret, the worlds which are left for Messrs. Buckley and Harvie-Brown to conquer are growing very few. . . . We know not how to approach them. Are we to urge them on upon their splendid enterprise, or to hold them back, that our pleasure may be drawn out the longer? The same plan is pursued as in the previous volumes of this admirable series. A detailed physical geography of the islands precedes the *catalogue raisonné* of the species and habitats. Even to those, therefore, who have little zoological curiosity or knowledge, this book must be of unusual importance, if the reader has an interest in the provinces described."—*Saturday Review.*

VOLUMES ALREADY PUBLISHED—

1. **A VERTEBRATE FAUNA OF SUTHERLAND, CAITHNESS, AND WEST CROMARTY.** [*Out of print.*
2. **A VERTEBRATE FAUNA OF THE OUTER HEBRIDES.** [*Out of print.*
3. **THE BIRDS OF IONA AND MULL, 1852-1870.** By the late HENRY DAVENPORT GRAHAM. With a Memoir of the Author. Illustrated from the Author's Sketch Book. 21s.
4. **A VERTEBRATE FAUNA OF THE ORKNEY ISLANDS.** 30s.
5. **A VERTEBRATE FAUNA OF ARGYLL AND THE INNER HEBRIDES.** 30s.
6. and 7. **A VERTEBRATE FAUNA OF THE MORAY BASIN.** Two Vols. 60s.
8. **A VERTEBRATE FAUNA OF SHETLAND.** By T. E. BUCKLEY and A. H. EVANS. 30s.
9. **A VERTEBRATE FAUNA OF THE NORTH-WEST HIGHLANDS AND SKYE.** By J. A. HARVIE-BROWN and H. A. MACPHERSON. 30s.
10. **A VERTEBRATE FAUNA OF THE TAY BASIN AND STRATHMORE.** By J. A. HARVIE-BROWN. 30s.

AMONG BRITISH BIRDS IN THEIR NESTING HAUNTS. By OSWIN A. J. LEE. Illustrated by the Camera. Parts I. to XVI. are now ready, folio, 11 by 15 inches, price 10s. 6d. net each Part; also in Vols., 4 Vols., at 50s. net each Vol.

HELIGOLAND AS AN ORNITHOLOGICAL OBSERVATORY. The Result of Fifty Years' Experience. By HEINRICH GÄTKE. Translated by RUDOLPH ROSENSTOCK, M.A. Oxon. Royal 8vo. 30s.

A TOUR IN SUTHERLANDSHIRE. With Extracts from the Field Books of a Sportsman and Naturalist. By CHARLES ST. JOHN. 2nd Ed. With Appendix on the Fauna of Sutherland, by J. A. HARVIE-BROWN and T. E. BUCKLEY. Two Vols. Crown 8vo. Illustrated. 21s.

THE BIRDS OF THE ISLE OF MAN. By P. G. RALFE, M.B.O.U. Demy 8vo. Illustrated. 18s. net.

THE CAPERCAILLIE IN SCOTLAND. By J. A. HARVIE-BROWN. With Etchings on Copper, and Map illustrating the extension of its range since its restoration at Taymouth in 1837 and 1838. Demy 8vo. 8s. 6d.

EDINBURGH: DAVID DOUGLAS, 10 CASTLE STREET.

CONTENTS

No. 66] 1908 [APRIL

The Annals of Scottish Natural History

A QUARTERLY MAGAZINE

WITH WHICH IS INCORPORATED

"The Scottish Naturalist"

EDITED BY

J. A. HARVIE-BROWN, F.R.S.E., F.Z.S.
MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION

JAMES W. H. TRAIL, M.A., M.D., F.R.S., F.L.S.
PROFESSOR OF BOTANY IN THE UNIVERSITY OF ABERDEEN

AND

WILLIAM EAGLE CLARKE, F.R.S.E., F.L.S.
KEEPER OF THE NATURAL HISTORY DEPARTMENT, ROYAL SCOTTISH MUSEUM, EDINBURGH

EDINBURGH
DAVID DOUGLAS, CASTLE STREET
LONDON: R. H. PORTER, 7 PRINCES ST., CAVENDISH SQUARE

Price 2s. 6d. Annual Subscription, payable in advance, 7s. 6d., Post free.

The Annals of Scottish Natural History.

All Articles and Communications intended for publication, and all **Books, etc.**, for notice, should be sent to MR. EAGLE CLARKE, ROYAL SCOTTISH MUSEUM, EDINBURGH; except those relating to **Botany,** which should be addressed to PROF. TRAIL, THE UNIVERSITY, ABERDEEN.

Subscriptions and Advertisements should be addressed to the Publisher, MR. DAVID DOUGLAS, 10 CASTLE STREET, EDINBURGH.

Authors of General Articles will receive 25 Reprints (in covers) of their Contributions gratis. Additional copies, in covers, may be had from the Printers, at the undermentioned rates, provided such orders accompany the Manuscript.

	25 Copies.	50 Copies.	100 Copies.
4 pages	3/6	4/6	7/–
8 „	4/6	5/6	8/6
12 „	6/–	7/–	11/–
16 „	7/6	8/6	13/6

EDINBURGH: DAVID DOUGLAS, 10 CASTLE STREET.

BOOKS ON NATURAL HISTORY.

THE VERTEBRATE FAUNA OF SCOTLAND.

Edited by J. A. HARVIE-BROWN and T. E. BUCKLEY.

"We receive few books that are so grateful alike to the eye and sense as the sage-green octavos of Scottish zoological geography which come to us, one after another, from Mr. Douglas. In welcoming this delightful *Vertebrate Fauna of the Orkney Islands*, we feel but one regret, the worlds which are left for Messrs. Buckley and Harvie-Brown to conquer are growing very few. . . . We know not how to approach them. Are we to urge them on upon their splendid enterprise, or to hold them back, that our pleasure may be drawn out the longer? The same plan is pursued as in the previous volumes of this admirable series. A detailed physical geography of the islands precedes the *catalogue raisonné* of the species and habitats. Even to those, therefore, who have little zoological curiosity or knowledge, this book must be of unusual importance, if the reader has an interest in the provinces described."—*Saturday Review.*

VOLUMES ALREADY PUBLISHED—

1. **A VERTEBRATE FAUNA OF SUTHERLAND, CAITHNESS, AND WEST CROMARTY.** [*Out of print.*
2. **A VERTEBRATE FAUNA OF THE OUTER HEBRIDES.** [*Out of print.*
3. **THE BIRDS OF IONA AND MULL, 1852-1870.** By the late HENRY DAVENPORT GRAHAM. With a Memoir of the Author. Illustrated from the Author's Sketch Book. 21s.
4. **A VERTEBRATE FAUNA OF THE ORKNEY ISLANDS.** 30s.
5. **A VERTEBRATE FAUNA OF ARGYLL AND THE INNER HEBRIDES.** 30s.
6. and 7. **A VERTEBRATE FAUNA OF THE MORAY BASIN.** Two Vols. 60s.
8. **A VERTEBRATE FAUNA OF SHETLAND.** By T. E. BUCKLEY and A. H. EVANS. 30s.
9. **A VERTEBRATE FAUNA OF THE NORTH-WEST HIGHLANDS AND SKYE.** By J. A. HARVIE-BROWN and H. A. MACPHERSON. 30s.
10. **A VERTEBRATE FAUNA OF THE TAY BASIN AND STRATHMORE.** By J. A. HARVIE-BROWN. 30s.

AMONG BRITISH BIRDS IN THEIR NESTING HAUNTS. By OSWIN A. J. LEE. Illustrated by the Camera. Parts I. to XVI. are now ready, folio, 11 by 15 inches, price 10s. 6d. net each Part; also in Vols., 4 Vols., at 50s. net each Vol.

HELIGOLAND AS AN ORNITHOLOGICAL OBSERVATORY. The Result of Fifty Years' Experience. By HEINRICH GÄTKE. Translated by RUDOLPH ROSENSTOCK, M.A. Oxon. Royal 8vo. 30s.

A TOUR IN SUTHERLANDSHIRE. With Extracts from the Field Books of a Sportsman and Naturalist. By CHARLES ST. JOHN. 2nd Ed. With Appendix on the Fauna of Sutherland, by J. A. HARVIE-BROWN and T. E. BUCKLEY. Two Vols. Crown 8vo. Illustrated. 21s.

CHARLES ST. JOHN'S NOTE BOOKS, 1846-1853. Invererne, Nairn, Elgin. Edited by Admiral H. C. ST. JOHN. Sm. 4to. 7s. 6d. net.

THE BIRDS OF THE ISLE OF MAN. By P. G. RALFE, M.B.O.U. Demy 8vo. Illustrated. 18s. net.

EDINBURGH: DAVID DOUGLAS, 10 CASTLE STREET.

CONTENTS

Printed by R. & R. Clark, Limited, *Edinburgh*

No. 67] 1908 [JULY

The Annals of Scottish Natural History

A QUARTERLY MAGAZINE

WITH WHICH IS INCORPORATED

"The Scottish Naturalist"

EDITED BY

J. A. HARVIE-BROWN, F.R.S.E., F.Z.S.
MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION

JAMES W. H. TRAIL, M.A., M.D., F.R.S., F.L.S.
PROFESSOR OF BOTANY IN THE UNIVERSITY OF ABERDEEN

AND

WILLIAM EAGLE CLARKE, F.R.S.E., F.L.S.
KEEPER OF THE NATURAL HISTORY DEPARTMENT, ROYAL SCOTTISH MUSEUM, EDINBURGH

EDINBURGH
DAVID DOUGLAS, CASTLE STREET
LONDON: R. H. PORTER, 7 PRINCES ST., CAVENDISH SQUARE

Price 2s. 6d. Annual Subscription, payable in advance, 7s. 6d., Post free.

The Annals of Scottish Natural History.

All Articles and Communications intended for publication, and all **Books, etc.,** for notice, should be sent to MR. EAGLE CLARKE, ROYAL SCOTTISH MUSEUM, EDINBURGH; except those relating to **Botany,** which should be addressed to PROF. TRAIL, THE UNIVERSITY, ABERDEEN.

Subscriptions and Advertisements should be addressed to the Publisher, MR. DAVID DOUGLAS, 10 CASTLE STREET, EDINBURGH.

Authors of General Articles will receive 25 Reprints (in covers) of their Contributions gratis. Additional copies, in covers, may be had from the Printers, at the undermentioned rates, provided such orders accompany the Manuscript.

	25 Copies.	50 Copies.	100 Copies.
4 pages	3/6	4/6	7/–
8 „	4/6	5/6	8/6
12 „	6/–	7/–	11/–
16 „	7/6	8/6	13/6

EDINBURGH: DAVID DOUGLAS, 10 CASTLE STREET.

BOOKS ON NATURAL HISTORY.

THE VERTEBRATE FAUNA OF SCOTLAND.

Edited by J. A. HARVIE-BROWN and T. E. BUCKLEY.

"We receive few books that are so grateful alike to the eye and sense as the sage-green octavos of Scottish zoological geography which come to us, one after another, from Mr. Douglas. In welcoming this delightful *Vertebrate Fauna of the Orkney Islands*, we feel but one regret, the worlds which are left for Messrs. Buckley and Harvie-Brown to conquer are growing very few. . . . We know not how to approach them. Are we to urge them on upon their splendid enterprise, or to hold them back, that our pleasure may be drawn out the longer? The same plan is pursued as in the previous volumes of this admirable series. A detailed physical geography of the islands precedes the *catalogue raisonné* of the species and habitats. Even to those, therefore, who have little zoological curiosity or knowledge, this book must be of unusual importance, if the reader has an interest in the provinces described."—*Saturday Review.*

VOLUMES ALREADY PUBLISHED—

1. **A VERTEBRATE FAUNA OF SUTHERLAND, CAITHNESS, AND WEST CROMARTY.** [*Out of print.*
2. **A VERTEBRATE FAUNA OF THE OUTER HEBRIDES.** [*Out of print.*
3. **THE BIRDS OF IONA AND MULL, 1852-1870.** By the late HENRY DAVENPORT GRAHAM. With a Memoir of the Author. Illustrated from the Author's Sketch Book. 21s.
4. **A VERTEBRATE FAUNA OF THE ORKNEY ISLANDS.** 30s.
5. **A VERTEBRATE FAUNA OF ARGYLL AND THE INNER HEBRIDES.** 30s.

6 and 7. **A VERTEBRATE FAUNA OF THE MORAY BASIN.** Two Vols. 60s.

8. **A VERTEBRATE FAUNA OF SHETLAND.** By T. E. BUCKLEY and A. H. EVANS. 30s.
9. **A VERTEBRATE FAUNA OF THE NORTH-WEST HIGHLANDS AND SKYE.** By J. A. HARVIE-BROWN and H. A. MACPHERSON. 30s.
10. **A VERTEBRATE FAUNA OF THE TAY BASIN AND STRATHMORE.** By J. A. HARVIE-BROWN. 30s.

A VERTEBRATE FAUNA OF LAKELAND, including Cumberland and Westmorland, with Lancashire north of the Sands. By the Rev. H. A. MACPHERSON, M.A. With Preface by R. S. FERGUSON, F.S.A., Chancellor of Carlisle. Demy 8vo. Illustrated. 30s.

HELIGOLAND AS AN ORNITHOLOGICAL OBSERVATORY. The Result of Fifty Years' Experience. By HEINRICH GÄTKE. Translated by RUDOLPH ROSENSTOCK, M.A. Oxon. Royal 8vo. 30s.

A TOUR IN SUTHERLANDSHIRE. With Extracts from the Field Books of a Sportsman and Naturalist. By CHARLES ST. JOHN. 2nd Ed. With Appendix on the Fauna of Sutherland, by J. A. HARVIE-BROWN and T. E. BUCKLEY. Two Vols. Crown 8vo. Illustrated. 21s.

CHARLES ST. JOHN'S NOTE BOOKS, 1846-1853. Invererne, Nairn, Elgin. Edited by Admiral H. C. ST. JOHN. Sm. 4to. 7s. 6d. net.

THE BIRDS OF THE ISLE OF MAN. By P. G. RALFE, M.B.O.U. Demy 8vo. Illustrated. 18s. net.

EDINBURGH: DAVID DOUGLAS, 10 CASTLE STREET.

CONTENTS

Printed by R. & R. Clark, Limited, *Edinburgh.*

No. 68] 1908 [OCTOBER

The Annals of Scottish Natural History

A QUARTERLY MAGAZINE

WITH WHICH IS INCORPORATED

"The Scottish Naturalist"

EDITED BY

J. A. HARVIE-BROWN, F.R.S.E., F.Z.S.
MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION

JAMES W. H. TRAIL, M.A., M.D., F.R.S., F.L.S.
PROFESSOR OF BOTANY IN THE UNIVERSITY OF ABERDEEN
AND
WILLIAM EAGLE CLARKE, F.R.S.E., F.L.S.
KEEPER OF THE NATURAL HISTORY DEPARTMENT, THE ROYAL SCOTTISH MUSEUM, EDINBURGH

EDINBURGH
DAVID DOUGLAS, CASTLE STREET
LONDON: R. H. PORTER, 7 PRINCES ST., CAVENDISH SQUARE

Price 2s. 6d. Annual Subscription, payable in advance, 7s. 6d., Post free.

The Annals of Scottish Natural History.

All Articles and Communications intended for publication, and all **Books, etc.,** for notice, should be sent to MR. EAGLE CLARKE, ROYAL SCOTTISH MUSEUM, EDINBURGH; except those relating to **Botany,** which should be addressed to PROF. TRAIL, THE UNIVERSITY, ABERDEEN.

Subscriptions and Advertisements should be addressed to the Publisher, MR. DAVID DOUGLAS, 10 CASTLE STREET, EDINBURGH.

Authors of General Articles will receive 25 Reprints (in covers) of their Contributions gratis. Additional copies, in covers, may be had from the Printers, at the undermentioned rates, provided such orders accompany the Manuscript.

	25 Copies.	50 Copies.	100 Copies.
4 pages	3/6	4/6	7/–
8 „	4/6	5/6	8/6
12 „	6/–	7/–	11/–
16 „	7/6	8/6	13/6

BOOKS ON NATURAL HISTORY.

THE VERTEBRATE FAUNA OF SCOTLAND.

Edited by J. A. HARVIE-BROWN and T. E. BUCKLEY.

"We receive few books that are so grateful alike to the eye and sense as the sage-green octavos of Scottish zoological geography which come to us, one after another, from Mr. Douglas. In welcoming this delightful *Vertebrate Fauna of the Orkney Islands*, we feel but one regret, the worlds which are left for Messrs. Buckley and Harvie-Brown to conquer are growing very few. . . . We know not how to approach them. Are we to urge them on upon their splendid enterprise, or to hold them back, that our pleasure may be drawn out the longer? The same plan is pursued as in the previous volumes of this admirable series. A detailed physical geography of the islands precedes the *catalogue raisonné* of the species and habitats. Even to those, therefore, who have little zoological curiosity or knowledge, this book must be of unusual importance, if the reader has an interest in the provinces described."—*Saturday Review.*

VOLUMES ALREADY PUBLISHED—

1. **A VERTEBRATE FAUNA OF SUTHERLAND, CAITHNESS, AND WEST CROMARTY.** [*Out of print.*
2. **A VERTEBRATE FAUNA OF THE OUTER HEBRIDES.** [*Out of print.*
3. **THE BIRDS OF IONA AND MULL, 1852-1870.** By the late HENRY DAVENPORT GRAHAM. With a Memoir of the Author. Illustrated from the Author's Sketch Book. 21s.
4. **A VERTEBRATE FAUNA OF THE ORKNEY ISLANDS.** 30s.
5. **A VERTEBRATE FAUNA OF ARGYLL AND THE INNER HEBRIDES.** 30s.

6 and 7. **A VERTEBRATE FAUNA OF THE MORAY BASIN.** Two Vols. 60s.

8. **A VERTEBRATE FAUNA OF SHETLAND.** By T. E. BUCKLEY and A. H. EVANS. 30s.
9. **A VERTEBRATE FAUNA OF THE NORTH-WEST HIGHLANDS AND SKYE.** By J. A. HARVIE-BROWN and H. A. MACPHERSON. 30s.
10. **A VERTEBRATE FAUNA OF THE TAY BASIN AND STRATHMORE.** By J. A. HARVIE-BROWN. 30s.

A VERTEBRATE FAUNA OF LAKELAND, including Cumberland and Westmorland, with Lancashire north of the Sands. By the Rev. H. A. MACPHERSON, M.A. With Preface by R. S. FERGUSON, F.S.A., Chancellor of Carlisle. Demy 8vo. Illustrated. 30s.

HELIGOLAND AS AN ORNITHOLOGICAL OBSERVATORY. The Result of Fifty Years' Experience. By HEINRICH GÄTKE. Translated by RUDOLPH ROSENSTOCK, M.A. Oxon. Royal 8vo. 30s.

A TOUR IN SUTHERLANDSHIRE. With Extracts from the Field Books of a Sportsman and Naturalist. By CHARLES ST. JOHN. 2nd Ed. With Appendix on the Fauna of Sutherland, by J. A. HARVIE-BROWN and T. E. BUCKLEY. Two Vols. Crown 8vo. Illustrated. 21s.

CHARLES ST. JOHN'S NOTE BOOKS, 1846-1853. Invererne, Nairn, Elgin. Edited by Admiral H. C. ST. JOHN. Sm. 4to. 7s. 6d. net.

THE BIRDS OF THE ISLE OF MAN. By P. G. RALFE, M.B.O.U. Demy 8vo. Illustrated. 18s. net.

EDINBURGH: DAVID DOUGLAS, 10 CASTLE STREET.

CONTENTS

Printed by R. & R. CLARK, LIMITED, *Edinburgh.*

The Annals

OF

Scottish Natural History

A QUARTERLY MAGAZINE

WITH WHICH IS INCORPORATED

"The Scottish Naturalist"

EDITED BY

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

MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION

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

PROFESSOR OF BOTANY IN THE UNIVERSITY OF ABERDEEN

AND

WILLIAM EAGLE CLARKE, F.L.S., F.R.S.E.

KEEPER OF THE NATURAL HISTORY DEPARTMENT, THE ROYAL SCOTTISH MUSEUM, EDINBURGH

1909

EDINBURGH

DAVID DOUGLAS, CASTLE STREET

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

THE NATURALIST

A MONTHLY JOURNAL OF NATURAL HISTORY FOR THE NORTH OF ENGLAND

Cheshire	Lancashire	Nottinghamshire
Cumberland	Lincolnshire	Westmoreland
Derbyshire	Isle of Man	Yorkshire
Durham	Northumberland	

Edited by

T. SHEPPARD, F.G.S., and T. W. WOODHEAD, F.L.S.,
Museum, Hull; Technical College, Huddersfield;

With the assistance as Referees in Special Departments of

J. Gilbert Baker, F.R.S., F.L.S.	Geo. T. Porritt, F.L.S., F.E.S.
Percy F. Kendall, F.G.S.	John W. Taylor.
T. H. Nelson, M.B.O.U.	William West, F.L.S.

All Communications to be addressed—

THE EDITORS, "THE NATURALIST," MUSEUM, HULL.

Annual Subscription, 6s. 6d. Single Numbers, 6d.; by post, 7d.

LONDON: A. BROWN & SONS, Ltd., 5 Farringdon Avenue.

***MONTHLY, PRICE* 2d.**

A Specimen Copy will be sent by the Publishers to any address on receipt of a 2½d. Stamp.

THE SELBORNE MAGAZINE

AND NATURE NOTES

THE ORGAN OF THE SELBORNE SOCIETY

Edited by Prof. G. S. BOULGER, F.L.S., F.G.S.

The *minimum* Annual Subscription (which entitles Subscribers to a Monthly copy of The Selborne Magazine is 5s. All particulars may be obtained from the Honorary General Secretary, Wilfred Mark Webb, F.L.S., at 20 Hanover Square, London, W.

The Selborne Society was founded in 1885, and its objects are—

To Promote the Study of Natural History.
To preserve Wild Animals and Plants from Needless Destruction.
To protect Places and Objects of Antiquarian Interest or Natural Beauty.

GEORGE PHILIP & SONS, Ltd., 32 Fleet Street, LONDON.

The Annals
of
Scottish Natural History

No. 69] 1909 [JANUARY

ON THE OCCURRENCE OF EVERSMANN'S WARBLER (*PHYLLOSCOPUS BOREALIS* (BLASIUS)) AT FAIR ISLE: AN ADDITION TO THE BRITISH FAUNA.

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

ON the 28th of September last, while in search of migratory birds at Fair Isle, I put up from a patch of potatoes, where it was hiding, a dark-coloured Willow Warbler, which I at once suspected belonged to some species I had never before seen in life. I was fortunate enough to secure the bird, and congratulated myself, as I contemplated its outstretched wings each with a conspicuous *single* bar and its well-defined, pale, superciliary stripe, on the capture of the third British example of the Greenish Willow Warbler (*Ph. viridanus*).

On my return to Edinburgh, however, I was agreeably surprised to find that my bird was undoubtedly an example of Eversmann's Warbler (*Ph. borealis*)—a bird which had not hitherto been detected in Britain. The descriptions of this species are misleading, far too much importance being made of the so-called double wing-bar. The second bar is absent in some examples, while in others it is only present in the shape of a few flecks of greyish-white on the tips of

the median wing coverts. A much safer guide is to be found in the wing formula. In this species the second primary quill is intermediate in length between the fifth and sixth, the third and fourth are equal and are the longest, the fifth is much shorter, and the sixth is considerably shorter than the fifth. In all these respects the Fair Isle specimen, which is a male, agrees with the descriptions, and the wing measures 2.55 inches.

In colour the upper surface is darker than that of our familiar Willow Warbler (*P. trochilus*), being dusky greyish-green; the eye-stripe is well defined, extends on to the nape, and is yellowish-white; the greater wing coverts are broadly tipped with greyish-white, forming a conspicuous wing-bar; the cheeks whitish, dappled with grey; the under surface whitish, greyer on the breast and flanks, and faintly washed with greenish-yellow.

On examination, the contents of the gizzard were found to consist of a Phalangid, two Noctuid larvæ, and the remains of *Scatophaga stercoraria* and *Anthomyia phorbia* and many fragments of other Dipterous insects.

This species has only once before, I believe, been obtained in Western Europe, namely, at Heligoland on the 6th of October 1854. This is, perhaps, somewhat remarkable, since the bird occurs in summer in Finmark and Northern Russia. It also summers throughout Siberia, and has been obtained in Alaska, where it is known to American ornithologists as Kennicott's Willow Warbler. In winter it occurs in Burma, the Malay Peninsula, the Andaman Islands, China, Formosa, Borneo, etc. It would be extremely interesting to know where the European contingent pass the cold season, for it is difficult to believe that there are no winter retreats for the species nearer than the eastern section of Southern Asia.

Eversmann's Warbler frequents woods composed of deciduous trees in elevated districts, especially those in the vicinity of water. Its food consists of insects, which it seeks high up among the foliage. The nest is described as being a semi-domed structure of moss and dry grass, placed on the ground, and lined with fine grass. The eggs are five or six in number, rather larger than those of the Willow Warbler, and are white abundantly spotted with pink.

SOME AUTUMN BIRD NOTES FROM THE OUTER HEBRIDES.

By the Duchess of Bedford.

As comparatively few Ornithologists visit the Outer Hebrides in the month of November for bird-watching, the following notes, made in Barra and South Uist between the 31st October and 8th November, may be of interest. Fortunately, Barra boasts of resident observers who have kept a very careful record of the birds for many years, but, as migrants often spend but a day or two in passing, it is not possible even for residents to note more than a small proportion of their interesting visitors.

At this time of year every day brings something worthy of note, whether it be the arrival of regular winter visitors, of rare stragglers, or the exceptionally late appearance of summer migrants (on passage from Northern Europe), which are generally supposed to have left the British Islands several weeks earlier. Amongst these last were three Wheatears, seen on the 1st November, and a Chiff-chaff on the 7th. Probably a great many of the Chaffinches, Hedge Sparrows, Greenfinches, and Golden-crested Wrens that were there in the beginning of the month were also migrating. The only thick bit of shrubbery that I know of on this island is a great attraction to these birds. When visiting it on 3rd November my attention was at once arrested by a little brown bird, which I at first took for a Warbler. Its strikingly large eye, buff breast, and some very conspicuous white about the tail puzzled me very much, as the bird was so restless that I could not see exactly where the white came. At last, however, it obligingly perched on a wire fence only the width of a narrow road from me, and I was able to see that with the exception of the dark centre feathers the basal half of the tail was white. I then recognized that it was either a female or a young male Red-breasted Flycatcher (*Muscicapa parva*).

The Geese arrived much later than usual. On the 31st

October I saw a single Bernacle Goose, and on 1st November three Brent Geese. These latter were so tame that I walked up within gunshot of them on the sands without disturbing them. On the 3rd November, for the first time, I noticed large flocks of Bernacle, Brent, and Grey-lag Geese, also a flock of thirteen Whooper Swans flying over. On a still day Barra Sound is seen to be teeming with bird-life. The Great Northern Diver is a common bird, and five or six may often be seen at one moment. The Slavonian Grebe is also by no means uncommon, and I have seen five in one morning round the rocks. I have counted over 300 Mergansers in one small bay. The Eider Ducks and Long-tailed Ducks are more select and go about in smaller parties, but they are scattered in every direction. There are a few Black Guillemots and an abundance of Gulls ; amongst the latter, however, the Lesser Black-backed is conspicuous by its absence. Manx Shearwaters and Arctic Skuas are scarce, but an occasional one may be seen near the open sea. Redwings and Fieldfares had arrived on the 3rd November, and on the same day I saw a flock of Bramblings, and on the 5th came upon a flock of Snow-Buntings on the Island of Fuday.

It is curious to watch the Seals following my Pekingese Spaniel along the shore for half a mile or more, even when he is on the sandhills above them and quite sixty to seventy yards from the sea. I have seen as many as sixteen collect and swim close to the shore in sight of him.

On an island near Tobermory, on my way to the Outer Hebrides, I saw a Stoat slip into the sea, without a moment's hesitation, as an Otter would take to the river, and swim over to another island.

Before leaving the Outer Hebrides I spent one morning on South Uist (6th November). There were very large flocks of Bernacle and White-fronted Geese on the western side of the island, and a considerable number of Whooper Swans on one of the lochs, also six Grey Plovers on the shore of the loch. Just before reaching the pier where my launch was waiting for me, I put up a Redstart. It sat on a wire fence close to me, and gave me ample opportunity of seeing from its size, uniform sooty-brown plumage, and red

tail, that it was a Black Redstart (*R. titys*). Not only was it larger than *R. phœnicurus*, but it struck me as being of slimmer build. The only other bird worthy of note seen on this occasion was the Hen-Harrier.

Woburn Abbey, Woburn.

BIRD NOTES FROM THE ISLE OF MAY FOR THE YEAR 1908.

By Evelyn V. Baxter.

Thanks to the observations made by Mr. Maccuish, I am able to supplement the account of my own work on the Isle of May with many interesting notes which he has sent me during the year. I arrived on the island on 10th September and stayed till 9th October. I was alone for the first fortnight, but my cousin, Miss Jackson of Swordale, was with me for the latter half of my visit. During my stay on the island I saw 83 species of birds, and Mr. Maccuish has sent me reports relating to 21 others, which bring the total up to 104 species observed on the May this year.

The first appearance of birds at the lantern in any numbers was on 10th February, when Thrushes, Redwings, Skylarks, and Starlings are reported. On the night of 7th March (N. wind, light) a "miniature rush" took place, and later in the month, on the 25th and 26th, great flocks of Fieldfares, Blackbirds, Thrushes, Rooks, Hooded Crows, and Jackdaws arrived on the island and remained for several days. Only small numbers of migrants are recorded till we come to 29th April, when a "great flock" of Fieldfares is noted, and the next night there were many Wheatears and Willow Warblers at the lantern. On 4th May there was a rush, when Wheatears, Willow Warblers, and Redstarts are noted as "swarming on the lantern from 11 P.M. till daybreak on the 5th" (N.E.-E. light, fog), and next night the three species named above, as well as Fieldfares and Redbreasts, were numerous at the light. Throughout May, and until 2nd June, we have occasional records of migrants; and on 13th August the first of the autumn movement is

reported, two Wheatears being seen on that date. Redstarts, Redbreasts, Whitethroats, Willow and Sedge Warblers, Goldcrests, and Cuckoos followed in small numbers, but when I arrived on 10th September very few birds of passage were to be seen. For nine solid days thereafter the wind kept persistently in the N. and W., and with the exception of the Scarlet Grosbeak, my records were of a most disappointing description. However, on 19th September the wind at last went into the S.E. and I had a crowded week of glorious life; Redstarts, Pied Flycatchers, Whitethroats, Garden Warblers, Siskins, Whinchats, Chaffinches, and Bramblings came in, in numbers, and in lesser quantities were to be seen rarer migrants, as Bluethroats, Lesser Whitethroats, Blackcaps, Yellow-browed Warblers, Grasshopper Warblers, White Wagtails, and Wrynecks. The last fortnight of my stay was characterised by very light airs, mostly off the S. and S.W., and the stream of migration slackened very much though there were always some birds to be seen. In the end of October and beginning of November there were huge rushes at the lantern, chiefly Redwings; but there were also Fieldfares, Thrushes, Blackbirds, Wheatears, Robins, Blackcaps, Chiff-chaffs, Goldcrests, Siskins, Greenfinches, Bramblings, Chaffinches, Ring Ouzels, Starlings, Skylarks, Woodcock, Snipe, and Lapwings at the light. I wish to express my grateful thanks to the Commissioners of Northern Lights for their kindness in again permitting me to spend a month on the May, a time so full of interest and pleasure. I have also to thank Mr. Maccuish most heartily for supplying me with records and birds throughout the year, and both Mr. and Miss Maccuish for their great kindness and hospitality, which contributed so much towards making my stay so pleasant; also Mr. and Mrs. Ross, and all the other lighthouse officials, for allowing me to hunt their gardens for birds, and for their many other kindnesses; and Mr. Eagle Clarke for much valuable help and advice.

Missel Thrush, *T. viscivorus*.—This is not a frequent visitor to the May. I have only four records for the year, viz. single birds on the 8th February and 23rd September, several on 7th October, when (contrary to what we had observed before on the island) they chiefly frequented the gardens, and two on 29th October.

Song Thrush, *T. musicus*.—Mr. Maccuish reports that a few stayed all winter. The first entry of Thrushes at the lantern is on 10th February, followed by a "miniature rush" on 7th March. On 21st March there were "many at the lantern"; flocks all day on the 25th; great numbers on 26th March, which stayed for several days; and on 1st April a few were at the lantern all night. When I arrived there were very few. On 20th September, however, a good many appeared, and they were numerous till the 22nd. The next two days there were only a few, but a fresh immigration took place on the 25th, and there were a good many till the 29th. Further rushes took place on 1st, 2nd, and 5th October, and they were still plentiful when I left on 9th October. Mr. Maccuish reports them as numerous all day on 16th October, and on the nights of the 17th, 23rd, 27th, and 28th they were at the lantern in small numbers.

Redwing, *T. iliacus*.—Some are reported at the lantern at 1 A.M. on the morning of 10th February. The first seen in autumn appeared on 2nd October, nearly a week later than the first-comers last year; on the 3rd one bird was observed, and there were a good many from 5th to 7th October. After I left Mr. Maccuish reports a great rush on 16th October, and on the 23rd from 2 A.M. till daylight (W. wind, light, hazy) "an enormous rush" followed, and another from 7 P.M. on the 23rd till daybreak on the 24th. On 27th, 28th, and 29th October there were large flocks at the lantern; from 6 P.M. on 3rd November till daylight on the 4th there were many at the light; and next night the rush was repeated. Mr. Maccuish says that this was the largest rush of one species he has ever seen.

Fieldfare, *T. pilaris*.—On 14th February Fieldfares are reported to have been "on the island for the last 4 or 5 days"; flocks on 25th and 26th March (S.E.-S. fresh, haze) which stayed for several days. There were large numbers on 9th and 29th April, and the birds remained numerous till 2nd May. On the night of 5th May from 10 P.M. to daybreak on the 6th they were numerous on the lantern. In autumn the first, a solitary bird, was got at the lantern on the night of 23rd October; a few appeared on 28th October, and were also at the lantern that night. On 3rd and 5th November many were at the lantern, and a small rush is recorded on 14th November.

Blackbird, *T. merula*.—A few stayed on the island all winter; on 7th March there was a small rush, and there were many at the lantern on the night of 21st March (S.E. fresh, haze). On 25th March and for several days there were numbers on

the island; there were a few at the lantern on 8th April, and a great many throughout the day on the 9th. Blackbirds nest on the island; I found their nests on the ground or in holes in stone gate-posts and such-like places. I saw very few till 22nd September, when a number arrived but stayed only two days; the next immigration was on 1st October, and they continued plentiful till the 4th, but appeared in renewed numbers on the 5th, and continued plentiful till I left. In the early morning of 23rd October a few were at the lantern; on the 24th and the next three nights some were reported at the light. From 6.30 P.M. on 3rd November till next morning a few were seen, and many from 1 A.M. till daylight on 5th November.

RING OUZEL, *T. torquatus*.—On the 26th April (N.E. light, clear) one was seen, and two next day. I only saw one, namely, on 5th October. On the night of 23rd October two came to the light; one on the night of the 27th; and three the next night.

WHEATEAR, *S. œnanthe*.—The first of the season is noted on 1st April, and one stayed on the lantern all that night; on the night of the 8th there were a few at the light, and next day they were present on the island in large numbers. On the night of 30th April they were numerous, as also from 12 to 4 A.M. on the morning of 4th May, and next night they were "swarming on the lantern from 11 P.M. till daylight on the morning of the 5th"; they were numerous from 10 P.M. on 5th May till daybreak on the 6th. Under date of 22nd June Mr. Maccuish writes, "Wheatears do not breed here; not one is to be seen." On 13th August the first detachment (consisting of two birds) of the autumn migrants arrived, and on the 17th and 20th single birds were at the lantern. When I reached the island on 10th September a few were to be seen till 22nd September, when a good many arrived and remained for a while. On 5th October there were fresh arrivals, which, however, passed on next day. A few came to the light with the big rush of migrants on the night of 23rd October, and one was observed on the island on 29th October.

WHINCHAT, *P. rubetra*.—Two of these smart little birds are reported on 5th May, and a beautiful male killed itself against the lantern on the night of 6th May. Whinchats were present from the 19th September to the 4th October. The largest number seen was on 25th September.

STONECHAT, *P. rubicola*.—A male on 8th October is the only record for the year; it frequented a large patch of thistles not far from the lighthouse.

REDSTART, *R. phœnicurus*.—On 1st May two Redstarts were on the island all day; in the early morning of the 3rd five were at the light; but they were "swarming on the lantern" from 11 P.M. on the 4th till daylight on the 5th, and next night they were again numerous.

On the return journey the first was seen on 23rd August, and one was at the lantern on the night of the 30th. I saw none till 19th September, when the wind at last came out of the W. into the S.E., and several appeared. On the 22nd a lot arrived, and many more came in on the 24th, when the island was full of Redstarts. A good many left on the 28th and only one or two remained, which stayed till 1st October. My last entry is a single bird on 6th October.

RED-SPOTTED BLUETHROAT, *C. suecica*.—On 22nd September (S.E. wind, very light) to my great joy I had my first glimpse of a Bluethroat; it was among some rocks near the south end of the island, and was very wild, but before it disappeared I saw that it had a distinct stripe of blue, bordered with rust-red, on the breast. Next day I saw another also among the rocks; this bird had the whitish throat of a young bird, but it was even wilder than the last. On the 24th there were two in Mr. Ross's garden, and on the 25th several in the gardens. Thereafter I saw no more till 5th October, when one made its appearance in the lighthouse garden, but left the same day. They were so very wild that I only succeeded in securing one, a bird of the year. When about to alight Bluethroats spread out their tails like a fan, when the chestnut basal portion of the tail feathers contrasts strongly with the dark-brown terminal portion, forming a striking and most pleasing picture. They also have an attractive way of cocking their tails straight up into the air while sitting on the ground or on a wall, at the same time making a funny little bob.

REDBREAST, *E. rubecula*.—Mr. Maccuish reports single birds on 12th and 30th January, and 10th February (at lantern), and two on 12th February. On 27th April there were a great many all day, and they were numerous on the lantern from 10 P.M. on 5th May till daybreak on the 6th.

One reappeared on 6th September, and on the 10th I saw a Robin in the lighthouse garden. I observed single birds on eight occasions between 20th September and 2nd October, and several on 5th October. In some cases they were very wild indeed, and would not let one anywhere near them; a wild Robin strikes one as a queer anomaly. This species participated in the great October rush. They were numerous all day on 17th October; several were at the lantern on the night

of 23rd October; a lot in the early morning hours of the 28th; many from 8 P.M. on the 28th till daybreak on the 29th; and a few on the night of 3rd November.

WHITETHROAT, *S. rufa.*—The first Whitethroat recorded for the season appeared on the lantern at 2 A.M. on 15th May, and in the early hours of the 17th four were attracted by the light, and another at 1.30 A.M. on 2nd June.

In the autumn one was at the light early on 19th August. I saw no Whitethroats on the island till 21st September, next day there were several about; on the 25th several appeared; and next day the gardens were full of them, and even amid the rocky parts one kept meeting Whitethroats at every turn, sometimes in the most unlikely-looking places; in some cases they were extraordinarily tame. There was one at the lantern that night, but next morning (27th September) I found that the great body had gone on, only a solitary bird being visible. I saw but one more during my stay, on 5th October, in Mr. Ross's garden. There were many more of this species than last year.

LESSER WHITETHROAT, *S. curruca.*—On 24th September a Lesser Whitethroat appeared in the lighthouse garden. Next day I came upon a most wonderfully tame bird of this species in the same garden. It let me stand within a yard of it, without minding in the least, but would not quite allow itself to be touched. On the 26th September another came in, and another killed itself against the lantern that night.

BLACKCAP, *S. atricapilla.*—I saw more Blackcaps this year than last. The first, a full-plumaged male, was seen on 20th September, and flitted about in the hemlock tangle most confidingly. Next day there were two males, and on the 22nd these birds had left and a female had arrived. On 23rd and 26th September and 5th October single birds were seen, all males; on 7th October there were several males and one female, but next day only one male was to be seen. One came to the lantern on the night of 17th October.

GARDEN WARBLER, *S. salicaria.*—One arrived on 20th September, and there were several in the gardens and tangle every day till the 25th, one on the 26th, and one at the lantern that night. Thereafter only single birds on 2nd and 5th October. They sat very close in the patches of potatoes and were more abundant than last year.

GOLDCREST, *R. cristatus.*—Only two or three Goldcrests were observed during the autumn and winter of 1907-8, and none were observed during our stay on the island last year. This year, however, it was a very different story. The first record

is for 3rd September, when three birds of the year were killed against the lantern. During my stay I saw Goldcrests on eighteen different days; in numbers on 27th September and 7th and 8th October, and on other occasions in small quantities. They were very confiding, letting me stand within a yard of them as they flitted from one bit of hemlock to another, or crept about on the face of the cliffs. They were often taken at the lantern, and on several occasions came into the houses of the lightkeepers. After I left Goldcrests were numerous on 17th October, and there were a few at the light from 7.30 P.M. on 23rd October till daybreak.

YELLOW-BROWED WARBLER, *P. superciliosus*. — I saw this most attractive little Warbler on four occasions. I was standing in the lighthouse garden just as it was getting dusk on the evening of 22nd September, when a Yellow-browed Warbler flew over my head and settled on a patch of bare earth; though it was difficult to see it, I managed to secure it. The next appeared on the afternoon of 24th September in the hemlock tangle, and the third arrived next day in the lighthouse garden. The last was found lying dead under a rock not far from the lighthouse on 3rd October. The three procured were all males.

CHIFF-CHAFF, *P. collybita*.—I procured one specimen of this bird in Mr. Ross's garden on 5th October, and another was sent me which had killed itself on the lantern on the night of 23rd October, when a few are reported as having come to the light.

WILLOW WARBLER, *P. trochilus*.—The first record of this bird is on 30th April, when two came to the lantern, and next day they were numerous on the island. They were again numerous at the light from midnight to 4 A.M. on 3rd May. They were swarming on the lantern from 11 P.M. on 4th May till daylight on the 5th, and next night they were again present in numbers. The return migration is first noted on 17th August, when three came to the lantern; two put in an appearance at the light on the night of 20th August, and on the night of 3rd September, at 9 P.M., a bird of the year struck. On my arrival on 10th September, I saw two in the hemlock tangle, and next day one in the garden. Others were seen on the 19th, 21st, and from the 22nd to 26th.

SEDGE WARBLER, *A. schœnobœnus*.—On 20th August one came to the lantern about midnight, and a bird of the year was killed on 3rd September. On arriving I found two in the hemlock tangle. I observed no more during the day, but one was got at the lantern on the night of 25th September, and two more next night; these birds were adults.

Grasshopper Warbler, *L. nævia.*—An adult female was procured in a garden on 21st September.

Hedge Accentor, *A. modularis.*—One of these birds arrived on 28th September, and on 1st October there were two in the lighthouse garden; one appeared on the 2nd, and was joined by another on the 8th. These birds fought a good deal when we put them out of the garden on to the wall, attacking one another with a right good will.

British Cole Tit, *P. britannicus.*—One was procured in Mr. Ross's garden on 1st October (S.S.E. wind, extremely light). I watched it for some time as it sat on the telephone wire, calling and preening itself. [An interesting record, for we have little information regarding this species as a wanderer.—Eds.]

Blue Tit, *P. cæruleus.*—On 30th September (W. wind, fresh) one was in Mr. Ross's garden; it was very tame and sat close in the currant bushes. [Another interesting observation.—Eds.]

Wren, *T. parvulus.*—On the night of 21st April one was taken at the lantern, and on 3rd October there was one in the lighthouse garden. On 7th and 8th October there were three or four about the gardens and tangle; they were almost as tame as the Goldcrests.

White Wagtail, *M. alba.*—Four or five adults appeared on the morning of 20th September, but did not stay long, all having left by the afternoon.

Pied Wagtail, *M. lugubris.*—Mr. Maccuish reports three on 14th March, and "many about" on 1st April. I saw a few almost every day from 10th to 29th September, and single birds on 1st and 2nd October. This was by far the most numerous and wariest of the wagtails. Both adults and young were present.

Grey Wagtail, *M. melanope.*—Two appeared on 2nd October, and ran about on the grass catching insects, sometimes fluttering a short distance, when their beautiful colouring became very conspicuous.

Meadow Pipit, *A. pratensis.*—Seen in small numbers throughout my stay, with the exception of 13th September and 1st October; from 19th to 25th September there were a good many. On 15th September I saw one parachuting and singing.

Tree Pipit, *A. trivialis.*—One was killed at the light on the night of 6th May. On the southward migration two were obtained, one at the lantern on the night of 26th September and one in Mr. Ross's garden on 28th September.

Rock Pipit, *A. obscurus*.—Mr. Maccuish informs me that this species remains on the island throughout the year. I saw them every day; a good many from the 14th to 28th September; otherwise a few only.

Great Grey Shrike, *L. excubitor*.—One was caught in the lobby of the lighthouse at 6 P.M. on 25th October, and sent to me. It proved to be a female with a single wing-bar.

Spotted Flycatcher, *M. grisola*.—The only spring record is for 7th May, when one came to the lantern at 11.30 P.M. In autumn I saw two on 25th September, one on the 26th, and one was killed at the lantern the same night.

Pied Flycatcher, *M. atricapilla*.—The first of these nice little birds came in on 19th September, and frequented the ravine. It had a way of sitting on a pinnacle of rock and shrieking without intermission for several minutes. I often heard it long before I came in sight of it, and at first I could not think what bird it was that was making such an unholy noise. There were one or two about till 23rd September, a good many on the 24th and 25th, two or three on the 26th, and a good many at the lantern that night; one on the 28th. The light seems to have a great attraction for these birds, and if there were any on the island they were sure to turn up at the lantern, if the night were at all favourable. They frequented both the gardens and the rocks, and were very wild at the beginning of the migration, but much tamer ere its close.

Swallow, *H. rustica*.—The only spring record is for the 11th May. In autumn I saw one on the 12th September, two on the 15th (one young and one old), several on the 22nd, one on the 23rd, and several flying over from north to south on the 24th.

House Martin, *C. urbica*.—I have only two notes of this species, one on 15th September and three going south on 29th September.

Sand Martin, *C. riparia*.—One flew over from north to south on 11th September.

Siskin, *C. spinus*.—A flock of seven appeared on 22nd September. I think they were probably a family party, as they consisted of one male in good plumage, and six in the duller dress of the female and young. These stayed for three days, and a fresh small flock came in on 25th September; there were three or four on the 26th; a pair, ♂ and ♀, on the 29th; and on 3rd October there were three, one being a beautiful male. One came to the lantern on the night of 17th October, and a few during the small hours of 28th October. All were wonderfully tame while they pecked away at the heads of thistles.

GREENFINCH, *L. chloris.*—Under date of 11th March, Mr. Maccuish reports "several seen for several days." I saw none, but there were a lot at the lantern on the night of 17th October.

TREE SPARROW, *P. montanus.*—There were a party of five when I arrived, but they were reduced to three before I left; presumably the hawks had taken toll of them. They were very wary birds, being up and away long before one got anywhere near them.

CHAFFINCH, *F. cœlebs.*—On 21st September, about 9 P.M., several Chaffinches made their appearance at the light, and next morning a flock of about fifteen were on the island. These were augmented by further arrivals on the 25th, and on the 26th there was a very large flock. On 27th and 28th September they were still numerous, and a few remained for the next three days. On 6th October another small party arrived, and were still on the island when I left. A lot are reported at the lantern in the big rush in the early morning of 28th October.

BRAMBLING, *F. montifringilla.*—Two birds appeared on 25th September (S.E. wind, very light), and consorted with the Chaffinches. Next day and on the 28th there were single birds. The next arrival was on 2nd October; in the morning a flock of about half a dozen birds was to be seen, and about 4 P.M. another small flock came in from the north and joined the others. These birds stayed for some time, receiving a further addition to their number on 6th October, but there were only a few left on the 8th. A good many Bramblings are reported at the lantern early on the morning of 28th October.

LINNET, *L. cannabina.*—On 11th March one appeared on passage. During my stay I saw Linnets on four occasions, one on 19th September, three on 6th October, and single birds on 7th and 8th October; in each case they were very wild.

MEALY REDPOLL, *L. linaria.*—Two came to the lantern on the night of the 29th December 1907, and single birds are reported on the 13th and 18th January and 8th February. On 12th March a bird in dark plumage was procured.

SCARLET GROSBEAK, *C. erythinus.*—On 12th September, about midday, I was standing in the lighthouse garden when a bird flew over the wall, coming from the east, and settled on the oats, where it sat uttering a soft "twe-eek" at intervals. I recognised it as a Scarlet Grosbeak, having seen one on the May last year, and watched it for some time as it fluttered gently from one oat-stalk to another. The bird then flew on to the wall, when I procured it; it proved to be an adult female.

Reed-Bunting, *E. schœniclus.*—This was the only kind of Bunting that I saw on the island. A single bird arrived on 24th September and was seen the next two days; on 27th and 28th September there were two, and one on the 30th. A single bird on 7th October. These Buntings were extremely wild.

Snow-Bunting, *P. nivalis.*—On the 2nd January and 21st and 26th March single birds are reported, and one was killed at the lantern on the night of 25th October.

Skylark, *A. arvensis.*—On the nights of 10th, 20th, and 26th February and 4th March a few are reported at the lantern; a small rush on the night of 7th March, and a few at the light on the night of 1st April. From 19th September onwards I saw a few Skylarks most days; a lot passed over from north to south on 2nd October, and on several occasions they came to the light. On 17th October they were numerous during the day and several were at the lantern at night; in the early morning of 23rd October a few are reported, and the same next night.

Starling, *S. vulgaris.*—On the night of 10th February there were a few at the lantern, and on 7th March a small rush. On the 25th March there were flocks all day, and on 26th March "great flocks which stayed several days." On the night of 1st April there was a great rush all night.

I saw Starlings every day, a few to begin with, increasing gradually towards the end of my stay. On several occasions they came to the lantern and sat on the hand-rail, gazing in at the light till daylight came; they were difficult to catch, hurrying round the rail when pursued. This species figured largely in the big rush on the night of 17th October, a few in the early morning of 23rd October, and many next night. Other movements are recorded for 27th and 28th October, and for 3rd and 4th November.

Jackdaw, *C. monedula.*—Mr. Maccuish reports that great flocks came in on 26th March and stayed for several days. On 28th October there were a few on the island.

Hoodie Crow, *C. cornix.*—Flocks are reported on 25th March, and great flocks next day. These birds stayed several days. A flock is recorded on 18th October, and a big flock throughout the day on 28th October.

Rook, *C. frugilegus.*—On 9th January one was seen, and three on 5th March; on the night of 6th March one struck the lantern and was killed. This species participated in the great rush on 25th and 26th March, flocks being reported for the former date, and "great flocks which stayed for several days" for the latter. In autumn a large flock is reported on 28th October.

SWIFT, *C. apus.*—8th May is the first record, and single birds are reported on 13th, 16th, and 23rd May.

WRYNECK, *J. torquilla.*—I saw a Wryneck on the wall of the lighthouse garden on 20th September, and one came to the lantern on the night of 26th September.

CUCKOO, *C. canorus.*—The first of the season was heard on 4th May, and on 18th and 24th May single birds were seen. On the return journey a bird of the year was procured on 20th August.

SHORT-EARED OWL, *A. accipitrinus.*—On 7th March one was seen at midnight, busily engaged in chasing other migrants that were attracted by the light. On 26th March, 1st April, and 3rd and 4th May single birds were seen.

Two were reported on 24th September, one on 25th October, and another on 29th October. On 13th November one was observed by Mr. Maccuish chasing a Redwing.

PEREGRINE, *F. peregrinus.*—I saw a bird of the year on four occasions, on 20th September and from the 3rd to the 5th October. Once I saw it single a bird out from amongst a flock of Starlings; it stooped at the Starling three times, but each time the pursued one dodged just at the critical moment, and it eventually escaped, for the time being, anyway. After this chase the Starlings would not move for an hour or so from the telephone wire, or flag-staff, or wherever they happened to be sitting. Once I saw a Herring Gull chase the Falcon away, but Herring Gulls will chase most things.

MERLIN, *F. æsalon.*—One was to be seen most days from 26th September to 8th October. I was walking over the island one day when I heard a great twittering, and looking up saw a Skylark being pursued by a Merlin. There was a great chase, but by vigorous dodging the Lark managed to elude its pursuer.

KESTREL, *F. tinnunculus.*—One noted in spring on 29th April. I saw one or two occasionally, and on the night of 4th October a male was caught at the lantern. On one occasion a Kestrel was seen to kill and eat a Chaffinch, and twice I saw four or five Herring Gulls mob and chase one of these birds with such ardour that it had to twist and turn to escape the rushes of its pursuers; it was quite routed, being driven away to the south of the island.

HERON, *A. cinerea.*—Seen in small numbers on the rocks most days during my stay on the island. The Herring Gulls used to mob and hustle this species too.

BERNACLE GOOSE, *B. leucopsis.*—A single bird reported by Mr. Maccuish on the 31st March.

MALLARD, *A. boschas.*—The only note for the year is one bird seen by Mr. Maccuish on 2nd May.

SHOVELLER, *S. clypeata.*—Mr. Maccuish reports a beautiful drake on a small pool near the lighthouse on 2nd May.

TEAL, *Q. crecca.*—Seen on six occasions from 12th September to 7th October, from one to six at a time.

WIGEON, *M. penelope.*—On 21st October a small flock came in, one female was procured by Mr. Maccuish and sent to me.

TUFTED DUCK, *F. cristata.*—Five flew close over my head on 21st September, they were going S.E.

EIDER, *S. mollissima.*—I saw Eider throughout my visit, a fair-sized flock when I arrived, which was augmented by fresh arrivals on 24th September, and yet more appeared on 1st October. On 11th September I saw an Eider duck with five chicks, still small and downy; by 28th September one drake had assumed his full plumage, but there were many in various stages of eclipse.

BLACK SCOTER, *Æ. nigra.*—Only once seen by me, viz., on 29th September, when a small flock consisting of two ducks and three drakes arrived, and after circling round several times settled just outside the harbour, among a flock of Eiders.

WOOD PIGEON, *C. palumbus.*—I have only three records for the year, viz., single birds on 28th March and 22nd September, and two on 23rd September.

CORN-CRAKE, *C. pratensis.*—One appeared on 7th May, and one was heard craking at 5 A.M. on 19th May.

MOORHEN, *G. chloropus.*—On 2nd April one came to the lantern at 3 A.M., and on 11th May one was found dead on the island.

GOLDEN PLOVER, *C. pluvialis.*—"A few" were observed on 2nd May. On the return journey a small flock appeared on 22nd September and stayed till the 24th. One of the flock killed itself against the lantern, and another on the telephone wire.

RINGED PLOVER, *Æ. hiaticula.*—On 20th September one was trotting about by the harbour, and on the night of 4th October one was caught at the lantern; both were birds of the year.

LAPWING, *V. vulgaris.*—15th February is the first record of Lapwings for the year, one being noted at the lantern. On 5th March five or six were attracted by the light; on 21st March "a few, 11 P.M., one killed." On the night of 1st April there were many at the lantern. In autumn one appeared on the 19th and 20th, four on the 21st, and two on the 22nd and 24th September. On 3rd October, three flew over going south, and on the 5th, four or five spent the day on the island. I

constantly heard them at night, calling in the rays. Other records are for 29th October, and the nights of 3rd and 5th November a large flock at the light, two being killed.

Turnstone, *S. interpres.*—Seen in small numbers on the rocks throughout my stay.

Oystercatcher, *H. ostralegus.* — One bird of this species is reported on 19th February, and four on 14th March. Mr. Maccuish tells me that they nested on the island, and I saw them constantly while I was there, in numbers ranging from one to seven.

Woodcock, *S. rusticola.*—Single birds are reported on 3rd and 9th January and 7th February; several on 21st March; on 27th March several at the lantern, one killed; on 1st May two are reported, and several next day. In autumn several were seen on 21st October; on the 23rd and 27th two came to the lantern; on the 28th a few, and several came to the light in the small hours of 5th November.

Snipe, *G. cœlestis.*—Seen on seven occasions between 22nd September and 8th October, one or two birds each time, and once I flushed one in Mr. Ross's garden. One bird killed itself against the lantern on the night of 5th November.

Jack-snipe, *G. gallinula.*—Single birds are noted on 20th February, 24th September, 8th and 29th October.

Dunlin, *T. alpina.*—A small flock turned up on 23rd September, and I saw a single bird by one of the little pools on the island on 26th September.

Purple Sandpiper, *T. striata.*—I saw four on the 13th, and two on the 17th, 19th, and 27th September; as usual, they were very tame.

Redshank, *T. calidris.*—Mr. Maccuish reports that these birds leave the island during summer, 13th August being the date of the first to return. I saw them constantly on the rocks and at the pools throughout my visit.

Curlew, *N. arquata.*—On 1st April a few are reported at the lantern. I saw them throughout my stay, but never in large numbers.

Common Tern, *S. fluviatilis.*—On 11th, 13th, and 15th September flocks were passing, they flew very close to the water in a south-westerly direction. On the night of 26th September an immature bird was taken at the lantern.

Sandwich Tern, *S. cantiaca.*—On 13th September I saw two, and on the 15th three or four flew by; on the 17th several small flocks passed; on the 27th two; and on 4th October four were seen.

Black-headed Gull, *L. ridibundus.*—I saw only a single bird during my stay, on 13th September.

Common Gull, *L. canus.*—One on 15th September.

Greater Black-backed Gull, *L. marinus.*—There were Greater Black-backs about the island throughout my visit, a good many from 12th to 19th September, otherwise a few only.

Kittiwake, *R. tridactyla.*—On 15th March great numbers are reported as being on the cliffs all day. On 22nd June they were laying. They were numerous during my stay, and were usually to be seen some little way out to sea.

Great Skua, *S. catarrhactes.*—On 6th October I noticed that something had disturbed the Gulls on a rock, a little way north of me, and then I caught sight of a Great Skua, which, however, paid no attention to the Gulls, but flew towards the south rather close to the surface of the sea and quite near the island. The white alar patches were very conspicuous.

Arctic Skua, *S. crepidatus.*—I saw single birds on six occasions between 12th September and 6th October, they were usually employed in chasing the Kittiwakes, and I saw one that appeared to be extra aggressive, giving an immature Kittiwake a very bad time. Not content with making swoops at its victim it closed with it, grappling it with its feet, and the two birds tumbled over several times in the air together. Then the Kittiwake got away, but the Skua pursued it and hit it several times with its bill, and at last I saw the aggressor seize the poor little bird by the back of the head with its beak and hold on for some time, all this in the air. Occasionally the Kittiwake sought to escape by sitting on the sea, but each time the Skua made it rise by flying very close over its head. The whole time of the chase, the Kittiwake screamed dolefully, and at last it got away and sat on a rock, looking very rueful and draggled.

Storm Petrel, *P. pelagica.*—One of these little birds came to the lantern at 12.30 A.M. on 31st October.

Fork-tailed Petrel, *P. leucorrhoa.*—A beautiful specimen came to the lantern in the early morning hours of 7th October (S.W. wind, very light, hazy), the first I had ever seen in the flesh.

Manx Shearwater, *P. anglorum.*—On 22nd September at 7.15 P.M., I was startled by hearing loud shrieks coming from the lantern; they proved to have been uttered by a Manx Shearwater, which was attracted by the light. When caught it screamed loudly and constantly, and bit so viciously as to draw blood each time.

Black Guillemot, *U. grylle*.—On 3rd January one was procured by Mr. Maccuish and sent to us.

Little Grebe, *P. fluviatilis*.—I found a Dabchick lying dead in the harbour on 24th September, and another appeared on the pond in the ravine on 1st October; it was very shy and took refuge under the overhanging parts of the south bank where it was well hidden.

Roselea, Upper Largo, Fife.

THE DEAL-FISH OR VAAGMAER, *TRACHYPTERUS ARCTICUS* (Brünn.), ON THE COAST OF EAST LOTHIAN.

By William Evans, F.R.S.E.

Six months ago I had the satisfaction of recording in this Magazine (1908, p. 150) the stranding of an Oar-fish at Dunbar. I now have the further satisfaction of recording the occurrence of a specimen of another member of the same remarkable family, namely, the Deal-fish or Vaagmaer (*Trachypterus arcticus*), near the same place.

Early on Saturday, 28th November 1908, a fisherman out gathering bait came upon a strange fish of large size lying dead on the sands at high-water mark, about a quarter of a mile east of Barnsness Lighthouse, near Dunbar. An attempt was made by the finder and other fishermen to remove the fish to Dunbar, a distance of over three miles; but the rough handling to which it seems to have been subjected soon told upon it, the head being severed from the body and other damage inflicted, with the result that it was abandoned in a worthless condition, and subsequently buried at no great distance from where it was found. Fortunately Mr. George Pow, Dunbar, interested himself in the matter, and having unearthed the mutilated remains, kindly secured a couple of "cuts" for me, one being a transverse section from about the middle of the body, the other the terminal 10 inches. These I examined on 5th December, and had no difficulty in identifying them as portions of a Deal-fish (*Trachypterus arcticus*), a view in which Mr. Eagle Clarke, to whom I showed them the following day, entirely

concurred. The rapid convergence of the outlines of the body to the point where the caudal fin (which, unfortunately, was gone) had sprung from ; the sub-central position of the lateral line with its curious plates ; the cartilaginous tubercles along the ventral margin,—these and other features were all characteristic of this species. The presence of roe proved it to be a female. Reports in the newspapers referred to it as another Oar-fish.

From conversation with some of the men who had seen the fish and roughly measured it while it was whole, I ascertained that its length was about 6 feet—two good paces. The transverse section examined by me, which may not have been from quite the deepest part of the body, gave a depth of 13 inches exclusive of fin ; at its thickest it was only one inch and a quarter, showing the ribbon- or deal-like form of the creature. At 10 inches from the end of the vertebral column the depth diminished to 7 inches. The dorsal fin had been much broken and torn, so that it is impossible for me to say precisely what its original height may have been ; but some of the spines, and these not quite entire, in the middle portion were fully $3\frac{1}{4}$ inches long. All I could learn about the head was that the mouth-parts protruded much, suggesting to one imaginative mind the profile of a calf ; to another, that of a hound. In this connection it is interesting to note that Smitt, in his " History of Scandinavian Fishes," says its appearance, when the mouth is protruded, is " not unlike that of a swine's snout." As regards colour, the silvery epidermis seems to have been mostly rubbed off by the time the fish was found, leaving it of a dull grey or yellowish-grey tint, the long dorsal fin retaining, however, traces of the bright red colour for which, in life, it is remarkable. Although giving off an offensive oily smell, the parts given to me were in a fairly fresh condition, and I do not think the fish could have been long dead when discovered.

The only previous record of the Deal-fish from the Firth of Forth appears to be that of a specimen 5 feet 4 inches in length, which was cast ashore on the coast of Fife, near Elie, in the beginning of April 1848, and sent to Prof. Reid of St Andrews, who published a very full description of it in the " Annals and Magazine of Natural History " the follow-

ing year.[1] From other parts of Scotland, more especially Orkney, over a score of examples have at one time or another been reported. Day figures one in his "British Fishes" which was captured at Montrose in April 1872; and in Sim's "Vertebrate Fauna of Dee" there is a record of one caught at Buckie in April 1878, and of another cast upon the beach at Mennie, Aberdeenshire, in August 1888. More recently specimens have been recorded in this Magazine[2] from Shetland (June 1896), Orkney (April 1896), and Banff (March 1905).

According to Smitt ("Scandinavian Fishes," 1893), "the true home of the Deal-fish is unquestionably in the deeper, if not the deepest, parts of the North Atlantic." It belongs, he explains, to the abyssal depths between Iceland and the North of Norway, and has oftenest been met with north of the polar circle, but also on several occasions off the South of Norway.

THE FALSE-SCORPIONS OF SCOTLAND.

By Robert Godfrey, M.A.

(*Continued from p.* 161, *No.* 67, *July* 1908.)

Chernes nodosus (Schrank) 1803.

As a Scottish species little is yet known about this deeply interesting form. The first recorded Scottish specimen was obtained by Mr. J. F. Jeffrey, August 27, 1895, in the herbarium of the Edinburgh Botanic Gardens; two others were found by my friend Mr. Alex. Baxter, in August 1900, attached to the leg of a fly in a chemist's shop in N.-W. Circus Place, Edinburgh. One of these latter was killed along with the fly, but the other was taken alive to Mr. Wm. Evans, to whom the previous specimen from the herbarium had also been forwarded.

The ordinary habitat of *Ch. nodosus*, as Mr. Wallis Kew has pointed out to me, appears to be among refuse; that is, in accumulations of decaying vegetation, manure-heaps, frames, and hot-beds in gardens. He refers to its occurrence in a manure-heap in the open air at Lille, and draws my attention to its abundance in a melon-frame near Hastings in 1898, where it was found by Mr. W. R. Butterfield.

[1] Vol. iii. 2nd series, pp. 456-77.

[2] "Ann. Scot. Nat. Hist." 1896, pp. 159, 160; and 1905, p. 184.

I may say that on June 14, 1904, I saw a *Chernes* on the wooden label of a flower-pot in the Edinburgh Botanic Gardens. I thought I had inserted the creature carefully in a tube, but I could not afterwards find it, and without microscopic examination I cannot tell what the species may have been.

Chernes dubius, Cambridge, 1892 (= *Chelifer tullgreni*, Strand).

At the time of the publication of Cambridge's "Monograph," 1892, this species was known from two specimens only, and its name implied Cambridge's hesitation in allotting it specific rank, but the obtaining of further material has abundantly justified the correctness of his decision in marking it off from allied forms as a distinct species.

On April 12, 1901, I found the first Scottish example, but I could not authoritatively place it under this name till January 1907. I erroneously recorded the species in the "Annals of Scottish Natural History," 1901, as Simon's *Chernes phaleratus*, a form that has not yet occurred in Scotland.

Chernes dubius is an abundant species in the "Forth" area. Its main haunts are close to the sea, under stones a few yards from high-water mark, but it occurs inland also on rocky patches of ground which preserve to some extent their natural condition. In West Lothian, where I first found it, the haunt is under stones deeply embedded in the soil on the Bonnytoun hills near the farm of Northbank; a single immature specimen was also taken in another locality near Northbank from a piece of rock tightly embedded in the face of a disused quarry. In East Lothian it occurs on North Berwick Law, where I took five under a stone on May 19, 1903; and in Fife also, to the west of Aberdour, where during 1902-3, I found thirty-nine specimens, I took the first under large stones firmly buried in the soil on rocky ground left in a natural state. Further search at Aberdour revealed the stronghold of the species to be just above the tide-mark, not only under deep stones, but also under very small stones from just over an inch broad, and even on the sand under a stone. To the east of Crail, and also at a headland near Cambo in the "Tay" area, I discovered this species commonly in September 1905, on natural ground within a short distance of the sea.

Outside of the "Forth" and the "Tay" areas this species (in Scotland) has been detected only in Ross-shire, where Robert Whyte obtained two on a piece of drift-wood lying on the shore near Balmacara House on August 27, 1906. Under the same beam were *Ideoroncus cambridgii* and *Chthonius rayi*.

Chernes dubius—measuring from 1·5 to 2 millimetres in its adult state—has deep red-brown palpi and a yellowish upper surface which darkens with age. Its colours harmonise well with its home, and, although it is quite conspicuous when once detected, it may

readily be overlooked. Often at a first glance have I failed to see specimens on stones which on a more careful survey would yield me two or three individuals; on such occasions I should sometimes have missed them altogether but for the minute examination to which I subjected the stones in the belief that I was in their haunts. If one's attention is turned away from the creature for a few seconds, some difficulty is often experienced in detecting it again.

Several individuals are often found together, and the creature associates freely with *Chthonius rayi*, and to a less extent with *Ch. tetrachelatus* and *Obisium muscorum*. It moves slowly, generally keeping its nippers partially extended, and constantly varies the position of its pedipalps, that every corner within range of the great pincers, as the creature advances, may be thoroughly investigated. The long pedipalps, exploring regions so far comparatively from its head, give the creature a rather unwieldy appearance.

On one occasion a *Chernes dubius* which I had turned up had three eggs, apparently those of a mollusc, attached to its chelicerae. Thinking that these were merely in accidental touch with the creature I proceeded to remove them, but on doing so, I found that they were being held by the animal, and, although at my next attempt I separated the eggs, I was then convinced that they were being sucked by the False-scorpion. On another occasion I saw a *Ch. dubius* carrying a larval centipede in one of its great pincers. The slow but persistent activity of this species, when under observation, leads one to infer that it is accustomed to be ever on the hunt for food. One wonders how such a little blind animal of this kind can procure food at all, but, though our little friend may require great patience before he effects a capture, he no doubt makes a lasting meal off a single catch.

The finding of nests containing individual immature specimens, on September 12, 1903, at Aberdour in Fife, was a great event in my working out of the life-history of these animals. I lifted up a large stone resting firmly near high-water mark in the kind of position which experience had taught me offers a tempting home for *dubius*; at first glance the stone, which was covered with many little pits, revealed nothing, but a second glance detected *Chthonius rayi*, then a *Chernes dubius*. The latter I touched with a pin from behind, and it responded very feebly and slowly to the touch, betraying nothing of the activity of *Ch. rayi* in facing round to the enemy. Meanwhile two more *Ch. rayi* came under my notice, and the possibility of the presence of nests occurred to me. A very short search revealed a small, but typical, False-scorpion's nest; I opened it carefully with a pin, and, to my intense surprise and delight, there issued from it a young *Ch. dubius* of the light hue so characteristic of all False-scorpions when beginning a free life or after having moulted. There were many nests on the stone, and out of

four of these I took immature *Ch. dubius*. The nests were very thin, fine silky cocoons, covered with minute specks of sand and earth exactly resembling a blob of sand; they measured from 2·5 to 3 mm. in diameter, with contained creatures just over one millimetre long. On emerging, young *dubius* was quite active and very sensitive; one placed in a chip-box, on coming into touch with the inequalities of the box drew back its pedipalps close to the forebody, keeping the tibia and the nippers directed outwards nearly at right angles, and retreated in this fashion. My inference at the time was that the youngsters were hibernating within the cocoons, but I was then ignorant of the moulting-process taking place inside a nest; and that these young False-scorpions were really moulting was proved two years later at Cambo, when I again found in the month of September numbers of nests of this species, in four of which at least were the cast-off moults of immature specimens.

Ch. dubius does not appear to hibernate inside a cocoon. Some of the adults at least live in winter in a free condition under stones. In their Aberdour haunt, on November 26, 1904, during hard frost which had continued for some days, I found three individuals under stones in a wood. They were alive but practically inert, and, one would say, almost dormant. Two which I kept alive were active enough at night, however, on my reaching home. Aird and Robert Whyte found the species living free on December 22, 1906, in the same locality.

On October 1, 1904, I succeeded in finding in the Aberdour stronghold the female with her embryonic young attached to her. I had long been expecting to discover *Ch. dubius* with her young inside a nest, but Mr. Wallis Kew had from his knowledge of allied species suspected that there would be no nest for reproductive purposes, and stated this to me in our correspondence. My discovery proved that he was right, for the adult was quite free, in no cocoon whatever, but simply resting in a small depression on the underside of a stone, with her irregularly-shaped white embryonic mass attached to the underside of her abdomen.

Chernes panzeri (C. L. Koch), 1836 = *C. rufeolus*, Sim.; Camb., 1905.

My first introduction to this species was in April 1907, at the hamlet of Grange, Borrowdale (Cumberland), in the neighbourhood of which Aird and Robert Whyte were spending their Easter holidays in pursuit of False-scorpions. While collecting *Cheiridium museorum* in a barn, on April 11, they obtained a specimen of *Chernes panzeri* on the under side of a stone buried among hay. Six days later they took me to the same barn, where, by lifting stones deeply embedded in the earthen floor, we found both old and young individuals somewhat commonly. Several specimens were living under a cake of damp hay and barn refuse that was

closely attached to the under side of a large stone. In three different barns we came on the creatures, and on April 18 we discovered typical nests, made of stable refuse with a tough silk lining. The first nests met with, being empty, did not afford us the full evidence necessary for connecting them with this species, but later nests contained the moults of the animals. The nests varied from 3 to 5 millimetres in cross diameter; and many nests were placed closely together on one stone.

On June 28, in the same year, I took my first Scottish specimens. While examining a hay-loft in Walls Street, Glasgow, I found on a piece of wood a False-scorpion's nest containing the moult of a great nipper, and, by sifting rubbish in the neighbourhood of the wood, I obtained three individuals of *Ch. panzeri*. On July 1, I obtained a fourth specimen by a similar process and came on moulting nests on wood and in a clotted mass of straw. Again, on September 14, Aird Whyte and I obtained three adults from the same stable by sifting refuse from one of the stalls.

Meanwhile, in August 1907, at Balmacara, Messrs. Whyte and I found this species tenanting two byres, from one of which we took eighty specimens. The False-scorpions were living safely in the undisturbed refuse that filled the gaps between planks of wood and the wall, and were so numerous that a single handful of refuse was tenanted by quite a colony. On August 24 a female carrying her embryonic mass was shaken out of some refuse; she thus appeared to have been living a free life, but she may have been resting in a snug enough cranny of the compact refuse mass before she was disturbed by my intrusion.

On the East of Scotland the species was detected at the farm of Haswellsykes, Peebles, by Alastair Urquhart, on September 24, 1907.

(*To be continued.*)

REVISION OF THE HYDRACHNIDÆ IN JOHNSTON'S "ACARIDES OF BERWICKSHIRE."

By William Williamson.

Through the courtesy of Mr. Wm. Evans, F.R.S.E., my attention was drawn to a series of papers by Dr. Johnston, on the "Acarides of Berwickshire," in the early volumes of the "History of the Berwickshire Naturalists' Club." In these papers Dr. Johnston deals with thirty-six species, of which only three are referable to the Hydrach-

nidæ or water-mites. Apart from any interest attaching to the species themselves, the record is interesting as it constitutes, so far as I know, the earliest British record of Hydrachnids.

Dr. Johnston describes these three species under the names of *Hydrachna cruenta* Müll., *Atax histrionicus*, and *Hydrachna naïca*, the last being a new species. A consideration of Dr. Johnston's descriptions leads me to the conclusion that

Hydrachna cruenta Müll. (Johnston) = *Diplodontus despiciens* (Müll.).

Atax histrionicus = *Limnesia histrionica* (Herm.).

Hydrachna naïca Johnston = *Hygrobates reticulatus* (P. Kram.).
= *Hygrobates naïcus* (Johnston).

Diplodontus despiciens (*Müll.*).

Johnston described what he believed to be *Hydrachna cruenta* Müll., but his description of the eyes points not to the genus Hydrachna, in which the two lateral eyes are fused together and enclosed in a capsule, but to Diplodontus, in which the two lateral eyes are separated one behind the other, and are situated on the body margin, where, owing to bulging of the body, they are at times seen with some difficulty.

In describing the palpi as four-jointed, Johnston evidently considered the fifth segment as a claw, which, in this case, is opposed to a pointed elongation of the fourth segment so as to form a chela-like termination to the palpus.

Limnesia histrionica (*Herm.*).

I do not see any reason to doubt that the species described by Johnston as *Atax histrionicus* Dugès is any other than *Limnesia histrionica* Herm., although the length of the palpus as compared with that of the body is rather shorter than usual.

Hygrobates naïcus (*Johnston*).

SYN.

1848. *Hydrachna naïca*, Johnston. "History of the Berwickshire Naturalists' Club," vol. ii. p. 314.

1879. *Nesæa reticulata*, Kramer. "Archiv für naturgeschichte," vol. i. p. 11.

1881. *Hygrobates gracilis*, Haller. "Mittheilungen der Bern. naturforschenden Gesellschaft," Heft ii. p. 68.

SYN.

1892. *Hygrobates reticulatus*, Koenike. "Zoologischer Anzeiger," vol. xv. p. 268, No. 396.

1897-1900. *Hygrobates reticulatus*, Piersig. "Zoologica," Heft xxii. p. 197 (Deutschlands Hydrachniden).

1899. *Hygrobates reticulatus*, Soar. "Science Gossip," vol. vi. p. 38.

1901. *Hygrobates reticulatus*, Piersig. "Das Tierreich," Lief. xiii. p. 187. (Hydrachnidæ u. Halacaridæ—Piersig u. Lohman.)

The following record the name only :—

1900. *Hygrobates reticulatus*, Soar. "Journal of Quekett Micro. Club," Ser. 2, vol. vii. p. 392.

1902. *Hygrobates reticulatus*, George. "Naturalist," p. 14.

1904. *Hygrobates reticulatus*, Halbert. "Irish Naturalist," vol. xiii. No. 9, p. 201.

1905. *Hygrobates reticulatus*, Soar. "Transactions of Norfolk and Norwich Naturalists' Soc.," vol. viii. p. 88.

1906. *Hygrobates reticulatus*, Rousseau. "Mémoires de la Société Entom. de Belgique," xii. p. 186.

1907. *Hygrobates reticulatus*, Williamson. "Proc. Roy. Soc. Edin.," vol. xxvii. pt. iv. p. 304.

1907. *Hygrobates reticulatus*, Walter. "Revue Suisse de Zoologie," vol. xv. p. 527.

1907. *Hygrobates reticulatus*, Maglio. "Rendiconti del R. Ist. Lomb. di Sc. e lett." Serie ii. vol. xl. p. 967.

1908. *Hygrobates reticulatus*, Maglio. *Ibid.* vol. xli. p. 193.

Before considering Dr. Johnston's description, it will be of advantage to review the literature since Kramer's time, dealing with the species hitherto known as *Hygrobates reticulatus* P. Kram.

In 1879 Kramer described a new species under the name of *Nesæa reticulata*. The information he gives is confined to a description of the reticulated skin and of the genital plates. With regard to the latter, it is very evident from his description and from the figure which he gives, that the specimen he had before him was a nymph and not a male as he supposed.

In 1881 Haller described a new species which in some respects resembled *Hygrobates longipalpis*. The principal points of difference pointed out by Haller between *H. longipalpis* and the new species, were the structure of the palpus and the hexagonally faceted body-skin.

In the same communication he also records *Nesæa reticulata* Kram. with which in his table of synonymy he associates *Nesæa lutescens* of Lebert. Reference to Lebert's memoir ("Bull. Soc. Vaud. Sc. Nat." xvi., 1879), and to Koenike's revision ("Zeitschr. f. Wiss. Zool." Bd. xxxv. p. 626), shows the association to depend

on the fact that in each case there are two small genital plates, each with two discs. It is well known now that what was then considered to be a distinct species, is only a stage in the life-history—the nymphal period.

In 1892, after pointing out that *Nesæa reticulata* Kramer was the nymphal form of the species which Haller later described as *Hygrobates gracilis*, Koenike established *Hygrobates reticulatus* Kram. as the name of the species.

Piersig, in his large treatise on the German water-mites ("Zoologica," H. xxii.), and again in his work on the family Hydrachnidæ ("Das Tierreich," Lief. xiii.), makes use of Kramer's *Hygrobates reticulatus*.

In recording specimens found within the Britannic area, C. F. George, Halbert, Soar, and I have also continued the use of the same name.

As indicated by Haller, the main points in identification are the structure of the palpus and the reticulated skin. Fortunately, Dr. Johnston, when describing his specimen, described these two points in detail.

The only literature on mites available to Dr. Johnston was the works of Müller and Dugès, together with Koch's "Übersicht." Not being able to identify his specimen from these, with some diffidence he described it as a new species. His diagnosis is:—"H. orbicularis albescens maculis fuscis fusè signata, oculis 2, pedibus pellucidis albis sparse spinosis, palpis articulis inferioribus crassis minutissime serrulatis."

After describing the shape and colour of the body, he gives the following description of the palpus:—"pediform, proportionately large, thicker than the legs, 4-jointed, the 1st and 2nd joints thick and short, minutely serrulated on the outer edge, a rough or granulous mucro at the articulation of the first joint, 3rd joint elongate and slender, 4th small and unquiform, and terminated with two minute claws."

The normal number of segments in the hydrachnid palpus is five, but a reference to Johnston's figure shows that he has not taken the basal segment into consideration. Consequently, the first, second, third, and fourth segments of Johnston's figure are respectively the second, third, fourth, and fifth segments of normal specimens.

PALPUS OF *HYDRACHNA NAÏCA* (AFTER JOHNSTON).

Johnston's figure does not show the two hairs which stand one behind the other on the flexor edge of the penultimate segment,

but he shows distinctly the thickened lower segments with their serrulations and the flexor surface of the second segment (Johnston's first segment) continued to a sharp point (not blunted as in *H. longipalpis*), and this, coupled with the general description and particularly that of the skin "when highly magnified minutely areolar," leads me to the conclusion that the species which Dr. Johnston described in 1848 as *Hydrachna naïca*, is no other than the *Nesæa reticulata* which Kramer described in 1879—*Hygrobates reticulatus* P. Kram. of later writers.

This being so, the law of priority as set out in Article 25 of the International Rules of Nomenclature comes into operation. The name of the species must in future be *Hygrobates naïcus* (Johnston), with *H. reticulatus* P. Kram. as synonym.

4 Meadowbank Terrace, Edinburgh.

THE HIGH ALPINE FLORA OF BRITAIN.

BEING A LIST OF THE FLOWERING PLANTS AND FERNS FOUND AT A THOUSAND METRES AND UPWARDS ON THE MOUNTAINS OF THE BRITISH ISLES, WITH AUTHENTIC REFERENCES AND CRITICAL NOTES.

By Frederic N. Williams, F.L.S.

(*Continued from p.* 251, *No.* 68, *Oct.* 1908.)

Fam. 18. Cruciferaceæ.

45. *Draba rupestris*, Aiton.—In crevices on alpine rocks, up to the summit of Ben Lawers ("Fl. Perthsh." 64). "Near the top and on the summit of Ben Lawers" (R. Brown, 1793, in Herb. Brit.). First found by James Dickson in 1789 on Ben Lawers ("Trans. Linn. Soc." ii. 288 [1790]). On rocks near the summit of Ben Lawers (G. Don). Summit of Ben Lawers (Wm. Christy, 1829, in Herb. Brit.), and within 10-12 feet of the top (G. C. Druce). Ben Dothaidh, above 915 m. very scarce (E. S. Marshall, 1893, in Herb. Brit.). Rocks at the summit of Cairn Gorm (Hook. "Fl. Scotica," 1821, 197 ; Hook. et Arn. "Brit. Flora," ed. 8, 1860, 31).

46. *Draba incana*, L.—On alpine rocks in the Breadalbane district from 518-1082 m. ("Fl. Perthsh." 65). "My specimens were collected from Ben Lawers," (G. Don, fasc. viii. 1806, n. 187). Descends to sea-level in Londonderry.

47. *Cardamine flexuosa*, With.—Ascends to 1190 m. on Ben Lawers ("Fl. Perthsh."), in damp places. Descends to sea-level in Dublin.

48. *Cardamine hirsuta*, L.—Ascends to 1160 m. in the Breadalbane district ("Fl. Perthsh." 62), on bare ground. Descends to sea-level in Cork.

49. *Cochlearia micacea*, E. S. Marshall in "Journ. Bot." 1894, p. 289, tt. 345, 346.—Radix perennis. Rhizoma crassum lignescens foliorum vetustorum vestigiis cicatricosum. Frondatio[1] orobitino-nitida, coriacea. Folia primordialia subintegra, tenuiter cordata; plantæ floriferæ plerumque parva, 4-6 mm. lata, plana vel leviter concava, venis paucis inconspicuis, petiolis tenuibus canaliculatis 8-25 mm. longis suffulta, orbicularia vel deltoideo-reniformia, integra vel leviter denticulata. Folia caulina plus minus denticulata angulata; inferiora petiolata, superiora sessilia amplexicaulia; auriculæ parvæ acutæ vel nullæ. Caules floriferi crebri, simplices vel ramosi, primum breves compacti, dein elongati, erecti vel adscendentes. Sepala ovato-lanceolata obtusa cucullata, extus apice rubella. Petala speciosa alba nivea; limbus oblongus, in unguem dimidio breviorem abrupte contractus. Racemi fructiferi sæpe elongati. Siliqua matura venis elevato-reticulatis carens, basi apiceque angustata, ambitu late ovato-lanceolata ad lineari-lanceolatam, formâ longiore sæpe ad faciem interiorem complanata (ut videtur falcata vel zizyphomorpha[2]), pedicello patente vel adscendente æquilongo suffulta. Stylus distinctus, sat longus. Septum haud fenestrellatum. Semina in quaque siliqua 2-6 (sæpius 4), magna fusca late ovoidea, tuberculis rotundatis brevibus vel rugis vestita.

Hab.—Ben Lawers, from 1070 to 1130 m. Ben Ein, from 976 to 1070 m. Ben Dothaidh, above 915 m. Specimens from all three mountains in Herb. Brit. Ben Lawers (E. S. Marshall, 1887, n. 199, n. 894, 1891, n. 84, C. P. Hurst, 1906). Ben Ein (E. S. Marshall, 1889, n. 198). Ben Dothaidh (E. S. Marshall, 1893, n. 1012). The long-fruited form mentioned in the description was found by Messrs. Marshall and Hanbury on Ben Ein. The reference-numbers are taken from the type-specimens, and are not cited by Mr. Marshall in his English description of the plant.

Mr. Marshall also states on the label that his plant proved distinct from *C. alpina* and *C. danica* by five years' cultivation. In all three stations it grows in company with *Cerastium arcticum*, and may be presumed to belong to a dying-out arctic vegetation. Mr. Marshall also identifies with this plant an example of *C. alpina* in Herb. Kew. gathered by H. C. Watson near the summit of Ben Lawers in 1832.

[1] A new term proposed for the general foliage.
[2] A new term proposed for "jujube-shaped."

50. *Cochlearia arctica*, Schlecht.—Mr. Marshall thinks it possible that a peculiar smooth-podded plant found on the upper part of Ben Lawers might be referred to this species, but its admission to the British list is not yet sufficiently definite.

51. *Cochlearia alpina*, Watson.—Ascends to 1175 m. on the mountains of the Breadalbane district, and probably rarely descends below 610 m.,—a plant of alpine springs, rills, and wet rocks ("Fl. Perthsh." 66). On Ben Ein up to about 1070 m. (E. S. Marshall and F. J. Hanbury). Ben Ein (E. S. Marshall, 1889, in Herb. Brit.). Ben Lawers (Herb. Kew. and C. P. Hurst, 1906, in Herb. Brit. —but no height given on either specimen). Ben Lawers (W. Gardiner, 1842, in Herb. Brit.). Stob-Coire-an-Easain, Glen Nevis, at 1037 m. (E. S. Marshall, 1896, in Herb. Brit.). Top of Ben Lawers (J. Carroll, 1864, in Herb. Brit.). On all the damp ledges of rocks on Snowdon and Carnedd Llewelyn (Banks's herb. 1773, in Herb. Brit.).

52. *Cochlearia grœnlandica*, L.—Ben Ein, from 1006 to 1070 m., also on Ben Lawers, at a high level (E. S. Marshall and F. J. Hanbury). For a critical note on this plant by Mr. Marshall, and the only good figure which has been made of it, see "Journ. Bot." 1892, p. 225, t. 326 a, where the writer states that he suspects it is often biennial.

Fam. 19. RANUNCULACEÆ.

53. *Thalictrum alpinum*, L.—Alpine rock ledges up to the summit of Ben Lawers ("Fl. Perthsh." 45). "Ben Lawers in Breadalbane" (R. Brown, 1794, in Herb. Brit.). Within 10-12 feet of the top of Ben Lawers (G. C. Druce). Descends to 274 m. in Donegal.

54. *Ranunculus acer*, L.—Ascends to the summit of Ben Lawers ("Fl. Perthsh." 51). "At considerable heights on Ben Lawers, Breadalbane" (R. Brown, 1794, in Herb. Brit.). Ascends almost to the summit of Ben Lawers ("Cyb. Brit." i. 87). Ben Nevis, at 1026 m. (J. Sadler in "Trans. Proc. Bot. Soc. Edinb." xiii. 50-54 [1878]), and at 1100 m. and upwards ("Cyb. Brit." i. 87). Cairn Toul, at 1067 m. (F. J. Hanbury, 1887, *ex* "Journ. Bot." 1890, 180). Descends to sea-level in Cork.

f. *Nathorstii*, G. C. Druce in "Ann. Scot. Nat. Hist." 1900, 166.—Up to 1070 m. on Ben Lawers.

f. *humilis*, G. C. Druce in "Ann. Scot. Nat. Hist." 1904, 115.—At 1037 m. on Ben Dearg, in Ross-shire.

Var. *pumilus*, Wahlenb. "Fl. Lapponica," 159. — Corrie Sneachda, on the northern side of Cairn Gorm, from 854 to 1068 m. (G. C. Druce in "Journ. Bot." 1889, 204).

55. *Caltha palustris*, L.—At 1000 m. on Ben Macdhui (E. G.

Baker, 1893, in Herb. Brit.). At 1100 m. on Braeriach (*Dr. J. W. H. Trail*, 1902). Ascends to 1067 m. on Ben Macdhui (R. Mackay *ex* Dickie, p. 4); and to 1100 m. on Loch-na-gar (F. B. White.) Descends to sea-level in Cork.

Fam. 20. Rosaceæ.

56. *Alchimilla vulgaris*, L.—Most commonly almost quite glabrous, but not unfrequently hairy all over, even to the calyx. Ascends to the summit of Ben Lawers ("Fl. Perthsh." 131). Ascends to 1037 m. on Ben-na-Bourd (Watson, 1844); and to 1100 m. elsewhere on the Grampians of Aberdeenshire (Watson). Descends to sea-level in Londonderry.

57. *Alchimilla alpina*, L.—On alpine pastures up to the summit of Ben Lawers ("Fl. Perthsh." 131). Ascends to 1220 m. on Ben Nevis, and nearly to the summit of Ben Macdhui (Watson, "Outlines Geograph. Distrib. British Plants," 1832, p. 142), and to 1130 m. on the table-top of Ben-na-Bourd (Watson, 1832, in herb.). Ascends to 1271 m. on Ben Macdhui (Dickie, 51). Descends to 610 m. on Thonalagee Hill, Wicklow.

58. *Sibbaldia procumbens*, L.—In Perthshire the plant is found in rather bare places on the higher mountains, from 518 m. in the Atholl district to 1122 m. in the Breadalbane district, and high up on Ben More (Lightfoot, "Fl. Scotica," 175). In Inverness-shire ascends to the summit of Ben Alder (F. B. White), and to 1220 m. on Ben Nevis (Watson, "Outlines Geograph. Distrib. British Plants," 1832, p. 141). In Aberdeenshire ascends to 1250 m. on Ben Macdhui (R. Mackay *ex* Dickie, 52), and in great profusion on the higher mountains, such as on Ben-na-Bourd up to 1037 m. (Watson, 1844). "On the summits of the Highland mountains of Scotland, in a micaceous soil, plentiful" (Smith, "English Fl." ii. 121). Under the name of "Fragariæ sylvestris affinis planta, flore luteo" first recorded as a British plant in 1684 by Sir R. Sibbald ("Scotia Illustrata," ii. p. 25, t. 6, f. 1); "transmissa fuit ad Hortum Medicum a regione *dęrnensi* ubi in sylvis sponte provenit." Also figured later by Petiver under the name of "Scotch Cinquefoil." There are examples from Ben Lawers in Herb. Brit., but no height is given. It is rather local on the mountains of Perthshire.

59. *Potentilla rubens*, Vill.—Ascends to 1022 m. on the mountains of the Breadalbane district ("Fl. Perthsh." 129). Ben Lawers (R. Brown, 1793, as *P. opaca*, and J. L. Knapp, 1830, as *P. alpestris*, in Herb. Brit., but no heights given).

60. *Potentilla erecta*, Hampe. in Linnæa, xi. 50 (1837).—Ascends to 1006 m. on Ben-na-Bourd (Dickie, 51). Descends to sea-level in Cork.

61. *Rubus chamæmorus*, L.—Ascends to 1067 m. on the mountains of the Rannoch district, in peaty places ("Fl. Perthsh." 124). "Upon the mountains about Loch Rannoch" (Lightfoot, "Fl. Scotica," 266). Ascends to the summit of Glas Maol, on the Aberdeenshire side (J. Barton, 1859, in Herb. Brit. *ex* herb. Trimen); and to 1160 m. on Ben-na-Bourd (F. B. White in "Scot. Nat." i. 119 [1871]).

Fam. 21. ONOTHERACEÆ.

62. *Epilobium alpinum*, L.—Ascends to 1190 m. on Ben Lawers, by alpine springs, rills, and damp places (F. B. White). "Found near the snow upon Ben More in Breadalbane, July 2, 1771; more than 2500 feet above the sea" (Wm. MacRitchie, in Herb. Brit.). "Tops of the hills between the head of Clova and Invercauld in Aberdeenshire" (R. Brown, 1794, in Herb. Brit.).

63. *Epilobium alsinifolium*, Vill.—Ascends to 1037 m. on the mountains of the Breadalbane district, as on Ben Lawers,—"in little rills at very great heights east side of Ben Lawers" (R. Brown, 1794, in Herb. Brit.); in or near alpine and subalpine rills and streams, or among damp rocks, but not very common. "This species seems not to descend along the rivers, like some other mountain plants, to any great extent" ("Fl. Perthsh." 156). On the margins of alpine rivulets high up on Ben Nevis (Alexander Murray, about 1820). Descends to 305 m. on the limestone cliffs of Glenade, in Leitrim, growing in the springs and at the foot of small trickling waterfalls, just sufficient to keep the rocks thoroughly wet (Barrington and Powell, in "Journ. Bot." 1884, 247); the only locality known for this plant in Ireland.

Fam. 22. SAXIFRAGACEÆ.

64. *Saxifraga autumnalis*, L.—Common in the Highland area. Ascends to 1175 m. on Ben Lawers in marshy places, chiefly alpine and subalpine. Sides of rills on Ben Lawers (Wm. Gardiner, 1842, in Herb. Brit.). This name does not seem to have been taken up in English floras. Whether *S. autumnalis*, L., is conspecific with *S. aizoides*, L., I cannot say, but *S. autumnalis* is the earlier name of the two (for those who insist on actual priority); and all the Scottish alpine examples under the name of *S. aizoides* which I have examined agree with the Linnean description of *S. autumnalis*, and not with that of *S. aizoides*—the differential characters of the form and margin of the leaves are very obvious. I may also point out that specimens named *aizoides* in the Linnean Herbarium also obviously belong to *S. autumnalis*. This, however, counts for little, as Linnæus was notoriously indifferent to the critical naming of specimens in his herbarium, and based his species mainly on

descriptions and previous synonyms, not on individual plants. In compiling his systematic works be made abundant use of the descriptions of his predecessors. In the habitat of *S. aizoides* Linnæus gives "In Alpibus . . . Westmorlandicis," in that of *S. autumnalis* he gives "In humentibus . . . Angliæ." In "Mant. Plant." ii. 383, Linnæus cites Haller's view as to the status of *S. autumnalis*: —"Dubitat nunc, utrum sit vere specie distincta a *S. aizoide*, cum Jacquino, Hallerus."

65. *Saxifraga hypnoïdes*, L.—Common on the Highland mountains; on alpine and subalpine stony places and rock ledges. Ascends to the summit of Ben Lawers ("Fl. Perthsh." 142). Ben Lawers (J. Carroll, 1864, in Herb. Brit.). The type (var. *gemmifera*, Ser., ap. Cand. Prodr. iv. 31) is apparently confined to the limestone and basalt; and descends to sea-level in Clare.

66. *Saxifraga quinquefida*, Haworth, "Miscell. Nat." 163 (1803). —Ben Lawers (G. C. Druce, specimen named by Prof. Engler).

67. *Saxifraga grœnlandica*, L. — Near the summit of Ben Lawers (G. C. Druce in "Ann. Scot. Nat. Hist." 1898, p. 243). If this plant is considered conspecific with *S. hypnoides*, then *grœnlandica* is the earlier name of the two. There is no specimen under this name in Herb. Linn.

68. *Saxifraga oppositifolia*, L.—On rocky alpine places ascends to the summit of Ben Lawers, and descends to 366 m. on the mountains of the Breadalbane district ("Fl. Perthsh." 144). Summit of Ben Lawers (Watson, 1832, in Herb. Kew.). Ben Lawers (G. Don, Fasc. iii. 1805, n. 57). Ben More (Watson, 1830, in Herb. Kew. but no height given). Descends to sea-level in Donegal.

69. *Saxifraga sponhemica*, C. G. Gmelin.—Rather common on the alpine rocks of the Snowdon range, and first recorded from here as a Welsh plant in 1821, though not under this name (P. B. Williams, "Tourist's Guide through the County of Carnarvon"). It is the plant referred to by Smith in "Engl. Flora," ii. 278:—"Mr. Griffith has favoured me with an alpine Welsh specimen, answering to Mr. Don's account of his *condensata*, but I cannot consider it as a distinct species. Whether it be Gmelin's plant, I have had no opportunity of ascertaining." Gmelin figures *S. condensata* in "Fl. Badens." ii. p. 226, t. 3, but it does not seem possible to separate the two plants by any definite characters, and *S. sponhemica* is the earlier name. There is a specimen labelled *Saxifraga cæspitosa* in Herb. Soc. Linn. gathered by J. W. Griffith, in which the calyx-lobes are lanceolate and acute (not obtuse), which may be this, from Idwal lake. Summit of Snowdon (R. N. Streeten, 1839, in herb. Watson); this specimen exactly agrees with the description

and authentic examples of *S. sponhemica*. A very protean species: a form approaching *S. cæspitosa*, from Ben More, at 1000 m., is a bright green, densely tufted plant, with shorter scapes, and broader yellower petals than usual (E. S. Marshall, in "Journ. Bot." 1889, 231.

(*To be continued.*)

PLANTS OF THE FAROE ISLES NOT OCCURRING IN GREAT BRITAIN, AND OTHERS NOT OCCURRING IN SHETLAND, ORKNEY, CAITHNESS, OR THE OUTER HEBRIDES.

By Arthur Bennett.

The full lists of plants of the Faroes given by Mr. C. H. Ostenfeld[1] enables me to compare the species wanting in the northern islands and the extreme north of Scotland.

1. Faroese Species not occurring in Great Britain.

Ranunculus glacialis, *L.*
Papaver radicatum, *Rottb.*
Draba hirta, *L.*
Koenigia islandica, *L.*
Epilobium lactiflorum, *Hausskn.*
Archangelica officinalis, *L.*
Salix glauca, *L.*
Carex Lyngbyei, *Hornem.*

And twenty-one named Hieracea, all of which are said to be endemic in the Faroes.

2. Species occurring in the Faroes, but absent from one or more of the Vice-Counties—Shetlands (1), Orkneys (2), Caithness (3), Outer Hebrides (4).

Absence from any of these is denoted by the relative numeral. Many of the species occur in Iceland, and are marked I.

Ranunculus auricomus	—	1	2	3	4
R. reptans	I.	1	2	3	4
Arabis petræa	I.	—	2	3	—
Subularia aquatica	I.	—	2	—	—
Sagina nivalis	I.	1	2	3	4
S. subulata	I.	—	2	3	4
Cerastium Edmonstonii	I.	—	2	3	4

[1] "Botany of the Faroes, Additions and Corrections," 835-863, 1907. "Land-Vegetation of the Faroes," 896-902, 1908.

C. trigynum	I.	1	2	3	4
Arenaria rubella	I.	—	2	3	4
Hypericum quadrangulum	—	1	2	—	4
Geranium sylvaticum	I.	1	—	—	4
Montia lamprosperma	—	1 (?)	—	3	4
Rosa mollis	—	1	—	—	—
Alchemilla filicaulis	I.	—	—	3	4
Potentilla verna	I.	1	2	3	4
Sibbaldia procumbens	I.	—	2	3	4
Dryas octopetala	I.	1	—	3 (?)	4
Sedum villosum	I.	1	2	3	4
Saxifraga cæspitosa	I.	1	2	3	4
S. hypnoides	I.	1	—	—	4
S. nivalis	I.	1	2	3	4
S. rivularis	I.	1	2	3	4
S. stellaris	I.	1	2	—	—
Callitriche hamulata	I.	1	2	—	—
C. stagnalis	I.	1	2	—	—
Epilobium alsinifolium	I.	—	2	3	4
E. anagallidifolium	I.	1	2	3	—
Cornus suecica	I.	—	—	3	4
Gnaphalium supinum	I.	1	[2]	3	4
Matricaria phaeocephala	I.	—	2	—	—
Taraxacum spectabile, Dahlst	—	—	2	3	4
Campanula rotundifolia	I.	—	2	—	—
Pyrola minor	I.	1	2	3	4
Lysimachia nemorum	—	1	—	—	—
Myosotis palustris	—	1	—	—	4
Veronica alpina	I.	1	2	3	4
V. fruticans	I.	1	2	3	4
Bartsia alpina	I.	1	2	3	4
Rhinanthus grœnlandicus	—	—	2	3	4
R. pubescens	—	1	2	3	4
R. fallax	—	1	2	3	—
Euphrasia borealis	—	—	2	—	—
Salix phylicifolia	I.	1	—	—	4
Malaxis paludosa	—	1	2	3	—
Tofieldia palustris	I.	1	2	—	4
Potamogeton alpinus	I.	1	2	—	4
P. prælongus	—	1	2	—	4
Juncus balticus	I.	1	2	—	—
J. biglumis	I.	1	2	3	4
J. obtusiflorus	—	1	2	3	4
J. triglumis	I.	—	2	3	4
Luzula spicata	I.	—	2	—	—
L. arcuata	I.	1	2	3	4

Carex atrata	I.	1	2	3	4
C. pulla	I.	1	2	3	4
C. rigida	I.	—	2	—	—
C. salina	I.	1	2	—	4
Poa alpina	I.	1	2	3	4
P. glauca	I.	1	2	3	4
P. nemoralis	I.	1	2	3	4
Aira alpina	I.	1	[2]	3	4
Agropyrum junceum	—	1	—	—	—
Polystichum Lonchitis	—	1	—	—	4
Phegopteris Dryopteris	I.	—	2	—	—
Equisetum pratense	I.	—	2	—	—
Lycopodium annotinum	I.	1	—	—	—
Isoetes echinosporum	I.	—	2	3	—

23 are not found in any of the four Scottish vice-counties.
17 „ „ three „ „
14 „ „ two „ „
11 „ „ one „ „

Ranunculus auricomus, *L.* — Watson observes on this[1] "there seems no climatic cause to prevent its occurrence in the West and North Highlands." In Arctic Norway it extends to 71° 8′, and altitude 1440 feet; in Sweden to 68° N.; and from Skåne to Swedish Lapland its distribution is continuous; in Russian Lapland to 69°. Of the 23 above species, *Sedum villosum*, *Pyrola minor*, and *Juncus obtusiflorus*, seem the most likely to occur in one or more of the four vice-counties named. Of those absent from three—*Hypericum quadrangulum*, *Rhinanthus grœnlandicus*, *Juncus triglumis*, and *Poa nemoralis* are most likely to occur in some one or more of the three; of those absent from two *Sagina subulata*, *Geranium sylvaticum*, *Alchemilla filicaulis*, the two *Callitriches*, *Salix phylicifolia*, and *Isoetes echinosporum*; of those absent from one *Subularia aquatica*, *Campanula rotundifolia*, *Euphrasia borealis*, *Luzula spicata*, and *Phegopteris Dryopteris*.

Polygala vulgaris, var. *Ballii*, is given as in the Faroes; but the specimens sent me so named are certainly not the same as the Irish plant.

Alsine (Arenaria) hirta, *Hartm.*— Mr. Beeby[2] says Dr. Lange considered the Ben Lawers '*rubella*' "a compact form of *A. verna*, var. *hirta*." Hooker[3] gives it as *A. hirta*, Wormsk., with the syn. of '*A. rubella*, Hook.' Wormskiold published it in "Flora Danica," F. 38, t. 1646, 1819, edited by J. W.

[1] "Cyb. Brit." i. (1847), p. 87. [2] "Scot. Naturalist," (1888), p. 209.
[3] "Stud. Fl." ed. 3 (1884), p. 63.

Hornemann. Of course if placed under *Arenaria* the name *rubella* (published in Parry's "Second Voyage") is later than that of "Fl. Danica."

Summing up the numbers, there are in the Faroes but not in Shetland 49, not in Orkney 53, not in Caithness 41, and not in the Outer Hebrides 43.

Comparing the altitudes in the Faroes and in Scotland:—

Sagina nivalis.—Rocky flat, Bordö, at 600 m. Lowest altitude in Scotland, 3100 feet.

Cerastium trigynum, about 2200 feet. Scotland, 2700 feet.

"Potentilla verna, *L.* (P. maculata, Pourr.)."—No definite height given. Scotland down to 400 feet.

Sedum villosum.—"Both in the mountain-plateaux and the lower regions." Scotland down to 50 feet or less. N. England 600 feet.

Saxifraga cæspitosa.—In the Faroes this is found not only on the mountains but on the lower regions, and in Iceland it descends to sea-level, while in Scotland it is one of the species found only above 2000 feet.

Saxifraga nivalis.—"Sub-alpine latitude, *i.e.* lower regions, and exceptionally on the mountain-plateaux." 1300 feet in Bordö. In Scotland, 1200 feet Skye (Roy); Perth, probably at under 2000 feet (White); 1500 feet in Westmoreland (Baker). This shows, as with *cæspitosa*, the difference between Faroe and Scotland.

Saxifraga rivularis.—Only on the mountain-plateaux. In Scotland I can find no record below 2700 feet.

Pyrola minor.—1270 feet, associated with *Silene acaulis*, *Luzula spicata*, *Alchemilla alpina*, and *Sibbaldia*, "an extremely peculiar habitat for the plant."[1] In Scotland it grows up to 2900 feet (Marshall), and 3700 feet (White).

Veronica alpina.—Mountain-plateaux only. Down to 1200 feet in Perth (White).

Veronica fruticans.—Mountain-plateaux only. Down to 1200 feet in Perth (White).

Bartsia alpina.—Mountain-plateaux only. England, Humber 900 feet (Watson). Scotland, in Perth at 1600 feet (White).

Juncus biglumis.—At 1140 feet and 2000 feet. Scotland, at 2500 feet in Perth (White); "down to 2000 feet" (Dickie).

Luzula arcuata.—Mountain-plateaux only. In Scotland, Aberdeen and Easterness at 3000 feet.

[1] Ostenfeld, *l.c.* 999.

Carex atrata.—Mountain-plateaux only. 1600 feet in Perth (White) is lowest I can find.

Carex pulla.—1170 feet, 1300 feet, 1610 feet (Faroe). 2200 feet in Perth (White).

Poa alpina.—Mountain-plateaux, and occasionally descending lower. 1000 feet in Perth.

Poa glauca.—Found in the lower regions and in the mountain-plateaux. Scotland, descending to 400 feet ("Fl. Perth," p. 352).

Of these plants that do not occur in the four most northern vice-counties of Scotland, the most remarkable as occurring in the Faroes are *Sagina nivalis*, *Cerastium trigynum*, *Saxifraga cæspitosa*, *S. rivularis*, *Juncus biglumis*, and *Luzula arcuata*. These are species in Scotland not recorded from below 2000–2500 feet; and though there are hills above 2000 feet in Caithness and the Outer Hebrides they are nowhere recorded from them. It may seem that the geological formation may have something to do with this, as it is absolutely of one formation, or the products of it, in the Faroes.

ALIEN PLANTS.

By James Fraser.

The following list consists mainly of Alien Plants seen during 1908, but a few of them, observed during the three or four preceding years, have only now been identified.

In August last, under the guidance of Miss Hayward of Galashiels, the banks of the river Tweed from Abbotsford to Leaderfoot were examined for alien plants, and about one hundred and twenty species were observed, nearly all wool and hide introductions which escaped from the mills on the Gala, the Ettrick, and the Tweed. Many of them are natives of Australia, the Cape, the Argentine, and Chili, and had not previously been found in Britain.

As in previous papers, the following names under each Natural Order are arranged in rough alphabetical order: an asterisk *in front* of a name indicates a new British record: α = once found; β = twice or thrice, but rare; γ = neither rare nor frequent; δ = frequent; ϵ = abundant: the name

"Tweed" indicates those observed on the shingle of that river between Abbotsford and Leaderfoot.

CRUCIFERÆ.

Barbarea arcuata, *Reichb.* Leith, α.
B. sicula, *Presl.* Leith, α.
Eruca vesicaria, *Cav.* Leith, ε.
Erysimum Perofskianum, *Fisch. and Mey.* Leith, γ.
Iberis sempervirens, *L.* Leith, α.
Malcolmia maritima, *R. Br.* Leith, β.
Nasturtium amphibium, *Br.* Leith, γ.
Sisymbrium runcinatum, *Lag.* Leith, α.

MALVACEÆ.

Lavatera trimestris, *L.* Leith, γ.

AMPELIDEÆ.

Vitis hederacea, *Ehrh.* Slateford (outcast), γ.

RUTACEÆ.

Ruta graveolens, *L.* Leith, α.

LEGUMINOSÆ.

*Astragalus hispidulus, *DC.* Leith, ε.
*A. Stella, *Gouan.* Leith, γ.
*Lupinus linifolius, *Roth.* Slateford and Leith, β.
Medicago laciniata, *Mill.* Leith and "Tweed," γ.
*M. coronata, *Desr.* Leith, α.
Ononis reclinata, *L.* Leith, β.
Trifolium angustifolium, *L.* Leith and "Tweed," β.
T. stellatum, *L.* Leith, β.
T. glomeratum, *L.* "Tweed," α.

LYTHRACEÆ.

Lythrum Hyssopifolia, *L.* Leith and "Tweed," γ.

UMBELLIFERÆ.

*Astrantia helleborifolia, *Salisb.* In a wood in Linlithgowshire, β.
Bupleurum aristatum, *Bartl.* Leith, β.
Trinia vulgaris, *DC.* Leith, α.

DIPSACEÆ.

Cephalaria transylvanica, *Schrad.* Leith, β.

COMPOSITÆ.

Artemisia Dracunculus, *L.* Leith, β.
Anacyclus clavatus, *Pers.* Leith, β.
A. valentinus, *L.* Leith, β.
Bidens tripartitus, *L.* "Tweed," α.
Cirsium oleraceum, *Scop.* Near Selkirk, β.
Calotis hispidula, *F. von Muell.* "Tweed," δ. A native of Australia.
Cotula coronopifolia, *L.* "Tweed," γ.
*C. australis, *Hook. f.* "Tweed," α.
*C. integrifolia, *Hook. f.* Leith, β.
Cenia turbinata, *Pers.* "Tweed," α. A native of the Cape.
Gnaphalium luteo-album, *L.* "Tweed," α.
Grindelia squarrosa. *Dunal.* Leith, β.
Guizotia abyssinica, *Cass.* Leith and "Tweed," δ.
Hypochœris glabra, *L.* "Tweed," γ.
Helipterum corymbiflorum, *Schlecht.* "Tweed," α. A native of Australia.
Helianthus Maximiliani, *Schrad.* Leith, β.
*Rhagadiolus hedypnois, *L.* Leith, α.
Erigeron acre, *L.* "Tweed," β.
Madia sativa, *Molina.* "Tweed," γ.
Senecio lautus, *Forst.* "Tweed," γ. A native of Australia.
S. brachyglossus, *F. von Muell.* "Tweed," γ. A native of Australia.
S. subdentatus, *Ledeb.* Leith, α.

BORAGINACEÆ.

Anchusa hybrida, *Ten.* Leith, β.
Borago officinalis, *L.* Leith, β.
Echinospermum deflexum, *Lehm.* Leith, β.

SOLANACEÆ.

Datura Stramonium, *L.* One plant by the Esk, above Musselburgh in July 1907.

SCROPHULARIACEÆ

Linaria spuria, *Mill.* Leith, α.

LABIATÆ.

*Nepeta nuda, *L.* Leith, α.
Marrubium Alysson, *L.* Leith, β.
Salvia controversa, *Ten.* Leith, α.

PLUMBAGINACEÆ.

Statice Suworowi, *Regel.* A fine clump, on a rubbish heap near Slateford (outcast).

ILLECEBRACEÆ.

*Paronychia bonariensis, *DC.* "Tweed," α. A native of the Argentine.
Herniaria cinerea, *DC.* Leith, β.

AMARANTACEÆ.

Amaranthus caudatus, *L.* Leith and near Slateford, β.
Celosia cristata, *L.* Near Slateford, β. (outcast or escape).

CHENOPODIACEÆ.

Atriplex spongiosa, *F. von Muell.* "Tweed," δ. A native of Australia.
Atriplex rosea, *L.* Near Musselburgh, γ.
Chenopodium ambrosioides, *L.* Leith and "Tweed," α.
C. opulifolium, *Schrad.* Leith, α.
Suæda altissima, *Pall.* Leith, γ. These plants appeared yearly for three or four years, but never flowered till this year.

POLYGONACEÆ.

Rumex Brownii, *Campd.* "Tweed," δ. A native of Australia.

EUPHORBIACEÆ.

Euphorbia platyphyllos, *L.* Leith, β.

IRIDACEÆ.

Tritonia crocosmiflora. One plant by the Esk above Musselburgh, in September 1907. (Outcast, side by side with *Tellima grandiflora.*)

LILIACEÆ.

Smilacina stellata, *Desf.* In a wood in Linlithgowshire, plentiful.

GRAMINEÆ.

*Agrostis retrofracta, *Willd.* Several plants of this Australian grass were gathered by Miss Hayward and myself on the Tweed shingle between Galafoot and Melrose. We are indebted to Professor Hackel for its identification.

Agrostis scabra, *Willd.* (Agrostis hyemalis, *B.S.P.*). This plant Mr. M'Andrew gathered in Leith, in 1904, and meagre specimens were seen in each of the following years till 1908, when good, healthy plants were found. We are indebted to Professor Hackel for its determination.

Agrostis verticillata, *Vill.* "Tweed," *a.*

Avena orientalis, *Schreber.* Plentiful at Leith.

Bromus brizæformis, *Fisch. and Mey.* Several plants at Gorgie and Leith.

Bromus hordeaceus, *L.*, *var.* β leptostachys, *Beck.* Identified by Professor Hackel. Plentiful at Leith.

*Hordeum chilense, *Brong.* A single plant, Leith. Identified by Professor Hackel.

H. bulbosum, *L.* (H. strictum, *Desf.*). Two fine clumps at Slateford.

Phleum exaratum, *Hochst.*? A single plant, Leith. Of this plant Professor Hackel has some doubt. It comes very near *P. exaratum*, Hochst, a species closely allied to *P. græcum*, if not a variety of it. He writes, "Your specimen is in a young state, and shows not the characteristic thickened side and marginal nerves, between which there is a furrow ('glumis exaratis,' Boissier) in the more advanced state which Boissier described." In all other respects my plant agrees with *P. exaratum.*

*Phalaris angusta, *Nees.* Several fine plants at Leith.

Setaria viridis, *Beauv. var.* majus, *Gaud.* Several at Leith.

*Trisetum Cavanillesii, *Trin.* One plant, Leith.

*Sphenopus divaricatus, *Reichb.* A single plant, Leith. Identified by Professor Hackel.

*Triticum triaristatum, *G. and G. var.* macrochætum, *Hackel.* (Ægilops macrochæta, *Shuttl. and Huet.*). A fine clump at Leith.

*T. triaristatum, *G. and G.* "A form intermediate between the type and the var. *macrochætum.*" Several plants at Leith and Slateford. For the identification of the above two grasses I am indebted to Professor Hackel.

*T. ventricosum, *Ces.* Very plentiful at Leith, Gorgie, and Slateford.

LEITH, *December* 1908.

THRINCIA NUDICAULIS, BRITT., IN PERTHSHIRE.

By William Barclay.

In August last Mr. David Campbell, a keen botanist and one of the most promising recruits of the P.S.N.S., brought me a specimen of *Thrincia nudicaulis*, Britt., which he had found by the roadside at the policies of Dupplin Castle. He recognised the plant from having seen it in Haddingtonshire, where it occurs in various places in considerable quantity. On visiting the station at Dupplin I found the plant growing in patches along one side of the road, at the base of the boundary wall, for a distance of about a hundred yards or more. It was not to be found on the other side of the road.

In Dr. White's "Flora of Perthshire," under its synonym *Leontodon hirtus*, two old records are given. One "in a field below the garden at the Earl of Kinnoull's seat near Perth (Mr. Miller in Smith's 'Fl. Brit.,' 1800) has not been verified." The other, "Steirck-an-Lochan, Ben Lawers" (W. Gardiner, 1842), is probably an error.

On reading this, one would suppose that Mr. Campbell's discovery was simply a verification of the first of these old records, for Mr. Miller's station, as given in the "Fl. Brit.," is almost the same as Mr. Campbell's. But on referring to the "Flora Britannica" itself, I found, to my surprise, that there is no such record in that work. There the plant is given under the name *Hedypnois hirta*, with amongst other synonyms *Leontodon hirtum*, Lin., but no localities are mentioned except "in pascuis et ericetis glareosis." After some trouble, however, I found the key to the mystery. In the "Addenda et corrigenda" to Smith's work, at page 1401, No. 684, we read: "*Thlaspi hirtum.* In a field below the garden at the Earl of Kinnoul's seat near Perth." In the "English Flora" of the same author (1825), vol. iii. page 167, *Lepidium hirtum*, the *Thlaspi hirtum* of the Flora, is stated to occur "in Perthshire, near the seat of the Earl of Kinnoul.

Mr. Miller and Mr. J. Mackay." This is evidently a mere repetition of the former record.

It is easy now to see how the mistake arose. In making out a list of records of Perthshire plants from the "Fl. Britt.," which he would do when he first began the work of compiling a county Flora, Dr. White had copied the record correctly enough, but had written *L. hirtum* for *Lepidium hirtum*, the new name of *Thlaspi hirtum*. But in reading his own note, probably many years afterwards, he would naturally conclude that *L. hirtum* stood for *Leontodon hirtum*, a plant which he had never been able to find in the county, instead of *Lepidium hirtum*, quite a common plant in many parts of Perthshire. Besides, by that time he would have got into the habit of thinking of the latter plant as *Lepidium Smithii*, Hook., as given in the 8th edition of Babington's "Manual," the Flora which he always carried with him for reference.

It is certainly a singular coincidence that the new discovery should have been made so close to the place pointed out in the old erroneous record. There can, however, in my opinion be no doubt that Mr. Campbell is the first who has really found the plant in Perthshire. But the question arises, Is the plant really native, or has it been purposely or accidentally introduced through the agency of man? There is not the slightest ground for supposing that it has been purposely introduced, and I am unable to conceive in what way it could have come there indirectly and unintentionally through man's agency. On the other hand it may be asked, Is it possible to believe that it could have been in its present station for a lengthened period, and have escaped notice until now? Such cases have happened, and I could give more than one instance of a plant, by no means very inconspicuous, which was overlooked for a long series of years, although competent botanists must have walked scores of times past the spot where it was growing.

The question, therefore, is one which it is not easy to decide, or rather it is one to which it is impossible to give an absolutely certain reply. At present I incline to believe that the plant has not come to Mr. Campbell's station through the agency of man.

ZOOLOGICAL NOTES.

The Late Mr. James Tomison, Lightkeeper.—It is with great regret that we have to record the death of our valued contributor Mr. James Tomison, which occurred at the Royal Infirmary, Edinburgh, in September last. Mr. Tomison was a keen and excellent observer, and availed himself of the great opportunities afforded him by his calling, as his singularly interesting and well-written papers contributed to the "Annals" on the bird visitors to Sule Skerry and Skerryvore abundantly testify. He was personally known to us and won our high esteem, and we regard his death, in the prime of life, as a loss to Scottish Natural History and one which is greatly deplored.

Pipistrelle Bat in Orkney.—A male of *Pipistrellus pipistrellus* was captured at Deerness on the 21st of September last. No bat appears to have been captured in Orkney during the past fifty years, and the few that have occurred have not been identified. I sent the specimen here recorded to the Royal Scottish Museum, where my identification of it was confirmed by Mr. Eagle Clarke.—M. Spence, Schoolhouse, Deerness, Orkney.

Destructive Habits of the Bank Vole.—Lately I came across an instance of an unusual piece of destruction by this species. A small odd patch of ground on the outside of a large garden had been planted with potatoes late in the past season, and had been rather neglected and weed-covered. On digging the crop, at least one-half of the produce was found to be more or less eaten by these Voles (*Microtus glareolus*). Not one of the potatoes was completely eaten, as would have happened if the Water Vole or the Common Brown Rat had done the mischief. Small irregular patches on the sides of the potatoes most easily accessible were the feature of the attack. Succulent green vegetables or herbage in summer, wayside and hedgerow fruits in autumn, surface roots and soft stems in winter and spring, are usually devoured by the Bank Vole, and although I have often known it to eat a patch in an odd potato, I have not known of a general and severe attack on this crop before.—Robert Service, Maxwelltown.

Brambling in West Sutherland.—On the 25th of October, while at Inchnadamph, I observed a number of Bramblings (*Fringilla montifringilla*). Their identification was easy from the white rump, so much in evidence when these birds are in flight. Redwings in plenty were seen all along the road from Kylesku to Ullapool *via* Knockan and Drumrunie. Fieldfares were to be

seen, but these are not nearly so numerous as they were during the autumnal migration last year.—J. T. HENDERSON.

[The Brambling has not hitherto been satisfactorily identified in the area.—EDS.]

Hawfinch in East Lothian.—On the 8th of July I received by post an immature male Hawfinch (*Coccothraustes vulgaris*), which had been found dead at Tyneholm, Pencaitland, on 3rd July, and had passed through several hands before it reached me. The bird was well plumaged and had its tail about half grown. It was found by Mrs. Reid of Tyneholm, lying dead near a wire enclosure where some chickens were kept, and had probably dashed against the netting. It was too far gone to make a skin of.—H. N. BONAR, Saltoun, Pencaitland.

Little Bunting and other Birds at Sule Skerry.—Mr. Allan M'Millan kindly sent me four birds for identification which he had captured at the lantern of the Sule Skerry Lighthouse on the 22nd of September last at 10 P.M., the weather at the time being hazy and the wind a S.-E. strong breeze. These proved to be a Little Bunting (*Emberiza pusilla*), Pied Flycatcher (*Muscicapa atricapilla*), Redstart (*Ruticilla phœnicurus*), and Garden Warbler (*Sylvia simplex*). The Little Bunting has occurred in small numbers on the autumn migration at Fair Isle during the past four years, and less frequently in the spring, but has not yet been detected on the mainland of Scotland, over which it can only be very thinly scattered and hence escapes notice. Sule Skerry, it may be remarked, is a rock-station situated out in the Atlantic some 33 miles W.N.W. of the Orkney Island of Hoy.—W. EAGLE CLARKE.

Red-breasted Flycatcher and other Birds at the Butt of Lewis.—Since coming here I have had a great deal of station work, and not the time I would have liked for the observation of bird life, etc. I have, however, considered the place generally rather bare and uninteresting, comparatively; there being no turnips grown in the district, and no cover for small birds. This latter half of October has, however, been exceptional, and I have been pleased to see a few Warblers and other woodland birds about for the first time. On 25th and 26th we had Blackcaps, Redstarts, and Willow Warblers. On 1st Nov. I watched for a long time, catching midges on the cliff edge, what, I am certain, is a Red-breasted Flycatcher (*Muscicapa parva*), the same species as I got last year on the Bell Rock ("Annals," 1908, p. 49). The tail was kept nearly always on the move, and often erected wren-like, and the white feathers, when it made evolutions in the air after insects, were as conspicuous as the white on a Wheatear's rump. There were no markings on the wings or body. I thought Wheatears were all

gone, as none have been seen since 29th October, but I saw one female to-day, 1st November.—ROBERT CLYNE, The Lighthouse, Butt of Lewis.

Black Redstart in the Tay Area.—On 22nd October at Balcomie, a little to the north of the East Neuk of Fife, we procured a fine specimen of a Black Redstart (*Ruticilla titys*). It was a male in beautiful plumage. We believe this to be the first record of this species in the Tay area.—LEONORA JEFFREY RINTOUL and EVELYN V. BAXTER, Largo, Fife.

Coal Titmouse on the Bass Rock.—Titmice so seldom appear in the Migration Reports that the occurrence of two Coal Tits on the Bass Rock on 28th September last is perhaps worth putting on record. A leg and a wing of one of them were sent to me for identification by Mr. J. M. Campbell, the lighthouse keeper. Had the whole bird been preserved, it might have been possible to say whether it belonged to the continental or the British race.—WILLIAM EVANS, Edinburgh.

Gadwall in Fifeshire.—A young male Gadwall (*Chaulelasmus streperus*) in transition plumage was among the ducks shot at evening flight on Morton, near Tayport, on the night of the 14th November 1908. Our bag for two nights of that week (one gun) consisted of ten ducks, and included, besides the Gadwall, Mallard, Widgeon, Teal, Shoveller, Golden Eye and Scaup Duck, all killed after dusk, and when species could no longer be distinguished. We are accustomed to meet with ducks of many kinds in the course of a season, but this Gadwall is the first that has come under my notice in the eighteen years or so that I have been intimately acquainted with the moors and marshes near the mouth of the Tay, though I have heard a report that one was killed in Forfarshire at an earlier date in 1907. The bird was alone when shot, and so far no other has been seen. The "flighting" bag for that week also included a Pink-footed Goose having a curious malformation of the base of the bill, the result, I have no doubt, of some previous injury. This Goose and the Gadwall have both been sent to the Royal Scottish Museum for preservation.—WILLIAM BERRY, Tayfield, Newport, Fife.

Long-tailed Duck far Inland.—An adult female Long-tailed Duck (*Harelda glacialis*) was shot on the Spey 40 miles from the sea in October last. As this is a far inland occurrence, it may be considered worthy of a record in the "Annals."—J. R. PELHAM BURN, Roy Bridge.

Golden-eyes in the Forth Area in Summer.—On 16th May, and again on 5th June 1908, I saw a flock of eighteen Golden-eyes on Loch Leven—six of them males in adult plumage; and on 10th

June I counted nineteen on Loch Coulter among the Denny Hills. It would be interesting to know if they were seen elsewhere. A pair of Goosanders, I may add, were observed on Linlithgow Loch on 20th May.—WILLIAM EVANS, Edinburgh.

Note on the Drumming of the Snipe.—In the "A.S.N.H." 1906, p. 113, I recorded hearing a Snipe "drumming" as early as 4th February. This year I heard one in Dunfermline on 1st August, and watched it for several minutes. I think these are exceptionally early and late dates for this performance.—HUGH S. GLADSTONE, Thornhill, Dumfriesshire.

Black-headed Gulls Molesting Lapwings.—Returning late one evening I found the "Annals" for October awaiting me, and perhaps the best answer from the west regarding Mr. Evans's inquiry on above subject is to say that within twelve hours of the receipt of that number, standing in Cadder Wilderness, our great beech wood north of Glasgow, looking to the fields north of the wood, I remarked to Mr. Alex. Ross: "there are Mr. Evans's Gulls chasing the Lapwings." This is a matter of common observation here, and standing in a gap of a hedge in the Cathcart district watching this game going on in the green crops, has been a Sunday morning diversion from time to time in autumn and winter for the past twenty years.—JOHN PATERSON, Glasgow.

Note on the Moulting of the Great Northern Divers.—In my note under the above heading in the July number of the "Annals," p. 185, you have omitted to mention the moulting bird. This particular specimen was shot during the first week in February, and was in full moult, many of the primaries being missing altogether, the rest of the wings being well spotted, but the back was quite unspotted with the exception of the extreme end near the root of the tail, and here the white spots were also making their appearance. On 10th April, I only came across one fleet of them, numbering fourteen, again off Houton Head, and of these two had their heads half changed. They all dived as we sailed up to them, but only five came up from the dive, a lot of three and another of two, which also soon vanished, the former failing to come up after their third dive, and the latter being kept in view and followed for about ten minutes. On this occasion the sea was very choppy, and although we sailed right over the spot where they dived, we never saw any trace of the other nine again, including the two whose heads were half changed, as they probably only put the tips of their beaks up out of the water for a fresh supply of air. On 25th April I saw two in the flesh, sent from Orkney to my friend Mr. F. Smalley, and both these had the heads half changed, being shot on the 21st, at which date most of those seen were in this stage of plumage. The other day I saw the skin of an American-shot

Northern Diver in full summer plumage which had been shot on 22nd April, so, evidently, in America they are a week or so ahead of us in the completely changed condition.—H. W. Robinson, Lancaster.

Bird Notes from Tiree.—We have had eleven days' shooting, during which two guns got about 1300 Snipe, or, to be exact, 1293. Our best day was 217. A feature of the shooting was the numbers of Woodcock that were about. We seldom used to see more than one or two at this time of year. On the 10th November, I put up 9 or 10 when walking across a bit of rough ground. The place seemed to be alive with them. They looked tired and only flew a short distance—very unusual at that date. South-east strong winds continued without a break from the end of September until the second week in November. Consequently, Thrushes, Redwings, Fieldfares, Blackbirds, and other small birds were literally in thousands all along the south side of the islands; whilst Wheatears were still fairly numerous in the first week of November—very late, as they nearly all disappeared when the wind changed to the west. It shows that they are waiting for a change of wind. White-fronted Geese, which used to arrive from 15th to 17th October, did not arrive this year until 5th November; which shows that the continuous south-east winds kept them back. I dare say, it was the same cause that made the Woodcock and Snipe so abundant here. About the middle of October Mr. M'Kenzie, Scarnish, caught a Gold-crested Wren inside his window. After he had shown it to me, he let it go. A few days later, he got a young Brent Goose, which had got its wing injured against a telegraph wire. He put it in an enclosure, along with a farm Duck, and it has now become quite tame, and will take food out of the hand. Altogether there were tremendous numbers of birds on migration here until the wind changed to the west, when they nearly all disappeared. I expect there may have been some rare birds among them; but as I was busy at the time I did not have the time to look about for them. I forgot to mention that we have crowds of Swans—both Bewicks and Hoopers. They arrived as early as usual, but they came from the east and north-east, and the south-east winds did not affect them.—Peter Anderson, Tiree.

Labrax lupus, *Cuv.*, in the North Sea.—A good specimen of this fish, the Basse, measuring 24 inches, and weighing 5 lbs., was obtained on the 11th October by trawler "Primrose," skipper David Kidd, fishing 30 miles east of the Bell Rock, and sent to me by Messrs. Cameron and M'Farlane, Dundee. This is the first Scotch specimen that I have seen. Parnell speaks of it as making its appearance now and then in the Firth of Forth, more particularly in the months of July and August; but the only examples that I have heard of in recent years are two got by Professor M'Intosh

in St. Andrews Bay in May 1887, and one recorded by Dr. Fulton from Kincardine-on-Forth in February 1902 ("Scottish Fishery Board's Reports, Pt. III. 1888, p. 275; 1902, p. 229).—D'ARCY W. THOMPSON, University College, Dundee.

[A specimen, weighing about 2 lbs., was captured in the Firth of Forth off Elie in November 1904, and is now in the Royal Scottish Museum. The date is an unusual one.—EDS.]

Another Occurrence of the Oar-fish in Scotland.—Referring to the article in the July number of the "Annals" on the Oar-fish, I can add another occurrence of this fish in Scottish waters, which Mr. Evans omits from his list, and which I mentioned in "The Field" of 16th March 1907, as follows: "Last week a fine specimen of the Ribbon Fish was washed ashore on the beach of Whitemill, Burness, Sanday, Orkney. It was of a beautiful silver colour, and measured 13 feet in length, 2 inches across, and about 8 inches in depth. It was quite fresh when washed ashore, but unfortunately was not preserved, and the Gulls soon made short work of it." "The Field" again mentions this specimen in its issue of 13th June 1908, when mentioning the occurrence of the Dunbar specimen.—H. W. ROBINSON, Lancaster.

Hydrachnids from Neighbourhood of Kirkliston.—During the last eighteen months, I made three or four collections of Hydrachnids from a small loch and some ponds in the neighbourhood of Kirkliston. The loch yielded the largest number of specimens, but the ponds gave very meagre results, which I attribute mainly to the lack of vegetation. In a small quarry now filled with water I was able to get some large specimens of the genus *Hydrachna*. Only fourteen species representing seven genera were found by me. *Piona* and *Limnesia* each contribute four species, while *Arrhenurus*, *Thyas*, *Hygrobates*, *Brachypoda*, and *Hydrachna* yield only one each. *Piona* and *Limnesia* are represented by *P. conglobata* (C. L. Koch), *P. discrepans* (Koen.), *P. uncata* (Koen.), *P. carnea* (C. L. Koch), *L. undulata* (Müll.), *L. maculata* (Müll.), *L. koenikei*, Piersig, and *L. histrionica* (Herm.). None of these call for particular mention as they are fairly common species. *Hygrobates longipalpis* (Herm.) also appears to be a common species. *Brachypoda versicolor* (Müll.) cannot claim to be common. I have only found it on two occasions before, one specimen at Duddingston some years ago, and one at the Elf Loch last December. It is a small species with colour markings which tend to render it inconspicuous when creeping among the sediment which lies at the bottom of the water. *Thyas venusta* (C. L. Koch) is rather conspicuous from its bright red colour. I have also found it at Bavelaw. *Hydrachna scutata*, Piersig, can be readily seen swimming in clear water. It is one of the larger species and red in colour. The distinguishing feature is the plate situated well forward on the dorsal surface. The shape

of the plate is rather variable, which tends to make identification troublesome. One specimen of *Hydrachna* has not yet been identified, as the dorsal plate is a distinct departure from that of any species hitherto found in this country. The large genus *Arrhenurus* is poorly represented, only a few females not yet identified having been taken. I have never been able to find many specimens of *Arrhenurus*, and of those found the males are decidedly in the minority.—Wm. Williamson, Edinburgh.

BOTANICAL NOTES AND NEWS.

The High Alpine Flora of Britain.—In his first article (No. 67, p. 168) Dr. Williams states that "as compared with Scotland, alpine plants descend to lower levels in Ireland." This is an unexpected proposition, in support of which no evidence is adduced; for the eighteen species enumerated (pp. 244-250), as descending to sea-level in Ireland, are not alpine plants. They are nearly all of them plants of universal range which may be expected at sea-level almost anywhere from Land's End to Saxa Vord. Indeed fifteen of them are recorded in the "Cybele" as descending to coast-level *in the Peninsula*, which means as much. With regard to the other three, *Galium boreale* and *Empetrum* both reach coast level in Scotland, while *Pyrola minor* no doubt has the same habit since it "descends almost to coast-level in the south of England." Turning to our farthest north, four of these species are not known in Shetland, while two others are so very rare that no deduction can be drawn from them. The remaining twelve all occur at sea-level; not in one place, but commonly, with a frequency which varies with the prevalence of the respective species. Dr. Williams gives the descending level in only two other cases. *Vaccinium vitis-idæa* "descends to 30 m. in Armagh," while so far it has not been noted below 120 m. in Shetland. This is the only case which really seems to favour Ireland in the comparison with Shetland, but here again we are dealing with a rare plant known only from a few scattered localities in the northern group of islands. On the other hand, the truly alpine *Saussurea alpina* "descends to 305 m. in Donegal"; but it descends to 244 m. in Shetland,[1] though I have not myself seen it so low down.

Besides the plants referred to above, three others, for which Dr. Williams gives no descending limit, are all found at sea-level in Shetland.—W. H. Beeby.

Nasturtium palustre, *DC.*, **in Orkney.**—In September 1908 Mr. M. Spence sent me specimens of the above species from N.

[1] Tate in "Journ. Bot.," 1866, ϕ 6.

Ronaldshay, the northernmost island of the Orkneys. This is about 59° 20′ N. lat., and a far northern extension of its range in Scotland. Dr. Trail's Kincardine station is north of the Forfarshire ones, but there seems no record north of this except for S. Aberdeen (92).

In Sweden its range is almost continuous from Skåne to Lapland; in N. and S. Norway and in Finland it extends to all the provinces except the three most northern, and occurs up to 68° N. lat. It is absent from the Faroes, but occurs in Iceland. The Iceland plant was called var. *islandicum* by the Icelandic author Hjaltalin in 1830; and was figured in "Fl. Danica," t. 409 (1768), as *Sisymbrium islandicum*, Oed. That it will bear a very cold climate is shown by Laestadius,[1] who writes:—"It may be observed that it is only during warm summers that *Nymphæa*, *Potamogeton*, *Myriophyllum*, and other water plants reach their full development." "*N. palustre* occurs near Karesuando and Enontekis." In Canada it occurs north to York Factory, about 57° N. lat.—ARTHUR BENNETT.

Crithmum maritimum, *L.*, in the Outer Hebrides.—Mr. Gibson of Stornoway, Lewis, has lately (11th October 1908) sent me a fresh specimen of the above plant, gathered on the Mangursta cliffs, a little north of the island of Eilean Molach, on the west coast of the Lewis, in lat. 58° 10′. This a really interesting extension of habitat, as in Scotland it is only recorded for Ayr, Wigton! and Kirkcudbright. In August 1906 the late Mr. A. Somerville sent me specimens gathered on "Machrins coast rocks at sea-level" in the Isle of Colonsay, V.C. 102, this being about 56° 5′ N. lat.

In Europe it is not recorded north of lat. 51°, except in our isles. Its most northern station seems to be on the coast of Normandy in France. The distribution given by Nyman[2] for Europe will show how little it can be claimed as a northern species, *i.e.* Britain, Spain, Portugal, France, Italy, Istria, Croatia, Dalmatia, Herzegovina, Macedonia, Ionian Islands, Taurus. It also occurs in Algiers, the Canaries, the Azores, and Madeira.

It belongs to an order that, with few exceptions, does not range far northwards. No doubt the open Atlantic, with the Gulf Stream impinging on the coast or very near it (unless it has been diverted as lately suggested), allows of species occurring that would otherwise be unable to survive. It was reported for the coast of Fife; but if it existed there it seems now extinct, and Greville in his "Flora Edinensis" (1824), 62, says: "Said to grow in the islands in the Firth of Forth, but not now to be found."

Mr. Gibson also sends a specimen of *Mercurialis perennis*, and mentions *Veronica Chamædrys* as "common in the Castle grounds,

[1] "Bid. t. känn.," i. Torneå Lappmark, 1860.
[2] "Consp. Fl. Europ.," ii. (1879), p. 292.

and this neighbourhood"; these are both additional records for the Outer Hebrides.

Crithmum maritimum has sometimes been said not "to grow on the sand"; but this is certainly an error. I have seen it on pebbly beaches, on sandy shores, and on the chalk cliffs of the south of England.—ARTHUR BENNETT.

Limosella aquatica, *L.*, **in Dumbarton.**—Mr. L. Watt of Clydebank has sent specimens of the above species from a dam at Duntocher in that county, some nine miles from Glasgow. It is only on record for Ayr in the west, and for Haddington, Forfar, and Kincardine in the east of Scotland. Mr Watt writes: "One side of the dam being dry was covered with Limosella." No doubt it is one of those species that can easily be passed over, especially if the water-level is high. Its range is continuous in Sweden from Skåne to Norland; and it occurs in Swedish, Finnish, and Russian Lapland (though rare) north to 69° 50′ N. lat. South of lat. 67° it is generally dispersed in Finland.—ARTHUR BENNETT.

Carex atrofusca, *Schler* (*ustulata*, Wahl), **in Perthshire.**—In the "Trans. Nat. Hist. Soc. of Glasgow," vii. (1907), p. 232, Mr. P. Ewing, in a paper entitled 'An Œcological Problem,' remarks:—"Nyman in his *Conspectus Europæa* mentions this plant from Lawers, but I am inclined to think that this is an error caused by the common expression, 'Scotch mountains,' of the older botanists. Evidently he was not aware that Dr. Paul found the species, on July 22, 1892, 'on one of the slopes of the hill that descends to the loch, Lochan à Chait.'" According to Dr. F. A. Lees in "The Naturalist," September 1884, p. 70, in a review of the 3rd edition of Hooker's "Students' Flora," "Specimens undoubtedly gathered on Ben Lawers within about forty-two years, by the late Surgeon Newnham, are in more than one herbarium; and the writer found one amongst a number of other carices sent him to be named by F. C. King of Preston, gathered on the same hill within five years, unrecognised at the time, the collector being a comparative tyro." These dates make for years about 1842 and 1879 respectively.

If so, Don's report of the species was confirmed many years before any notice or publication of the fact was made known, Mr. Brebner's discovery of the plant on Ben Heasgarnich dating from July 1885.

It remains a remarkable thing that from 1810, the date on Don's specimens, it should have escaped notice for so many years, on a mountain so often ascended by botanists. Mr Pickard of Leeds notes that the late Mr F. C. Crawford found it on Craig-Cailleach in Perthshire. Did that botanist record that find anywhere?—A. BENNETT, Croydon.

Physcomitrella patens, *B. and S.*, **in Scotland.**—On 24th October last I found this interesting little moss at Torduff Reservoir

near Colinton, Midlothian; it was subsequently detected also at Clubbiedean Reservoir in the same neighbourhood. The water has been very low in these ponds all summer, mosses and liverworts having thus been given time to appear on the exposed mud, which is of considerable area. The *Physcomitrella* occurred abundantly along with antheridia-bearing plants of *Funaria hygrometrica*, Sibth., and *Riccia crystallina*, Linn., in both localities. In the "Census Catalogue of British Mosses," issued in 1907 by the Moss Exchange Club, there is no mention of *Physcomitrella patens*, B. and S., in any Scottish county. The identification was verified by Mr. H. N. Dixon, F.L.S.—W. Edgar Evans, Edinburgh.

Rosa spinossissima, *Linn.*, × mollis, *Sm.*, in Banffshire. — In July last, whilst visiting Boyne Castle, near Portsoy, I met in with a fine clump of what I have no doubt is this hybrid. It was growing on the lofty, tree-shaded bank of a gorge which runs down from the castle to the sea. There were numerous bushes of *R. spinossissima*, Linn., growing around it, and *mollis* and other species were also not far off.

Its prickles are precisely those of *R. spinossissima*, Linn., even affecting the declining habit often found in those of that species. In the form of its leaflets, however, it closely approaches the shape of those of *R. mollis*, Sm. They are softly hairy in both surfaces, the hairs rather long and appressed. In colour they are of a very glaucous hue, with a bluish tinge, darker above, paler below. Subfoliar glands are present, but in very small quantity, chiefly on the midrib. The serration is composite-glandular. The upper stipules are much dilated, though varying in this respect; some are glandless, others densely glandular on the back. The peduncles, fruits, and sepals are more or less densely glandular. The sepals are long and slender, broadened at the point, and perfectly simple. Some leaves with nine leaflets occur on the flowering branches.

The shape, colour, and clothing of the leaflets, the dilated stipules, and the long, slender, and simple sepals seem to me to leave no doubt as to the parentage of this form.—William Barclay.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—October-December 1908.

[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.

Notes on the Natural History, Geology, and Antiquities of Duror, Argyllshire. Rev. G. A. Frank Knight,

M.A., F.R.S.E. *Trans. Perthshire Soc. Nat. Science*, vol. iv. part v. (1908), pp. 213-228.—A list of Marine Molluscs, comprising 51 species, is given on p. 214.

Mole Variation. Robert Service. *Trans. Edin. Field Nat. and Micro. Soc.*, vol. vi. part i. (1908), pp. 64-65.

Goldcrests from East Coast Lighthouses. William Evans. *British Birds*, December 1908, pp. 232-233.—Specimens captured at the lantern of the Isle of May and Barnsness Lighthouses in October were of the British form.

Hoopoe in Ross-shire. Col. W. H. E. Murray. *The Field*, September 19, 1908, p. 547.—Specimen caught at Geanie's on 9th September.

Scops Owl off Aberdeenshire. E. R. Paton. *British Birds*, November 1908, p. 204.—Refers to a specimen captured on a trawler, about 25 miles off the coast of Aberdeenshire in October 1900.

A Marked Pintail. A. R. *The Field*, December 5, 1908, p. 1021.—Specimen shot on the shores of the Dornoch Firth at Edderton, Ross-shire, with a metal ring on its right leg, marked "H. Chr. Mortensen, Vigborg, Denmark, 366."

On the Nesting of the Scaup Duck in Scotland. P. H. Bahr, M.A., M.B., etc. *British Birds*, December 1908, pp. 209-217, 4 figs.

White Snipe in Argyllshire. H. M. B. *The Field*, December 5, 1908, p. 1021.—A pure white specimen, with *black* eyes, shot at Coll on 21st November.

Tern in Wigtownshire in October. J. Lawrence Sowerby. *The Field*, October 24, 1908, p. 721.—A solitary tern, believed to be the Sandwich Tern, observed off Barsalloch Point on 14th October.

Fulmar Petrel in the Firth of Forth. W. F. T. Malloch. *Zoologist*, October 1908, p. 396.—Specimen picked up dead at Canty Bay on 17th July.

Sphinx convolvuli and Acherontia atropos in Selkirk. B. Weddell. *Entomologist*, November 1908, p. 272.

Acherontia atropos in Inverness-shire. Henry H. Brown. *Entomologist*, November 1908, p. 272.—Specimen picked up dead at Milton, near Drumnadrochit, on 28th September.

Noctua ditrapezium, a Scotch Species. R. Meldola. *Entomologist*, November 1908, p. 273.—Specimen taken at sugar at Fortrose in August 1903.

Note on the Scottish mountain form of Notiophilus aquaticus, L. G. C. Champion. *Ent. Mo. Mag.*, December

1908, p. 271.—This form is compared with N. pusillus, Waterh., and with the typical form of N. aquaticus, L.

Pyropterus affinis, Payk., at Nethy Bridge. T. Hudson Beare. *Ent. Mo. Mag.*, December 1908, p. 273.

Habitat of Anaspis septentrionalis, Champ. Horace Donisthorpe. *Ent. Mo. Mag.*, November 1908, p. 255.—Note on a specimen taken at Nethy Bridge, in September.

Cryptophagus subdepressus, Gyll., and Melanophthalma similata, Gyll., at Nethy Bridge. T. Hudson Beare. *Ent. Mo. Mag.*, December 1908, p. 272.—Both species taken on spruce fir.

Phlœophilus edwardsi, Steph., at Nethy Bridge. T. Hudson Beare. *Ent. Mo. Mag.*, December 1908, p. 273.—A single specimen obtained on 13th September.

Eccoptomera microps, Mg., and other Diptera in Moles' Nests in the East of Scotland. William Evans. *Ent. Mo. Mag.*, December 1908, p. 277.—Besides the species mentioned in the title Lonchoptera lutea, Pz., var. palustris, and undetermined species of Limosina and Sciara are recorded from various localities.

On the British Species of Phora (Part II.—concluded). John H. Wood, M.B. *Ent. Mo. Mag.*, October 1908, pp. 217-218. —P. fuscinervis and campestris, 8 pp. nn., recorded from Bonhill.

Notes from the Gatty Marine Laboratory, St. Andrews, Prof. M'Intosh, M.D., LL.D., F.R.S., etc. *Ann. and Mag. Nat. Hist.*, December 1908, pp. 524-544, pls. xii. and xii.*a*—These notes include an account of an adult female Mesoplodon bidens, Sowerby, stranded at St. Andrews in May, and record the occurrence of Orthagoriscus mola, Bl., off Crail on 9th October.

BOTANY.

Note on "The London Catalogue," 10th ed., by Rev. E. S. Marshall, F.L.S. (*Journ. Bot.*, 1908, pp. 313–319), and Notes on the Foregoing, by James Britton, F.L.S. (*Journ. Bot.*, pp. 320–322).—Includes a good many references to Scotch plants.

The Genus Rosa in "London Catalogue," 10th ed., by W. Barclay (*Journ. Bot.*, 1908, pp. 356–358).

Inverness-shire Cryptogams, by Albert Wheldon, F.L.S., and J. A. Wheldon, F.L.S. (*Journ. Bot.*, 1908, pp. 347–356).—Enumeration of species observed in July 1908 in Rothiemurchús, belonging to mosses, liverworts, and lichens, a good many being new records for the district.

Leathesia crispus, by A. D. Cotton, F.L.S. (*Journ. Bot.*, 1908, pp. 329–331).—Epiphytic on Chondrus crispus, first described by Harvey from Cumbrae.

Biographical Index of British and Irish Botanists, by James Britton, F.L.S., and G. S. Coulger, F.L.S. (*Journ. Bot.* 1908, Nov. Supplement, pp. 1–15). Includes a number of natives of Scotland.

BOOK NOTICES.

Animal Life. By F. W. Gamble, D.Sc., F.R.S. Pp. 305, with 63 illustrations. London: Smith, Elder, and Co. Price 6s. nett.

Of the legions of books issued in recent years which have been devoted to the elementary study of animal life this is one of the most readable and most valuable. Not that it contains more matter of fact than the average nature study book—indeed the average nature study book is generally so over-crowded with matters of fact that the legitimate fancies of the biologist, the theories which endeavour to reduce his hotch-potch of facts to system, are crushed out—but because here structural details and the like are placed in their proper settings, and are treated, not as isolated items of information, but as illustrations of some established generality. Dr. Gamble aims at "dealing with the adaptations and factors of animal life in a broad and connected manner," and he has adopted a method of treatment which admirably carries out his object. In turn the great life-activities and the responses which they have called forth are taken up and discussed under such headings as—the organisation of animal life, movement, the quest for food, the breath of life, the senses of animals, the colours of animals, and the welfare of the race; while the scheme is completed by a long chapter on the life-histories of insects. Throughout, as must be within so limited a compass, the treatment is suggestive rather than complete, but the material has been carefully chosen, and so skilfully have the themes been handled that the discussion never fails to be both interesting and stimulating.

Of adverse criticism we have little to offer. On p. 33 it is alleged (as, indeed, is usual) that in the Brittle-Stars the tentacles have no suckers at their tips, and that the creature's movement is an ungainly shuffle caused only by fin-like motions of the arms. But surely such an explanation does not allow for the fact that Brittle-Stars can cling to and climb the glass walls of aquaria? The reference on p. 113 to fig. 19 F should obviously be to fig. 26 F.

The get-up of the book is pleasing, the type clear, and the

illustrations, many of which are from photographs of nature studies in the Manchester Museum, are on the whole excellent. According to the preface the work is "written in the first instance for those who wish to learn or teach such a survey of the animal pageant as can ally itself with observation and experiment; and in the second place for those who wish to organise their knowledge of animal life," and to each of these classes no better guide to animal study could be recommended. J. R.

The Game Animals of Africa. By R. Lydekker. London: Rowland Ward, Limited, 1908. Price 25s. net.

The volume under notice affords much interesting matter and useful information relating to the numerous and varied forms of the larger mammals to be found in the vast continent of Africa—the most fascinating of all the hunting grounds of the world. All these species, and their various races, are adequately described, and their geographical distribution, haunts, habits, etc., fully treated of. The book is abundantly illustrated by 15 plates and 93 text figures, which are a valuable adjunct to a work of this kind, and which from their great excellence will be duly appreciated. It is the latest and at the same time best and most concise treatise on the game mammals of Africa that has ever appeared.

The Indian Ducks and their Allies. By E. C. Stuart Baker, F.Z.S., M.B.O.U. With 30 coloured plates. Published by the Bombay Natural History Society. London: R. H. Porter, 1908. Price 42s. net.

The Bombay Natural History Society is well known for the yeoman service it has rendered to the cause of Indian zoology; and this, its latest product, is a valuable contribution to our knowledge of the Indian members of an interesting order of birds. The information afforded concerning each of the 45 species treated of is of a comprehensive and interesting nature, both from the standpoint of the naturalist and the sportsman; nothing appears to have escaped the vigilance of the author, who has gleaned facts from widely scattered sources; while the 30 coloured plates are first-rate specimens of modern bird-pictures. The work, too, has been exceedingly well planned; the descriptions of the various stages of plumage are excellent; and he would, indeed, be a captious critic who could find fault with the get-up of the volume, either externally or internally—it is beautifully bound in half-morocco and is handsomely printed. A considerable number of the species included are more or less familiar British birds, and it is both interesting and instructive to become acquainted with them in their Indian haunts, and to learn something about their habits in their eastern winter retreats. As last words on this handsome volume, we desire to express the hope that the Society will regard this book as the forerunner of a series devoted

to the avifauna of our great Indian Empire. The Society includes within the ranks of its membership the necessary talent for producing the standard work on Indian birds : we hope that it will avail itself of its resources.

English Bird Life. By H. Knight Horsfield, M.B.O.U. London : Everett and Co., 1908. Price 7s. 6d. net.

Mr. Knight Horsfield has produced a very readable book : one that is written in a bright and pleasant style which will appeal to bird-lovers both old and young. The book is divided into nineteen chapters. The first of these treats of the diurnal birds of prey ; and here the author says a good word on behalf of the smaller hawks, pointing out that their food consists chiefly of voles, mice, and insects. An excellent account is given of the various Warblers in the chapter devoted to "The Birds of the Woodlands," slight mention being made of our more uncommon visitors, such as the Icterine and Yellow-browed Warblers. Under the heading of Tree-Climbing Birds, the habits of the Woodpeckers, Tits, Creeper, Wryneck, and Nuthatch are described, and the reader will see that the author is both a keen, patient, and happy observer of bird-life. The Finches, Crows, and Thrushes are discussed in separate chapters, while 56 pages are given to "Birds of the Field" and "Birds of the Heath." The two sections referring to "Birds of the Moorland" and "Birds of the River" strike us as particularly interesting, as do also the chapters relating to the Pheasant and Woodcock. The author has a pleasant way of imparting his knowledge, and his descriptions and observations are given in a bright and entertaining manner. A particularly good description is given (p. 427) of a winter's evening on the sand-dunes with the gloom and mist hanging over the adjoining mud-flats. The illustrations are all from photographs from life, and they are remarkable for their excellence and clearness ; mostly by Mr. T. A. Metcalf. On looking over a hundred of these photographs one realises that the author in no way exaggerates when he states in the preface that the illustrations represent the work of years spent in observation. The addition of an index would have been a useful adjunct to an excellent little volume. G. G.-M.

How to Attract and Protect Wild Birds. By Martin Hiesemann, translated by E. S. Burchheim. London : Witherby & Co., 1908. Price 1s. 6d. net.

The lovers of our native birds, and they are fortunately a numerous body, cannot fail to welcome this little volume on the protection of their favourites. The subject is treated from a scientific point of view, and, as the author points out (on p. 21), "Baron von Berlepsch has made it possible for us to carry out the protection of birds on a basis which is rational and entirely in accordance with Nature." The experimental station on the estate of Seebach (situated in the

district of Langensalz in Thuringia) comprises about 500 acres, of which 19 acres are park, 60 acres are thicket, and 400 acres are wood. Over 50 different species of birds are enumerated as nesting in the "Home Park" and "Shelter Woods," whilst the lake is inhabited by various species of water-birds. The Baron's system of protection is based on three fundamental ideas: first, *creating opportunities for breeding*; second, *winter-feeding*; and third, *fighting the enemies of birds*. He is of the opinion that success can only be attained if these measures are carried out in close connection with each other. The first chapter deals with the subject of the provision of nesting-places, and distinguishes between those birds which build in regular holes and those which prefer irregular cavities and niches. With this end in view he has had nesting-boxes built to his own design (which is a close imitation of Nature), and these are described in detail, so that the reader may have them constructed in his own workshop. The position in which these boxes should be placed is of much importance, and careful instructions are afforded on this point. It is interesting to notice that out of the 9300 boxes erected by the Government in the State and Communal woods of the Grand Duchy of Hesse, 70 to 80 per cent were used in the first year, whilst in 1907 every box was inhabited. These facts speak for themselves. The second chapter deals with the extensive plantations which have been laid out at Seebach, and a list is given of the various shrubs and bushes, and the question of cutting and pruning is carefully gone into, and should be read by all who are anxious to encourage the breeding of birds in their grounds. The subject of the feeding of birds in winter is thoroughly gone into, and the idea of the food tree, the food house, and the food bell will probably be new to most readers. We notice that mention is not made of supplying water, and this is an important fact, especially in winter. Not the least interesting portion of the book is that which treats of the economic value of birds. An instance is cited of a certain wood adjoining the Seebach estate having been stripped bare one spring by the larvæ of a little moth (*Tortrix viridana*), whilst Baron Von Bulepsch's woods (in which 2000 nesting-boxes had been erected) were left quite untouched. As regards the question of the suppression of the birds' enemies, the author gives some interesting facts. Baron Von Berlepsch strenuously teaches that it is unwise to allow certain birds and animals to develop at the expense of others, and that man must step in to regulate matters. G. G.-M.

CONDITIONS OF LIFE IN THE SEA. By James Johnstone. pp. xiv + 332. Cambridge University Press, 1908. Price 9s. net.

Every one interested in the progress of our knowledge of the sea and its inhabitants, especially he who is curious as to the economic

resources of the deep and the influences which affect them, will be grateful to Mr. Johnstone for bringing together in convenient form the results of much of the work recently accomplished in marine science. The department of knowledge which endeavours to deal with the productions of the sea from a quantitative point of view is of comparatively recent origin, and even yet, as Mr. Johnstone's pages undisguisedly show, has only reached the hesitating stage of infancy —though, to be sure, the healthy infant and of great promise. This slowness of advance is in great part due to the exceedingly complicated nature of the problems which the quantitative biologists have set themselves, for obviously the seasonal fluctuations of organisms and the distribution of marine creatures in general are dependent upon physical causes, and on this account extended hydrographical and oceanographical investigations have been rendered necessary. With all those branches of study, with the methods and results of quantitative marine biological research, and with hydrography and oceanography in so far as they bear thereon, Mr. Johnstone deals clearly and interestingly. Some of the results are almost incredible. For instance, we are told that 1 cubic metre of water from the Mediterranean Sea off Syracuse contains in all 2,425,665 drifting organisms, and that the number of haddocks in the North Sea in the spring of 1905 was calculated at 180,239,000, and we are enlightened as to the methods by which those approximate results are obtained.

This, the main portion of the book, is preceded by a useful introductory part dealing with the apparatus and methods employed in oceanographical research, with life in the sea, its distribution, fluctuations, and general significance, and with the economic population of the sea and the modes by which it is exploited. Part III., on the general conditions of marine life, contains many results of great interest. Thus Pütter's researches seem to indicate that many marine animals—Sponges, Holothurians, Copepods—utilise as food, not so much solid organic particles, as the inorganic carbon and nitrogen dissolved in the sea water.

Mr. Johnstone has brought together with great care and much labour a guide to recent marine research indispensable to the general biologist who, unable to devote special attention to the conditions of life in the sea, yet wishes to keep abreast of advancing knowledge. To say that the book belongs to the Cambridge Biological Series is to vouch for the high standard of typography, paper, and binding.

We mention the following slips for the sake of future editions :— on p. 46. "*minimum* contraction" for "maximum contraction"; p. 48, "ocean currents are deflected to the *right*" is ambiguous, "west" would be clearer; p. 58, "*mussels* beds" for "mussel beds"; p. 312, "*Luidia*, a bottom-loving *sea urchin*"!! J. R.

THE CHANGELING, A NATURE STORY FOR BOYS AND GIRLS. By Sir Digby Pigott, C.B., M.B.O.U. London: Witherby & Co., 1908. Price 2s. 6d. net.

Sir Digby Pigott has written a very charming little nature book in *The Changeling*. The hero of the story, Tommy, is able, through the assistance of his guide Johnny Fairy, to lead the actual life of his animal friends. His first excursion is taken as a Bee, when escorted by his cicerone he visits a large hive and is shown all the wonders of bee-lore. The workings of these wonderful insects are clearly and accurately described. Tommy's flight with the Rooks is one of the most interesting chapters, and the youthful reader will learn from it of the practical use this bird is to the farmer; whilst the drawing of the mole's nest will give a clear idea of the underground fortress of "the little gentleman in black velvet." A description is given of the cliff-climbers and how they gather the sea-birds' eggs; whilst the wanderings of the Storm-petrels tell of the wild life of these ocean-tramps. The hero's trips, however, are not confined to Great Britain, and an account is given of the flight of the Wild Geese to the far North; whilst another chapter tells of Birds of Paradise, and incidentally something is learned of the inhabitants of New Guinea. The charm of the book seems to lie in the blending of poetical feeling with scientific accuracy. The young reader will gather much knowledge of birds and insects, whilst at the same time he will realise that "all the world is fairyland." The illustrations are above the average: there are 39 drawings in black and white, all of which are very true to life, whilst the four coloured plates are also pleasing. The book will form an excellent and instructive Christmas present for young people. G. G.-M.

The Annals
of
Scottish Natural History

No. 70] 1909 [April

WHALING IN SCOTLAND FOR 1908.

By R. C. Haldane, F.S.A. (Scot.).

I returned home from Uganda on 4th August and, consequently, saw but little of whaling this season. The catch was :—

Stations.	*B. musculus.*	*B. sibbaldii.*	*B. borealis.*	Sperm.	*B. biscayensis.*	*Megaptera.*
Norrona Co. .	...	...	...	...	...	...
Shetland Co. .	60	...	22	...	...	...
Alexandra Co. .	72	...	20	...	..	...
Olna Co. . .	165	...	136	...	...	...
Buneveneader Co.	51	17	34	1	20	1
	348	17	212	1	20	1

B. borealis were more abundant, *B. musculus* scarcer than last year ; the reason given for this is that during the time of the 40-mile limit there were plenty of *B. musculus* within the limit, doubtless feeding on the herring which were abundant on the west coast of Shetland, while beyond the 40 miles *B. borealis* were plentiful and *B. musculus* not so numerous. It will also be noticed that Sperms and Megaptera were rare. In fact, the latter seem to have left the coast of Shetland, though they were never numerous.

BALÆNOPTERA MUSCULUS: Common Rorqual.

The following gives the particulars of these whales:—

STATIONS.	Number of Bulls killed.	Average Length.	Number of Cows killed.	Average Length.	Proportion of Bulls per cent.	Proportion of Cows per cent.
		ft. ins.		ft. ins.		
Shetland Co. .	31	59 9	29	59 0	51.7	48.3
Alexandra Co. .	37	60 6	35	61 7	51.4	48.6
Olna Co. . .	78	60 4	87	61 2	47.2	52.8
Buneveneader Co.	22	60 3	29	64 5	43.1	56.9
	168	60 3	180	61 6	48.3	51.7

To take the average of the last four years, the sizes and proportion of bulls to cows works out—

	Average Length of Bulls.	Average Length of Cows.	Proportion of Bulls per cent.	Proportion of Cows per cent.
1905-1908	59.8	61.9	53.2	48.0

Of course, if the undersized animals were deducted, the average size would be greater, as I pointed out in "The Annals of Scottish Natural History" for July 1906, which showed the average length of bulls to be 62.2 feet and cows 64.0 feet.

The lengths of the largest bulls got this year were—

	Feet.
Shetland Station . . .	68, 67
Alexandra ,, . . .	72, 72, 72, 65
Olna ,, . . .	72, 70, 67
Buneveneader ,, . . .	68, 68

The largest cows measured—

	Feet.
Shetland Station . . .	73, 71, 70
Alexandra ,, . . .	74, 72, 71
Olna ,, . . .	75, 73, 72, 72
Buneveneader ,, . . .	76, 73, 71, 70

BALÆNOPTERA SIBBALDII: Sibbald's Rorqual. Blue Whale.

Of the 17 whales of this species killed at Buneveneader station 9 were bulls averaging 65.3 feet in length, 8 were cows averaging 67.6 feet. The largest was a cow of 80 feet, while the largest bull was 77 feet. It seems as if these whales do not attain the length they

do in other seas. The girth of the 80-foot cow is given at 46 feet, while the 77-foot bull is given at 34 feet. To take the average lengths of the Blue Whales killed in Scottish waters in the last four years, we find 68 bulls averaged 70.4 feet long, and the proportion of bulls to cows was 61.2.

Forty-three cows averaged 72.9 feet long, and the proportion of cows to bulls was 38.7.

So the bull Blue Whales were about 11 feet longer than the Finner bulls during four years' observation, and the cow Blue Whales were 11 feet longer than the Finner cows.

Captain Castberg writes me about whaling in the Antarctic. "The Blue Whales down there are bigger than I ever saw them, up to 120 feet long and of an enormous girth. It seems to be just the same sort of whales South as we have North." He says whales are numerous down there, excepting Sperms and *B. borealis*.

Balænoptera borealis: Rudolph's Rorqual. Seihval.

These whales were plentiful this last season; to my mind the most graceful of all whales, as its proportions are so perfect and wanting the clumsy strength of the two larger Balænoptera, Sperms, and Megaptera. It is also far the best whale to eat, the flesh tasting of something between pork and veal, and quite tender.

I give a table of these whales killed in 1908:—

Stations.	Number of Bulls killed.	Average Length.	Number of Cows killed.	Average Length.	Proportion of Bulls to Cows.	Proportion of Cows to Bulls.
		ft. ins.		ft. ins.		
Shetland Co. . .	16	43 5	6	45 3	...	...
Alexandra Co. .	11	44 7	9	45 0	...	...
Olna Co. . .	75	44 3	61	46 2	...	...
Buneveneader Co. .	16	43 0	18	45 4	...	...
	118	43 9	94	45 5	55·7	44·3

To take the results of the last two seasons—

291 bulls averaged . . . 42.8 feet.
251 cows averaged . . . 43.8 „

The Seihval are certainly the second most common whales in Shetland waters, always excepting *B. rostrata* and the smaller whales, of which I know nothing. But I have noticed that they are restless—one week there will be plenty, the next week none. I have before pointed out how a storm took them away both from Buneveneader and Shetland: they certainly seem to be of a shy nature.

PHYSETER MACROCEPHALUS: Sperm Whale.

Buneveneader station got one sperm whale this year, a bull of 60 feet. Since 1903, 19 sperm whales have been killed in the seas around Scotland. These include the 57-foot cow killed by the Buneveneader Company, and to which I called attention in July 1906. The average length of these 19 whales is 58.2 feet. They are at most rare visitants to Scottish waters, though a dead cow was found off Ronas Voe in 1902. The capture of the cow is, I believe, unique in British Natural History.

BALÆNA BISCAYENSIS: Atlantic Right Whale—the Nordcaper of the Norwegians.

Buneveneader got 20 of these rare whales—12 bulls averaging 43.8 feet, and 8 cows averaging 44 feet.

Taking the total whales killed in Scottish waters, I find that 28 were bulls averaging 45.1 feet long, and 22 were cows averaging 46.1 feet. The proportion of bulls to cows being 56.0, and the proportion of cows to bulls being 44.0.

The whalebone of these whales is said to be worth £700 a whale. They are got in or about the Antarctic seas, a correspondent telling me his steamers got 17 in 1907-8. This is rather different to what I wrote last year, and different to the experiences of the Dundee whalers in 1892-3. But "Antarctic" is a wide word, and in a part of the ocean so little known these whales may exist in different localities.

MEGAPTERA LONGIMANA: Humpback, Knul.

Buneveneader station got a bull of 51 feet long and 28 in girth. They are rare whales in Scottish seas. I only can give a record of the following:—

12 bulls averaging	. . .	44.6 feet.
5 cows averaging	. . .	42.4 „

From the coast of Brazil to the Antarctic they abound. One company last year got 305. These whales yield a great deal of oil for their size, and are consequently more sought after than the Finners.

I am indebted to Mr. Lund for the catch of whales at the Arranmore station in the North of Ireland:—

5 *B. biscayensis.*	31 *B. borealis.*
19 *B. sibbaldii.*	1 *Megaptera.*
21 *B. musculus.*	

This is interesting, as it helps to trace the course of the Atlantic Right Whale to Iceland. It also shows that *B. sibbaldii* follow the

same track between Scotland and Ireland. It is to be regretted that we do not know more of the whales on the West of Ireland.

By the kindness of Mr. T. Salvesen, Leith, I give catch of Mr. M. C. Bull, Iceland :—

10 *B. sibbaldii.*	11 *Megaptera longimana.*
70 *B. musculus.*	2 *B. borealis.*

And at the Dansk Hvalfangst and Fiskin Co. :—

4 *B. sibbaldii.*	51 *B. borealis.*
45 *B. musculus.*	4 *Hyperoödon rostratum*, or Bottle-nose.

These catches throw some light on the migration of whales.

I do not think it necessary to give in future any particulars about the sizes of whales caught at the different stations unless any of peculiar rarity should occur. I have already given the average size of 912 *B. musculus* bulls and of 762 cows, and sufficient particulars about size and proportion of bulls to cows of *B. sibbaldii* and *B. borealis* to give the needed information, also what information I could get about Sperms, Atlantic Right Whales, and Humpbacks, all more or less rare whales in Scottish waters, which I trust may prove more or less useful to naturalists.

To show the risks of whaling, the gunner of the s.s. *Noronha* fired at a whale, missed it, and the harpoon ricochetted, the attached cable snapped, the slack coming back shattered the poor man from head to ankle. He died soon after.

THE BIRDS OF FAIR ISLE.—IV. REPORT ON OBSERVATIONS MADE DURING THE YEAR 1908.

By Wm. Eagle Clarke, F.R.S.E., F.L.S.

With the year 1908, the Fair Isle ornithological investigations entered upon a new era. Being convinced, by the experiences gained during my short visits, that the island was a most important station for observing the movements of migratory birds, I determined, if the necessary help were forthcoming, to obtain for 1908 a day to day record of the feathered visitors; in fact, to establish a bird-watching station, and to appoint an observer whose duty it would be to devote the whole of his time to the investigations.

Thanks to the generosity of a few friends, which I desire to gratefully acknowledge, I was enabled to carry my project to a practical conclusion, and George Stout (an excellent and capable youth, who had previously helped me, and had been well trained in my methods) was appointed observer.

Much assistance has also been rendered by my many friends among the islanders, and special acknowledgments are due to Messrs. J. W. Anderson, George Stout, *ter.*, Stewart Stout, and to the Lightkeepers.

I spent six weeks on the island in the autumn, during which I devoted the whole of my time to the investigations. In connection with my visit, I have to express my great indebtedness to Her Grace the Duchess of Bedford, who most kindly placed her beautiful yacht, the *Sapphire,* R.Y.S., at my service to convey me to the island—an act of kindness which relieved me of some anxiety, for the island is by no means easy to reach, or to get away from.

The results obtained for the year are very remarkable, and more than confirm my high opinions of the importance of the island as an ornithological observatory ; indeed, the value of the record has greatly exceeded my most sanguine expectations. The records are very voluminous, but it is not my intention to deal with them at present, more especially as I hope to be able to continue the daily observations for a year or two. It is also my intention to visit Fair Isle during both the spring and autumn of 1909, and to personally assist the observer.

During the year the visits of no less than 140 species of migratory birds were recorded. Of these 106 species came under notice during the passage northwards in spring, and 122 species when moving southwards in the autumn. The identical species known to have appeared on both the spring and autumn passages were 89. The new birds added to the ornis of the island were 25 in number, making its total known avifauna at the end of the year 185 species. Several of these additions are new to the fauna of Scotland.

It is only proposed here to treat of the species added to the fauna during 1908, for I do not consider it necessary to allude to the occurrences of a number of interesting

birds, which have been recorded for past years; they, and the great mass of information relating to the times of appearance of the regular migrants, are reserved for publication in a future contribution.

A pleasant duty remains to be discharged. I have to express to Mrs. Bruce, of Sumburgh, and to the Commissioners of Northern Lighthouses, my great appreciation of the privileges they most graciously granted me, and to Mr. Dick Peddie for his helpfulness and advice. My acknowledgments are also due to Mr. and Miss Wallace for their kindness and attention during my residence in the lighthouse; and, finally, my good friends among Fair Islanders have earned my sincere thanks for allowing me to tramp their crofts, —without such permission very much would have been lost to me.

The following are the species added to the fauna during the year.

161. Rose-coloured Pastor, *Pastor roseus*.—An adult male in full plumage visited the island in the spring. A similar bird was reported, on good evidence, as having appeared in 1907.

162. Golden Oriole, *Oriolus galbula*. — Was observed during both the passage periods. In spring one was found dead, but in a perfectly fresh condition, in a crevice in the face of the cliff, into which it had evidently crept for shelter, the weather at the time being very ungenial.

163. Hawfinch, *Coccothraustes coccothraustes*.—A male visited the island in spring, and finding neither trees nor shrubs led a terrestrial life. It also had to descend to feeding on the dung of ponies—such are some of the shifts which have to be resorted to by migratory birds when journeying between their accustomed seasonal haunts.

164. Two-barred Crossbill, *Loxia bifasciata*.—This is another spring visitor which found itself quite out of its natural surroundings and away from its ordinary food-supplies when at Fair Isle. It, too, was observed on the ground feeding on pony's dung. This Crossbill has only once previously been recorded for Scotland, namely, from the Orkney island of North Ronaldshay.

165. Rustic Bunting, *Emberiza rustica*.—Single birds of this species appeared on both passages. The Rustic Bunting

has only once previously been known to visit Scotland, having occurred at Cape Wrath in the spring of 1906.

166. Grey Wagtail, *Motacilla melanope*.—This bird appeared in the spring. Since it does not nest in countries north of our islands, it is not surprising that it is only a casual visitor to the Orkneys and Shetlands.

167. Blue-headed Wagtail, *Motacilla flava*.—The occurrence of this species is interesting, because with its appearance all the British species of Wagtails have occurred at Fair Isle. The Blue-headed Wagtail has been *recorded* for both the Orkney and Shetland groups; but the occurrences of this bird and the commoner, though much overlooked, *M. borealis* have been mixed in the past, and it is now quite impossible to say to which species most of the records refer. Both species are summer visitors to Scandinavia, but this is much the most uncommon of the two.

168. Red-throated Pipit, *Anthus cervinus*.—I have long been on the look-out for this Pipit at Fair Isle, and had examined, with the aid of a field-glass, great numbers of Meadow Pipits in the hope of detecting it. During my last visit, however, this bird proclaimed its presence on two occasions by its notes, which are quite different from those of any other Pipit with which I am acquainted. There are very few reliable records of the visits of this bird to the British Isles, indicating perhaps that its routes to and from the north do not lie by way of our shores. It has not previously been recorded for Scotland.

169. Richard's Pipit, *Anthus richardi*.—Several of this summer visitor to central and southern Europe appeared on the island in the autumn. They frequented the crofts and open grass lands, and were extremely wary and difficult to approach. This species has only once previously been recorded for Scotland, namely, near Dunkeld in the early autumn of 1880.

170. Subalpine Warbler, *Sylvia subalpina*.—The occurrence of this species at Fair Isle is one of the most interesting events of the year in the annals of British ornithology. That the second British specimen of this pretty little Warbler should, like the first, have occurred in one of the most remote of our islands seems, on first thoughts, somewhat strange. It must be remembered, however, that in such places, should there be any one there to observe them, these waifs are more likely to be detected than elsewhere. If this bird has visited St. Kilda and Fair Isle it must surely have occurred elsewhere with us.

171. Barred Warbler, *Sylvia nisoria.* — Several birds of this species occurred in the autumn, and were for the first time identified beyond a doubt. I had seen the species during a previous visit, and though pretty certain of the accuracy of the observation I refrained from placing it on record.

172. Eversmann's Warbler, *Phylloscopus borealis.* — This new species to the British avifauna was chronicled in the last number of the "Annals." Though first recorded from Fair Isle it will be ascertained, by reference to p. 114 of the current number, that this species had previously occurred elsewhere in the Scottish Isles, but, alas, has hitherto passed under name of *P. irridanus.*

173. Icterine Warbler, *Hypolais hypolais.*—Although this species is a summer visitor to Scandinavia, it is only occasionally detected on the British shores during the period of its passages between its summer and its winter haunts. It has not been previously recorded from any part of Scotland.

174. Savi's Warbler, *Locustella luscinioides.*—The appearance of this species at Fair Isle during the spring must be regarded as one of the most interesting events in British ornithology for many years. This bird was formerly a summer visitor to the fens of East Anglia, but ceased to be a native bird over fifty years ago, and is not known to have visited us since. That it should have reappeared in Britain at a locality so far removed from its ancient English haunts is, indeed, most remarkable. Even Heligoland, with its unrivalled record for feathered rarities, cannot boast of having Savi's Warbler amongst its distinguished visitors. Needless to say, this bird has not hitherto been known to visit Scotland.

175. Alpine Accentor, *Accentor collaris.*—I saw a bird of this species, at close quarters, resting on the face of one of the great cliffs on the west side of the island. I might have shot it with ease, but had no desire to drop it into the Atlantic surf several hundreds of feet below. It flew off to another part of the cliff and was lost amid fastnesses so vast and unapproachable as to render observation quite impossible. Thousands of migrants, unfortunately, resort to this great range of precipices, and entirely baffle the efforts of the observer. This bird is new to the Scottish fauna.

176. Coot, *Fulica atra.*—Single birds appeared on several occasions during the spring and autumn. This species nests in the southern part of Shetland, and these visitors may have been wanderers from this colony, or migrants passing to and from it.

177. Grey Lag Goose, *Anser anser.*—"Grey Geese" appear every year, but are seldom satisfactorily identified. In 1908, however, several Grey Lags visited the island, and their identity was established beyond a doubt.

178. Tufted Duck, *Fuligula cristata.*—One or two appeared on migration, which is not very surprising since the bird is a summer visitor to Scandinavia. Fair Isle, however, offers no feeding resorts for the fresh-water diving ducks; but it is somewhat strange that we have not more information concerning the bird as a migrant in other isles of the Shetland group which afford suitable haunts: it is probably much overlooked.

179. Grey Plover, *Squatarola helvetica.*—This species, being essentially a shore bird during its visits to the British Isles, finds little or nothing suited to its requirements at Fair Isle, whose rock-bound coast-line offers little attractions for wading birds. The reefs at the south-western corner are the chief resort of the few shore birds that do alight, but this haunt is a most difficult one to explore, owing to its rugged nature, the out-crop of the strata being almost perpendicular, and their exposed edges irregular, sharp, and saw-like. I saw a single Grey Plover flying high over the island, and heard its familiar note. Though a flock of Golden Plover were on the wing at the time, and close at hand, this bird did not join it.

180. Temminck's Stint, *Tringa temmincki.*—The species must be considered a very rare visitor to Scotland, for it has only, I believe, been recorded for Aberdeenshire. It will be interesting to observe if it repeats its autumn appearance at Fair Isle.

181. Wood Sandpiper, *Totanus glareola.*—This is a not unexpected addition to the fauna of Fair Isle, for the bird is a common summer visitor to northern Europe. It has, however, not yet been detected on its passages elsewhere in Shetland, and has only once been recorded for Orkney.

182. Greenshank, *Totanus canescens.*—A single bird was observed for several days during the autumn. It haunted the reefs at the south-west corner of the island.

183. Bar-tailed Godwit, *Limosa lapponica.*—This is another of the waders which was not detected until the present year (1908). There is no reason to doubt that it occurs annually at the seasons of passage, but probably in only small numbers, as suitable feeding grounds are wanting.

184. Black-tailed Godwit, *Limosa limosa.*—One visited the island in mid-winter, and frequented a croft which was in a very moist condition at the time.

185. Great Northern Diver, *Colymbus glacialis*.—The Fair Isle seas are much affected by the strong tides which sweep along them on all sides; and this, along with the fact that there is little shelter in the shape of enclosed bays, may account for this bird being more or less uncommon, and have led to its having hitherto escaped notice. One was seen on several occasions during the winter of 1908.

ON THE OCCURRENCE OF BRÜNNICH'S GUILLEMOT IN THE FIRTH OF FORTH.

By William Eagle Clarke, F.R.S.E., F.L.S.

On 11th December 1908 a specimen of Brünnich's Guillemot (*Uria lomvia*) was picked up on the shore at Craigielaw Point, on the Haddingtonshire coast of the Firth of Forth, and sent to the Royal Scottish Museum by Mr. Valentine Knight. The bird had evidently been dead some little time, for it was in rather high condition, and had been mauled by gulls or crows. It was at once placed in strong spirit and allowed to remain there for several weeks, and has now, thanks to the skill of Mr. Hugh Mackay, been made into an excellent cabinet specimen.

The only other Scottish example of this arctic species is one discovered by Macgillivray about eighty years ago among some birds from Orkney in the collections at the University of Edinburgh. On the strength of this specimen, which is in full summer plumage and is still to be seen among the birds in the Collections in the Royal Scottish Museum, Brünnich's Guillemot was added to the British avifauna. Other specimens are said to have been obtained in Caithness, Sutherland, and Suffolk, but these occurrences cannot be regarded as entirely satisfactory. During the arctic winter of 1894-5, three examples were obtained on the Yorkshire coast and one in Cambridgeshire, and the claim of this bird to be regarded as British was thereby fully established. From that date until the finding of the present bird, no other specimen has been detected either in British waters or on our shores.

The bird under consideration is a female, and possesses all the characteristics of the species. It has a short, stout, curved bill, the basal portion of whose upper mandible is not overhung by plumes; the upper plumage is blue-black (showing a greenish hue in certain lights), except the medium and primary coverts, which are dark brown; the wing measures 8.45 ins. from the carpal joint, and the tarsus 1.4 ins. Judging from the size of its bill, which, measured along the curve of the culmen, is only 1.2 ins. in length, I consider it to be a bird of the year, that is to say, about five months old. There is no patch of white behind the eye, that tint on the sides of the head being confined to the region well below the eye and extending from the gape backwards. I mention this character specially, because the white patches on the side of the occiput are present in adult specimens of this species in winter plumage, and also in common Guillemots both young and old at that season. The Forth specimen resembles exactly the bird in the background figured on plate 40 of vol. vi. of Lord Lilford's "British Birds," except that its bill is more decidedly curved.

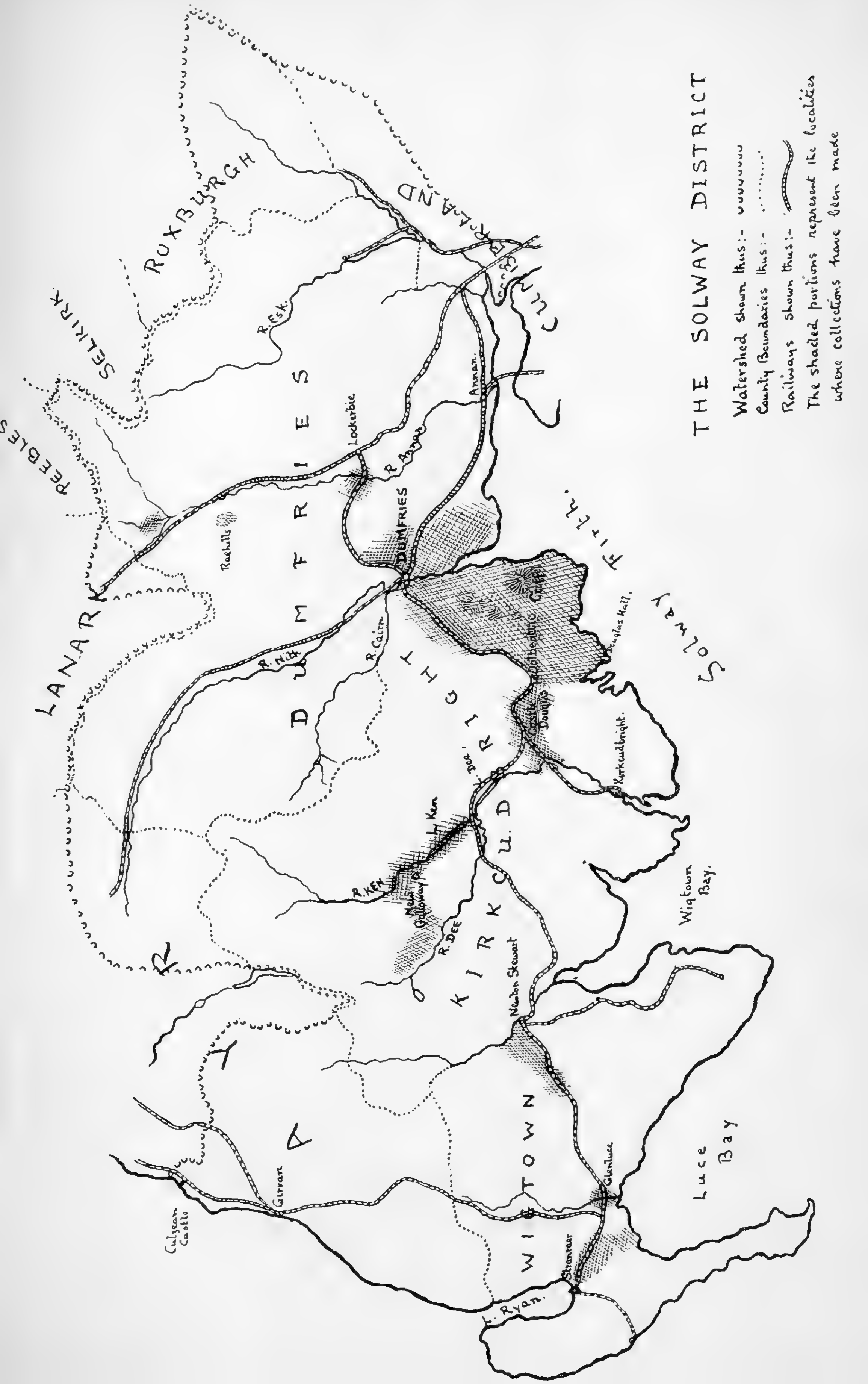
THE AQUATIC COLEOPTERA OF THE SOLWAY DISTRICT.

By Frank Balfour-Browne, M.A. (Oxon.), F.R.S.E., F.Z.S.

Plate I.

In spite of the fact that so keen a collector as the late Mr. William Lennon spent his life in the district, and although the late Professor M'Nab did some collecting there, and Dr. Sharp also spent some years at Dumfries, very little has been published on the Coleoptera of the Solway district. In the bibliography I have included the only 14 papers which I have been able to find.

Dr. Sharp defined the Solway district as "the part drained by rivers between the Liddel and Culzean Castle" ("Col. of Scotland," 1871). This area includes the counties of Wigtown, Kirkcudbright, and Dumfries, part of Ayrshire,


THE SOLWAY DISTRICT
Watershed shown thus:-
County Boundaries thus:-
Railways shown thus:-
The shaded portions represent the localities where collections have been made
ROXBURGH
SELKIRK
PEEBLES
LANARK
DUMFRIES
KIRKCUDBRIGHT
WIGTOWN
AYR
CUMBERLAND
R. ESK
Lockerbie
R. Annan
Annan
DUMFRIES
Raehills
R. Nith
R. Cairn
Solway Firth
Douglas Hall
Castle Douglas
Kirkcudbright
L. Ken
R. KEN
New Galloway
R. DEE
Newton Stewart
Wigtown Bay
Luce Bay
Glenluce
Stranraer
L. Ryan
Girvan
Culzean Castle

a small part of Lanark where the Eyan Water, a tributary of the Annan, has its source, a small corner of Roxburgh, and also a small portion of Cumberland and of Northumberland.

In the present paper I refer to the results of three years' work—so far as my own records are concerned ; and in view of the fact that the county and vice-county system of recording distribution, as originally laid down by Watson ("Cybele Britannica") is gradually being, and will I hope soon be universally, adopted by naturalists, I shall give a county reference for each species. Also in referring to the distribution in Great Britain or Ireland of any of the species, I shall adopt the same system which is used by Mr. J. W. Taylor in his "Monograph of the Land and Freshwater Mollusca of the British Isles," which is now appearing, the system which is officially recognised by the Conchological Society of Great Britain and Ireland.

In saying that my collecting in the district has covered three years I do not wish to convey the idea that I have spent three whole years at the work, but that on various occasions during that time I have visited the district and have spent most of the time of my visits hunting water-beetles. Most of my collecting has been done in Kirkcudbrightshire, but I have done a certain amount in Dumfriesshire, and much less in Wigtownshire, and on the accompanying map I have marked all the stations at which collections have been made. It will be seen from the map that a very small part of the whole district has been worked by me, so that, although my list contains 105 species, there are possibly others to be found in outlying parts. Although I have probably covered most of the ground worked by the earlier collectors I have failed to find several species recorded by them, some of which, I have no doubt, would have turned up if I had searched the right habitats. One gets into the habit of working certain kinds of ground and of, perhaps unconsciously, neglecting others, so that the results of any one collector are almost certain to be imperfect in some direction. I have entirely neglected the genera Sphæridium, Cercyon, Megasternum, and Cryptopleurum, which are, some chiefly, others entirely, terrestrial, so that few individuals turn up in the water-net.

Dr. Sharp ("Coleoptera of Scotland") gives a list of 88 species of water-beetles for the Solway district, and also mentions two species, *Hydroporus dorsalis*, F., and *Copelatus agilis*, F., as having been recorded, but as being doubtfully Scottish.

These species were both said to have been taken by the Rev. Wm. Little at Raehills, Dumfriesshire. The former species has apparently never turned up in Scotland since Little's time, but with regard to *C. agilis* there is a specimen in the Dublin Museum Collection labelled "Queensberry Hill," M'Nab! Now Queensberry Hill is within a few miles of Raehills, but it seems probable that M'Nab's specimen is not the one recorded by Little, because the date of Little's list containing his record is 1838, while the dates on M'Nab's specimens in the Dublin Museum—where, so far as I know, is all that remains of his collection—all run in the sixties and seventies, where any dates are given. This species has been recorded from England as far north as Lancs S., and Yorks N.E., S.W., and Mid W., but there are apparently no records for Cumberland or Northumberland, and the Dumfries records are the only Scottish ones.

Of the 88 species recorded by Dr. Sharp I have so far failed to find 12. These are:—*Haliplus striatus*, Sharp; *Cælambus confluens*, F.; *Deronectes latus*, Steph.; *Laccophilus interruptus*, Panz.; *Gyrinus suffriani*, Scriba; *Berosus luridus*, L.; *Chætarthria seminulum*, Herbst.; *Helophorus nubilus*, F.; *Hydræna testacea*, Curt.; *H. angustata*, Sturm.; *H. atricapilla*, Wat.; *H. pygmæa*, Wat.

Although I have worked both the Kelton and Caerlaverock salt marshes on numerous occasions I have not succeeded in finding *H. striatus*, Sharp. Sharp's record of *Cælambus confluens*, F., is apparently founded on a "Raehills" record given by Andrew Murray. This latter author also recorded the species for Renfrew and Stirling. The Dumfries record is supported by the fact that Lennon (MS. List) mentions having taken one specimen in a brackish pool in Caerlaverock salt marsh,—a somewhat strange habitat for the species?—and one specimen is to be found in his collection, although it stood there as *C. versicolor*, Schall. I have never been fortunate enough to find

D. latus, Steph., anywhere up to the present, as I have seldom worked the rapid streams which it inhabits. It is apparently rare, and Lennon does not mention it in his lists, nor has he any Scottish specimens in his collection. Sharp's record for *Laccophilus interruptus*, Panz., appears to be the only published one, but I believe I can show in a round-about way that Lennon took one specimen of this species in the district. The only specimen of *Hydrovatus clypealis* in the Lennon Collection came, according to the Register, from Cambridge, although that species is only known to occur in the Isle of Wight and South Hants, while a single specimen of *L. interruptus* is registered as having come from Portsea, one of the localities where *H. clypealis* occurs (see 'W. W. Fowler,' and 'J. J. Walker,' "Vict. County History, Hampshire and Isle of Wight"). Now Lennon evidently mixed up *L. interruptus* and *obscurus*, for he says of the former species, "not uncommon in Auchencrieff Loch" (MS. List), and fills up the space in his cabinet with *L. obscurus*. Of this latter species he says "very rare. One specimen only in river Nith above Dumfries" (MS. List). He had also in his collection one specimen of *Laccophilus variegatus*, Germ., labelled Dumfries, although the species only occurs in the S.E. of England, and one specimen of *Bidessus geminus*, F., labelled "Dover." Now, if we change these labels about, so as to make them refer to their proper species, I think we shall find that—*Bidessus geminus*, F., came from Cambridge; *Laccophilus variegatus*, Germ., from Dover; *Hydrovatus clypealis*, Sharp, from Portsea; *Laccophilus obscurus*, Panz., from Auchencrieff Loch; *L. interruptus*, Panz., from river Nith above Dumfries. The river is just the place where, in a quiet backwater, one would expect to find *L. interruptus!*

Since Sharp's record of *Gyrinus suffriani*, Scriba, Lennon has taken it at Maxwelltown Loch, where possibly it is still to be found, but I have paid very little attention to the *Gyrinidæ*. *Berosus luridus*, L., is another of Little's Dumfries records, and there is apparently no other Scottish one, except that of Robert Hislop for Elgin, 1870, which is referred to by Sharp. The species is an "English" type, not otherwise having been recorded farther north than

Lincoln N. and Derby. There are several Scottish records for *Chætarthria seminulum*, Hbst., and I have taken the species in Ayrshire, but, so far, not in the Solway district. *Helophorus nubilus*, F., is recorded for various districts in Scotland, but, unlike most of the other members of the genus, it is more commonly taken on dry ground away from water, so that it is perhaps not so surprising that I have not come across it.

Hydræna testacea, Curt., again, is commoner in the south than in the north, though there are records for Cheshire and Yorks S.W. and Mid W. Lennon (MS. List) mentions having taken one specimen on the banks of the Cairn (Kirkcudbright), but whether this is the record Sharp refers to, I do not know. *H. angustata*, Sturm., should probably refer to *H. longior*, Rey., as it seems doubtful if the former species occurs in Britain (see Newberry, "EMM.," ser. 2, xviii. 172-3, 1907). Although I have taken none of the three, *H. longior*, *atricapilla*, or *pygmæa*, in the Solway district, they are distributed throughout Scotland, and are not uncommon.

Sharp also mentions 19 species as probably occurring in the Solway district, although at that time he had no records of their occurrence. Of these I have found all except 6, which are:—*Ilybius obscurus*, Marsh; *I. guttiger*, Gyll.; *Gyrinus distinctus*, Aubé; *Helophorus rugosus*, Ol.; *Hydrochus brevis*, Herbst., *H. angustatus*, Germ. Lennon (MS. List) records *I. guttiger*, but he evidently intended *I. œnescens*, Thoms., so that species, *Ilybius obscurus*, and *Gyrinus distinctus*, have not apparently fulfilled Dr. Sharp's expectations. Lennon, however, seems to have found both species of Hydrochus, *brevis* being "common in marshy parts of Maxwelltown loch" (MS. List), while one specimen of *angustatus* seems to have occurred at the same place ('Some Addits. to Scottish Coleoptera,' etc., "Ann. Scott. Nat. Hist." April 1892; also MS. List.) In his collection is a very full series of the former species (32 specimens), while there are two specimens of the latter, one labelled Mid-Solway and the other "Midlands." I have visited Maxwelltown Loch on many occasions, but have never seen these species. Possibly the conditions have changed so much that they have become

extinct, or possibly I have never been to the locality at the right season of the year!

Among Lennon's 42 specimens of so-called *Helophorus nubilus* are 27 which are in reality *H. porculus*, Bedel, only recently recognised as a British species (see Newberry, "EMM." ser. 2, xix., 88, 1908) and previously mixed with *H. rugosus*, Ol. They are all registered as Mid-Solway specimens, and Lennon describes them as "common in or near brackish pools, Kelton and Caerlaverock Salt Marshes."

Apart from any species already referred to, Lennon records 7 "Mid-Solway" species which I have not so far come across, and they are:—*Haliplus obliquus*, F.; *Hydroporus neglectus*, Schaum; *H. celatus*, Clark; *Agabus biguttatus*, Ol.; *Berosus spinosus*, Stev.; *Helophorus tuberculatus*, Gyll.; *Hydræna nigrita*, Germ. He records *Haliplus obliquus* as "very local and scarce," and says, "As yet I have only taken this species singly in the Glen Mill Burn" (Kirkcudbrightshire) (MS. List). Now in his collection are 7 specimens of *H. obliquus* and 1 of *H. confinis*, labelled "Mid-Solway," while another specimen of *H. confinis* is labelled "Earlswood, Surrey." In his Mid-Solway list he does not mention *H. confinis* which is now, whatever it was then, fairly common in Lochrutton Loch. Neither of these species is a "running-water" denizen, and the probability is that the specimens found by Lennon, whether of *H. obliquus* or *H. confinis*, were washed down by the floods from Lochrutton Loch! There seems, however, no reason why *H. obliquus* should not have occurred as it is recorded from Cumberland, Northumberland S., and Berwick, and I have taken it very sparingly in both Fife and Forfar.

With regard to *Hydroporus neglectus*, Lennon (1895) records having found one specimen in Lochrutton Loch. This species is somewhat scarce, and very local in Britain, having apparently only been recorded from Kent W., and Surrey, Norfolk E., and Staffs, and Yorks N.E., Mid W., and N.W., and I am inclined to doubt the Solway record, the more especially as the specimen is not in the Lennon collection.

There is no reason to doubt the record of *H. celatus*, Clark, although specimens representing this species in

Lennon's collection are all *H. morio*, Dey. There are, however, 3 specimens of *celatus* in the collection which were labelled *morio*.

With regard to *Agabus biguttatus*, Ol., there is room for comment.

In his collection Lennon has 18 specimens representing this species, all of which were *A. guttatus*, Payk; while among 15 specimens representing *A. guttatus*, and all registered "Mid-Solway," were 3 specimens of *A. biguttatus*. In his MS. List Lennon says of *A. biguttatus* that it is "local but not uncommon in small clear-running streams," while in "Some Addits. to the Scott. Coll.," 1892, written jointly by him and Mr. W. Robinson Douglas, the species is described as "common, Orchardton, W.D.R.D." Mr. Robinson Douglas very kindly allowed me to examine the water-beetles in his collection, and all his so-called *A. biguttatus* turned out to be *A. guttatus!* The two species are, I think, often mixed by collectors, and I think that a number of the records of *biguttatus* really refer to *guttatus*. The late Mr. Arthur Chitty allowed me to examine the specimens which he took at Loch Awe and at Forres, and recorded as *A. biguttatus* ("EMM.," ser. 2, iii. 216, 1892; "Ann. Scott. Nat. Hist.," ii. 119, 1893; and "EMM.," ser. 2, iv. 68-71, 1893), and they were all *A. guttatus*, Payk.

The species is really easily distinguished from *guttatus* by several characters. First in the ♂ of *biguttatus* the anterior claw of the anterior tarsi is toothed, while in *guttatus* there is no tooth. Secondly, the palpi are usually pitchy in *biguttatus*, and usually testaceous in *guttatus*, but this is not an altogether reliable character as occasionally *guttatus* has rather dark palpi. If, however, the elytra are examined under a high-power lens a difference between the two species is quite evident. In *biguttatus* the surface is smooth and finely reticulate without any punctures in the reticulation, while in *guttatus*, where the lines of the reticulation cross one another there is a puncture. Thus *guttatus* is reticulate and punctate while *biguttatus* is reticulate and impunctate! Sometimes the punctuation of *guttatus* is so well marked that the specimen appears punctate even under low magnification, *e.g.*, some of the specimens in the Power Collection—but as

a rule it requires a high-power lens to make out the punctures. On the strength of the 3 specimens labelled "Mid-Solway" occurring in the Lennon Collection I shall include the *biguttatus* in the Solway List.

A note of the occurrence of *Berosus spinosus*, Stev., in the Caerlaverock Salt Marshes ("Ann. Scott. Nat. Hist.," April 1892) is certainly startling in view of the fact that the recorded distribution of this species in Great Britain is entirely eastern, the records being for Yorks N.E., Norfolk W., Suffolk E., Essex S. and N., Kent E., Sussex E., and Hants, S. Unfortunately, however, there are no specimens of this species in the collection, but there is a full series of *B. signaticollis*, Charp., on Lennon's original cards marked along the base with a blue line to show their Scottish origin. This species is not altogether eastern in its British range since there are records for Cornwall (E. or W.?) and Glamorgan. Otherwise its records are for Sussex E., Kent E. and W., Surrey, Middlesex, Suffolk E., Norfolk E., Cambs, and Yorks Mid W. In view of the fact that two or three other southern British species occur in the Solway district, this record is interesting.

There is no doubt as to the correctness of the records for the rare species *Helophorus tuberculatus*, Gyll. Two specimens occur in the Collection, and were recorded in "EMM." xvi. 134, 1879-80, and in "Ann. Scott. Nat. Hist.," April 1892.

The record of *Hydræna nigrita*, Germ, is interesting. Lennon (MS. List) refers to the species as "local and somewhat scarce. Muddy banks of the Glen burn," but only one specimen with the "Scottish" mark is in his Collection. There are, however, more recent records for Ayr (Anderson Fergusson, 'Coleoptera' in "Handbook of Nat. Hist. of Glasgow and the West of Scotland," p. 279, 1901), and for Mull (Ebudes Mid.), (MS. List of T. H. Beare), which are the only western Scottish records.

From what I have seen in some collections I am not sure that all the records for this species really refer to it, or whether some of them are not for dark specimens of *H. riparia*, Kug. In my experience *H. nigrita* is rare; in fact the only place I have so far taken it is at Ballycarry,

Co. Antrim. I have, however, seen specimens from Norfolk (Chitty), Stirling (Power), S. Wales (Chitty), and Sussex E., so that it appears to be fairly well distributed.

With regard to Little's records, I have already referred to the fact that *Hydroporus dorsalis* has not been taken in Scotland since his time. The absence of this species from Scotland is extraordinary, as it is a species with a decidedly northern distribution in Euro-Asia ranging to Finland and Siberia. In England it apparently occurs as far north as Northumberland S., but on the west it has not yet been recorded north of Cheshire, although it has been taken in all the five vice-counties of York. Until recently the species had not been taken in Ireland. The first record is to be found in the supplement to 'The Beetles of Ireland,' by Messrs. Johnson and Halbert ("Proc. Roy. Irish Acad." vi., ser. 3, 1901), where it is mentioned as having been taken by the late Mr. Buckle "in the Lagan Canal in Moira," evidently while the paper was in the press. The species turned up again in Co. Down in 1904 (W. F. Johnson, "Ir. Nat.," xiii. 93, 1904), and I have recently (1908) taken it sparingly in various places in the northern part of that county. In October last the Rev. W. F. Johnson and I found it in abundance in various places near Armagh, where he is quite certain the species did not occur 13 years ago when he lived in that district and worked it thoroughly (*v.* "Ir. Nat.," xviii. 72, 1909). The only other Irish specimen or specimens I have seen are from Tonabrocky, Galway, W. (collected, I believe, by Mr. Halbert in 1904), but apart from these occurrences the species is not recorded from Ireland. Thus the "Britannic" distribution of the species is extraordinary, and although it is apparently spreading in the NE. of Ireland it seems unable to reach Scotland.

One other record by Little given by Andrew Murray (1853) calls for remark, and that is for *Hydroporus halensis*, F., said to have been taken at "Raehills." Otherwise, with three exceptions, the records for this species are entirely eastern. Essex N., Suffolk E., Norfolk E., Cambs, Lincs N., Notts, Lancs S., and Cumberland. The Notts record is for a single specimen taken by the Rev. Alfred Thornley in

November 1895, which I have seen. The Lancs S. record is given by Mr. W. E. Sharp for Bolton ("Vict. County History, Lancs," 1906), and there is a "local" specimen in the Reston Collection in the Manchester Museum. The Cumberland record is given as "Carlisle, T. C. Heysham," in the "Vict. County History," 1901.

There are very few records for this species even in the eastern counties. It was common in Norfolk E. many years ago near Brundall Station, where it was taken by Dr. Sharp, and in 1904-5 it swarmed at the Palling Brick Pits in the same vice-county, but it gradually got scarcer so that in 1906 it was hard to find. The localities, "Horning, Stalham, and Brundall are given by Edwards (Norfolk Coleoptera, "Trans. Norf. and Norw. Nat. Soc.," 1893), and there is a "Ranworth" specimen in the Power Collection.

The species was first taken in Suffolk (Garney's "Ent. Annual," 1865, p. 40), and other records for that county are mentioned by Morley ("Col. of Suffolk," 1899). The Cambridge record is for a specimen or specimens taken at Horseway by Mr. J. F. Dutton, who kindly sent me a list of his captures, and the Essex record rests upon the capture of "several in shallow pools in a ballast pit" (B. S. Harwood, "EMM." xxxv. 72, 1899).

Thus Suffolk and Norfolk seem to be the centre of this species in Britain as they are the only counties from which there is, so far, more than one record, and the occurrence of specimens so far away as Lancs and Cumberland—and perhaps Dumfries—seems to have been due to chance.

There seems to be no record of *Agabus uliginosus* having occurred in the Solway district. Sharp mentions records for Forth and Dee districts, quoting from Murray's "Catalogue":—"Rare, near Edinburgh; Aberdeenshire," and then says—"I think it probable that individuals of *A. congener*, Thunb., were mistaken for this species. *A. uliginosus*, however, has been found in Northumberland, so that it may ultimately prove to be a Scottish species." This species has since occurred in Cumberland as I learn from Mr. F. H. Day (who has kindly sent me a list of additions to the Cumberland list given in the "Victoria County History," 1901), and in the Dublin Museum Collection there is a

specimen marked "Tinwald Downs" (M'Nab), which brings the species into Dumfriesshire.

The Solway List of Water-beetles includes, then, about 120 species, which is rather more than half the total number of species known in Great Britain. I have left *Haliplus fluviatilis* and *straitus* standing as species, although I am not altogether satisfied that they are really distinct from *H. ruficollis*, De G. I have, however, come to the conclusion that *Hydrobius picicrus*, Thoms., is a mere variety of *H. fuscipes*, L. I have also neglected *H. immaculatus*, Gerh., recently introduced as "a species or variety" to the British List [Newbery, "EMM.," ser. 2, xviii. 4, 1907]. Of this total I have taken 101 species in Kirkcudbrightshire, and about 10 others recorded by Sharp and Lennon are from the same county.

(*To be continued.*)

COLEOPTERA FROM MOLES' NESTS IN THE SOUTH-EAST OF SCOTLAND.

By Prof. T. Hudson Beare, B.Sc., F.R.S.E., F.E.S.,
and William Evans, F.R.S.E.

The success which has recently attended the search for Beetles in moles' nests in the south of England, induced us a year ago to see what this same method of collecting would produce north of the Tweed. Accordingly, we made a beginning on 19th February 1908, and in the course of the past twelve months a hundred moles' nests, all seemingly in use, have been examined in the neighbourhood of Edinburgh. A record was kept of the beetles found in each, and it is here reproduced in the hope that the particulars may be of interest to Coleopterists working at this subject. The observations were made in the months of February, March, April, May, and November 1908, and January and February 1909. We wish now that they had been continued throughout the year.

Of the 100 nests examined, 29 did not yield any Beetles or their larvæ, while 12 contained larvæ only. In the re-

maining 59 nests there were found 180 Beetles (fully 3 per nest), exclusive of larvæ, belonging to 24 species. The largest number in any one nest was 10. Of the species obtained, only 4, all *Staphylinidæ*, namely, *Aleochara spadicea*, Er., *Oxypoda longipes*, Muls., *Quedius longicornis*, Kr., and *Q. vexans*, Epp., belong to the group of 9 taken in England, which are considered by Mr. N. H. Joy to be peculiar to moles' nests.[1] So far we have seen no signs of any of the other 5, namely, *Homalota paradoxa*, Rey, *Heterothops nigra*, Kr., *Quedius nigrocæruleus*, Rey, *Medon castaneus*, Gr., and *Hister marginatus*, Er. The absence of the *Heterothops* is especially noteworthy in view of its abundance in nests in the south of England. The *Hister* has been taken in a mole's nest in Ross-shire by Mr. Joy, so that its detection here is probably only a question of time.

With us the most common species is probably *Aleochara spadicea*,[2] which was present in 19 nests, and next to it comes *Quedius vexans*, detected in 18 nests. *Q. longicornis* is much scarcer (taken in 10 nests), while *Oxypoda longipes* occurred in only 8 nests, two of them in the locality (near Aberlady) where the first British specimen was captured by Dr. Sharp (but not in a mole's nest) many years ago.

The other Beetles, most of them doubtless only casual visitors, found in the nests were :—*Dyschirius globosus*, Herbst., *Metabletus foveolatus*, Gyll., *Megasternum boletophagum*, Marsh, *Aleochara cuniculorum*, Kr., *Homalota* (3 species), *Tachyporus hypnorum*, F., *Tachinus collaris*, Grav., *Xantholinus linearis*, Ol., *X. ochraceus*, Gyll., *Othius myrmecophilus*, Kies., *Stenus speculator*, Er., *S. pusillus*, Er., *S. brunnipes*, Steph., *Oxytelus sculpturatus*, Grav., *Choleva angustata*, F., *C. tristis*, Panz., *Catops sericeus*, F., and *Trichopteryx*, sp. ?.

Besides the Beetles there were present in the nests many other creatures—Fleas and their larvæ, Diptera and their larvæ, Springtails, Spiders, Mites, Myriapods, and Enchytræid Worms—upon most of which the Staphylinids no doubt prey.

[1] "Ent. Mo. Mag." Nov. 1908, p. 246.

[2] First taken in Scotland in a mole's nest in Peeblesshire, March 1905 (Evans, "Ann. Scot. Nat. Hist.," 1908, p. 120).

PARTICULARS OF MOLES' NESTS EXAMINED.

Near Largo, Fife, 19th February 1908, 12 nests examined by T. H. B. and W. E.; sandy soil.

1st nest, Blank.
2nd nest, *Quedius longicornis*, 2.
3rd nest, *Oxypoda longipes*, 2.
4th nest, *Quedius longicornis*, 1; *Aleochara cuniculorum*, 2.
5th nest, A few Staphylinid larvæ only.
6th nest, *Aleochara spadicea*, 4.
7th nest, *Aleochara spadicea*, 2; *Choleva angustata*, 3.
8th nest, *Quedius longicornis*, 1; and *Quedius* larvæ, 4.
9th nest, Blank.
10th nest, *Homalota*, sp. ?, 3.
11th nest, *Catops sericeus*, 1.
12th nest, Blank.

Gullane, Haddingtonshire, 5th March 1908, 6 nests examined by W. E.; sandy soil.

1st nest, *Quedius longicornis*, 1.
2nd nest, *Quedius vexans*, 1.
3rd nest, *Aleochara spadicea*, 1, and 2 Staphylinid larvæ.
4th nest, *Aleochara cuniculorum*, 1.
5th nest, *Homalota*, 2 sp., 7.
6th nest, *Choleva tristis*, 4.

Near Dirleton, Haddingtonshire, 14th March 1908, 13 nests examined by T. H. B. and W. E.; sandy soil.

1st nest, *Quedius longicornis*, 1; *Q. vexans*, 1; *Aleochara spadicea*, 6; *Homalota*, sp. ?, 2.
2nd nest, A few *Quedius* larvæ only.
3rd nest, *Quedius vexans*, 2, and several *Quedius* larvæ; *Homalota*, 2 sp., 2; *Megasternum boletophagum*, 1; *Trichopteryx*, sp. ?, 2.
4th nest, *Quedius vexans*, 2; *Aleochara spadicea*, 2; *Choleva angustata*, 1.
5th nest, *Quedius longicornis*, 2; *Xantholinus linearis*, 1.
6th nest, *Quedius vexans*, 3, and larvæ; *Homalota*, sp. ?, 1.
7th nest, Blank.
8th nest, *Aleochara spadicea*, 1; *Homalota*, sp. ?, 2.
9th nest, *Quedius vexans*, 1; *Aleochara spadicea*, 6; and several Staphylinid larvæ.
10th nest, Two *Quedius* larvæ only.
11th, 12th, and 13th nests, Blank.

Links near Largo, 21st March 1908; 12 nests examined by W. E.; sandy soil.

1st nest, *Aleochara spadicea*, 1.
2nd nest, Blank.
3rd nest, *Homalota*, sp.?, 1.
4th nest, Blank.
5th nest, *Aleochara spadicea*, 1, and larva.
6th nest, *Aleochara spadicea*, 2.
7th nest, One *Quedius* larva.
8th nest, *Aleochara spadicea*, 5.
9th nest, *Aleochara spadicea*, 1.
10th nest, Blank.
11th nest, *Quedius longicornis*, 1.
12th nest, Blank.

Ravelrig Toll Moss, 28th March 1908, 5 nests examined by W. E.; damp peaty soil.

1st and 2nd nests, Blank.
3rd nest, *Othius myrmecophilus*, 1.
4th and 5th nests, Blank, but for 1 Staphylinid larva.

Upland pastures, 2-3 miles south of Leadburn, Peeblesshire, 4th April 1908; 11 nests examined by W. E.; clayey and peaty soil.

1st nest, Blank.
2nd nest, *Quedius vexans*, 2.
3rd nest, Blank.
4th nest, *Othius myrmecophilus*, 1.
5th nest, Only some smallish Staphylinid (*Aleochara*?) larvæ.
6th nest, Blank.
7th nest, *Quedius longicornis*, 3.
8th nest, *Quedius vexans*, 4, and larva.
9th nest, *Quedius vexans*, 6, and larva.
10th nest, Two larvæ of *Quedius*.
11th nest, Blank.

Luffness Links, near Aberlady, Haddingtonshire, 8th April 1908; 12 nests examined by T. H. B. and W. E.; sandy soil.

1st nest, *Stenus brunnipes*, 1; *Homalota*, sp.?, 2.
2nd nest, *Homalota*, sp., 1; *Trichopteryx*, sp.?, 3; and several *Quedius* larvæ.
3rd nest, Blank.
4th nest, *Tachinus collaris*, 1; *Tachyporus hypnorum*, 1; and several Staphylinid larvæ.
5th nest, *Quedius vexans*, 3; *Aleochara spadicea*, 4; *Homalota*, sp. 1; and many larvæ of *Quedius* and *Aleochara*.
6th nest, *Quedius vexans*, 2, and several larvæ; *Oxypoda longipes*, 2; *Aleochara spadicea*, 2; *Choleva angustata*, 1.

7th nest, *Aleochara spadicea*, 1 ; several larvæ of *Aleochara*, and one of *Quedius*.
8th nest, *Stenus pusillus*, 1, and *Quedius* larva.
9th nest, *Aleochara spadicea*, 1 ; *Homalota*, sp. ?, 1 ; *Stenus speculator*, 1 ; and several *Quedius* larvæ.
10th nest, *Quedius vexans*, 1 ; *Homalota*, sp. ?, 1 ; and many *Quedius* larvæ.
11th nest, Only one larva of *Aleochara* ?, and a dead mole !.
12th nest, *Oxypoda longipes*, 1 ; *Aleochara spadicea*, 2 ; *Oxytelus sculpturatus*, 2 ; *Homalota*, sp. ?, 5.

Near Elie, Fife, 11th April 1908 ; 10 nests examined by W. E. ; light sandy earth.

1st nest, Blank.
2nd nest, *Oxypoda longipes*, 1.
3rd to 9th nests, Blank, except for a few *Quedius* and other larvæ.
10th nest, *Quedius longicornis*, 1.

Luffness, 2nd May 1908 ; 3 nests examined by W. E. ; sandy soil.

1st and 2nd nests, Blank.
3rd nest, *Metabletus foveolatus*, 2 ; *Homalota*, sp. ?, 1.

Dirleton, 9th May 1908, one nest examined by W. E. ; light earthy soil.

In nest—*Dyschirius globosus*, 1 ; *Quedius vexans*, 1, and 2 larvæ.

Fullarton, Midlothian, 5th November 1908 ; 5 nests examined by W. E. ; soil more or less peaty.

1st nest, *Quedius vexans*, 2 (♂ and ♀), and a Staphylinid larva.
2nd and 3rd nests, Blank.
4th nest, *Oxypoda longipes*, 1.
5th nest, Blank.

Luffness Links, 7th November 1908 ; 1 nest examined by W. E. ; sandy soil.

In nest—*Xantholinus ochraceus*, 1, and a Staphylinid larva.

Dirleton Links, 9th January 1909 ; 2 nests examined by W. E. ; soil very sandy.

1st nest, *Quedius vexans*, 1 ; and 4 *Quedius* larvæ.
2nd nest, *Quedius vexans*, 1 ; and 2 *Quedius* larvæ.

Near Bathgate, Linlithgowshire, 6th February 1909 ; 7 nests examined by W. E. ; clayey and peaty soil.

1st nest, *Oxypoda longipes*, 1 ; *Aleochara spadicea*, 1 ; *Homalota*, sp. ?, 1.
2nd nest, 4 *Quedius* larvæ.
3rd nest, *Oxypoda longipes*, 2.
4th nest, *Quedius longicornis*, 3.
5th nest, *Oxypoda longipes*, 2 ; *Homalota*, 2 sp., 3.
6th nest, *Quedius vexans*, 1
7th nest, *Quedius vexans*, 4 ; *Aleochara spadicea*, 4 ; and a few larvæ.

EDINBURGH, *February* 1909.

ON SOME SCOTTISH DIPTERA—STRATIOMYIDÆ TO ASILIDÆ.

BY A. E. J. CARTER and Rev. JAMES WATERSTON, B.D., B.Sc.

THE publication of Mr. Verrall's recent work (vol. v. of "British Diptera") is an event of first-rate importance for every student of the families dealt with. The book must long remain the standard work.

We have taken the opportunity thus afforded of thoroughly revising the specimens of the above group in our collections. The results are contained in the present paper.

Many of the examples here mentioned have passed under Mr. Verrall's critical eye, one or two have already been included in Mr. Grimshaw's lists of the "Forth" Diptera. Some repeat or confirm old records. But for the sake of completeness and because members of the Stratiomyidæ, etc., except in the case of one or two common forms, are seldom met with abundantly, it has seemed best to notice all the species we have secured. The bulk of our captures have been made in the last seven or eight years.

In indicating localities the county name has been added to the first mention of the place, but dropped later. Field notes have been as a rule initialed. For any other remarks we are jointly responsible.

STRATIOMYIDÆ.

OXYCERA DIVES, *Lw.*—3 ♂ ♂, Aberfoyle, Perthshire. 6, 8, and 9, vii. '03. This species is very rare in Britain, and Mr. Verrall only knows of four or five specimens—a ♀ without

locality in the old Entomological Club collection, a ♂ recorded from Rannoch in 1898, and the 3 ♂ ♂ mentioned here. "At rest on Bracken" (C.).

O. TRILINEATA, *F.*—♂ and two ♀ ♀, Aberlady, East Lothian, 29, vi. '05.

NEMOTELUS ULIGINOSUS, *L.*
,, NOTATUS, *Ztt.*
,, NIGRINUS, *Fln.*

All three from Aberlady. *Uliginosus* and *notatus* are common and occur together. We have continuous records from 1902-1905 inclusive, the dates ranging from June to August. *Nigrinus* is distinctly scarcer than its congeners, and has been taken by us only in June. "On flowers of Ranunculus" (W.).

SARGUS FLAVIPES, *Mg.*—♀, Musselburgh, Midlothian, 29, viii. '01. Both sexes, Aberfoyle, 25-29, viii. '06. ♀, Aberlady, 6, viii. '04. The last is a small example barely 7.5 mm. in length.

S. CUPRARIUS, *L.*—Musselburgh, "fairly common in July and August" (C.). ♀, Blackford Hill, Edinburgh, 18, vii. '04.

S. IRIDATUS, *Scop.*—2 ♂ ♂, Aberfoyle, 30, vi. '04; ♀, *ibid.* 8, vii. '03. ♀, Musselburgh, 18, viii. '04. ♀, Colinton, Midlothian, 12, ix. '05; ♀, Comrie, Perthshire, 11, vii. '07.

CHLOROMYIA FORMOSA, *Scop.*—♂, Comrie, 27, vi. 1900; ♂, St. Boswells, Roxburghshire, 7, vii. '02; ♂, Blackford Hill, 18, vii. '04.

MICROCHRYSA POLITA, *L.*—Musselburgh; Comrie; and Blairgowrie, Perthshire. "Common" (C.). Two ♀ ♀, Bavelaw Burn, Midlothian, 1, vii. '04; ♂, Dunvegan, and also at Uig, Island of Skye, June 1905-1906 respectively.

M. FLAVICORNIS, *Mg.*—♀, Loch Tay, Perthshire, 2, vii. '04; ♂, Blackford Hill, 18, vii. '04; ♀, Arniston, Midlothian, 17, vii. '06; ♂, Aberdour, Fifeshire, 7, vi. '04.

M. CYANEIVENTRIS, *Ztt.*—Occurs sometimes in large numbers. Taken in June and July, 1902-1908, Taynuilt (Argyllshire), Comrie, Blairgowrie, Bavelaw Burn, Aberdour, St. Boswells.

BERIS VALLATA, *Forst.*—In June and July from Bavelaw Burn, Iona, Blackford Hill, Musselburgh, and Comrie (1902-1907); never more than one or two examples. But the species was common at Aberlady, 7, viii. '05, where it occurred on nettles in company with a species of sawfly, coloured almost exactly like itself (C.). ♀, Small Isles, Jura, first week of Sept., 1907.

B. GENICULATA, *Curt.*—Not a common species in Britain, but the "Forth" area appears to be one of its strongholds. In view of the interest attaching to it we give our records in full. 11, vii.

'02, ♂, Bavelaw Burn; 21, vii. '02, 2 ♂ ♂, Blackford Hill; *ibid.*, 18, vii. '04, 9 ♂ ♂, 5 ♀ ♀; 29, vii. '04, ♂; 6, vii. '06, ♀; 15, vii. '04, ♂, Royal Botanic Garden, Edinburgh; 22, vii. '04, ♂, St. Boswells; 6, viii. '04, 2 ♀ ♀, Aberlady; 17, vii. '06, 4 ♂ ♂, Arniston; 28, vii. '06, Musselburgh, "in some numbers" (C.), and "most years in August and September" (C.); 6, viii. '06, ♀, Polton. Recorded "A.S.N.H.," January 1904, p. 32, as *B. fuscipes* Mg., a species neither of us has yet been fortunate enough to secure. Mr. Verrall gives only five recent English records, and Musselburgh, Perth, and Golspie, in Scotland.

B. CHALYBEATA, *Forst.* — A fairly common species. Taken as early as May at Musselburgh; chiefly, however, in June and July (1902-1908). From the following localities,—Winchburgh (West Lothian), Polton (Midlothian), Blairgowrie, Balerno, Lochgelly (Fifeshire), Loch Tay.

B. MORISII, *Dale.*—2 ♀ ♀, Arniston, 17, vii. '06; ♀, Polton, 6, viii. '06. Not a common species; the only Scotch records given by Mr. Verrall are Ballater and Logie.

LEPTIDÆ.

LEPTIS SCOLOPACEA, *L.*—Aberlady, Musselburgh, Aberfoyle, Comrie, Blairgowrie, West Calder (Midlothian), Lochgelly. Also in June 1905, both sexes, at Balelone, N. Uist, Outer Hebrides, and June 1906, at Uig, in Skye (♂ only).

L. NOTATA, *Mg.*— ♂, Musselburgh, 11, vi. '04; 2 ♂ ♂, Polton, 9, vi. '06. "The Musselburgh specimen is the only one taken there during several years collecting in the locality" (C.). According to Mr. Verrall, it is a mountain species.

L. TRINGARIA, *L.*—Frequently met with, chiefly in July and August, Lochearnhead (Perthshire), Comrie, Blairgowrie, Aberfoyle, Blackford Hill, Musselburgh, Arniston, Broughton, and Stobo (Peeblesshire). "A very dark ♂, taken near Edinburgh, but hardly *nigriventris*" (W.).

L. LINEOLA, *F.*—The commonest of the genus, June to Sept. 1902-1908. Blackford Hill, Polton, Arniston, Midcalder, Aberlady, Aberfoyle, Blairgowrie, Comrie, Callander, Loch Tay, Whiting Bay (Arran), Small Isles, Jura. "A ♂, Blairgowrie, 12, vii. '08, is very much darker than typical examples" (C.).

ATHERIX IBIS, *F.*— ♀, Comrie, 26, vi. '07; 3 ♀ ♀ on the Earn, near Crieff, Perthshire, 3, vi. '08. "Standing fishing in the middle of the river I saw a large number of these flies come down stream in a continuous string. They settled one after another on my waders—at the same spot" (W.). The remark-

able egg-laying habit of this species is well known. The ♀ ♀ cluster together, lay their eggs and die. The cluster, which is continually receiving new accessions and may contain thousands of dead flies, is attached to boughs overhanging streams. The larvæ hatch out and fall into the water. The above field-note may refer to this peculiar habit.

SYMPHOROMYIA CRASSICORNIS, *Pz.*—2 ♂ ♂, Comrie, 7, vii. '07. "At rest on palings" (C.).

CHRYSOPILUS CRISTATUS, *F.*—(Formerly in our list as *C. auratus*, F.) A common species. Found especially near water. The ♂ ♂ outnumber the ♀ ♀. Taken chiefly in July. Blackford Hill; Bonally near Colinton; Musselburgh; Longniddry; Aberlady; Aberdour; St. Boswells; Loch Tay; Aberfoyle; Comrie; Blairgowrie; also in June 1906 at Uig, Skye.

PTIOLINA ATRA, *Staeg* (= *nigra*, Ztt.).—21 and 24, v. '04, on each occasion a single ♂, Luffness, Aberlady. "By sweeping the herbage of marshy pools" (W.). The first British records. In addition to these specimens Mr. Verrall records it from Brodie (Elgin), Bonhill (Dumbartonshire), and Porthcawl (Glamorgan), apparently a rare species.

SPANIA NIGRA, *Mg.*—♀, St. Fillans, Perthshire, 16, vii. '07. "Taken by sweeping under trees near the Loch" (C.). This is the ♀ referred to by Mr. Verrall in his description, "I have had only one good specimen before me for examination," p. 318.

TABANIDÆ.

HÆMATOPOTA PLUVIALIS, *L.*—The "cleg," sometimes a pest at midsummer. Our records range from April to September. We have the ♀ from Aberlady, Aberfoyle, Comrie, Blairgowrie, and Jura; and the ♂ from Whiting Bay, Arran (1); and Hirta, St. Kilda (common).

H. CRASSICORNIS, *Whlbg.*—Several ♀ ♀ at Aberfoyle, July 1901 and 1903. No doubt often passed over through its resemblance to the previous species.

THERIOPLECTES DISTINGUENDUS, *Verr.*—Several ♀ ♀, Aberfoyle, July 1901, 1903, 1904. ♀, Comrie, 18, vii. '07. "♀ given me by Mr. Godfrey. Taken before 1901. No data. Perthshire?" (W.). Hitherto not separated from *T. solstitialis*, Mg., under which name the Aberfoyle specimens were recorded in "E.M.M." 1905, p. 163, and again in "A.S.N.H.," 1904, p. 32.

ATYLOTUS FULVUS, *Mg.*—♀, Aberfoyle, 3, vii. '01. A rare species. Banchory is the only other Scotch locality given by Mr. Verrall.

TABANUS SUDETICUS, *Zeller.*—"♂ and ♀, the latter dated '8, vii. '01.' The ♂ was received from Mr. Godfrey and probably

the ♀ also. One or other I believe occurred at Lochearnhead" (W.).

♂, Aberfoyle 7, vii. '03) "The ♂ at rest on Bracken, the
♀, ,, 28, viii. '06) ♀ one of three that settled on my coat at the same time! Near the top of Craigmore" (C.).

T. CORDIGER, *W.*—2 ♀ ♀, Comrie, 17 and 18, vii. '07. "Appears to be an uncommon British species," Verrall, p. 416.

CHRYSOPS RELICTA, *Mg.*—♀, Aberfoyle, 10, vii. '01; 4 ♂ ♂, 3 ♀ ♀, Blairgowrie, 28, vi. '08. "The latter specimens taken on the leaves of shrubs, etc., growing round a curling pond. The next day none were to be seen" (C.).

BOMBYLIDÆ.

BOMBYLIUS MAJOR, *L.*—♀ on Primula, near a pond at Inverawe House, Argyllshire, 18, iv. '03. The species of this genus appear to be rare in Scotland.

ANTHRAX PANISCUS, *Rossi.*—♂, Aberlady, 6, vii. '04. Aberlady is the only Scotch locality given by Mr. Verrall.

THEREVIDÆ.

THEREVA NOBILITATA, *F.*—♂, Musselburgh, 2, vii. '02; 2 ♂ ♂, Longniddry, 3, viii. '03. Both sexes at Aberlady, '03 and '04. ♀, Blackford Hill, 6, viii. '06. In the last specimen the venation is peculiar. The lowest vein from the discal cell is partially defective in both wings. Mr. Verrall calls attention to a ♂ from Cambridge with this character in the right wing (p. 561). One of the Aberlady ♀ ♀ has the fourth posterior cell open. It is usually closed in this species.

T. ANNULATA, *F.*—"♂ from Tentsmuir, Fifeshire. Taken about June 1898, and given me by its captor, Mr. A. J. D. Lothian" (W.). Aberlady, 27, vi. '02. "In some numbers" (C.). Longniddry, 2 ♂ ♂, 9, viii. '02.

ASILIDÆ.

DYSMACHUS TRIGONUS, *Mg.*—♀, Tentsmuir. Taken by Mr. Lothian, June 1898. A widely distributed species; but Mr. Verrall gives only Kingussie, Irvine Moor, and Troon as Scotch localities.

ISOPOGON BREVIROSTRIS, *Mg.*—♂, Aberfoyle, 7, vii. '03. "Both sexes in some numbers in Glen Lednock, Comrie, July 1907. Taken in coitû" (C.).

DIOCTRIA ŒLANDICA, *L.*— ♀, Comrie, 7, vii. '07. Mr. Verrall gives no Scotch localities, but there is an old record in Mr. Grimshaw's 'List of "Forth" Diptera,' "A.S.N.H.," 1903, p. 162.

D. RUFIPES, *Deg.*—18 and 27, vii. '04; five examples in all, ♂ ♂. Blackford Hill. "Taken by thoroughly sweeping the nettle patches above the Hermitage on the hill-side" (W.).

ON THE BRITISH PLANT LISTS AND THEIR DISCREPANCIES.

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

(*Continued from* 1908, *p.* 242.)

505 and 506. *Oxalis stricta* and *corniculata*, L. In the "List of British Seed Plants," Rendle and Britten have followed the example of Dr. Robinson ("Journ. Bot.," 1907, 386) and reversed the above names, using *stricta* for the prostrate and *corniculata* for the erect species. The "London Catalogue" and my List keep to the names as they have been, without exception (till Dr. Robinson's innovation), used by botanists since Linnæus founded them. The confusion which would result if such a change were sanctioned would be so great as to render a trinomial necessary; but I hold that Dr. Robinson has not got over the essential point, *i.e.*, the description, as given in the "Species Plantarum" of *O. corniculata*, caule ramoso diffuso, pedunculis umbelliferis. Now Linnæus could not have had *stricta* before him when he wrote this description, which is not applicable to it. It is a rule, supported, I believe, by all botanists, that the description is the essential part in establishing a species, and that references to plates and synonymy are secondary. But Linnæus cites "Trifolium luteum minus repens, etiam procumbens" (Moris. "Hist.," 2, p. 183, t. 17, f. 2), which is certainly not *strictum*; and Dr. Bucknall and Mr. J. W. White agree in naming the specimen in the Morisonian Herbarium *O. corniculata*, so that the only figure definitely cited does not refer to *stricta*. It is quite likely Linnæus may have muddled the two species; but the definition caule ramoso diffuso, wherever it may have been

taken from, does not apply to *O. stricta* ; and to quote it for that plant is misleading.

Again, under *O. stricta*, Linnæus has caule ramoso erecto, which does not apply to *corniculata* ; and his reference to S. acetosum corniculatum luteum majus rectum indicum s. virgineum (Morison's "Hist.," 2, p. 184, t. 17, f. 3) is again to a figure which does not represent *corniculata*. The specimen in Hb. Morison is also *O. stricta*, L. Therefore I still contend that we may continue to use these as heretofore.

No. 619. In "Flora Salop," Leighton, in describing *Trifolium striatum*, L., var. *erectum*, cites Gaspar as the author, but perhaps not as published by him. In full, the citation should doubtless be var. *erectum* Gaspar, *ex* Leighton.

705. *Vicia tetrasperma*, Moench. Fries established his var. *tenuifolium* under *Ervum* (Fries' "Nov.," p. 12, 1814), quoting *Ervum tenuifolium*, Lagasc., and *E. tenuissimum*, Pers. In the "Flora of Berkshire" I described it as *V. gemella*, var. *tenuissima*, altering the name *tenuifolium* because there was already a *V. tenuifolia* established. If the pertinence of the varietal name had been made obligatory we might have had to use var. *tenuifolia*. But the point is, Fries did not write *tenuissima*.

746. *Spiræa Ulmaria*, L., var. *denudata*, Boenn. Mr. Britten has ridiculed the claims of this variety, and draws support from a statement, not however based upon extensive experience, of one of his correspondents. So far as my experience goes, it is a fairly well-defined variety occupying distinct areas, and is by no means a diseased form. If it were a Hawkweed it would probably have been described as a "good species."

908. *Potentilla palustris*, Scop. Herr Wolf, in his recent "Monograph of the genus Potentilla," keeps up the variety *villosa* (Lehm). Although intermediate conditions are found, yet the extreme form is very distinct.

943. *Rosa villosa*, L., which I retain, because I do not follow the Vienna rules, is also used in the British Museum "List," in defiance of them.

937. *Rosa Eglanteria*, L. This is certainly the Sweet-briar, as established in the first edition of the "Species Plantarum," not of Herb. In the second edition Linnæus

confused, or rather perhaps replaced, it with the yellow rose. There is no need to cite Hudson. M. Crépin says *Rosa Hailstoni* of Baker belongs to *dumalis*, and the var. *Nicholsoni*, Christ, belongs to the *involuta* group. M. Crépin also says *R. cæsia*, Sm. = *R. corrifolia*, Fries ; but I do not think Ley or Wolley-Dod agrees with this. Crépin was quite confident about it. He also referred Baker's *celerata* to *R. glauca*, Vill.

958 bis. *Pyrus semipinnata*, Roth. I omitted this as being always a planted tree ; but I have since added it as an alien.

966. *Cratægus Oxyacantha*, L. This is well represented by several sheets in the "Linnean Herbarium," all being what I call true *C. Oxyacantha*, L., *i.e. monogyna*, Jacq.; which is really, I hold, synonymous. This species has much the widest European range, and alone extends to Norway and Sweden. The description in "Sp. Pl." would cover both species ; but the habitat and synonyms belong to the one-styled plant. Our second species is *C. oxyacanthoides*, Thuill., which is essentially a plant of Central and Eastern England, scarcely reaching Scotland, except perhaps as an introduced plant. I have never seen it there. It appears to be absent from the Channel Isles. When the two species grow together hybrids are very frequent. Such an area is Wychword, Oxfordshire, where, as in Whittlebury Forest, Northamptonshire, the old thorns are often *oxyacanthoides*. This plant, although sometimes growing in upland places, rejoices in the clayey soil of river-valleys.

1141. *Siler trilobum*, Crantz, is now extinct near Cambridge.

1267. *Filago germanica*, L. "Syst. Nat.," ed. x., 1235, 1759, is, according to Mr. Britten, the authority ; but Mr. F. N. Williams ("Prod. Fl. Britt.," p. 18) says the plant of the "Systema" is not *F. germanica*, and refers to "Sp. Pl.," ed. 2, p. 1311, 1763 ; but if he is correct about the "Systema," Hudson is the authority, as given in my List.

1385. Surely *Petasites ovatus*, Hill, must stand. Linnæus had *T. hybrida* the female, and *T. Petasites* the male plant. One being synonymous with the other, the choice of his still-born name seems singularly unfortunate. To

make a name applied to a unisexual segregate the authoritative appellative for a species, and to take rank over a properly-applied binominal name, appears to stretch even a "Vienna rule" to breaking point. If Linnæus did not understand the species, there is no reason to perpetuate his name by miscalling our Butterbur *Petasites hybridus*, which it is not.

1274. *Gnaphalium uliginosum*, L., var. b. *pilulare* (Wahl.). Here again, I think, Mr. Fryer's observations ("Journ. Bot." (1889), 83), which may have been quite correct so far as they went, cannot be said to be more than suggestive. In the place where I found it the plants were quite normal; they grew with the type, and there was nothing to account for their variation so far as soil or situation went. I may say at that period I examined many hundreds of specimens, so evidently the variation is rare with us. I commend further research to our active botanists.

Genus 335. *Arctium*.—I am afraid all three Lists are wrong in their treatment of this genus. I followed Mr. F. N. Williams ("Prod. Fl. Britt.," 54) in treating our Burdock as *A. intermedium*, Lange, and as he stated that he and Mr. Bennett did not agree that our *nemorosum* was what was understood by Continental authors, he therefore distinguished it as a variety of *intermedium* under the name *Newbouldii*. He gave no citation to show that this had been established by Mr. Bennett either as a species or variety. I referred to the "Journ. Bot.," 1899, p. 342, but there the name was only given by Mr. Bennett as to be used under certain contingencies, and seems apparently to me to be invalid; therefore when raising Mr. Williams's variety to a species, I was the authority. However, it appears Mr. Bennett had elsewhere ("Irish Nat.," 1903, p. 289) published the name with some diagnostic characters; and if the name could be retained it must be cited as of Arth. Bennett. Mr. W. H. Beeby has ("Journ. Bot.," 1908, p. 380) contributed a valuable note in which he shows that both Mr. Bennett and Mr. F. N. Williams are wrong; that *A. nemorosum*, Lej., is British (it is the plant with agglomerated, almost sessile heads, at the apex of the principal stems), and that *A. intermedium*, Lange, is partly made up of *A. Lappa* × *minus*, and partly

of *A. minus*, var. *purpurascens*, Blytt. What the *A. pubens*, Bab. (which represents Lange's *intermedium* in "Brit. Mus. List"; see "Journ. Bot.," 1907, p. 439), is, has yet to be ascertained. Mr. Beeby doubts if we have any fourth species to represent it in Britain.

Genus 337. *Cirsium* [Tourn.], Hill, 1756; Scop., 1760. In the first edition of the "Species Plantarum," the genus *Cnicus* was given on p. 826 in a footnote, which is unindexed, and included *C. benedictus* as well as species of *Carduus* and *Cirsium*. The genus *Cnicus*, L., is usually on the Continent used to designate *benedictus*; and Tournefort's genus *Cirsium*, revived by Hill in 1756 and Scopoli in 1760, which Linnæus had wantonly ignored, is now in general use, with the exception of Bentham and Hooker and British botanists, for the plume thistles. In fact, the Vienna rules say *Carbenia*, Adans. (*Fam.* ii. (1763), 116), must be replaced by *Cnicus*, Gærtn. ("Fruct." ii. 1791, 385) [but why not *Cnicus*, L., "Sp. Pl." 1753, sens. ampl.?]; and in a footnote they add: "*Cnicus*, L., 'Sp. Pl.' (1753), 826, amplectitur et *Cnicum*, Gærtneri, et *Cirsium*, Adans., Em. DC. Genere Gærtneriano recepto genus homonymum Linnæanum interdum pro nomine usitato 'Cirsium' adhibitum (cf. Benth. and Hook. f., *Gen.* ii. 1873, 468) rejiciendum est; itaque valet *Cirsium*, Adans." As I have said, both the "Lond. Cat." and "Brit. Mus. List" profess to follow the Vienna rules, but in this instance have not done so. The Law of Priority seems to be best carried out in using *Cirsium* for our Plume Thistles, as is done by Mr. F. N. Williams, and in my List.

Genus 340. *Silybum* is quoted in both "Brit. Mus. List" and "Catalogue" as of Vaillant; but that author is pre-Linnean. Adanson revived it in 1763 after Hill had established *Mariana*.

1702. *Azalea procumbens*, L., is retained by Mr. Britten because he "does not understand the Vienna rules, which conserve *Loiseleuria*, to mean that Linnæus' genus *Azalea* must disappear, which it would do if *A. procumbens* were not retained." This seems something like special pleading. When Bentham and Hooker united *Sinapis* with *Brassica*, the Linnean genus *Sinapis* disappeared, and the

murmurs were few. If our mountain plant is a *Loiseleuria*, and that name has to be retained, it follows that *Azalea*, L., disappears. The "Index Kewensis" says *Azalea*, L. = *Rhododendron*, L. The point appears to be, Does the definition of the Linnean genus *Azalea* cover our Scottish plant? If so, I should prefer to use it; but those who follow the Vienna rules must surely accept the "nomina conservanda," and these include *Loiseleuria*; Kuntze wished to call it *Chamæcistus*, Oeder; and the Vienna rules seem specially designed, in this and other cases, to prevent his name being accepted, since they specifically reject Oeder's name, which, it is true, had no generic description in the "Flora Danica" in 1761. S. F. Gray tried to revive it in 1821. It is a monotypic genus. Babington pleaded strongly for the retention of *Azalea procumbens*, L.

1757 bis. Centaurium tenuiflorum (Hoffmg. and Link, as a sp. of *Erythræa*). I followed Mr. Townsend in putting it to *C. pulchellum*. In the last edition of the "Flora of Hampshire," p. 255, he treats it as a distinct species, and on a *Euphrasia* standard doubtless it is so. Curiously, Nyman thought it was synonymous with Smith's *latifolia*. I think the Rev. E. S. Marshall has made a slip in saying that Nyman makes it a sub-species of *E. linariifolia*, Pers. = *E. litoralis*, Fries. The only sub-species they have is Grisebach's *E. tenuifolia*, not *tenuiflora*, Hoffmg. and Link.

1763. *Gentiana Amarella*, L. In this [2] is misplaced in my List. It should obviously follow the British census number.

1843. *Cuscuta racemosa*, Mart.; an older name is *C. suaveolens*, Seringe.

1892. *Scrophularia aquatica*, L. The var. *c.*, *bracteata*, belongs to *nodosa*. It was accidentally transferred to the wrong species in my List. The variety bears much resemblance to *S. alata*, Gilib.

1940 bis. *Euphrasia*. Recently Miss Saunders has found *E. minima*, Jacq., on Exmoor in Somerset. C. H. Ostenfeld refers *E. paludosa*, *E. foulaensis*, and *E. scotica* to *E. minima*; and makes the following observations, additions, and corrections to the "List of the Phanerogamæ and Pteridophyta of the Faeroes," p. 845: "Wettstein considers

E. scotica to be very near *E. minima*, and says ('Mon. Euph.' 171) that the only difference of importance lies in the length of the capsule in proportion to the calyx, but adds that he does not know if this difference is constant. Shortly after Townsend ('Mon.' p. 426) declared that it is not constant, as he has found specimens of *E. scotica* with capsules exceeding the calyx; he says that a marked distinction seems to lie in the form of the upper leaves and bracts of *E. scotica*, which are narrower than those of *E. minima* and have a cuneate base. I have examined many hundreds of specimens of *E. scotica* from Scotland, Shetland, and the Faeroes, and have compared them with many specimens of *E. minima* both from the Alps and Scandinavia, and I cannot find any distinction which holds good. I feel pretty sure that the Scottish, etc., plant is identical with true *E. minima*. Townsend, who has seen a good deal of my Faeroese material, has determined many specimens with capsules exceeding the calyx as *E. scotica*, specimens which are quite like the typical *E. minima* from the Alps. As pointed out by R. Wettstein ('Mon.' 159), *E. minima* varies much with regard to the colour of the corolla; the true *E. scotica* represents a form with pale or whitish flowers (f. *pallida*, Gremli); but from this we find all possible variations of colour until a form with dark purple corolla (f. *purpurascens*, Wettst.) . . . it is the same form which has been described as *E. foulaensis*, Towns., *apud* Wettstein. I have examined Mr. W. H. Beeby's specimens from Hamnafeld on Foula, upon which F. Townsend has made his description, and they are after my opinion only rather coarse, unbranched *E. minima* with dark purple corollas and long capsules; the specimens were found among heather, and this explains their somewhat flexuose stem. Both Wettstein and Townsend compare it with *E. latifolia*, Pursh; but it is easily distinguished from it by its nearly glabrous leaves; common to both forms are the obtuse teeth of the leaves and bracts. The same form has been described in 1870 by E. Rostrup ('Faeroernes Flora,' p. 48) as *E. gracilis*, f. *atropurpurea*, Rostr., which consequently is the name to be used. I have seen Rostrup's specimens (from Hestö), and found them almost identical with Beeby's specimens of *E. foulaensis*. The synonymy of the form is,

then, as follows :—*E. minima*, Jacq., f. *atropurpurea* (Rostr.) = *E. minima*, f. *purpurascens*, Wettst. = *E. foulaensis*, Towns."

1953. *Rhinanthus Perrieri*, Chabert, in "Bull. de l'Herb. Boiss." 1899 (Or. *g*), p. 512. Dr. von Sterneck ("Mon. der Gattung Alectorolophus," p. 108, 1901), while quoting in synonymy the above name for his *rusticulus*, says : "Die Exemplare von Modäne beschreib Chabert, a.a. O, unter dem Namen *Rhin. Perrieri* und stütze die Begründung der neuen Art einzig und allein auf das Anwachsen der Corolla in Laufe der Anthese. Die übrigen die neue Sippe characterisierenden Merkmale (der kurze Stengel, die 'Calyces aenochroi,' die mangelende Verzweigung) deuten direct ihre Stellung in der monticolen Formenreihe, somit ihre Identität mit *A. rusticulus* an."

Therefore, as he also alludes to *R. Perrieri* under *A. minor*, I followed Sterneck in choosing *rusticulus* as the specific name (for which we are also indebted to Chabert), since a species, founded primarily on a character possessed only in common with other species of the genus as is *Perrieri*, cannot be cited.

(*To be continued.*)

ON THE FLORA OF SHETLAND.

By William H. Beeby, F.L.S.

Last year attention was devoted to the central portion of the main isle, a part which I had been unable to visit before. Although there is a good deal of limestone in this district and I had anticipated that the flora might exhibit some interesting features, the country did not prove very productive. Three long ranges of hills, the Easter Kame, Mid Kame, and Wester Kame, run parallel for miles. Their average height may be called 400-500 feet, with many higher points, the highest, Scallafield, in the Wester Kame, reaching 921 feet. For a long distance the ridges are but a quarter of a mile apart, so the valleys are narrow. A limestone dyke runs along the whole length of the Weisdale valley, but it is mostly covered with surface soil which

affords fine pasturage. This is so well looked after by the sheep that there is not much left for any other collector.

New Shetland records are marked *.

Sagina Linnæi, Presl.—This plant must be expunged from the Shetland List. It was recorded partly on my own, partly on another determination; but the plants prove to be a form of *S. subulata*. I had suspected this, and it is now confirmed by Dr. Ostenfeld.

Montia lamprosperma, Cham.; Syn. *M. rivularis* auct. nonnull. (non Gmelin).—This is a new name, rather than a "new British plant," as it has been called. In his last article in the "Botany of the Faroes" (iii. 853) Dr. Ostenfeld, following Dr. Harald Lindberg, adopts the above name in place of *M. rivularis*, on the sufficient ground that Gmelin did not describe the seeds. In consequence of this omission, we find that *M. rivularis* is variously placed by different authors. On proceeding to examine my material, both British and foreign, I found that the separation of *M. fontana* into two forms was not quite the simple matter that I had supposed it to be; for we have, in Britain, three distinct forms of seed which may be characterised as follows:—

1. Seeds entirely covered with large coarse tubercles, and quite without reticulations; black, dull or slightly shining.
2. Seeds covered on their face with rather coarse reticulations, but with about three rows of much smaller and more conical tubercles on each side of the keel, which is also minutely tuberculate; black and perhaps rather more shining.
3. Seeds entirely covered with fine reticulations which are a good deal longer and narrower than those of form 2; black, or more usually dark brown or purplish brown, polished, and quite without tubercles.

I propose the following arrangement of these forms; the counties named are those whence I have specimens, and must not be taken to represent their distribution or comparative rarity.

Montia fontana, L.

ssp. *minor*, Gmelin.

var. *a. chondrosperma*, Fenzl ap. Ledeb. (syn. *M. fontana*, Cham. in "Linnæa," 1831, pl. 7, fig. 1.; *M. fontana*, var. *minor*, Syme). Seed form No. 1.—Surrey.

b. intermedia, Beeby ined. (syn. *M. fontana*, var. *minor*, "Bab. Man."; *M. rivularis*, Garcke?). Seed form No. 2.—Cornwall W., Surrey.

ssp. *lamprosperma*, Chamisso, *l.c.* pl. 7, fig. 2 (syn. *M. fontana*, var. *major*, Bab. ; *M. fontana*, var. *rivularis*, Syme). Seed form No. 3.—Shetland.

I think there is very little doubt that Syme's var. *rivularis* is the same as *M. lamprosperma*, but his description of the fine reticulations as "flattened tubercles" is perhaps hardly happy. He describes the seeds as larger, "more inclining to claret-colour," and shining.

I take no account of the land and water states of these plants, since they are merely temporary conditions directly induced by the environment, and not varieties.

I have not seen the original description of var. *chondrosperma*, Fenzl, and for the meantime have relied on that given by Rouy and Foucaud—"Graines opaques, fortement tuberculeuse."

Arctium minus, Bernh.—I have now been able definitely to identify, as above, the plant recorded as "*A. intermedium*, Lange?" ("Scott. Nat." 1891, p. 28.)

* *Taraxacum spectabile*, Dalhst., ssp. *Geirhildæ*, Beeby, ined.—Differs from the type in the leaves being always undivided, whether growing among long herbage or on bare ground. (In the type they are undivided when among herbage but deeply lobed when on bare ground). After sixteen months' cultivation on bare ground the plants have never borne a lobed leaf, although the whole-leaved state of the type quickly assumes the bare-ground state, with lobed leaves, under similar conditions. The leaves are also of a much paler, yellower green, thus contrasting strongly with the dark brown-red midrib. The flowers are one-fifth to one-fourth more in diameter than those of the type when grown side by side; of a darker (browner) yellow; and copiously furnished with pollen, while the type is epolliniferous. The phyllaries and fruits are similar to those of the type.

The name has indirect reference to one of the localities, the Loch of Girlsta, formerly Geirhildarstadr; here Geirhild, Hrafna Floke's daughter, was drowned when accompanying her father on his voyage to Iceland about the year 870, as we are told in Landnámabok.

The sub-species occurs plentifully on rock ledges, among heather, and in grassy places by the east side of Lang Klödi Loch, Northmaven; also among rocks and heather by the Loch of Girlsta, and elsewhere in Nesting and Weisdale.

I have always found the type to be pollenless until this year, when I found pollen-grains on the stigmas; but as the pot was standing next to that containing the ssp. *Geirhildæ*, it is possible that the pollen had been conveyed by insects.

Euphrasia. — In the "Botany of the Faeroes" (iii. 845-7) Ostenfeld has made important changes in the arrangement of the Faeroean species; and, as these are the same as those found in Shetland, his conclusions, based on the examination of many hundreds of the specimens from the Faeroes, Shetland, Scotland, and the continent demand our attention. Dr. Ostenfeld now unites *E. scotica*, Wettst., *E. foulaënsis*, Towns., and the Faeroean "*E. latifolia*" (which is obviously not the same as the Scottish plant) under the name *E. minima* Jacq. It would occupy too much space to quote Ostenfeld's arguments, and reference must be made to his article; but I am strongly disposed to accept his conclusions, especially regarding the identity of *E. scotica* and *E. foulaënsis*, as I have long been unable to separate these two plants, and specimens which I considered quite the same as the Foula plant, and which were sent to Townsend a few years after gathering the original *Foulaënsis*, were returned to me named *E. scotica*.

Rhinanthus stenophyllus, Schur.—Under this autumnal variety of *Rh. minor* I should place plants from the following localities:—Cornfield, Baltasound, Unst.; borders of oatfield, Sand Voe, Northmaven; Walls; cornfield, Clousta, and by Clousta Voe.—Mr. Marshall has kindly looked through my plants, and while he would place some of the above under *Rh. stenophyllus*, he expresses a little doubt in other cases; if, however, the presence of intercalary leaves is the important character that it is said to be, I think that they should stand under the above form.

**Salix cinerea*, L.—This is an addition to the list, Edmondston's Gluss Burn plant having proved to be *S. aurita*. ("Scott. Nat." 1890, p. 216.) It occurs abundantly on a holm in the Muckle Mill Loch of Uyea, Northmaven, and I think that it occurs on holms in Clubbi Shuns, but owing to the depth of the water I could not get near enough to make certain.

Iris pseud-acorus, L.—The summer of 1908 having been "the finest for twenty years," I was at first much surprised to find no vestige of bud, flower, or fruit, although the plant was plentiful. The previous summer, however, was just the reverse, in fact it was quite "Faeroe weather," Scotch mist alternating with rain and little or no sun; so that the soil was continuously in a cold sodden state, and evidently the Iris was unable to ripen its shoots in that year, and consequently it did not flower in 1908. For the same reason the Orchids did not flower; and although *O. maculata*, var. *ericetorum*, occurred everywhere among the heather, none was seen in flower.

Triglochin maritimum, L.—In a small bog by the Kergord Burn, alt. c. 35 m., and two and a half miles from the sea. Apparently very rare in Britain in truly inland situations.

Scirpus lacustris, L.—Since I first saw this plant in Sandwater Loch when driving past, some fifteen years ago, it has increased greatly, and huge beds of it now occupy much of the lower half of the loch. I was surprised to learn on the testimony of several old inhabitants that some thirty years ago the plant was entirely unknown there. It is first recorded from this locality by Peter White, in Tudor's "The Orkneys and Shetland," 1883. Local opinion attributes its introduction to the flocks of swans which rest on the loch during migration, and as the southward migration of the common Shetland species, *Cygnus musicus*, corresponds with the time when the fruit of the *Scirpus* is ripe, this may perhaps be the explanation. The nuts may have been brought from the Loch of Lund, Unst, where the plant has been known since 1837.

**Cystopteris fragilis*, Bernh.—This long-expected fern was found in some abundance on a group of limestone rocks on the Pettawater Burn, about half-way between Pettawater and Sandwater.

The Comparison of the Shetland and Faeroe Lists.—A short time ago ("Annals" 1907, p. 165) I made reference to some discrepancies in the "Supplement to Top. Botany" affecting Shetland, but Mr. Bennett has apparently been content to rely on his imperfect record as the basis of comparison with the plants of the Faeroes. There are various mistakes in Mr. Bennett's article (No. 67. pp. 36-40), the correction of which involves a reduction of eighteen per cent in the number of Shetland absentees given on page 39.

There is no need to regard too seriously Mr. Bennett's Shetland exclusions when one half of them appear as inclusions in his Supplement referred to; and it will suffice to say that after making allowance for

1. An initial wrong count,
2. Six Shetland species excluded,
3. Two extra-Faeroean plants interpolated, and
4. One species wrongly accredited to Shetland,

there is found to be, on balance, a reduction of nine, so that the number of species occurring in the Faeroes, etc., but not in Shetland, is brought down to forty instead of forty-nine.

I am chiefly concerned to maintain the accuracy of the Shetland List; and I do not know how the other vice-counties have fared further than that their lists will certainly bear revising.

There are several omissions from the short list of extra-British plants found in the Faeroes.

THE HIGH ALPINE FLORA OF BRITAIN.

BEING A LIST OF THE FLOWERING PLANTS AND FERNS FOUND AT A THOUSAND METRES AND UPWARDS ON THE MOUNTAINS OF THE BRITISH ISLES, WITH AUTHENTIC REFERENCES AND CRITICAL NOTES.

By Frederic N. Williams, F.L.S.

(*Continued from p.* 36.)

Fam. 22. Saxifragaceæ—*Continued.*

70. *Saxifraga cernua*, L.—First recorded as a British plant by R. Townson, who found it on alpine rocks on the summit of Ben Lawers, in 1790 (Hooker, "Fl. Scotica"); but the earliest printed record is in 1794, "amongst the rocks on the summit of Ben Lawers" (J. Dickson in "Trans. Linn. Soc." ii. 290); from which elevation there are also examples in herb. Smith (*ex* herb. A. Bruce, 1805) and in Herb. Brit. (R. Brown, 1793, J. Carroll, 1864), and from the same mountain, height not stated (G. Don, 1794, G. Horn, 1876, G. F. Hampson, 1893). Recorded also from Ben Lawers on the authority of J. Dickson (Smith, "Fl. Britannica," 453 [1800]). "It is to be hoped that botanists, when taking specimens, will bear in mind that the limited station on Ben Lawers is the only place in Britain for this plant" ("Fl. Perthsh." 141). Rock-soil schistose. In considerable quantity near the top of Ben Lawers, in 1905 (E. Cleminshaw, in Rep. Watson Bot. Exch. Club, ii. 52); previous observers stating that the plant is almost extinct.

71. *Saxifraga hirta*, J. Donn (1809).—Near the summit of Macgillicuddy's Reeks (J. T. Mackay in "Trans. Roy. Irish Acad." xiv. [1825], where it was found in 1805. The figure in Smith's "English Botany," t. 2291, was published two years afterwards, on June 1, 1811; and was drawn from a garden specimen supplied by Joseph Woods.

Syn. *S. Sternbergii*, W. (1809), *S. hypnoïdes*, var. *Sternbergii*, "Cyb. Hib." ed. 2, 131.

S. hirta, Haworth, "Syn. Plant. Succ." (1812) = *S. sponhemica.*

72. *Saxifraga rivularis*, L.—Alpine streams and wet rocks. Earliest record as a British plant on Ben Nevis, where it was found by R. Townson in 1790 (J. E. Smith, in Linn. "Fl. Lapponica," ed. 2, 143 [1792]; and in herb. Smith, Townson, 1790, also Turner and Hooker, 1807. Ascends to 1067 m. on Ben Lawers; "it is still there, but in very small quantity" ("Fl. Perthsh." 141). Ben Nevis; gathered at an elevation of 1006 m. "in a spot irrigated,

while the plant is in flower, by water trickling from the melting snow shortly above; also on the northern declivity of the adjacent Red Cairn Hill, in a spot upon which the snow probably lies till July," and which is at an elevation of 1100 m. ("Cyb. Brit." i. 413). On the eastern precipice of Loch-na-gar, and on the west side at the height where *Carex leporina* grows (Dickie, 66). Northern precipices of Cairn Gorm, at 1190 m. (A. Ley, 1874, n. 541, in Herb. Brit.). Cairn Toul, at 1100 m. E. S. Marshall, 1886, in Herb. Brit.). Aonach Beg, above 915 m. (E. S. Marshall, 1896, in Herb. Brit.). Stob-Coire-an-Easain, at 1037 m. (E. S. Marshall, in "Journ. Bot." 1897, 67).

73. *Saxifraga cæspitosa*, L.—A rare plant found high up on alpine rocks. Messrs. Groves ("Bab. Man." ed. 9) omit any reference to Scottish mountains, except the vague area "Aberdeenshire." Mr. E. S. Marshall ("Journ. Bot." *l.c.*), however, says,—"The true plant was obtained on one of the Glen Spean mountains, very scarce and small; we believe that the locality is one in which it was met with by some Scottish botanists a few years ago." This locality is in Inverness-shire. In Herb. Linn. one specimen under this name is from Idwal Lake in Caernarvonshire; the other specimen is quite a different plant, without any note about its origin. The Linnean description is somewhat vague, and may be applied to several distinct plants.

74. *Saxifraga nivalis*, L.—First recorded as a British plant "on Snowdon hill," 1666 (Merrett, "Pinax Rerum Nat. Brit." 111), where it is found on alpine rocks. Found in clefts of alpine rocks up to the summit of Ben Lawers ("Fl. Perthsh." 142), where its usual position lies between 732-915 m. ("Cyb. Brit." i. 408). Stob-Coire-an-Easain, at 1037 m. (E. S. Marshall, in "Journ. Bot." 1897, 67). "On rocks on Ben Lawers" (G. Don, 1794).

75. *Saxifraga stellaris*, L.—This plant reaches the highest point possible in the British Isles; it grows at the base of the cairn erected on the summit of Ben Nevis, where John Sadler in 1876 found a single very small plant ("Trans. Proc. Bot. Soc." Edinb. xiii. 53 [1878]):—"At a short distance above the spring, or about 3500 feet, phanerogamic vegetation and soil almost wholly disappear, only lichens and a few mosses are seen on the large blocks of porphyry with which the upper part of the mountain is covered." Common in the Silurian area. Found in alpine marshy places up to the summits of Ben Lawers and Ben Alder ("Fl. Perthsh." 142). Brought down by water in the Breadalbane district to 90 m. above sea-level. First recorded as a British plant under the name of "Cotyledon hirsuta sive Sedum petræum hirsutum" in 1641, "upon the moyst Rockes at Snowdon" (Johnson, "Merc. Bot." ii. 19). Beside the cairn on the summit of Ben Macdhui (Dickie, p. xxiii., but not referred to under the species on p. 64). "Flowering close

to patches of snow unmelted in July or August" (Watson, "Outlines Geograph. Distrib. Brit. Pl." 1832, p. 157). Ben Lawers (Wm. Gardiner, 1842, in Herb. Brit.). Summit of Ben Avon (Wm. Gardiner, 1844, in Herb. Brit.—dwarf state). One of the most generally distributed of our arctic or alpine species; and exclusively limited to the mountainous districts on wet rocks and marshy places by mountain rills. On the north side of Carn Tual, from 229 m. to the summit. Descends to 150 m. in Donegal ("Cyb. Hib." ed. 2, 125). Along the Snowdon range in many places (W. Brand, in herb. Watson). In a small spring near the summit of Ben-na-Bourd, 1832 (herb. Watson).

76. *Saxifraga umbrosa*, L.—Found in Ireland only; and on nearly all the mountains of Kerry, from sea-level up to 1027 m. on Carn Tual (Hart, 1881, in "Proc. Roy. Irish Acad." 1882, p. 578). "In Kerry, Connemara, and Waterford, the prevalent leaf-form is one with strongly serrate margins, and truly crenate forms are very rare in Ireland" ("Cyb. Hib." ed. 2, 128). Summit of Carn Tual (J. Carroll, 1853, in Herb. Brit.). First reported as an Irish plant by Rd. Heaton in 1650 (How, "Phytologia"). Accidentally omitted by Linnæus from first edition of *Sp. Plantarum*, as it is duly mentioned in *Hort. Upsaliensis*, p. 108, n. 2 (1748), under Magnol's name. The two alpine Saxifrages which follow may be noted here, but are not satisfactorily cleared up, and are possibly forms of *S. sponhemica*.

? 77. *Saxifraga platypetala*, Smith (1811).—Recorded from Snowdon (Dawson Turner, in herb. Smith, and Herb. Kew.). "Mr. Turner gathered this Saxifrage upon Snowdon in 1802, and communicated it to us long ago as a new species" (Smith, "Engl. Botany," t. 2276, 1 May 1811).

? 78. *Saxifraga lætevirens*, D. Don (1822).—"In very elevated situations, upon moist rocks, on the mountains of Angusshire and Aberdeenshire" (G. Don, in Smith, "Engl. Flora," ii. 280).

79. *Chrysosplenium oppositifolium*, L.—Ascends to 1037 m. on the mountains of the Breadalbane district, on damp and shady rocks ("Fl. Perthsh." 144). "Grows very near the perennial snow" (Watson, "Outlines Geograph. Distrib. Brit. Pl." 1832, p. 157). There is, however, no "perennial snow" on the Perthshire mountains.

Fam. 23. Crassulaceæ.

80. *Sedum roseum*, Scop.—Common on damp alpine rocks in the Breadalbane district, ascending to 1175 m. on Ben Lawers ("Fl. Perthsh." 146). Ben Lawers, near the summit (T. A. Sprague, 1895). Descends to sea-level in Galway.

81. *Sedum villosum*, L.—Widely distributed in marshy places on the mountains of the Breadalbane district, ascending to 1100 m.

as on Ben Lawers ("Fl. Perthsh." 146). Ben Lawers, 1807 (Herb. Kew.).

Fam. 24. UMBELLACEÆ.

82. *Heracleum sphondylium*, L.—Ascends to 1006 m. in the Breadalbane district ("Fl. Perthsh." 161). Descends to sea-level in Cork.

Fam. 25. CARYOPHYLLACEÆ.

83. *Melandryum diurnum*, Fries (1842).—On the cliffs of Cairn Gorm, at 1000 m. (G. C. Druce in "Journ. Bot." 1889, 202). Ascends to 1067 m. on Loch-na-gar (F. B. White in "Scot. Nat." i. 119 [1871]). Descends to sea-level on Lambay island, off the coast of Dublin (H. C. Hart, 1883).

Syn.—*Lychnis dioica*, L., Sp. Plant. 437 (1753), excl. varr. β et γ; *Lychnis dioica*, var. *rubra*, Weigel, "Fl. Pomerano-Rugica," 85 (1769); *Lychnis silvestris*, Schkuhr, "Handb." i. 403, t. 124 (1791); *Saponaria dioica*, Moench, Meth. Plant. 76 (1794); *Lychnis diurna*, Sibth. "Fl. Oxon." 145 (1794); *Saponaria diurna*, Fenzl, in Endl., "Gen. Plant." 974 (1840). To associate the Linnean specific name (of the aggregate) with *Melandryum* would unnecessarily make a new combination, and increase the synonymy.

84. *Silene acaulis*, L.—First recorded as a British plant in 1641, under the name of "Caryophyllus montanus minimus sive Caryophyllus pumilio alpinus" (Johnson, "Merc. Bot." ii. 18). The earliest locality given is "on the steep and higher rocks of Snowdon Hill in Carnarvonshire" (Ray, "Syn. Meth. Stirp. Brit." 141 [1690]); and found almost everywhere on Snowdon by Edward Lloyd (in Gibson's edition of Camden's "Britannia," 1695). Snowdon (J. Turner, 1806, in Herb. Kew.). On the upper ledges of Snowdon everywhere (Banks, 1773, in Herb. Brit.); summit of Snowdon (herb. Mrs. Robinson, in Herb. Brit.—before 1847). Carnedd Dafydd, Carnedd Llewelyn, and Snowdon (J. E. Griffith, "Flora" [1895]). On the summits of the loftiest mountains in Scotland (Smith, "English Fl." ii. 299). On all the elevated mountains of Scotland (Hooker, "Fl. Scotica," 135). "The flowers have no scent, but they constitute one of the most charming ornaments of the green-headed Scottish Alps" (Smith). Ascends to the summits of Ben Lawers ("Fl. Perthsh." 77), Ben Alder (White), Ben Macdhui (Watson, 1832), and Ben-na-Bourd (Watson, 1844). Abundant on Ben Dearg, in Ross-shire (with both white and red flowers), also on several other hills in the neighbourhood, up to 1006 m. (G. C. Druce in "Ann. Scott. Nat. Hist." 1903, 228). The drawing for "Engl. Botany," t. 1081, was from a Snowdon specimen supplied by Dawson Turner in 1802.

85. *Alsine sedoides*, Kittel, "Taschenb. Fl. Deutschl." ed. 2, 997 (1844).—Ascends to the summit of Ben Lawers, on bare

ground and rocks ("Fl. Perthsh." 84). Near the summit of Ben Lawers (Wm. Gardiner, 1842, in Herb. Brit.). Abundant on the ridges of Ben Dearg (in Ross-shire), and on two other hills in the district, up to 1100 m. (G. C. Druce in "Ann. Scott. Nat. Hist." 1903, p. 228). Syn.—*Cherleria sedoides*, L., "Sp. Plant." 425 (1753); *Mœhringia sedoides*, Clairv., "Man. Herb." 150 (1811); *A. Cherleria*, Petermann, "Deutschl. Fl." 85 (1846-1849); *A. Cherleriana*, Saint-Lager, in "Ann. Soc. Bot. Lyon," vii. 144 (1880).

86. *Alsine rubella*, Wahlenb.—"I found the plant upon Ben Lawers in Breadalbane, and I never observed it anywhere else. I believe it to be new to Britain. I first found it in 1793 in company with Mr. John Mackay" (G. Don, *mss.* in Herb. Mus. Brit.). This label is attached to specimens in Sowerby's herbarium, used for the figure in "Engl. Botany Suppl." t. 2638; where after the description D. Don writes, "Found by the late Mr. J. Mackay and Mr. G. Don, many years ago on the summit of Ben Lawers." To these specimens G. Don gives the provisional name of *Arenaria alpina*. *Alsine rubella* first appears as a British plant in Smith, "English Fl." ii. 309 (1828). Rocks on the summit and above the loch of Ben Lawers (G. Don, J. Mackay, 1794, and Wm. Gorrie, 1840, in Herb. Brit.). The south limit of the plant in Europe is on the summit of Craig-na-Caillich, above Loch Tay, Perthshire, at 912 m. (R. K. Greville, 1824, in Herb. Bot. Gard. Edinb.). A more recent record is "on rocks near the summit of Ben Lawers" (R. Lindsay in "Trans. Proc. Bot. Soc., Edinb." xxi. 104 [1898]). Fenzl, in Ledebour, "Fl. Rossica," i. 347-350 (1842), has included under *Arenaria verna*, L., a great many forms and species distinguished by different authors. The large-flowered typical form of *A. verna*, such as is found in the Swiss and Italian Alps, is not found in arctic regions, but there are in the Alps other forms which connect it with the arctic forms. Among such arctic forms it is not possible to group the plants and separate them by definite characters. In the driest stations the plant appears as var. *rubella*, generally even smaller and with shorter peduncles, as the figure of Wahlenberg shows. In somewhat moister and looser soil, it gets longer internodes, more leafy branches and longer flower-stalks, which are often 2- to 3-flowered, that is to say, it goes over to var. *hirta* Gürke (= *Alsine hirta*, Hartman [1838]). The above critical note is taken mainly from Mr. H. G. Simmons' interesting remarks on the species in his "Fl. of Ellesmere Land" (1906).

87. *Sagina procumbens*, L.—Ascends to 1006 m. on bare ground on the mountains of the Breadalbane district ("Fl. Perthsh." 86), such as Ben Ein (E. S. Marshall, 1889, in Herb. Brit.). Descends to sea-level in Cork.

88. *Sagina stricta*, Fries, "Novit. Fl. Suecic." i. 74 (1814-1823).—This I believe to be the species to which should be referred the plant mentioned in Mr. F. N. Garry's "Notes" in "Journ. Bot." 1903, suppl. p. 36, in regard to the specimen in herb. Sowerby, probably used for the figure of *Sagina maritima* in "Engl. Botany," t. 2195 (issued September 1, 1810): wherein it is stated, "Mr. G. Don sent the same from the summit of Ben Nevis in 1803." This interesting specimen has Don's label attached, and is here transcribed with the original spelling in the characteristic orthography of this remarkable botanist:—"*S. alpina*, this I believe to be a new species. I found it upon ben Nivis in Lochaber, this answers to the following description: foliis radicalibus linearibus, obtusis nitidis flore apetalo; this differs from the *apetala* in the radical leaves being broader and obtuse and [?] opening, and it is a considerable larger plant. I have cultivated this and *apetala* both for 2 years, and they remain permanently different. This is a cultivated specimint, but it is in no way different from the wild spe. in appairance; found in 1794." In support of this identification, Messrs. Groves (in Bab. "Man." ed. 9, p. 58) write that "Fries states that his plant sometimes occurs upon mountains in Norway; and G. Don seems to have found it on Ben Nevis." The plant from Cairn Gorm, referred to *Sagina alpina* by Mr. G. C. Druce (in "Ann. Scot. Nat. Hist." 1892, p. 273), has a central rosette, short peduncles, and sepals equalling the petals, and seems to me to be much nearer the type of *S. maritima*, G. Don, "Herb. Brit." fasc. vii. n. 155 (1806), than to the same botanist's *Sagina alpina*, found by him on Ben Nevis. Mr. G. C. Druce made an ascent of Ben Nevis for the express purpose of finding Don's plant, but the weather being unfavourable, with cold and driving rain, the search unfortunately did not prove successful—that is supposing it to be still in existence there. We have then but David Don's statement that his father found it still there in 1803, nine years after he first discovered it on the mountain. In English floras *S. stricta* is given as a synonym of *Sagina maritima*; but the former, like Don's plant from Ben Nevis, is distinguished by the following characters:—peduncles straight, not ascending, less shining, flowers apetalous (Mr. Druce's *Sagina alpina* from Cairn Gorm has conspicuous petals), sepals lanceolate subacute, not oval obtuse, leaves subcylindrical (not lanceolate-linear) and quite obtuse, with shorter internodes, stem usually solitary and without a central sterile rosette, simple at the base and slightly dichotomously branched above, always firm and strict from being more stoutish with closer leaves. The specimen, dated 1803, is in herb. Smith, and agrees exactly with that dated 1794 in Herb. Mus. Brit.

Syn. *S. maritima*, var. *alpina*, Syme, "Engl. Botany," ii. (1865); *S. maritima*, var. *stricta*, Clavaud, in "Act. Soc. Linn.

Bordeaux," xxxv. 386 (1881); *S. stricta*, var. *α alpina*, Fries, "Novit. Fl. Suecic." ed. 2, 58 (1828).

Its continental distribution includes Sweden, Norway, Finland, France, and N. Italy.

89. *Sagina Linnæi*, Presl.—Ascends to the summit of Ben Lawers ("Fl. Perthsh." 86). "At great heights even near the summit of Ben Lawers" (R. Brown, 1794, in Herb. Brit.). Smith ("Fl. Britannica," ii. 504 [1800]) says, "Mr. J. Mackay gathered it on Ben Lawers in 1794." Hooker, however ("Fl. Scotica," 145 [1821]), thinks it was first found by G. Don previously on Meall Ghaordie. Some other plants gathered here by G. Don are dated 1793. Ben Lawers, a series of examples gradually passing from the erect hardy rooting form of the summit into the ordinary procumbent more or less rooting form which descends to 762 m. (E. S. Marshall, 1887, in Herb. Brit.). Between 945-1022 m. on Ben Lawers (Prof. Balfour, 1864, in Herb. Brit.). Ascends to 1070 m. on Ben Ein (W. R. Brunton, 1864, E. S. Marshall, 1887, in Herb. Brit.). Corrie near summit of Stob-Coire-an-Easain-Mhor, above Loch Triag, 1891, Herb. Brit. *ex* herb. J. H. Morgan). Ben Lawers (J. Mackay, 1794, in Herb. Kew.); Meall Ghaordie (Herb. Kew. *ex* herb. Dawson Turner, dated 1789), "This is the earliest British specimen of the plant I have seen, and is very probably one gathered by G. Don, referred to above, as it is among Hooker's Scottish plants. Ascends to 1006 m. on the Grampians of Aberdeenshire" (G. C. Druce in "Ann. Scot. Nat. Hist." 1900, p. 168).

(*To be continued.*)

ZOOLOGICAL NOTES.

Pygmy Shrew 2000 Feet above Sea-level.—In November a Shrew was sent to me, which had been found crossing a snow-patch at an altitude of at least 2000 feet, by Mr. Ferguson, head stalker of Coiynafearn deer forest. It was subsequently identified at the Royal Scottish Museum as a specimen of the Pygmy or Lesser Shrew—*S. minutus*. It will be remembered that one of these little animals has been recorded from the summit of Ben Nevis.—Chas. H. Alston, Letterawe, Loch Awe.

The Occurrence of Phylloscopus borealis, not P. viridanus, at Sule Skerry : a Correction.—In the "Annals" for 1903, p. 22, I recorded the occurrence of the Greenish Willow Warbler (*P. viridanus*) at the Sule Skerry lantern on 5th September 1902; and on 22nd October 1902, the late Mr. Howard Saunders exhibited this specimen at the British Ornithologist's Club, and confirmed my iden-

tification (cf. "Bull. Brit. Orn. Club," xiii. 12). Having had occasion to re-examine this specimen, I was convinced that a mistake had been made, and that the bird was a specimen of Eversmann's Warbler (*P. borealis*) — a conclusion with which Dr. Hartert entirely agrees. Mr. Saunders and myself were both mistaken, being misled by the fact that the bird had only a single wing-bar. This conspicuous character is, however, shared by a considerable number of specimens of *P. borealis*, though the fact is not stated in any of the works on palæarctic birds to which I have access, and in most of them much importance is made of the double wing-bar which is more or less in evidence in the majority of examples of that species.

One now wonders if the specimen of *P. viridanus* obtained in North Lincolnshire by Mr. Caton Haigh, in the autumn of 1905, and also exhibited at the Ornithologist's Club, was really of that species and not *P. borealis*: the latter bird, from its being a summer visitor to northern Europe, is much the more likely to occur than its more eastern congener.—Wm. Eagle Clarke.

Long-eared Owls near Lerwick, Shetland.—On the 25th of February 1909 I was out at Hayfield, near here, and saw three Long-eared Owls among the trees. For the last fortnight of February we had a spell of marvellous weather, more like summer than early spring. Probably this may have been an inducement for them to visit us. Two of the birds had been seen by the Hayfield household for a couple of weeks before, but the third was only seen for the first time on the 25th February. I do not remember hearing of them at this season before. I saw quite a lot of Blackbirds at Hayfield too.—John S. Tulloch, Lerwick.

Nesting of the Stock-Dove in Lanarkshire.—In the Blantyre district of Clyde valley the Stock-Dove (*Columba œnas*) is now becoming quite established as a breeding species. In the autumn of 1906 I was informed by an acquaintance who pays some attention to bird-life, that he felt sure the Rock-Dove was breeding, as he had seen one in the summer flying out from a rocky bank. Having an idea that he meant the Stock-Dove, I determined to find out in the following summer; and was successful in finding two nests in the beginning of May. In one of these two young ones were successfully reared; but the other pair of eggs were, I think, destroyed by Magpies, which are far too plentiful here.

Last season I located four pairs breeding here, but only the small total of three young were fledged. The nesting sites chosen were all pretty similar—a shelving part in the rocky bank; and in no case was there much attempt at nest-building. — Walter Stewart, Blantyre, Lanarkshire.

Whooper in Fifeshire.—On 18th January I picked up a dead Wild Swan (*Cygnus musicus*) at the edge of Morton Loch, near Tayport. I had no hand in compassing its death, but it may very

possibly have been shot at about the Tay Estuary, and have flown inshore to this Loch after being wounded. It was recently dead when found.—WILLIAM BERRY Tayfield, Newport, Fife.

Gadwalls in Fifeshire.—Since I wrote my note on this species for the January number of the "Annals," I have two more occurrences of the Gadwall (*Anas strepera*) to record for this district. On 25th January a pair were seen at "flight time" on the Morton Loch, near Tayport, on the Tay Estuary, one of which, a drake, was secured and sent to the Royal Scottish Museum. On the 29th a flock of between 29 and 30 appeared at the same loch, three of which, as it happened, fell to one shot. From this I think it may be assumed that the whole flock was made up of Gadwalls, but it was too dark at the time to allow of species being otherwise identified with any certainty. Of the birds secured, two, a drake and a duck, were in full adult plumage, and these were also sent to the National Museum.—WILLIAM BERRY, Tayfield, Newport, Fife.

The Occurrence of the Gadwall in Orkney.—The occurrence of the Gadwall (*Anas strepera*) in Orkney may be of interest, as the species is described as being only an occasional visitant to the islands. On 8th March 1904 I got an adult drake on Loch Stenness, knocked out of a large pack of Wigeon. Two days afterwards I saw a female sitting on the loch about 150 yards from the shore. The second occurrence was on 14th December 1906, when I saw an adult male paired with a female Wigeon. I could have shot him two or three times as he passed close to me in his endeavours to get the Wigeon away, which he eventually did in safety for the time being; but about half an hour later I again saw them fly into this particular bay, and with a long high shot dropped the female bird, which I naturally thought was a female Gadwall. There is no doubt as to his being a Gadwall, as he twice passed well within shot on our first meeting, showing all his beautiful markings distinctly.—H. W. ROBINSON, Lancaster.

Heronries in Forth.—The list of "Forth" Heronries given in Mr. Boyd Watt's paper in the "Annals" for October last needs a good deal of "starring" and other explanation. According to my information there are now only four Heronries in the Forth area, namely, Tyninghame (not, however, Binning Wood, which was abandoned some fifty years ago), about 20 pairs (I remember when there were twice that number); Donibristle, about 10 pairs; Blair-Drummond, 4 or 5 pairs; and Brucefield, adjoining Tulliallan, 15 to 20 pairs. The other localities mentioned have either been entirely or practically abandoned, or never could boast of more than one or perhaps two nests now and again. The Dalkeith heronry ceased to exist over forty years ago.—WILLIAM EVANS, Edinburgh, December 1908.

Parasitic Habits of the Black-headed Gull. — In the recent notes in the "Annals" on the 'Food of the Black-headed Gull,' mention has been made of this species robbing Lapwings only, but I have lately noticed that it does not confine its attention to this bird. Near Loanhead, on 15th December last, I distinctly saw these Gulls robbing Golden Plover of the worms they were catching; while near Portobello, on 14th February, two Starlings were being victimised. In each case Lapwings were also feeding in the field and were being freely robbed. It, therefore, almost appears that this habit having originated with the Lapwing as victim, is being extended to any species feeding alongside, provided it is capturing suitable food and is not powerful enough to withstand the Gull. Following this supposition I have closely watched members of the Thrush family, Redwings in particular, when feeding beside Lapwings and Gulls, but so far I have noticed nothing in their case. Some Curlews, too, which I saw freely catching worms in a field near Annan, on 14th January, were left unmolested, while the Lapwings beside them were being subjected to a most rigorous persecution by these Gulls. This record, with regard to the Lapwings, may be of some interest on account of the locality. It will be interesting to hear if others have noticed birds other than the Lapwing being victimised by Gulls.—G. G. Blackwood, Edinburgh.

The Black-headed Gull as a Persecutor of the Lapwing.—Mr. Laidlaw and Mr. Evans have drawn attention in the "Annals" to the curious lack of records in British bird-books on this remarkable habit. In Mr. Ussher's "Birds of Ireland," p. 332, however, there is the following reference in the account of the Black-headed Gull:—"In severe frost, when Lapwings are driven to the southern pastures, each of these birds may sometimes be seen shadowed by a Black-headed Gull, and the moment the Plover pulls out a worm the attendant Gull rushes forward to seize it; the Lapwing takes flight and doubles like a hare, closely pursued by its tormentor. Possibly the name of Lapwing-Gull may be given in consequence of this habit." It may be worth noting that the habit is of daily occurrence in the Lothians nowadays (during winter), quite irrespective of severe weather.—S. E. Brock, Kirkliston.

Black-throated Diver in Fifeshire.—On 21st January a young Black-throated Diver (*Colymbus arcticus*) was killed at a Loch on Morton, near Tayport, Fifeshire. It was feeding vigorously on trout at the time it was killed, and in fact four trouts, each about 10 inches long, were shaken out of its gullet when is was brought ashore. It is impossible to leave such voracious birds to feed unmolested on what is in fact an artificial fishing loch, and its destruction, otherwise regrettable, was therefore a matter of necessity. As it turned out, however, the Royal Scottish Museum

did not possess a specimen of this Diver in the particular stage of plumage of the bird in question; and it has therefore been accorded an honourable resting-place in the National Collection.—WILLIAM BERRY, Tayfield, Newport, Fife.

Fork-tailed Petrels in Orkney.—On the night of 21st September 1908, the third night of fog, specimens of the Fork-tailed or Leach's Petrel (*Procellaria leucorrhœa*) came to the lantern of the Sule-Skerry Lighthouse, Orkney, and three were captured to send to me by the light-keeper. The Storm Petrel (*Procellaria pelagica*) nests on this island in large numbers, but the Fork-tailed is very rare there. Writing a week previous to their visit, the light-keeper informed me that during his six years' service on the island only three of the Fork-tailed species had been seen there. — H. W. ROBINSON, Lancaster.

Bass in the North Sea in Winter.—Mr. Thomas Cook, fishmonger, Edinburgh, has presented to the Royal Scottish Museum a fine specimen of the Bass (*Labrax labrax*), 23 inches in length and weighing 3 lbs. $5\frac{1}{4}$ ozs., which was captured 20 miles east of May Island on 14th January. This fish is only occasionally captured in Scottish seas, and is rarely taken anywhere in British waters during the winter months.—W. EAGLE CLARKE.

Ray's Sea-Bream in the Firth of Forth.—On the 10th of January a fisherman brought me a fine specimen of this fish which he had picked up on the beach at North Berwick. It was in perfectly fresh condition, and measured 22 inches by 9 inches.—W. M. INGLES, North Berwick.

[Although Dr. Parnell in his "Fishes of the Firth of Forth," published in 1838, regarded *Brama raii* as a somewhat frequent visitor, yet little information regarding this fish has been placed on record since his day. All we know is that several were cast ashore in the Firth in the winter of 1850; and, now, we have Mr. Ingles' interesting record.—EDS.]

Note on the Re-discovery of Apus cancriformis in Britain.—The Editor has requested me to send him an account of my discovery of *Apus cancriformis* in Kirkcudbrightshire in September 1907. There is very little to say about it, but there are one or two facts not mentioned by Mr. Robert Gurney in his short note in "Nature," 10th October 1907, which it may be well to put on record.

I was "fishing" the small pools on Preston Merse, Southwick, for Water-beetles, and having worked my net through a grassy shallow one, I emptied the contents on to my mackintosh sheet, and saw a thick mass of wriggling Apus. The pool was perhaps 6 inches deep, grassy almost all through it, and the water was somewhat fouled by cow dung. There were several hundred individuals

in the first haul, and on looking again at the pool I saw that the water was moving with them. Another similar pond close by was found to be in the same condition.

Both ponds had been much deeper, and were then drying up, which probably accounts for the "density" of the fauna!

On my return to the spot some ten days later, the pools were both dry and hard, and all over the mud were marks of Sea Gulls' feet, the only sign of Apus being a number of "shells" on the mud! On that occasion I found one other pool, rather deeper than the other two, which contained some Apus, and I took the precaution of distributing them in two or three other pools round about, which looked as if they were permanent. All these pools are so situated that they are *very* occasionally submerged by the sea, as I learnt from some of the local inhabitants.

I examined the same ground in July of last year and found all the pools dry, even those which I had thought were permanent. I returned there again in September, and although all the pools were then full of water, there was no sign of Apus.

The appearance of the species in Britain has been spasmodic, it having been recorded, I believe, only some three or four times, so that it can scarcely be called a native species, unless there is some permanent and as yet undiscovered centre in Britain, which seems most improbable. The species is common in Central Europe, and it is certainly remarkable that it should suddenly appear in the south-west corner of Scotland. Dr. Scharff when he heard of my discovery suggested that possibly I had found *Lepidurus glacialis*, an arctic-alpine phyllopod common in Northern Scandinavia, Greenland, etc., and of which fossil remains have been found in the northern parts of the British Islands. There seems no doubt, however, that the Preston Merse species is *Apus cancriformis*.—FRANK BALFOUR-BROWNE, Holywood, Co. Down, Ireland.

Notes on Lepidoptera in the N.E. Highlands.—I. The following is a further list of species unrecorded for Ross-shire in Barrett's "British Lepidoptera" which I have taken, mostly in 1908, at or in the neighbourhood of Swordale.

Leucania lithargyria, Esp.; *Luperina testacea*, Hb.; *Agrotis saucia*, Hb.; *A. præcox*, L.; *A. simulans*, Fb.; *Noctua depuncta*, L.; *Anchocelis litura*, L.; *Xanthia flavago*, Fb.; *Dasypolia templi*, Thnb.; *Epunda lutulenta*, Bork.; *Aplecta tincta*, Brahm.; *Hadena thalassina*, Rott.; *Tephrosia punctularia*, Hb.; *Geometra papilionaria*, L.; *Panagra petraria*, L.; *Hibernia aurantiaria*, Esp.; *Larentia olivata*, Bork.; *Eupithecia trisignaria*, H.-S.; *E. tenuiata*, Hb.; *Herbula cespitalis*, Schiff.; *Ennychea octomaculata*, Fb.; *Scopula alpinalis*, Schiff.; *Alucita hexadactyla*, L.; *Phycis fusca*, Haw.; *Leptogramma niveana*, Fb.; *Peronea rufana*, Schiff.; *P. sponsana*, Fb.; *Penthina marginana*, Haw.; *Sericoris urticana*, Hb.; *Euchromia*

mygindana, Schiff.; *E. arbutella*, L.; *Sciaphila virgaurena*, Tr.; *Phoxopteryx inornatana*, H.-S.; *P. lundana*, Fb.; *Grapholitha subocellana*, Don; *G. trimaculana*, Don; *G. naevana*, Hb.; *G. geminana*, St.; *Hypermecia angustana*, Hb.; *Paedisca corticana*, Hb.; *Ephippiphora similana*, Hb.; *Coccyx argyrana*, Hb.; *C. vacciniana*, *Pamplusia mercuriana*, Hb.; *Stigmonota perlepidana*, Haw.; *S. internana*, Gn.; *Dicrorampha herbosana*, Bar.; *Catoptria cana*, Haw.; *Trycheris aurana*, Fb.; *Simæthis pariana*, L.

II. The following Tineæ have not been recorded so far north in Meyrick's "Handbook of British Lepidoptera":—*Diurnea fagella*, Sta.; *Semioscopus avellanella*, Hb.; *Tinea semifulvella*, Haw.; *Cerostoma vittella*, L.; *C. parenthesella*, L.; *Phibalocera quercana*, Fb.; *Depressaria ocellana*, F.; *D. ciliella*, Stt.; *D. heracliana*, De Geer; *Gelechia nigra*, Haw.; *Chelaria hubnerella*, Don; *Chauliodus chærophyllellus*, Göze; *Lithocolletis junoniella*, Z.; *Bucculatrix nigrocomella*, Z.; *Gracilaria alchimiella*, Scop.

III. The following species unrecorded for so far north were taken in the neighbourhood of Stirkoke, Wick, in the beginning of September 1908:—*Notodonta dromedarius*, L.; *Thyatira batis*, L.; *Cymatophoraor*, Fb.; *Asphaia flavicornis*, L.; *Demas coryli*, L.; *Tapinostola fulva*, Hb.; *Triphæna janthina*, Esp.; *Xanthia flavago*, Fb.; *Selenia bilunaria*, Esp.; *Hypsipetes ruberata*, Frr.; *Botys lutealis*, Hb.; *Peronea sponsana*, Fb.; *Pædisca ophthalmicana*, Hb.; *Halonota similana*, Hb.

It may be worth mentioning that 36 specimens of *Dasypolia templi*, Thnb., were taken at light in Caithness between the middle of September and 22nd of October, forming the greatest proportion of moths taken at that time, even *Plusia gamma*, L., being far inferior in numbers. *Epunda nigra* was also taken.—Dorothy Jackson, Swordale, Ross-shire.

Hystrichopsylla talpæ, *Curt.*, **in Forth and Tweed.** — In my notes on 'Siphonaptera' in the "Annals" for 1904 and 1906, I recorded this large flea from Moles' nests in several places in Midlothian, Fife, and Peeblesshire. Since then I have found it commonly in nests of the same animal in other localities in these counties, and also in East Lothian and Linlithgowshire. During the twelve months from February 1908 to February 1909, I examined 100 moles' nests in the above five counties, and found *Hystrichopsylla* present in about three out of every four, the number in a nest ranging from two up to six or seven. The nests were examined in January, February, March, April, May, and November, and the flea was observed in each of these months, to which may be added August, for which I have already recorded it; so that it probably occurs throughout the year. Larvæ were also found on a number of occasions and were specially noted on 6th February last near Bathgate. The small yellow flea *Typhlopsylla gracilis* was also

present in most nests in all of the five counties.—WILLIAM EVANS, Edinburgh.

Panisus Michaeli, *Koen*, in Selkirkshire.—This was first found by Michael at Davos am Platz. It has since been recorded for Ireland by Halbert, and has also been chronicled by Evans as occurring in the neighbourhood of Edinburgh. Last September I found specimens at the Loch of the Lowes, near the point where it is fed by the stream named on the maps as Little Yarrow, but known locally by another name. I also got one specimen of a nymph.—WM. WILLIAMSON.

BOTANICAL NOTES AND NEWS.

The High Alpine Flora of Britain.—I have observed *Saussurea alpina* at less than 300 feet on the hills south of Durness, W. Sutherland; and a very luxuriant, broad-leaved form from rocks on the sea-shore near Thurso, Caithness, was annotated by its collector, Mr. F. Crawford: "These plants must have been splashed by the salt water." *Cochlearia grœnlandica* is a strictly submaritime species; the alpine plants formerly referred to it are, as is noted in "Journ. Bot.," 1894, p. 290, my *C. micacea*. I have cultivated *C. micacea* for more than twenty years; it is very constant, comes true from seed, and is, in my opinion, quite distinct from *C. alpina*, Wats., which retains its character equally well. I do not now think that we have *C. arctica*, Schlecht., in Britain; but there are some unnamed Scottish coast plants in my herbarium which do not seem to agree well with any known form—especially one from the shore of Loch Linnhe, near Fort William. *Saxifraga quinquefida* from Ben Lawers is, I believe, the common Highland mountain plant now usually assigned to *S. sponhemica*, and formerly called *S. platypetala*. *S. grœnlandica* (at least, the Brandon Mountain, Kerry, form; I have not seen it from Ben Lawers) comes very near indeed to *S. cæspitosa*, the chief difference being in the narrower and more acute foliage. It may be added that Dr. Williams's *Hieracium alpinum* is *H. holosericeum*, Backh., and that his Hawkweed names frequently differ from those adopted by Rev. W. R. Linton in the "British Hieracia" (1905).—EDWARD S. MARSHALL, West Monkton Rectory, Taunton.

Montia lamprosperma, *Cham.*, in Scotland.—My attention being called by my friend Wm. Ostenfeld to the occurrence of our plant in the Faroes, I was led to examine my Scottish specimens. I was glad to find it represented in my herbarium by specimens I gathered in Glen Dochart, Perth, in 1874; by others from Dornie and Glen Docharty, West Ross, in 1881; from the Spout of Loch-na-Gar at

3400 feet in S. Aberdeen, in 1892; near Dalmally, Argyll; Lerwick (R. Tate in Hb. Brit. Mus., 1865); Aviemore, Easterness, in 1882; and Broughton in Peebles in 1888. It has been collected in St. Kilda, in 1905, by Mr. O. Paulson. It may be known from *fontana* by its larger seeds being chestnut-brown, shining, and reticulate. In *M. fontana* (*M. chondrosperma*, Fenzl) the seeds are smaller, dull, dead-black, covered with acute tubercles. Each species has its water-form. In Kirkdale Pass, Cumberland, I have found it as a small upright plant, but the seeds are quite typical. On the contrary a floating form which is named *M. rivularis*, from Jersey, in Hb. Brit. Mus., is only *M. fontana*. The last edition of Koch's "Flora Germanica" keeps them as distinct species. The larger of *lamprosperma* is distinctly northern, being the only form found in the Faroes, Iceland, Greenland, and the common one in Denmark; occurring also in North Germany, Scandinavia, Russia, Finland, etc. It is also recorded for France, etc. I have found it also in North Ireland, and on Glydyr Fawr in North Wales.—G. Claridge Druce, M.A.

Solidago *sp.*—On one bank of the Forth between Stirling and Gargannoch, Mr. H. N. Dixon, the eminent bryologist, saw a species of *Solidago* quite naturalised. Can any reader obtain specimens so that the species may be identified?—J. Claridge Druce, Yardley Lodge, Oxford.

Schœnus nigricans, *L.*, in Haddingtonshire. — To the few counties given for this Rush in Prof. Trail's "Topographical Botany of Forth and Tweed" (*l.c.*), should be added Haddington (82). It occurs very sparingly on the links between Aberlady and Gullane, where it was gathered by Mr. A. H. Evans during an excursion of the Berwickshire Naturalists' Club on 29th August, 1900, as recorded in the "Proceedings," xvii. 240. I was with the Club on that occasion and got a specimen of the *Schœnus* from Mr. Evans, but did not see it growing, and it was not till 29th August last that I succeeded in rediscovering it—a single tuft only.—William Evans, Edinburgh.

Goodyera repens, *R. Br.*, in Haddingtonshire.—According to Prof. Trail's 'Topographical Botany of the River-Basins Forth and Tweed,' published in "Transactions of the Botanical Society, Edinburgh," for 1903, *Goodyera repens* has not been recorded from county 82, *i.e.* Haddington. The plant, however, grows abundantly in several pine woods in the central portion of the county, where it has been known to myself and others for a number of years past. The westmost point to which I have traced it, is near Fountainhall, where a few patches were met with in May 1906. Unfortunately, through the cutting down of certain woods in the district where it chiefly occurs, the area occupied by the plant has

been greatly curtailed during the last few years. In 1904 I witnessed the total destruction of many acres of it in this way. To one interested in the preservation of our native Flora, it was a sad sight; and I carried away armfuls of the trampled and uprooted orchid, and planted them in the adjoining woods. A few plants were also brought home and put out (April 1904) in the big pine wood at Bavelaw, near Balerno, in Midlothian, but I have failed to see anything of them in subsequent years. According to a note in the "Transactions of the Edinburgh Field Naturalists' Society" (iii. 298), *Goodyera repens* was discovered near Balerno by Dr. W. Watson, on 29th July 1896; but the statement was evidently the result of some misunderstanding, for Dr. Watson informs me he never saw the plant about Balerno or anywhere else in the county. With reference to the record of *Goodyera repens* from near Stromness, Orkney, in their magazine for July last (p. 170), my wife reminds me that in July 1874 she sent me a specimen from Harray in the same district. Referring to the queries under *Listera cordata* in Prof. Trail's paper, I may say that I have gathered this species in two localities adjoining the Pentlands, in Midlothian; and also at Macbiehill, in Peeblesshire, together with the commoner *L. ovata*.—WILLIAM EVANS, Edinburgh.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—January-March 1909.

[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.

THE BIRDS OF LENDALFOOT. Charles Berry, *The Glasgow Naturalist*, vol. i. pts. i. and ii. (Nov. 1908 and Feb. 1909), pp. 5-23.—A list of 162 species, all, with two exceptions, seen within a radius of four miles from Lendalfoot.

INCREASE OF WOOD-PIGEONS IN ORKNEY. James R. Hale, *British Birds*, March 1909, p. 345.—Noticed during 1907 and 1908 breeding in increasing numbers in the Island of Shapinshay.

NOTES ON THE EAGLES OF AYRSHIRE. John Paterson, *The Glasgow Naturalist*, vol. i. pts. i. and 2 (Nov. 1908 and Feb. 1909), pp. 28-32.—Mainly historical.

ICELAND FALCON IN SCOTLAND. Fred. Smalley, *British Birds*, February 1909, p. 310.—An adult example killed in December last on the Flannan Isles.

Little Ringed Plover in North Uist. J. E. Harting, *The Field*, 20th February 1909, p. 329.—Specimen shot in October last by Mr. H. E. Beveridge.

Little Gull in Aberdeenshire. A. Anderson, *The Field*, 16th January 1909, p. 118.—Specimen shot at Newburgh.

The Char (Salvelinus) of Great Britain. C. Tate Regan, M.A., *Ann. and Mag. Nat. Hist.*, February 1909, pp. 111-122, and figs.—Four new species described from Scottish localities, and numerous notes given on distribution.

Notes on Diptera in Scotland. A. E. J. Carter, *Ent. Mo. Mag.*, March 1909, pp. 65-66.—A list of species taken at Comrie, Blairgowrie, Polton, Aberfoyle, etc.

Diptera in Dumbartonshire in 1908. J. R. Malloch, *Ent. Mo. Mag.*, February 1909, pp. 40-41.—Twenty-nine species recorded.

Dasyneura (Perrisia) strobi, Winn., in Perthshire. William Evans, *Ent. Mo. Mag.*, January 1909, p. 17.—Specimens obtained from cones of spruce at Callander.

Some Phoridæ in Dumbartonshire in 1908, with Description of a New Species. J. R. Malloch, *Ent. Mo. Mag.*, February 1909, pp. 34-36.—*Phora* (*Aphiochæta*) *fumata*, n. sp.

On the British Species of Phora (Part II.). John H. Wood, M.B., *Ent. Mo. Mag.*, March 1909, pp. 59-63.—*P. parva*, *mallochi*, and *glabrifrons*, nn. spp., are recorded from Scotland.

Ornithomyia lagopodis, Sharp, from a Tawny Owl in Fifeshire. William Evans, *Ent. Mo. Mag.*, March 1909, p. 65.

Retrospect of a Coleopterist for 1908. Prof. T. Hudson Beare, B.Sc., etc., *Ent. Record*, February 1909, pp. 25-30.—Numerous Scottish records are referred to.

A New Method of Collecting Coleoptera. Norman H. Joy, M.R.C.S., F.E.S., *Ent. Mo. Mag.*, January 1909, pp. 1-3.—A large number of Scottish records are given in illustration of this paper.

Notes on various British Coleoptera. E. A. Newbery, *Ent. Mo. Mag.*, February 1909, pp. 32-33.—*Melanotus rufipes* taken at Rannoch.

Further Note on the Scottish Examples of Notiophilus strigifrons, Baudi. G. C. Champion, *Ent. Mo. Mag.*, January 1909, p. 12.

A new Coleopteron—Homalota scotica, nov. sp. E. G. Elliman, *Ent. Record*, February 1909, p. 33.—Described from

specimens obtained at Nethy Bridge in September last by Prof. T. Hudson Beare and Mr. H. St. John Donisthorpe.

Bledius denticollis, Faur. : a British Insect. H. F. Fryer, F.E.S., *Ent. Mo. Mag.*, January 1909, p. 6.—A specimen taken by J. C. F. Fryer at Nethy Bridge.

A Coleopteron new to Science—Anaspis hudsoni, nov. spec. H. St. J. K. Donisthorpe, F.Z.S., F.E.S., *Ent. Record*, March 1909, p. 60, pl. iii.—Described from a single male specimen taken at Nethy Bridge in September 1908.

Trichopteryx intermedia, Gillm., var. thomsoni, J. B. Ericson, a British Species. Horace Donisthorpe, F.Z.S., F.E.S., *Ent. Record*, March 1909, p. 58.—Taken in some numbers at Newtonmore, in June 1907 ; also at Nethy Bridge.

Phlœophilus edwardsi, Steph., in the South of Scotland. William Evans, *Ent. Mo. Mag.*, January 1909, p. 15.—Records an example from Gifford, Haddingtonshire.

Note on Orthoperus mundus, Matth., from Scotland. Richard S. Bagnall, *Ent. Mo. Mag.*, January 1909, p. 14.—A single specimen taken at Nethy Bridge in August 1908.

Aræocerus fasciculatus, De Geer, in Scotland. William Evans, *Ent. Mo. Mag.*, January 1909, p. 15.—Records a specimen captured in the Herbarium at the Royal Botanic Garden, Edinburgh.

Myrmecophilous Notes for 1908. H. St. J. K. Donisthorpe, F.Z.S., F.E.S. (concluded), *Ent. Record*, January 1909, pp. 17-20, pl. ii.—The following records are given :—*Limosina* (?) *rufilabris*, Stnh., in nest of *Formica fusca* near Dumfries ; *Thyreosthenius biovata*, Cambr., in nests of *Formica rufa* at Nethy Bridge ; *Evansia merens*, Cambr., in nest of *Formica fusca* at Nethy Bridge.

On some New and Rare Entomostraca from the Scottish Seas. Thomas Scott, LL.D., F.L.S., *Ann. and Mag. Nat. Hist.*, February 1909, pp. 122-130, pls. ii.-iv.—Four new species and one new genus described.

Notes on Larval Trematodes. William Nicoll, M.A., D.Sc., and William Small, M.A., *Ann. and Mag. Nat. Hist.*, March 1909, pp. 237-246.—The notes in this paper were made on material obtained in the Clyde area.

Notes from the Gatty Marine Laboratory, St. Andrews —No. XXXI. Prof. M'Intosh, M.D., LL.D., F.R.S., etc., *Ann. and Mag. Nat. Hist.*, February 1909, pp. 153-180, pls. v. and vi. —Numerous notes are given on the distribution of the British Spionidæ.

BOOK NOTICES.

My Life among the Wild Birds of Spain. By Colonel Willoughby Verner (late Rifle Brigade). (London: John Bale, Sons, and Daniellson, 1909.) Price 21s. net.

Colonel Verner has long been known to ornithologists as one who has devoted the leisure half of an active life to the study of birds amid their native haunts, and to Spanish birds in particular. His handsome volume on the birds of Spain will prove a "treasure-trove" to all field ornithologists, for it does not often happen that a book based upon such ripe experience falls to their lot. The author devotes his opening chapters to the discussion of the paraphernalia and equipment of the would-be tree- or cliff-climber, and, after affording much practical information, gives interesting accounts of some of the almost overwhelming difficulties he has overcome, in which he shows very clearly that great skill, coupled with unflinching pluck, are necessary for work of this kind. He then proceeds to treat of the bird-life to be found in various haunts, commencing with a laguna with its Herons, Terns, Flamingos, Storks, Cranes, Bustards, and Stone Curlews. The Flamingos he alludes to as "flying close together and presenting the spectacle of a moving mass of crimson and rose and white streaming over the blue wavelets below." Another chapter describes a day in the cork woods among the small birds, such as Cetti's, Bonelli's, Orphean, and Rufous Warblers, Serin Finches, Orioles, Hoopoes, and Bee-eaters. Most of the book, however, is devoted to the Birds of Prey, for Spain is *par excellence* a country for their study. It is among the Raptores that we find Colonel Verner at his best, and he has much to tell us regarding the various species of Eagles, Kites, Vultures (the Lammergeir in particular), that is of extreme interest. The illustrations are numerous, and are either from drawings in water-colour by the author or from photographs taken by himself. Being entirely a record of personal experiences, and replete with original observations, the book is a valuable contribution to the literature of field ornithology, and is a most excellent and entertaining work throughout. G. G.-M.

Through Southern Mexico, being an Account of the Travels of a Naturalist. By Hans Gadow, M.A., Ph.D., F.R.S. (London: Witherby and Co., 1908.) Price 18s. net.

It is quite exceptional to have a work of this description from the pen of a trained zoologist of Dr. Gadow's standing, and the stay-at-home naturalist is placed under a debt of gratitude to the author for a singularly instructive and entertaining book. The author tells us in his preface that Southern Mexico "swarms with life," and yet how little has been offered us concerning its animals

and plants except in the monographic works of specialists. The description of the floating-garden of Xochimilico makes one think of a veritable paradise where "the authentic airs of Paradise do blow": here the famous Axolotls are denizens of its waters, and Dr. Gadow's remarks upon these paradoxical creatures and their development are most interesting. That the vegetation in Mexico is luxuriant, and that there is an enormous variety and abundance of fruit, one would naturally expect, but when we read of a forest where Salvias, Dahlias, Begonias, Geraniums, Oxalises, Fuschias, Tradescantias, Irises, and Thistles flourish, one cannot help longing to visit such a favoured spot. *Apropos* of this particular forest, however, we learn that animal life seemed almost absent, even birds were very scarce, but the presence of Armadillos proved an interesting find. The ornithologist will read with pleasure of Hang-Nests, Humming Birds, Macaws, Motmots, and various other feathered inhabitants of the Mexican forests; while the entomologist will find much that is worth reading about the Butterflies and Moths, and of the ways of the Leaf-cutting Ants and of Termites. Much information is given about Rattlesnakes and other reptiles; and of the *modus operandi* of the Vampire Bat. Dr. Gadow has also a great deal of knowledge to impart about the natives and their customs, whilst his descriptions of the scenery help us to realise the glories of the country about which he tells us so much and in so pleasant a fashion. The book is abundantly illustrated by excellent reproductions of photographs, and is well got up. G. G.-M.

Report on the Immigration of Summer Residents in the Spring of 1907, etc. By the Committee of the British Ornithologists' Club. (London: Witherby and Co., 1908.) Price 6s. net.

Like the Report for previous years noticed in the "Annals," the one for 1907 affords much information of a reliable nature on the arrival or first detection of summer birds in England. It also gives some notes on the spring and autumn (1906) movements of a number of other migratory species which have heen reported to the Committee. The Report will be useful to those of our readers who are interested in the movements of migratory birds in Scotland, since it contains valuable data for instituting a comparison between the arrival, and other movements, of identical species in various localities from the shores of the English Channel northwards. The Committee are to be congratulated on the success that has attended its efforts.

Two Books on European Birds' Eggs.

Since our last notice several instalments of Mr. Dresser's great work have appeared, carrying the parts down to xvi., and leaving only the Waders, Gulls, Petrels, and Divers, to complete the book. The plates which, it is almost needless to remind our

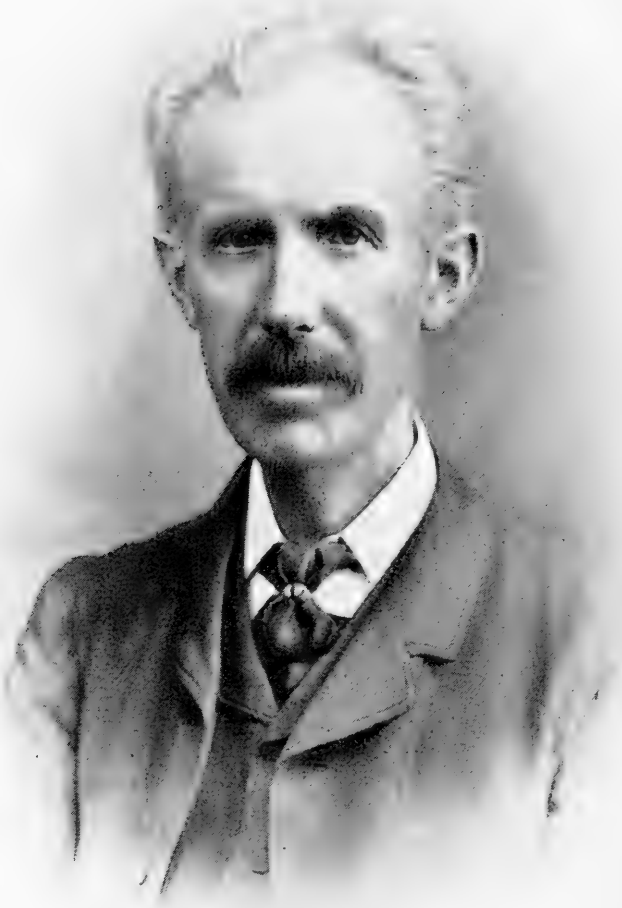
readers, are taken direct from the eggs themselves by the three-colour process, are marvellously good, and the author is much to be congratulated on the success that he has achieved, and on the marked progress he has made towards the completion of this most important work.

We welcome the appearance of part iii. of the Rev. Mr. JOURDAIN'S book on the same subject. The great merit of this work lies in the excellence and comprehensive nature of its text, upon which, it is manifest, great care has been bestowed. This work may be regarded as a companion to Dr. Hartert's "Vögel der paläarktischen Fauna," since it treats of all the subspecies recognised by that author as inhabiting Europe, and thus it occupies a place entirely its own among the egg-books in the English language. The figures of the eggs are, on the whole, very satisfactory.

THE MOTHS OF THE BRITISH ISLES. Second Series. By Richard South, F.G.S. (London: F. Warne and Company, 1908.) Price 7s. 6d. net.

This is the concluding portion of one of the most attractive and handy books on "British Moths" ever published. The author's name is in itself an ample guarantee of accuracy and judicious treatment, while the illustrations are, on the whole, of quite exceptional merit. Since the latter are, in the case of the adult insects, produced by the photographic three-colour process, it follows that the markings and shape of the wings are absolutely true to nature, while the colours are usually equally faithful. Some of the greens are, however, as in most cases where the three-colour process is used, not bright enough, or of a wrong shade. The text is admirably arranged, and gives just sufficient information for ordinary purposes; but the English names used on the plates would be better replaced by Latin ones, as the latter are nowadays even better known, and certainly of more value than the curious combinations of adjective and noun which occasion such names as Grey Shoulder-knot, Dingy Shears, or Ringed Carpet.

The handy size of this beautiful little book renders it possible for the collector to take it away with him to the country without inconvenience along with the companion volumes on the remainder of the Macro-Lepidoptera. Armed with the three he will have at hand a reliable, and at the same time a most readable and enjoyable, guide to the identification and life-history of his captures.



THE LATE GEORGE SIM, A.L.S.

The Annals
of
Scottish Natural History

No. 71] 1909 [JULY

OBITUARY—GEORGE SIM, A.L.S.

WITH PORTRAIT.

GEORGE SIM'S father James Sim, or Sime as he also wrote his name, was the son of a farmer in the parish of Grange, who died while James was a child, leaving enough to provide for his sustenance until able to earn a livelihood by his own labour. This he soon did, at first as a farm-servant, afterwards as a herring-fisher at Wick, then for some years as tenant of the farm of Netherton, in Boharm, Banffshire. Here he married the daughter of a farmer, and lived on the farm comfortably; but at the close of his lease another tenant took the farm at a higher rent; so Sim removed to Craigellachie, and began business as a general merchant, succeeding fairly well. Here he remained for some years; and here George was born on 26th March 1835. James Sim again leased a farm; but as considerable outlay had to be made on it, and he had a large family to support, he found himself unable to remain in it, so he became grieve or overseer on a farm in Marnoch for some years, moving after a time to Scobbach in Turriff; there in two years he lost five of his family by death. Others of the family were invalids; and he and his wife had a hard struggle, bravely met by them.

George had soon to help in the household, to assist his mother, burdened with the care of the invalids; and as attendance at school was not then compulsory he was often kept at home, while his own tastes led him to solitary rambles rather than to games or company of other children. Thus, although his parents were anxious to do what they could for their children, he had very little education in school as a child; and in 1848, at the age of 13, he began an apprenticeship to a tailor in Auchterless. From this time onward his opportunities for attending school ceased, apart from Sunday School, which he was expected to go to regularly, for a time, though as often as he could he gave the preference to a ramble in the woods or other homes of the wild creatures in whose ways he took a keen interest.

But much as he loved a ramble in the country, he did not neglect duty, and he was soon expert in his work. After an apprenticeship of $4\frac{1}{2}$ years he became a journeyman with the same master, and there he remained for a time. His master, when the apprenticeship began had had a good business, but an increasing love of drink brought him to ruin; and Sim found it necessary to seek work elsewhere. The experience made a deep impression on him, and led him to strive earnestly to save his fellow-workmen from the habit so disastrous to his master.

For a time he moved from one town to another in Scotland, England, and Ireland, working as a journeyman tailor. Returning to Scotland he spent some time in Glasgow, then in Turriff for a winter, then for some months in Edinburgh, and for $1\frac{1}{2}$ years in Inverness, followed by another winter in Turriff, during which he attended school. Then followed more wanderings, to Inverness, Grantown, Turriff, Dublin, and Glasgow. About 1857 he tried his fortune as a tailor on his own account in Turriff; but soon afterwards a brother who had been trained as a druggist induced him to join in the purchase of a druggist's business in Tarland, and here they spent about two years.

The brothers were both keen lovers of nature, and found the neighbourhood of Tarland afforded scope for the encouragement of their tastes rather than for pushing their business, which did not come up to their expectations, and was sold

by them. George had made a considerable collection of birds, the prizes of many a ramble, often taken during the time that should have been given to rest. He had often thought of taxidermy as a livelihood, and on leaving Tarland he resolved to supplement the experience gained in the preservation of skins for his own collection by a regular training, which he took under Mr. Sanderson, Edinburgh. After a short visit to London he came to Aberdeen in 1862, and commenced business in King Street. His success surpassed his hopes, and from this time he lived in Aberdeen, moving into a larger shop in a more prominent situation, in Castle Street, after some years. To his business as a taxidermist he added the sale of antiquarian and similar articles, of which he possessed an excellent knowledge. His integrity and skill were so relied on by all with whom he had dealings that this branch of his business extended largely.

Mr. Sim had married some time before he settled in Aberdeen, and his wife and child resided there while he tried his fortune in London. It must have been an anxious time for him until a livelihood seemed assured in the new venture; but he did not spare himself, working from an early hour until late at night, often until nearly midnight, in his shop or in the workroom beside it. Yet though so assiduous in his business, he spent many an hour in the investigation of the fauna of Aberdeen and its vicinity, often spending much or even all of the night in his rambles.

For a number of years he paid great attention to Fishes and Crustaceans; and few mornings passed without a visit to the sands between the Dee and the Don, or to the boats on their return from fishing. From the lines and from the trawl-nets many prizes were gathered, while the trawlers fished the nearer seas; but in later years the longer time spent between the fishing grounds and port resulted in the nets and decks being cleared before arrival. The fish-market was also one of Mr. Sim's favourite haunts, and strange fish were kept for him, or brought to his shop.

Results of his study of the Crustaceans and Fishes were published in 1878 in the Transactions of the Aberdeen Natural History Society in a "List of the Crustacea of the North-East Coast of Scotland," and a "Catalogue of Fish

found in the vicinity of Aberdeen by the late Dr. Dyce and George Sim." Interest in both groups continued all his life; and he formed collections in both, which he presented to the University of Aberdeen shortly before his death.

But his love for other sides of animal life was scarcely less strong; and the few days that he allowed himself away from the business by which he won a livelihood for himself and his family were chiefly devoted to long rambles that might well have been thought beyond his bodily strength. In these he was accustomed to carry a small spirit stove, and to cook his meals when out all day and sometimes all night. In company with one or two congenial friends he explored the coast north and south of Aberdeen, and the interior of the neighbouring counties, with a keen eye to animal life of all kinds, but interested also in geology, and in other sides of nature-study. From 1862 until 1890 he kept a systematic record of his work and observations, extending to 12 quarto books, filled with notes interspersed with neat drawings. These have been presented to the Aberdeen Free Library.

Much valuable information was gained also from the material that came under his professional care, and was carefully noted; and books and periodical literature were diligently studied whenever opportunity could be gained, however brief. Thus he acquired a very exceptional knowledge of the larger fauna of the district around Aberdeen. Numerous short notes in the "Scottish Naturalist" and its successor the "Annals of Scottish Natural History," in the "Zoologist," and in similar journals called attention to novel or rare species that came under his notice; and essays by him on the "History of the Herring," and the "Food of Fishes," were awarded prizes at the Fisheries Exhibitions in Edinburgh in 1882, and in London in 1883. He resolved to prepare an account of the Vertebrata of the district best known to him, and from 1890 onwards made this his special aim. Its pursuit made heavy demands on his time, and led to the giving up of the journal about 1890. In 1903 was published in Aberdeen, "The Vertebrate Fauna of Dee, including the Fishes of the East Coast from Wick to Firth of Forth," a handsome octavo, of almost 300 pages. Except a brief

introduction on the extent and physical features of the district included in "Dee," it is occupied with an account of the Vertebrata known to him from this region by personal observation, or from the work of others, whether published or communicated personally to him. It contains a very great amount of information, and its value is increased by the correction of errors in records previously published. It will remain a permanent monument to the unwearied and self-denying labours of a true naturalist, whose constant aim it was to discover and to state the truth as it appeared to him to exist, and who never spared himself in that quest.

The scanty education received in youth was felt by him in later life, but was largely made good by private study, whenever he could find time. He was an omnivorous reader, books of travels being especial favourites, but a wide range of other subjects being also studied. His wanderings as a journeyman tailor had brought him into many new scenes, had widened his outlook on life, and had strengthened his own character and his desire to help his comrades in the struggle and temptations of life. In later years he travelled in France, Italy, and other parts of Europe, visiting museums, picture galleries, and other places of interest.

Reserved and silent with strangers, or in uncongenial company, Mr. Sim was held in most esteem by those who knew him most intimately, for only they could learn to estimate aright the sterling worth of his character and the width of his information, while even to most of his friends certain kindly traits were seldom if ever revealed.

In 1886 he was elected an Associate by the Linnean Society, a recognition well deserved, and appreciated by him. He was for many years an active member and office-bearer in the Aberdeen Natural History Society, and was an Honorary-President of the vigorous Aberdeen Working Men's Natural History and Scientific Society.

He was of spare frame and almost ascetic appearance, and did not look fit to bear the unceasing activity and unsparing demands that his business and even his relaxations made on his bodily strength, but he reached the age of seventy-three, dying in his home in Aberdeen on 15th June 1908.

J. W. H. T.

THE WEIGHT AND LENGTH OF OTTERS.

By H. W. Robinson.

In the last vol. of the "Annals," No. 66, Mr. Harvie-Brown, in mentioning Otters of 28 and 26 lb., concludes by saying that record weights which are authentic are desirable. As a hunter of Otters nearly all my life with many different packs of hounds, and also as a collector of information concerning the animal, from personal experience, from masters of Otter hounds, and from such publications as "The Field," perhaps some of these statistics may be of interest.

The average length of an Otter has been given in numerous works on British mammals as 44 inches, which is about right, taking dogs and bitches together. Bell gives the average weight as 20 to 24 lb. for the male, and 16 to 20 lb. for the female: the former is correct, but the latter is too heavy, being from 14 to 16½ for the average. Still he is very near the mark, which is more than can be said of the explanatory labels on the Otter case in the Natural History Museum at South Kensington, where the weights are under the mark.

Daniel, in his "Rural Sports," is much below the mark when he gives the usual length as 39 inches, and above the mark when he says that the bitch may vary in weight from 13 to 22 lb. Anything over 25 lb. for a dog and 16 lb. for a bitch is large. Pennant mentions one as having been killed on the Lea near Ware which weighed 40 lb., and another killed by the Carmarthen hounds is given as having measured 66 inches, and said to have weighed 50 lb. Daniel says that the record was one taken in the river Lea between Hertford to Ware in October 1794 which proved "upward of 40 lb.," this being probably the same one mentioned by Pennant. Daniel also says that:—"In April 1804, the Otter hounds of Mr. Coleman of Lemonster killed in Monkland Mill Pond, an Otter of extraordinary size; it measured from the nose to the end of the tail 58 inches, and weighed 34½ lb."

In the "Zoologist" for 1849, page 2407, Mr. M'Intosh mentions one in his possession which measured in the flesh

55½ inches from tip to tip, not stating its weight, but saying it was trapped in the Stour at Spetisbury near Blandford in Dorsetshire.

The following I quote from "The Field" as being a letter from Captain E. F. Oakley:—"The accepted record weight for an Otter is, I believe, 38 lb., but I have one in my possession, stuffed by Rowland Ward, which weighed 42 lb. (*wet, in a bag*) say 40 lb. Mr. Rowland Ward was unable to accept this as an authenticated record owing to the lack of witnesses, but said that the measurements were larger than those of the Otter which weighed 38 lb. As a matter of fact, I am satisfied myself, Captain Oakley says, that the weight was genuine, since my keeper, a most reliable man, weighed it twice carefully. He trapped it on Spencer's Oak fishing on the Blackwater, in the spring of 1898, underneath the big rock on the left bank." It was again mentioned by Captain Oakley in "The Field" of 26th September 1908. I do not doubt his word, although I take it that he got the details second-hand from his keeper, and did not actually see it weighed, or even in the flesh. If he had deducted, not 2 lb., but 6 or 7 lb., or even more, for a wet Otter in a wet bag, I venture to say that he would have been nearer the mark, and this would bring down its weight to 35 or 36 lb. I have had some experience of wet Otters in wet bags and am sure that the water in the bag and Otter combined would weigh at the very least 6 lb. Messrs. Rowland Ward, to whom I applied for the length of this Otter, replied that it was not measured, and also said that they were unable to give me any information concerning the 38 lb. one quoted in the above letter of Captain Oakley.

In Millais's "British Mammals," vol. ii., the following weights and lengths of Otters are given, the author quoting Mr. Thomas Southwell, who, I believe, mentioned the heaviest of them in "The Field" of 30th December 1895.

37 lb. and 48 in. ♂	27 lb. and 50 in. ♂	16 lb. and 43 in. ♀
30 ,, ,, 53½ ,, ♂	23 ,, ,, 50 ,, ♂	16 ,, ,, 43 ,, ♀
28 ,, ,, 50½ ,, ♂	23 ,, ,, 48 ,, ♂	14 ,, ,, 44 ,, ♀
27 ,, ,, 53 ,, ♂	18½ ,, ,, 49 ,, ♂	

Surely, some may say, there is something wrong with these figures? The largest dog, weighing 37 lb., only

measured 48 inches, being the shortest of the eight dogs mentioned, even an inch less than the 18½ lb. dog. The two largest are a 30-pounder of 53½ inches and a 27-pounder of 53 inches, these two being respectively 5½ and 5 inches shorter than the great 37-pounder. Should not the 37-pounder, they may ask, have measured 58 inches instead of 48 inches, or is it that the 37 lb. is a misprint for 27 or even 17? It is not so. I am fully convinced, and I think that all masters of Otter hounds will agree with me, that a long Otter is not necessarily a heavy one and *vice versa*, the short thick ones of about 48 inches being the weight carriers.

In Squire Lomax's famous "Diary of an Otter Hunter," covering the forty-two years from 1829 to 1871, none killed were over 30 lb. in weight, his record being one of 26¼ lb. Mr. Courtenay Tracey, the oldest master of Otter hounds in the country, tells me that he has never seen an Otter of 30 lb. killed, and but a few of 29 lb., in his long experience of the sport.

My friend Mr. H. W. Clift, an ex-master of the West Cumberland hounds, who has probably had as much experience of Otter hunting as any man living, and hunted in almost every county in England, tells me that the largest Otter killed by him was on Coniston Lake, which weighed 29½ lb. and measured 48 inches in length, being the thickest Otter he ever saw.

Personally, I have yet to see an actually weighed 30 lb. Otter killed by hounds, although one which I shall mention later, which was not weighed, must have topped that weight, but I have seen several killed and weighed between 27 and 28 lb., one of 28¼ lb., and the heaviest 28½ lb. As a rule if there is a big Otter in a river hunted by hounds, especially so if there are many fox-hounds in the pack and the river low, he has not much chance if hounds find him lying loose, but is generally chopped at once, as he is too fat to get away; so we ought to see a good many 30-pounders killed if there were many existing.

On 10th July 1907, the Essex Otter hounds, after a four hours' hunt, killed a grand dog Otter which weighed on a Salter's spring balance 34 lb., it being found lying almost on

the sea-wall at Kirton Sluice, in Ipswich. Its length was not taken. The master told me that his next heaviest was one of 29 lb. killed at Blythburgh near Southwold, on the 28th September in the same year, and that they had killed quite a number of 28 lb. weight, none of which were measured for their length. Last year, on 3rd September 1908, the Bucks Otter hounds meeting at Trafford Bridge killed, after a seven hours' hunt, another 34 lb. otter; and during the same week yet another monster of 28 lb. after a four and a quarter hours' hunt at Haversham Mill. In answer to my inquiries concerning the lengths of these two latter, the master of the B. O. H. replied that they never *either weigh or measure* any of their Otters, so these weights, although they appeared in "The Field" hunt reports, are not of much value unless they were weighed officially, as it is very unsafe to estimate the weight of an Otter with anything like accuracy.

Captain Sheppard, a well-known ex-master, whose hunting was done chiefly in Ireland, states that his heaviest Otter weighed $29\frac{1}{2}$ lb., and goes on to say that the ordinary steelyard is most untrustworthy, he once finding his own $3\frac{1}{2}$ lb. wrong when he fondly believed he had killed a bitch of 20 lb. I can support him in this, as I myself found that there was $4\frac{1}{2}$ lb. difference between my Salter's spring balance and a new patent American one in favour of the latter, which I fortunately had never used except to weigh some wild swans, when I found it out. On 6th February 1906, one of 35 lb., measuring 48 inches in length, was shot on the Stour at Fordwich opposite the George and Dragon Hotel by the landlord, Mr. Watson, and set up by Dabbs of Canterbury.

The Kendal Otter hounds killed one of 33 lb. in Rydal Water in August 1886. During the first week of February 1907, a large dog of 32 lb. was trapped in the Rother, near Midhurst, which measured $48\frac{3}{4}$ inches in length. Another of 32 lb. with a dry jacket was shot in the garden of the Hon. A. Holland-Hibbert at Mundun, Herts, in 1876, a photograph of which, set up in its case, appeared in the "Sporting and Dramatic News" of 6th November 1908. The heaviest I have actually come across was one shot by

my boatman in the Loch of Harray in Orkney which, weighed carefully on two different sets of scales, was 35 lb.

One killed in the English Lake district measured 50½ inches and was said to have weighed 34 lb., but although the length is authentic, I cannot say the same for the weight. Another 32 lb. Otter was killed by the old Bishop Auckland pack when the late John Galton was master.

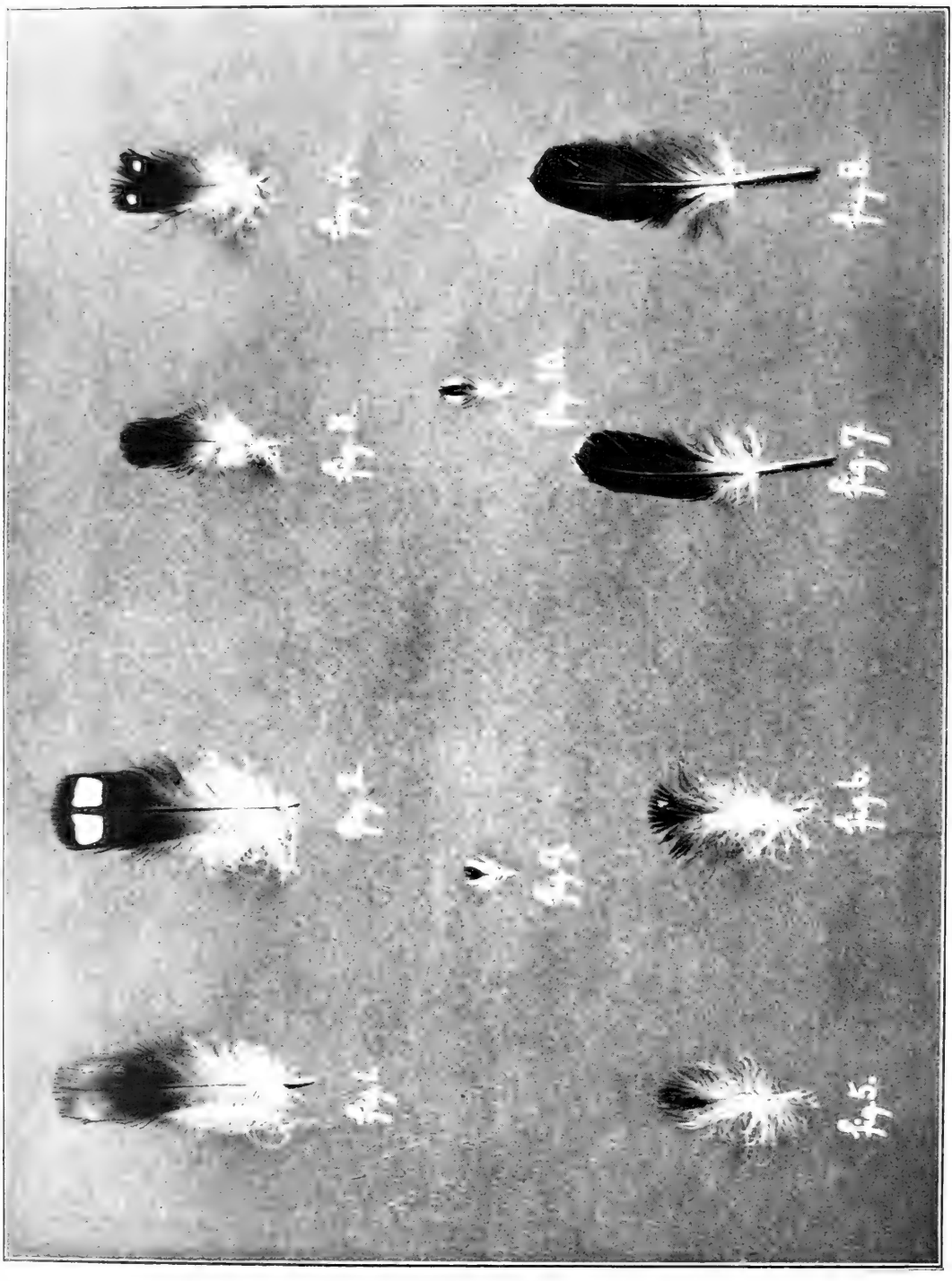
The Carlisle hounds, when hunted by Mr. Carrick, killed Otters of 31, 30, 29, and 28 lb., and Mr. Buckley's hounds in 1895 killed, in Lake Bala in Wales, one of 29½ lb.

A 30 lb. Otter was found dead on the banks of the Wyre in North Lancashire in March 1899. On Saturday, 11th June 1904, the famous Dumfriesshire Otter hounds killed their record Otter in the Kirkcudbrightshire Dee, hunting from Tongland Bridge, he weighing 29½ lb. and measuring 51½ inches, but on 5th August 1908 they killed a 30 lb. dog on the Esk at Parrisfoot which had a total length of 49 inches.

One of 29¾ lb. and measuring 51½ inches was shot on 11th November 1907, on the tidal waters of the Stour on the mud flats opposite Mistley, half a mile from shore, by a punt-gunner out after duck, and another of 29 lb. was tailed and killed near Yalding in Kent.

Last year, in September 1908, the West Cumberland Pack killed a fine dog of 28½ lb. in the river Mite in West Cumberland, which measured 50 inches in length. The East of Scotland pack killed an enormous Otter on the Tyne near Haddington on 4th July 1906, after a nine and a half hours' hunt in deep water, which must have been nearly a record. Everybody was too tired to weigh him before he was broken up, but his length was marked on a pole by one of the field, and on measuring it afterwards we found it to be just under 60 inches. I knew the Otter well, having been at close quarters with him on more than one occasion, and he appeared to be pounds heavier than anything I have seen before or since. Even when broken up his rudder measured 3½ inches more than normal, his mask 1½ inches, and the girth of his upper neck 3½ inches, the latter having a girth of 16½ inches.

Mr. Raine of Carlisle says that the Dumfriesshire 30-



FEATHERS TO ILLUSTRATE MOULTING OF THE GREAT NORTHERN DIVER.

pounder was the heaviest he has ever set up, but that its length, 49 inches, was exceeded by a 28-pounder killed by the Carlisle hounds in the Liddle in June 1897, whose length was 51 inches.

Messrs. Williams and Sons, the well-known Dublin taxidermists, inform me that they do not think they have had any Otters of over 28 lb. through their hands, but that the largest measured 50 inches in the flesh.

LANSDOWNE HOUSE, LANCASTER.

NOTES ON THE SEASONAL CHANGE IN THE PLUMAGE OF THE GREAT NORTHERN DIVER (*COLYMBUS GLACIALIS*).

By F. W. SMALLEY, M.B.O.U.

PLATE III.

CONSIDERING how meagre is the knowledge at present to hand concerning the changes of plumage which take place in our sea birds during the year, I feel that the following observations of the changes as noted by me in the spring moult of the Great Northern Diver may tend to throw some small ray of light on this very interesting matter.

Before proceeding farther I must make it clear that I am dealing entirely with the change of fully adult birds from their winter to their summer plumage, and although I mention the differences between adult birds and birds in their first winter plumage, I merely do so in order to enable others to clearly distinguish between young and old birds when checking my observations with any skins of *Colymbus glacialis* which they may come across or possess in their own collections.

Reference to the published plate of feathers will from time to time be necessary as indicated in the text.

The full adult winter plumage of the Great Northern Diver is a simple one, and the plumage of both sexes is alike in both winter and summer feather.

In winter the whole of the head and upper neck is mouse grey; the chin, throat, and lower neck white; the lores, region round the eyes and sides of the neck mouse grey intermixed in about equal proportions with white.

The feathers on the back and wings and those forming the upper tail coverts are dark blackish grey with two indistinct lighter grey spots on each feather corresponding to the white spots seen in the summer feathers of the same regions (Figs. 1 and 3).

The tail feathers are black with white tips (Fig. 7), and the wing feathers (primaries and secondaries) black. The belly pearly white, a dark mouse grey band of feathers forming a narrow V-shaped band across the vent.

The young birds in their first winter plumage are distinguished from the adult birds by having a broad light grey margin to each feather on the back, rump, and tail coverts, and an entire absence of light spots on these feathers.

The winter plumage of the adults appears to be complete but for a very short time, and the bird rapidly passes on through the following stages until the full summer plumage is completed. The first signs of change take place either on the back or on the throat, or on both places simultaneously, about December, and by the end of May the bird has assumed its full summer dress, which is as follows. The whole of the head, throat, and neck is deep glossy black with purple and green reflections; on each side of the neck and across the throat are lateral lines of white forming transverse bars. The whole of the upper part of the body is rich glossy black, each feather with two large white roundish spots towards the tips; the tail and primaries black, belly pearly white, and the narrow band across the vent black, each feather carrying a white spot towards the tip.

The time of year at which the summer feathers first make their appearance naturally varies in different individuals, but, generally speaking, so far as my observations go, the first new feathers begin to appear about the beginning of December, and from then onwards to May there is a gradual and continuous moult. At what time of the year precisely the Great Northern Divers cast their primaries is at present

unsettled, but it is quite certain they are much later than their cousins the Red-throated Divers (*C. septentrionalis*). These latter cast their primaries in early autumn, and are clean moulted through by the middle of November.

The Great Northern Divers are certainly several months later, and I have an adult specimen killed in Orkney on 18th Feb. 1908, in which all the primaries and secondaries are absent due to moult. I am inclined to think that these birds probably cast their primaries sometime about the New Year. During the process of the spring moult the birds assume a strangely mottled appearance, due to the new black feathers growing amongst the old mouse grey and white feathers on the head and neck, and the back apparently becomes wholly changed before the change in head and neck is completed.

The band across the vent appears to be moulted in or about the middle of the change, and is practically entirely lost for a short period, and is hardly distinguishable in specimens killed in late February and early March.

The following details respecting the individual feathers in summer and winter are worthy of note.

As already stated, the feathers in winter, covering the whole of the dorsal region, are dark mouse grey, almost dull black in colour, and there are hazy traces of two lighter grey spots, corresponding in size and shape to the white spots seen in the summer feathers. Fig. 1 represents a winter feather taken from the interscapular region. Fig. 2 represents a summer feather from the same region, the colour of which is glossy black, with two white spots, one on each side of the *rachis* and near the end of the feather.

Figs. 3 and 4 are respectively the winter and summer feathers of the *uropygium* (rump), the remarks as to colour being the same as for Figs. 1 and 2.

It is worth noting, however, that the size and shape of the white spots on the summer feathers vary somewhat, those on the feathers of the interscapular region (Fig. 2) being more or less large and rectangular in shape, whilst those of the rump and upper tail coverts are smaller and round (Fig. 4).

Fig. 5 represents a winter feather taken from the narrow

V-shaped band across the vent, and, as in Fig. 1, is dark mouse grey in colour, and spotless.

Fig. 6 is a summer feather taken from the same region, and is similar in colour to Figs. 2 and 4 with this marked difference that, whereas all the summer feathers of the dorsal region carry *two* white spots, some of those of ventral band feathers only carry *one*.

Briefly then, so far as the dorsal region and the narrow V-shaped band across the vent are concerned, the changes from winter into summer feather follow a fixed type, dark mouse grey spotless feathers in winter changing into glossy black spotted feathers in summer.

The *rectrices* (tail feathers), however, apparently show an entirely opposite state of affairs, for it will be noticed that in winter the feathers are black with a white edge to the tips (Fig. 7), and in summer are wholly black, without any white edge or spot (Fig. 8). It has been suggested to me that possibly the feathers of the tail appearing wholly black in summer may be due to abrasion, and that the white edging becomes worn completely away. This may be the explanation, but after careful examination of the material at my command, I am inclined to think that the summer tail feathers are grown wholly black from the beginning, and I come to these conclusions after carefully studying the feathers, for I find that the feathers which carry the white edging appear older and more faded in colour than those which are wholly black, and further, these wholly black feathers do not show signs of having lost, by abrasion, so broad and wide an edging as is seen in the white-edged winter feathers, and I therefore judge the wholly black feathers to be new ones, or, at any rate, newer than the white-edged winter feathers. The matter is extremely interesting, and needs further confirmation.

Figs. 9 and 10 represent the feathers taken respectively from the throat and neck-bands in summer. The general effect produced by these feathers is the formation of lateral lines of white forming three transverse bars, one on each side of the neck, and one across the *gula*. Although the effect so produced is the same in each case, on examination of the feathers it will be found that the distribution of black and

white varies: that in typical feathers from the gular band (Fig. 9), white predominates, whilst in typical feathers from the neck-bands, black predominates (Fig. 10). Dr. Elliott Coues ("Key to North American Birds," 5th ed., vol. ii. p. 1049), in describing these lateral lines, says, "The white throat-patch consists usually of five or six streaks; in this, as in the lateral neck-streaks, the individual feathers are broadly black, with sharp white edges towards their ends." Whilst this describes pretty accurately the feathers forming the transverse neck-bands (Fig. 10), it does not give a true description of the feathers forming the gular band (Fig. 9). In these latter, there is only a triangular piece of black at the tip of each white feather.

There is another point of extreme interest connected with Great Northern Divers. I refer to the nature of the feathers covering the head and neck during winter plumage. These feathers, in winter, are of a downy nature, in great contrast to the strong true feathers found on the head and neck in summer plumage. This downy state of the feathers seems not to be confined solely to the Great Northern Divers, as, upon examination, I find the same state of affairs appertaining during the winter feather, in an equally marked degree in the Black-throated Divers, and in a somewhat lesser degree in the Red-throated Divers and the Cormorants.

On examining the *Alcidæ* there is also an appreciable difference in the structure of the feathers on the head and neck in winter and summer, those in winter being of a more downy nature than those in summer, but it appears to be only in two species of the *Colymbidæ* that these winter feathers are of a purely downy nature. This downy nature of the feathers must not be put down to immaturity, as it is characteristic of the fully adult bird in winter plumage, and was, I believe, first noted in print by Mr. J. L. Bonhote ("Birds of Britain," p. 384).

On reviewing the whole matter one is at once struck by the analogy between the changes of moult seen in the Great Northern Diver, and the changes noted in the spring moult of some of the Anatidæ, for example the Long-tailed Duck (*H. glacialis*).

In both we notice:—

(*a*) That the first feathers to show signs of the spring moult are those of the interscapular region.

(*b*) That the feathers which cover the head and neck are the last to become completely changed.

(*c*) That all the flight feathers are dropped simultaneously and not in pairs, and that therefore the divers as well as the ducks are deprived of the power of flight during a short period of moult.

(*d*) That the period of the spring moult spreads over a considerable area of time, but that, roughly speaking, it commences in December and becomes complete in May, a period ranging through five months of the year.

Referring again to the specimen already mentioned as having been shot on 18th February in Orkney, and as having no flight feathers owing to moult, I have already expressed an opinion that the Great Northern Diver moults the primaries much later in the year than the Red-throated Diver. Furthermore one would reasonably expect the primaries to be moulted during the autumn moult.

Clear it is, that I have a specimen moulting its primaries during the spring moult. The question which naturally arises from this specimen is, Are the Great Northern Divers analogous to the Ducks in this respect? *e.g.*, as Mr. Bonhote has pointed out, in the Mallard the primaries are moulted immediately after the assumption of the "eclipse" plumage, and then, in a week or two, the assumption of the winter plumage starts. If this is so, the winter plumage of the Great Northern Divers is analogous to the "eclipse" plumage in the Ducks and the primaries are moulted immediately after the full winter plumage is assumed.

It must, however, always be borne in mind, in dealing with cases which appear out of the ordinary, that there may, very possibly, have been some physical debility in the particular specimen under notice, which may account for the apparently protracted or retarded moult. This may possibly be the explanation of my specimen being minus the flight feathers in the middle of February. The case is interesting, and further evidence on this and other matters raised in this article would be very welcome.

THE AQUATIC COLEOPTERA OF THE SOLWAY DISTRICT.

By Frank Balfour-Browne, M.A. (Oxon.), F.R.S.E., F.Z.S.

(*Continued from p.* 86.)

The total number of species compares very favourably with that of other counties. Surrey, for instance, has a list of about 135 species, while Sussex E. has about 130. The biggest list is for East Norfolk and contains about 150 species. The Cumberland List contains about 97 species and the Cheshire List about 107. Mid West Yorks, in which is the famous Askham Bog and Chaloner's Whin, only boasts about 102 species, while South Devon has 109 and East Suffolk 115. These are some examples of counties and vice-counties which have been well worked, and it is seen that the Solway district stands well in the list. It is impossible to be quite precise as to the number of species in any district owing to the recent changes which have been made in our list, *e.g.* the introduction of *Octhebius viridis*, Peyr., *Laccobius sinuatus*, Mots., *Helophorus porculus*, Bedel, etc., as additional species, previously mixed with others in our cabinets.

The most remarkable point about the Solway Water-beetle fauna is the Southern-British element which it contains, of which the following are examples:—*Bidessus minutissimus*, Germ.; *Berosus signaticollis*, Charp. (Lennon); *Helophorus mulsanti*, Rye [= *dorsalis*, Marsh] (Lennon, Sharp, etc.); *Octhebius auriculatus*, Rey (Lennon, etc.); *O. lejolisii*, Rey and Muls. The records for *B. minutissimus* in Britain are at present few in number. It was first found in the river Lee, at Cork, by Clear, and recorded by Wollaston as a new species, *H. trifasciatus* ['Descriptions of three newly discovered British Species of Coleoptera,' "Ann. Nat. Hist.," xviii. 452-3, 1846]. For some reason Wollaston later doubted the origin of Clear's specimens ('Capture in Devon of *B. minutissimus*,' "EMM." vi. 57, 1869), so that the Irish record was of little value. It was, however, rediscovered in Ireland about 1900, by Halbert,

who took specimens in the river Sheen, near Kenmare (Kerry S.), and also a single specimen in Co. Dublin ("I. Nat.," ix. 278-284, 1900). In July 1907, I rediscovered the species in the river Lee, Cork, thus confirming Clear's record ("I. Nat.," xvi., September 1907). In England the species has only been taken in South Devon, and, until in 1907 Mr. Philip de la Garde took 6 specimens in the river Teign ("EMM.," ser. 2, xix. 14-15, 1908), it had only been taken in Slapton Ley.

My discovery of the species in Scotland came about in the following way. In September 1907 I was collecting near the river Ken, Kirkcudbrightshire, when I came across a backwater of the river with grass growing at the edge and lying out on the water. This was the habitat of the species in the river Lee, so, without really expecting to find the species, I worked the grass along the edge. Had the first haul not produced a specimen, I doubt whether the species could now be added to the Scottish List, because, after all, there was no reason for expecting to find it there. However, one specimen did turn up in the first haul, and I got a few more specimens later. A few days later I visited the Nith, where I took 11 specimens in two or three hours. I tried one or two smaller rivers, such as the Urr at Dalbeattie, but without success, chiefly perhaps because a suitable habitat could not be found. In August 1908 I took 16 specimens in four hauls of the net in the Luce Water, near Glenluce, Wigtownshire; but although I found a likely place in the river Annan (Dumfriesshire), and worked for nearly an hour in October, I could not find the species.[1] It only occurred on one short stretch of the Nith on the Kirkcudbrightshire side, so that it has only been found in Wigtownshire and Kirkcudbrightshire.

Helophorus dorsalis, Marsh (=*mulsanti*, Rye), occurs commonly in the brackish pools by the Nith below Kelton, and until 1907 this was the only Scottish locality. I have since then taken it on the Preston Merse, Southwick, Kirkcudbrightshire, although not so commonly as at Kelton.

[1] This may, however, have no special significance as to distribution, as I failed to find it in the Nith last year, although I worked the same place as I had found it at in the previous year.

Fowler records this species as having been taken commonly by Crotch at Liverpool, but it seems to have disappeared from the modern Lancashire Lists. There is, however, a specimen in the Chitty Collection at Oxford labelled "Liverpool, Power!" Except for this record and one or two inland ones, *e.g.* Derby and Oxford, which, considering that the species is distinctly maritime, must surely be wrong, the range of the species, as at present known, is entirely south-eastern, from Hants S. to Norfolk E., but not recorded for either Essex or Suffolk. The species also occurs in Ireland, and has been taken in Co. Down by the late Mr. Buckle and by myself.

I first took a single specimen of *Octhebius auriculatus*, at Kelton, in June 1906, and I found it there again in August 1907. I did not, however, recognise it then, as I had not seen the species and thought my specimens were *O. rufimarginatus*, Steph. So far, I have only taken 5 specimens, but I found 3 specimens in the Lennon Collection mixed with *O. bicolor*, Germ. This species has only been recorded from Sussex E. and Kent E. in England, but it has been taken in Cos. Meath and Dublin in Ireland.[1]

Octhebius lejolisii, I only discovered in the Solway district in October last. When in Dublin, at the British Association Meeting, Professor Hudson Beare and I went to Dalkey on Mr. Halbert's instructions to find this species in the rock pools. After vainly searching for a considerable time, we at last found it in very small holes of clean salt water, and with the imagines we found the larvæ. The pools were just above high-water mark and held a pint or less of water. At high tide they were splashed by the sea, as we found to our cost. The sea was just settling down after a violent storm, which would perhaps account for the fact that the water in the pools appeared to be pure seawater. Having once discovered the beetles walking on the sides and bottoms of the pools, they were not difficult to find. After the British Association Meeting I went to West Donegal, and there, both at Dunfanaghy and at

[1] The species occurs as far north as Borkum Island on the west coast of Europe. Since going to press I have seen specimens from Lincs N. (Rev. A. Thornley), so, possibly, the species occurs all up the east coast of England.

Bunbeg, I found the species even more abundant than at Dublin, under exactly similar conditions, except that the water in the pools was practically fresh, probably owing to the fact that the weather was exceptionally wet. In October I went to Bangor (Co. Down) where I at once found the species, but much scarcer than at Donegal, mostly in clear salt water; but a few were in pools of stale sea-water. I then went to Kirkcudbrightshire, and at Douglas Hall I found 9 specimens in as many minutes, in extremely small rock pools, and on returning to Ireland I found the species again at Larne (Co. Antrim).

It was first found in Britain by Mr. W. H. Bennett, at Ilfracombe, "in putrid sea-water pools" ("EMM.," ser. 2, vi. 181, 1895), and has since been taken in that county (N. and S. Devon), in E. and W. Cornwall and in N. Somerset, by Messrs. J. H. Keys, G. C. Champion and others. It has also been taken in Carmarthenshire (Llanstephen), as I saw specimens from there in the collection of Mr. Kidson Taylor.

It is, perhaps, a fact of some significance that all these 5 southern British species which have turned up in the south-west corner of Scotland are also found in Ireland. They perhaps all belong to that group of the British fauna known as Lusitanian (see R. F. Scharff, 'The History of the European Fauna,' "Contemp. Sci. Series," 287-308, 1899; and "European Animals," Arch. Constable and Co., 1907). The fact that three of these species have been recorded for places on the western coast of England, *i.e.*, *B. signaticollis*, *H. dorsalis* (*mulsanti*), and *O. lejolisii*, is suggestive that possibly they—and other members of the same group—may be discovered all along that coast wherever suitable habitat offers. That they are confined in Scotland to the south-western corner is also improbable, and there seems no reason why they should not yet be discovered among the Western Isles, as other members of the Lusitanian group have been found there.

Besides the four species in the Lusitanian group, which constitute new Scottish records, two other records in the following list are of special interest. *Cœlambus versicolor*, Schall, has, so far as I know, only been once previously

recorded for Scotland (Berwickshire, Andrew Murray, 1853). There is, however, a single specimen of this species in the Dublin Museum Collection labelled "Royal Botanic Garden, Edinburgh, 1864" (M'Nab). I only found the species at one spot on the river Dee, Kirkcudbrightshire, where, however, it was distinctly common. It occurs in Northumberland, Durham, Yorks, and Lancs S., but has not so far been recorded from Cumberland, so that the northern counties of England and the southern counties of Scotland would appear to be its northern limit in Britain.

The other record of interest is *Rhantus pulverosus*, Steph., of which, however, I only took one specimen! The only other Scottish record is one of Little's, for Forfarshire, which, however, Dr. Sharp regarded as doubtful. It has been taken in Lancs S., and Durham, so that possibly my single specimen should be regarded as an individual which has exceeded the normal bounds of distribution of the species.

When Canon Fowler published his book on the "British Coleoptera" (1887), *Agabus affinis*, Payk, was only known to occur "near Dumfries." Whether the species has since rapidly increased its range, or whether the absence of other records at that time was due to confusion with *A. unguicularis*, Thoms., it is impossible to say, but the species is now very widely distributed in Great Britain, and occurs also in Ireland.

It had been previously recorded for "near Glasgow," Andrew Murray, 1853; Renfrewshire, "local but very abundant," Morris Young ("Ent. Weekly Intelligencer," i. 166, 1856); and Fifeshire, Andrew Murray, 1853; but these records had all been swept aside by Dr. Sharp, who said "specimens of *A. unguicularis* have usually been mistaken for this species" ("Col. of Scotland," 1871-78).

At the time of the publication of my paper on these two species ("Ent. Rec.," xviii. 1906), *A. affinis* had been recorded from Clackmannan (A. Beaumont, "Scott. Nat.," ix. 1887-88); Warwickshire (H. Willoughby Ellis, "Vict. County History," 1904); Edinburgh (Wm. Evans, "Ann. Scott. Nat. Hist.," ix. 91, 1900 (taken in 1896), and T. H. Beare, "Ent. Rec.," xv. 49, 1903); and Berwick (T. H. Beare, "Ent. Rec.," xv. 181, 1903); and I have since found

that several records of *A. unguicularis* really referred to this species.

I have seen English specimens of *A. affinis* from Cornwall, E. (Clark); Devon, S. (J. H. Keys); Essex, S. (E. A. Newbery); Warwick (H. W. Ellis); Cheshire (J. H. Bailey and J. F. Dutton); Cumberland (F. H. Day); and Surrey (H. Donisthorpe and E. C. Bedwell).

In Cornwall both *affinis* and *unguicularis* have been taken and recorded as the latter. In Devon and Cumberland apparently only *affinis* has occurred, but the record is for *unguicularis*. I have no record of *unguicularis* for Essex, the record of *affinis* being for a single specimen from Epping kindly sent me by Mr. E. A. Newbery. In Warwick both *affinis* and *unguicularis* were recorded, but apparently only *affinis* has occurred. In Cheshire only *unguicularis* has been recorded, but, thanks to Mr. Dutton, I have seen specimens of both species from there.

The Surrey specimens are interesting. Up to 1902 neither species had been taken, but from 1903 onwards Messrs. Donisthorpe and Bedwell have taken one of them freely, always at Oxshott. The species has been recorded as *unguicularis*, but all the specimens in the collections of these gentlemen are *affinis*.

A. affinis is very common all through the Solway district, chiefly in sphagnum pools on peat mosses. I have also taken it commonly in Ayrshire, Renfrew, Dumbarton, and Forfar, and have seen specimens from Clackmannan.

A. unguicularis, which is at present the common species in England, is fairly widely distributed in Scotland, although in the Solway district it has only turned up in four localities in Kirkcudbrightshire. I have taken it in Stirling and Forfar, and Dr. Sharp took it in Edinburgh and Haddington, and there are also records for Clackmannan and East Inverness. It is, however, I think, the rarer of the two species in Scotland.

The following is the full list of Solway species. Where I have taken the species myself I give no other authority. The *black* type indicates the county record, and the *smaller* type gives the localities where the species occurred.

Brychius elevatus, *Panz.*—**Dumfries,** R. Annan; **Kirkcudbright,** R. Nith, R. Dee, etc.

[Haliplus obliquus, *F.* — **Kirkcudbright,** "Glen Mill Burn" (Lennon).]?

H. confinis, *Steph.*—**Kirkcudbright,** Lochrutton Loch only, but fairly common.

H. flavicollis, *Sturm.* — **Dumfries,** R. Lochar; **Kirkcudbright,** Lochrutton L., L. Arthur, Cullochan L., R. Nith, R. Ken, R. Dee.

H. fulvus, *F.*—**Kirkcudbright,** Lochrutton L., R. Ken, Dalbeattie, R. Nith, etc.; **Wigtown,** R. Cree, Water of Luce.

H. ruficollis, *De G.*—**Dumfries, Kirkcudbright, Wigtown;** common.

H. fluviatilis, Aubé.—**Kirkcudbright,** R. Nith, R. Urr, etc.

H. striatus, *Sharp.*—**Dumfries,** Caerlaverock and Kelton (Lennon and Sharp); **Kirkcudbright,** Kirkconnel (Lennon).

H. lineatocollis, *Marsh.*—**Dumfries, Kirkcudbright, Wigtown;** common.

Laccophilus interruptus, *Panz.*—**Kirkcudbright,** 1 only, R. Nith (Lennon).

L. obscurus, *Panz.*—[**Dumfries,** Auchencrieff L. (Lennon)]?; **Kirkcudbright,** Lochrutton L., Carlingwark L., Rockcliffe, scarce.

Bidessus minutissimus, *Germ.*—**Kirkcudbright,** R. Nith, R. Ken; **Wigtown,** Water of Luce.

Hyphydrus ovatus, *L.*—**Dumfries,** Auchencrieff L. (Lennon); **Kirkcudbright,** Clonyard L., Carlingwark L., Ken Bridge.

Cœlambus versicolor, *Schall.*—**Kirkcudbright,** R. Dee (Thrieve Bridge).

C. 5-lineatus, *Zett.*—**Kirkcudbright,** Lochrutton L., Cullochan L., Carlingwark L., Ken Bridge.

C. inæqualis, *F.*—**Dumfries, Kirkcudbright, Wigtown.**

C. confluens, *F.*—**Dumfries,** one only, Caerlaverock Salt Marsh (Lennon).

C. 9-lineatus, *Steph.*—**Kirkcudbright,** Lochrutton L., Lochaber L., L. Arthur, White Loch, Colvend, L. Ken, R. Dee (Thrieve Bridge).

C. impressopunctatus, *Schall.*—**Dumfries,** one specimen, Caerlaverock Salt Marsh; **Kirkcudbright,** one only, Dalbeattie.

Deronectes latus, *Steph.*—"Solway" (Sharp).

D. assimilis, *Payk.*—**Dumfries,** R. Lochar; **Kirkcudbright,** Lochrutton L., L. Arthur, Lochaber L., Clonyard L., Maxwelltown L., R. Nith; **Wigtown,** R. Cree.

D. depressus, *F.*—**Dumfries, Kirkcudbright, Wigtown**; common in running water.

D. 12-pustulatus, *Ol.* — **Dumfries,** R. Annan; **Kirkcudbright,** R. Nith, Carlingwark L., R. Dee, etc.; **Wigtown**; not uncommon, but usually only in autumn.

Hydroporus pictus, *F.*—**Dumfries,** Racks Moss, Lochar Moss, Bankend; **Kirkcudbright,** Maxwelltown L., Clonyard L., Dalbeattie L., Ken Bridge, R. Dee; **Wigtown,** R. Cree; local and not common.

H. granularis, *L.*—**Kirkcudbright,** Maxwelltown L., Rockcliffe; **Wigtown,** nr. Kirkcowan. Fairly common where it occurs.

H. lepidus, *Ol.*—**Dumfries,** Racks Moss, Lochar Moss, Bankend; **Kirkcudbright,** Barclosh Peat Moss, Dalbeattie, Duff's L.; **Wigtown,** one only, Water of Luce; abundant in many large deep peat holes, otherwise generally scarce.

H. rivalis, *Gyll.*—**Dumfries, Kirkcudbright, Wigtown,** common in gravelly streams.

H. septentrionalis, *Gyll.*—**Dumfries, Kirkcudbright, Wigtown**; chiefly found in the larger streams in gravelly parts.

H. davisii, *Curt.*—**Dumfries,** Well-burn, Moffat; **Kirkcudbright,** near Carsethorn (Lennon); I failed to find it anywhere about Carsethorn.

H. lineatus, *F.*—**Kirkcudbright,** Lochrutton L., and a few ponds about the county; not common.

H. tristis, *Payk.*—**Dumfries, Kirkcudbright, Wigtown**; peat bogs at any altitude; common.

H. umbrosus, *Gyll.*—**Dumfries, Kirkcudbright, Wigtown**; fairly common.

H. angustatus, *Sturm.*—**Kirkcudbright,** Dalskairth, Castle Douglas, Dalbeattie; **Wigtown,** near Newton Stewart; only a few specimens.

H. gyllenhalii, *Schiödte.*—**Dumfries, Kirkcudbright, Wigtown**; the dominant peat-bog species up to about 1000 feet altitude.

H. morio, *Dej.*—**Kirkcudbright,** Criffel, etc., the dominant peat-bog species above 1000 feet altitude.

H. vittula, *Er.* — **Dumfries, Kirkcudbright, Wigtown**; fairly common.

H. palustris, *L.*—**Dumfries, Kirkcudbright, Wigtown.**

H. incognitus, *Sharp.*—**Dumfries, Kirkcudbright, Wigtown**; chiefly in large peat holes in some of which it swarms.

(*To be continued.*)

THE FALSE-SCORPIONS OF SCOTLAND.

By Robert Godfrey, M.A.

(*Continued from p.* 26.)

Chelifer cancroides (Linn.), 1761.

On the 2nd of April 1907, while sifting some hay-seed and refuse from a stable loft in Emily Street, Glasgow, I obtained a single specimen of *Chelifer cancroides*. A week later, with the help of the stableman, Mr. Alick Wilson, I examined the loft with great care, and, after long search, we came on a colony of the species living on a discarded piece of harness buried in the hayseed. Some of the specimens were very immature, but most of them were adult, and at least one seemed to be ready to lay her eggs. On the 29th of April, accompanied by Robert Whyte, I returned a third time to the loft, and together we obtained other eighteen specimens. By beating pieces of old harness sharply on the ground, we shook the creatures out of their recesses; and by cutting up the harness we found other individuals concealed in the narrow interstices between the strips of leather. We also succeeded in discovering the discarded moulting nests, placed between strips of leather that had been tightly sewn together. The nests were closed elliptical rings, 2 millimetres by 3 millimetres in cross diameter, of dust particles, within which was the inner silken lining appressed throughout the extent of both upper and under surfaces against the leather. Two of the nests contained the remains of moults.

I gave the stable a rest for two months, and returned on June 28 to hunt for the female with young. The previous ravages on the loft had evidently told on the colony, but I obtained other three from old harness, and the stableman unearthed a small wooden board, which proved to be haunted by the species. In all we took nine specimens. Of these, four were fully adult, and all males. Of the other five, two were females, swollen, but showing no external sign of the embryonic mass. Either the season for the appearance of the egg-mass had not yet arrived, or, what is more likely, the adult females were snugly hidden in cracks of the wood or elsewhere.

In a second stable loft, in Walls Street, Glasgow, on the same afternoon, I found an adult male resting on the outside of a small wooden box; later, on September 14, 1907, Aird Whyte and I visited this stable, and devoted our attention to one of the horse-stalls: we found adults and young that had but lately entered on a free life living in company with *Ch. panzeri*.

I put five of the specimens obtained on June 28 into a bottle

with some chaff and left it in my room. Periodically afterwards, on examining the bottle, I could see two or even three on the inner side of the glass. On September 13 I emptied out the bottle, and discovered that four of the inmates were moving about as actively as ever, though they had had no food since they had been made prisoners. In searching for the fifth I noticed parts of a silken nest fitted into the dense spike of a withered head of grass or other plant. The nest was partially covered with such pieces of chaff and dirt as the little builder could obtain. Inside was the fifth *Ch. cancroides*, guarding with her open nippers the entrance I had made. I tried patiently to induce her to show me her under side, but she clung so tenaciously to her home that I could not attain this end without destroying the nest. Still it was necessary for me to know whether she had her embryo mass, and I had to force her out. She was still swollen, but showed no external sign of the embryo mass; yet I thought it possible that she had built the nest for reproductive purposes, but it proved afterwards that she had done so for moulting.

At any rate Mr. Wallis Kew has succeeded in proving that this species builds a nest for reproductive purposes; in August 1907 he found in a stable in Essex two females in cocoons with their embryonic mass attached.

Among hay-seed and refuse *Ch. cancroides* is hampered in its movements, but on a level surface it walks at ease. Its normal line of progression is forward, the pedipalps being held so as to form a rude semicircle and the nippers being expanded. It keeps its body clear of the ground, but when tampered with it squats and lets its pedipalps droop or draws them back. When in danger *Ch. cancroides* moves sideways and backwards as well as forwards; but, when compelled to take a sideward line of retreat, it soon alters its position so as to face the danger and to retreat in a direct backward line from it.

When at rest with pedipalps fully drawn back, the long femurs lie back over the fore-body, their distal ends touching, the tibiæ are generally at right angles to the femurs, and the great hand nippers parallel to the femurs.

Chelifer latreillii (Leach), 1817.

This species was described by Leach in 1817, but his type remained unique, as far as Great Britain was concerned, until the discovery of Scottish specimens by Mr. H. Crowther in 1882. Mr. Crowther found three individuals on the promontory at North Berwick, their proximity to the sea being such that at high tide the spray was constantly thrown on the cracked igneous rock that sheltered them.

After prolonged hunting for this species on both shores of the

Forth, I rediscovered on May 23, 1905, the habitat at North Berwick in which Mr. Crowther had first found them. Just below the promontory proper and adjoining the swimming pond and harbour is a strip of low-lying porphyritic rock, whose surface is scarred and torn in every direction. Here in the crevices between the fragments of rock *Chelifer latreillii* lives. Most of the thirteen individuals seen were adult, but an immature specimen closely approaching in tint the colour of the rock was also observed. Some old nests in which individuals had moulted were attached to the fragments of rock, and a single occupied nest contained a young individual that may not have emerged from its hibernating quarters. This last nest was an elliptic ring, about four millimetres by two, formed of particles of grit agglutinated, with an inner lining of light silk; it was placed between two appressed rock-fragments and formed quite a safe retreat for the inmate.

This rediscovery of the original habitat of *Chelifer latreillii* was followed by the discovery of other haunts, indicating the abundance of this species on certain parts of our coast-line. To the west of North Berwick, at Gullane Point, in the cracks and crevices of the natural rock I saw many on October 14, 1905; a number of the immature individuals were dwelling alone in large cocoons, and had already in my opinion entered on hibernation. At the same spot, on November 10, 1906, adults and young were found hibernating solitarily in cocoons, and other adults were resting in a free condition in the joints of the rock.

On the opposite shore of the Forth, near Elie, Mr. Evans took two specimens in July 1905, and, on 14th September, George Barbour and I near the same place found over twenty specimens and many empty nests in cracks of the natural rock just above high-water. And at Kilminning, in the East Neuk of Fife, during September 1905, George Barbour and I met with the species abundantly under stones on a fine pebbly subsoil a few yards above tide-mark; and on 11th November of the same year I found five individuals living free in the rock crevices of Rosyth promontory.

My delay in finding *Chelifer latreillii* in Scotland is partly explained by a preconceived notion that it would be found in haunts similar to those in which it is known to occur in England and in France. Mr. Wallis Kew had informed me that on the treeless sand-hills and warrens of the Lincolnshire coast it occurs in abundance under pieces of wood and other objects lying on the sand or sandy soil, as well as under the bark of maimed stumps of sea-buckthorn and elder, and of dead branches of these bushes in fences. There can hardly be any doubt but that it occurs in similar situations in Scotland, but our present information shows that it prefers here natural rocky ground close to the sea.

When exposed to the light *Chelifer latreillii* remains for a while

inactive, with its pedipalps drawn back to the sides of the fore-body, and, if tampered with, it moves slowly backwards, still retaining its pedipalps in the retracted position. If undisturbed, however, it gradually stretches its pedipalps outward and forwards, and opening the fingers wide, begins to move along by jerky stages of five or six paces, then settles down into a regular travelling movement. No species lends itself to observation so readily as this one, and individuals kept in captivity have allowed me to determine for myself the use of the serrula and the method of feeding—both of which are detailed in the introductory portion. In the fields I have watched one carry off in its chelicerae a beetle[1] as long as itself. Mr. Wallis Kew tells me that he has seen it, in captivity, catch with its great hands and afterwards suck out the juices of *Chthonius tetrachelatus*; he has also seen it preying on *Chthonius rayi*; and among the insects which it caught with great dexterity were five specimens of the active little wasp-like Hymenopterous parasite which is commonly bred from cocoons of weevils of the genus *Cionus*. *Chelifer latreillii* is of social habits, numbers being found in close proximity.

The nests of this species, used for moulting and for hibernation, are large and generally placed between two closely-appressed pieces of rock; they are formed of earth with a silk lining and with a silken floor and roof attached to the stones. The creature may exceptionally take possession of a natural hole in the rock, and cover the mouth with silk without any earth; in one such case, on my inserting a pin, the adult creature within showed fight, and tackling the pin with its great nippers emerged from its nest-hole after it; shortly afterwards it again disappeared into the hole, but when disturbed a second time and forced to come out, it refused to return. In September we found nests containing the cast-off moult, and on the 7th of the month we examined a nest, three by five millimetres, containing both a moult and a creature within it.

No nest is made for reproductive purposes. I first observed this in my captive specimens, one of which on June 27 was wandering about freely with her embryonic mass attached to the under side of her hind-body. I do not think the eggs had been produced earlier than June 21, as I had not noticed anything peculiar about her on that day. On June 30 the mass appeared to be developing well, but on July 13—after my return from a trip to St. Kilda—I found the chelifer clean, without any trace of her embryonic mass. She was still alive, however, and was active till August 30 at least; she had received no food since her capture, but beyond being much thinner after her experiences, did not appear greatly inconvenienced by her imprisonment. On August 1 I examined her dwelling carefully and found what I took to be the discarded embryonic mass; it was so shrivelled up, however, that I could make nothing of it.

[1] Identified for me as *Tachyporus chrysomelinus* by Dr. D. Sharp.

In their natural condition also the females are free while carrying their mass of eggs or embryonic young. Moreover, on September 5, 1905, at Kilminning, I found one, a female, moving about with ten young ones which had attained their definitive form, seated on the under surface of her hind-body. She stood or walked with the front of the fore-body almost touching the ground, and her emaciated hind-body raised in a concave arch above the ground. The young were seated with their heads outwards; the outer young were clinging to the inner, and one youngster wandered over the upper surface of its parent.

Cheiridium museorum (Leach), 1817.

This, the smallest of our British species, measuring just over one millimetre in length, has its proper home in stables and hay-lofts, where it occurs among the hay-seed as well as on pieces of wood and stones covered with dust and spiders' webs; it also lives in houses, but its presence there is rarely suspected unless when it wanders from the cracks of the furniture in which it passes its existence to books, or to collections of dried plants or natural history objects.

My introduction to this species came in quite an unexpected fashion. While busy writing a sermon in my room at Bankhead, Bo'ness, on June 20, 1901, I noticed a little brownish-red speck on the Bible that lay open before me, and was surprised to see that it was a live specimen of the long-looked-for Book-scorpion. In its movements it resembled other species previously known to me, walking with its pedipalps held well forward, and altering their position or retracting them on the slightest suspicion of danger. Repeatedly I put my pencil in front of it, taking care, however, not to touch it, and it always showed its sensitiveness to the presence of the pencil point by drawing back its pedipalps, and at the same time moving backwards. When I followed it up, the little creature continued to retreat before my pencil, of whose presence it seemed to be quite conscious before actual contact took place. When I blew on the creature, it drew its pincers quite close to its head, and appeared then like a small speck of brownish-red dirt.

Four years afterwards, almost to the very day, June 21, 1905, I discovered that a large colony had been living unknown to me in my own house in Cumberland Street, Edinburgh. Our kitchen bunker had to be removed to allow of some repairs being effected on the wall, and was judged so aged and decayed as to be undeserving a place in the house any longer; it had been in the house during the twenty-four years of our occupancy, and was probably fifty years old at least. Before removing it to a cellar, I had pulled off a plank that had overlapped the back of the bunker to prevent articles falling down between it and the wall, and I instinctively examined the under side of the plank. It was literally covered with

typical false-scorpion nests, little dust-covered blotches on the wood. In subdued excitement I proceeded to open these with a pin, and in the second nest opened I exposed an adult *Cheiridium museorum* with her embryonic young attached to her under surface. On this strip of wood were a hundred and seventy-three nests, with sixteen more on the portion of the bunker-lid which it had covered. On examining the two planks more carefully next morning I noticed a number of dead specimens lying on the wood, and two brightly coloured adults besides a few immature individuals moving among the dust. By testing one of these live specimens I assured myself that their sense of touch lies in the fine hairs of the great nippers.

On March 26, 1906, in breaking up an old chest brought by my brother James from Smeaton, East Lothian, two days previously, I discovered many nests of this species in the woodwork, and found one colourless individual moving free.

In September 1905 another important clue to this creature's habits was obtained at Crail, Fifeshire. While a guest of Dr. Barbour at Kirkmay House, I received a letter from Mr. Wallis Kew suggesting a search for False-scorpions in stables, and, on September 9, George Barbour and I visited the stable-loft to look for these creatures. Almost at once George found two specimens of *Cheiridium museorum* on a loose stone lying under the rafters, and in a very short time we obtained fifty-five specimens. These were mainly found under the thick layers of dust and cobwebs that covered stones and boards, but a few were obtained by sifting the hay-seed. On subsequent visits to the loft we discovered that *Ch. museorum* was common among the hay-seed and the refuse in the loft corners. By shaking this stuff over a stone, and blowing upon it, we saw many of the tiny chestnut-coloured specks left behind on the stone. We also saw the nests quite numerously on the wood as well as on the stones; in three of these we found live creatures, and in thirteen of them we saw the cast-off moults.

Following up this clue, I obtained a single dead specimen in refuse from a flour-mill at Stravithie on September 25, 1905; and five specimens at the farm of Newhouse, Dunbar, in May 1906,—four being on a piece of wood in a barn, and the fifth under a stone in a shed. In April 1907, G. A. and R. B. Whyte informed me of the extraordinary abundance of this species in the barns at Grange, Keswick, and gave me full proof of their statement during a stay of a few days with them in the locality. In hay-lofts and in barns the species swarmed on dust-covered stones and old wood, as many as sixty individuals being found on a single stone. On some of the stones favoured by the False-scorpion there also occurred in abundance a small Mite; and each creature seemed, to a slight extent at least, to be profiting from the other's presence. One *Ch. museorum*

was carrying a Mite in its chelicerae; and on the other hand, a living Mite was occupying a discarded nest, in which the False-scorpion's moult remained. Stones and wood were thickly dotted with the minute nests of this False-scorpion.

The nests vary in size from just over one millimetre to two millimetres in diameter, and are formed of two thin layers of fine silk, one of which is attached to the surface of the wood or stone, and the second of which forms a hemispherical dome over the first. In rare cases the nest is formed of silk only, but in most cases it is covered with a coating of tiny particles of wood or of dust. The nests are used for the various purposes of moulting, rearing young, and resting (rather than hibernating). As already indicated, adult females with their embryonic young attached have come under my notice in the nest; but in three of the nests on our bunker lid in Edinburgh there were embryonic masses of five, four, and two young respectively without any attendant adult. In no other False-scorpion's nest had I found the eggs or the undeveloped young without their parent, and I hesitated to put this fact on record without fuller evidence. I noticed, however, that in the case of an adult carrying four embryonic young, the larval mass was easily detached, and did not therefore appear to be in any vital relation with the parent; and in April 1907, G. A. Whyte at Keswick made a further observation on this point. He opened several nests, each of which contained three colourless young individuals which had attained their definitive form, but had no adult beside them. One such nest with its three young he opened in my presence. And again on October 19, 1907, at Haswellsykes, Peebles, he confirmed his Keswick experience by finding another nest of this species containing three young without any adult.

The number of young in this species varies from two to five.

Ideoroncus cambridgii (L. Koch), 1873.

So far as present Scottish records indicate, this species is restricted to the west coast, but it is safe to say that its known haunts afford us no exact estimate of the creature's range. The first specimens, three in number, were obtained by myself in a rocky wood at Barbreck on the shores of Loch Awe, June 30, 1900; they were living in the crannies of the rock under a thin covering of earth and vegetation. A fourth Argyllshire specimen, fully adult, and presented to me by its captor, was taken by Rev. James Waterston on April 23, 1903, on the under side of a stone deeply imbedded in the soil on the south-western slope of Ben Cruachan.

Since then, this species has been proved to be commonly distributed along the west coast from the Kyle of Lochalsh to the Solway Firth. At Balmacara, Ross-shire, Aird and Robert Whyte

and I found it on natural rocky ground throughout a considerable area, in August 1906. At Oban, in April 1906, we took it not only on the mainland, but also on the Maiden Island and on Kerrera. Farther south, on the shores of Loch Fyne at Shirvan, Henry Drummond Simpson and I, during August and September 1904, found many specimens on the stony hillsides both of the open and of the woodland; and at Ronachan in Cantire I obtained four individuals at Christmas 1905.

Meantime I had discovered another stronghold of the species among the rocks at Portincross Castle in Ayrshire. From November 7, 1903, to April 2, 1904, I have entries of eighty-two specimens in my note-book. The Ayrshire haunt of *I. cambridgii* is the tree-clad cliff-foot that skirts the shore; here the ground is in a natural condition with many stones imbedded in the earth or rudely jumbled together, and with a soft and somewhat marshy soil; under the stones *I. cambridgii* dwells. In the extreme south of Scotland also, at Kippford in Kirkcudbrightshire, we obtained five specimens in January 1907, taking two of these on the small Rough Island.

Its main haunts are on rocky hillsides, both by the shore and inland, where it is most generally found under tightly-imbedded stones. It has, however, been procured on driftwood also, in company with *Chernes dubius* and *Chthonius rayi*, by Robert Whyte; and it has been obtained among leaves, in company with *O. muscorum*, by the same naturalist.

This species is not so active as *O. muscorum*, although, so far as its free life is concerned, it possesses similar habits. Its mode of progression is a slow advance with extended nippers; in making its way between little blobs of soil, it twists its pedipalps simultaneously, now to right, now to left, to suit the necessary line of progress, and, on touching any suspicious object, it retracts them and runs backwards. When prodded behind, it turns slowly.

I. cambridgii preys on tiny worms and springtails. Although I have seen this species five times with its prey, I have never seen it using its great nippers in handling the food at all; I have not, however, witnessed the full process of capture in this species. Once I disturbed an *I. cambridgii* with a small whitish worm of about its own length and as thick as the False-scorpion's fore-body; it was holding the worm by the middle in its chelicerae, and had already sucked one half. It began to move off, carrying the worm with it, lying over its left chelicera and along the left side of its carapace; and, as it walked, it jerked out a minute dot of chalky excrement from its anus. It carried its prey quite easily and moved slowly about with it till it discovered a convenient ball of earth under which to retire; but, on being disturbed by me a second time, it left its prey and retreated backwards.

On another occasion, August 22, 1906, Robert Whyte and I watched for a full hour an *I. cambridgii* carrying an Annelid in its chelicerae. During all this time the False-scorpion never once used its great nippers. At first the Annelid was juicy and actively writhed under the grip of the False-scorpion; later it shrivelled into a dry thin stick, but even in this condition was still carried about by the False-scorpion. As the False-scorpion gave no sign of removing the remains of its feast from its chelicerae, we at length used a pin to force it to quit the Annelid, but for four minutes we played with the False-scorpion before we could compel it to drop the dried-up worm. During the time we watched it, the False-scorpion kept constantly on the move, having its great nippers open as it prowled about.

The existence of a nest for any purpose whatever in this species has yet to be proved. All the creatures found so far—and the only months in which I have not seen them are May, July, and October—have been living free. Neither adults nor young appear to hibernate; at Portincross, from January 14 to the end of March 1904, I saw numbers of immature examples, in the colourless condition of those just beginning a free life, moving about actively under the stones. The adults also, though rather inert, were leading free lives throughout the winter.

The time and the manner of moulting are still unknown, though probably this part at least of the animal's life-history takes place inside a nest.

It still also remains an open question whether or not this species makes a nest for reproductive purposes. Very immature youngsters are to be met with in September, as well as in January, February, and March; but the female has not yet been observed carrying her eggs or embryonic mass.

Obisium maritimum, Leach, 1817.

Two important facts connected with *O. maritimum* bestow upon it an interest which is not attached to our other British species. The first is its distribution, which, so far as I have ascertained, is confined to Great Britain, the Isle of Man, and the Channel Islands. The second is its habitat, which normally lies between tide-marks.

Mr. Wallis Kew has very kindly transcribed for me the recorded history of the species from its discovery by Montagu to the present time. It appears to have been taken first (for there is hardly any doubt that this species is indicated) in Cornwall "on the rocks contiguous to the sea," whence it was described and figured by Montagu in a paper read before the Linnean Society in 1807, and published in 1815. Leach, in 1817, described and figured it under the name it now bears, and says of it, "Habitat in Angliâ occidentali inter

rupes ad littora maris. Communicavit Dom. C. Prideaux." The exact locality is not given and the figure is poor; but the type is preserved in the British Museum, labelled, "West of England, C. Prideaux, Esq." No further reference appears to occur till 1869, when M'Intyre published an article on "Pseudo-scorpions" in Hardwicke's "Science Gossip," and mentioned a large *Obisium*, which is almost undoubtedly *O. maritimum*, and which was taken at Plymouth by Mr. C. Stewart, who found it rather abundantly below high-water mark. In such a situation, it is added, the animals would nearly always be submerged, "but doubtless the crannies of the rocks which it inhabits always contain a certain amount of air." Later, in 1892, Mr. Pickard-Cambridge, in figuring and describing the species anew, stated that he had received it from the Devonshire coast, where it was found by Mr. Bignell of Stonehouse, Plymouth, under stones below high-water mark; and also from Mr. Sinel from a similar situation in Jersey.

In March 1905, Mr. Pickard-Cambridge informed me that he had lately received this species from the Isle of Man; and in June Mr. Wallis Kew told me he had had it from St. Ives, Cornwall, where it was collected by Mr. F. W. Wilson.

While a guest with Professor, now Sir Alexander, Simpson at Shirvan, Argyll, in September 1904, I discovered this species somewhat commonly between tide-marks just below the house. Henry Simpson and I had gone down to fish, but, on taking out the boat, we considered the wind too strong, and, giving up our purpose, we returned to land again. While Henry fastened the boat, I turned over a few stones, and on the under surface of the second or third stone I detected a large dark-coloured False-scorpion, which in the shape of its great nippers resembled *I. cambridgii*. A few seconds of suppressed excitement, while I brought my lens to bear on the eyes, were followed, when I saw that the creature had four eyes, by that indescribable joy which accompanies the finding of long-sought treasure. I knew that I had found *Obisium maritimum*, and I was conscious as I gazed on it of being highly privileged in seeing in its native haunts a creature which so few naturalists had looked on before. My young companion entered into the excitement of the moment, and together we carried on an enthusiastic hunt, and found other eight specimens. On subsequent days I spent much time studying the species and seeking to work out its life-history. Altogether, twenty-three individuals were noticed, living at from a few feet to several yards below high-water mark. Their home is under stones firmly set in the matrix of sand and shells, where in some cases their haunts may remain comparatively dry when the tide is in, but in others their retreats must be soaking with sea-water for the greater part of the day. It is probable, however, that their choice of tightly-fitting stones is not so much for the

purpose of escaping from the sea-water as for the sake of the air enclosed in these crannies.

Obisium maritimum rests with its pedipalps drawn back, so that the nippers are close to the front of the fore-body, and keeps its nippers expanded as if to receive visitors. In moving, it holds its pedipalps, still kept open, well forward, and with the tips of its nippers it taps the tiny shells and other material in its way as if testing them. It is less regardful of interruptions placed in its path than the land species are, and is less inclined to retreat from an obstacle. When it thinks fit, however, it moves easily backwards, and can run actively backwards or forwards, and at times retreats into very narrow crevices of the stones. I did not succeed in observing them catch their prey, nor could I discover what they preyed upon. One moved over a number of springtails without taking any notice of them.

Obisium maritimum forms nests for the purposes of reproduction and moulting. Whether or not it also forms a nest for the purpose of hibernation remains a matter for future investigation. The nest is a tough cocoon of white silk, fastened on the under side of a stone, and lying between the stone and the matrix below. In the nests that came under my observation there was no external covering of earth whatever; the slight pieces of dirt attached to the white silk seemed purely accidental. Yet the nest of *O. maritimum* is not, in spite of its white colour, glaringly conspicuous, but might easily be passed over as a piece of quartz or other white mineral substance embedded in the stone. In a nest found September 24, 1904, was a female with her embryonic young—at least eleven in number—attached in the form of a hemispherical mass to the under side of her hind-body. The embryonic mass forms one whole, of irregular outline, each embryo being distinctly marked off from the others. Each embryo appears to lie in a thin white sheath of its own, and to be connected vitally with the living female.

Under the same stone was a second nest of the same nature, measuring 5.5 mm. across by 4 mm. in another direction; it was slit open along one side, and contained the moulted fore-body of one of these creatures, but the moult was carried off by the wind before I had subjected it to the examination I should have liked.

The second Scottish record for *O. maritimum* was obtained on August 27, 1907, at Balmacara, West Ross, when, after a long search, a single immature female was captured. It was moving freely on the under surface of a stone set in the sandy mud some distance below the high-tide line. In spite of a continued search, no more specimens were discovered.

(*To be continued.*)

THE HIGH ALPINE FLORA OF BRITAIN.

BEING A LIST OF THE FLOWERING PLANTS AND FERNS FOUND AT A THOUSAND METRES AND UPWARDS ON THE MOUNTAINS OF THE BRITISH ISLES, WITH AUTHENTIC REFERENCES AND CRITICAL NOTES.

By Frederic N. Williams, F.L.S.

(*Continued from p.* 114.)

Fam. 25. Caryophyllaceæ—*Continued.*

90. *Sagina intermedia*, Fenzl in Ledeb., "Fl. Rossica," i. 339 (1842).—Syn. *Spergula saginoides*, var. *nivalis*, Lindbl., in "Physiogr. Sällsk. Tidskr." 328 (1837-38), et in Flora, xxiv. 587 (1841), ex parte; *Sagina nivalis*, Fries, "Novit. Fl. Suecic. Mant." iii. 31 (1842), ex parte; *Sagina nivalis*, var. *β laxa*, Lindb., in "Bot. Nat." 1845, 66; *S. nivalis*, auctt. angl.; *Spergula saginoides*, Hook., "Fl. Bor. Amer." ex parte, sed non L. (1753). An examination of what is understood by the names quoted of Lindblom and of Fries leads to the conclusion that these authors include under this name both *S. nivalis* and *S. cæspitosa*, Vahl (= *Sagina cæspitosa*, Lange, "Consp. fl. Grœnl." i. 22). As *Sagina nivalis*, Fries, and *Sagina intermedia*, Fenzl, are both of the same date, and as there is some doubt about the status of the former, and none whatever about what is meant by the latter, it is better to use the name of a plant of which the application is certain, and that is what I have done here in the case of the Scottish plant. The following is Fenzl's original description:—"Cæspitans, glaberrima, cauliculis subsimplicibus haud radicantibus, 1-2-floris; foliis carnosis lineari-subulatis, acutis, muticis vel mucronulatis; floribus omnibus vel plurimis tetrameris (paucissimis pentameris immixtis); calycis laciniis ovalibus vel subrotundis; petalis ovalibus ellipticisve calyce subbrevioribus; staminibus 8 vel 4 saltem pluribus." Fenzl's name is from the fact that it seemed to be a plant intermediate between *S. procumbens* and *S. Linnæi*. On the other hand, *Sagina cæspitosa*, Lange, is not found south of the Arctic Circle. The figure of *S. nivalis* in Syme, "Engl. Botany," t. 250, is very bad, and gives no idea of the Scottish plant. First recorded by Watson, in "Journ. Bot." 1863, 355. "Mr. Boswell Syme has shown to me a specimen of this Arctic plant picked on Ben Lawers several years ago by Prof. Balfour." It is still another instance of the extreme botanical interest of this famous Scottish mountain. There is good reason for believing, however, that it was first gathered in Scotland by R. K. Greville before 1840 (see

"Trans. Proc. Bot. Soc. Edin." xiii. 95). Balfour's specimens are actually dated August 25, 1847.

The plant occurs in bare places on alpine ridges on Ben Lawers between 946-1022 m., and up to 1060 m. on Ben Ein (Messrs. Marshall and Hanbury, *ex* "Fl. Perthsh." 86). On bare rocks near the summit of Ben Lawers (R. Lindsay, in "Trans. Proc. Bot. Soc. Edinb." xxi. 104 [1898])—this is much higher than the level given in "Fl. Perthsh." Ben Lawers ("Herb. Kew." dated 1864), and up to 1000 m. (P. Ewing, 1901).

91. *Cerastium triviale*, Link, var. *alpinum*, Mert. & Koch, in Röhl. "Fl. Deutschl." ed. 3, iii. 336 (1831).—Ascends to 1067 m. on Ben Ein (E. S. Marshall, 1889, in Herb. Brit.) in dry places. Ascends to 1100 m. on the Grampians of Aberdeenshire (Watson in Herb. Kew.). This is a variety with larger flowers and longer fruit. Probably the form which is found at 946 m. on Carn Tual (H. C. Hart) also belongs here.

Syn.—*C. fontanum*, Baumg., "Enum. Stirp. Transsilv." i. 425 (1816); *C. triviale*, var. *alpestre*, Hegetschw., "Fl. Schweiz," 436 (1840); *C. vulgatum*, var. *alpinum*, Grenier, "Monogr. Cerast." 40 (1841); *C. vulgatum*, var. *β alpinum*, et var. *γ macrocarpum*, Fenzl in Ledeb., "Fl. Rossica," i. 409 (1842); *C. macrocarpum*, Schur, in "Verhandl. Naturf. Ver. Siebenb." ii. 177, nomen solum (1851), *l.c.* x. 131 (1859); *C. longirostre*, Wichura, in "Jahresber. schlesisch. Gesell." xxxii. 75 (1854); *C. alpestre*, Schur, in "Verhandl. Naturf. Ver. Brünn," xv. 1876, ii. 151 (1877); *C. triviale*, var. *fontanum*, Rouy et Fouc., "Fl. de France," iii. 207 (1896); *C. triviale*, var. *longirostre*, Groves, in Bab., "Man. Brit. Bot." ed. 9, 65 (1904).

The following description (varietal characters only) is adapted from Fenzl:—Dense ac longe pilosum latifolium, pilis rigidulis patentissimis quandoque ferrugineis hirsutissimum. Turiones plerumque plures adscendentes elongati ramosi polyphylli. Caudiculi simplicissimi haud vel vix fasciculiferi, cauliculis validis. Folia turionum caulinaque infima lanceolata; reliqua lata oblonga vel ovata. Cyma 3-10-flora. Calyx 8-10 mm. Petala oblongo-cuneata, ungue glabra vel interdum subciliata. Capsula (in forma longirostrata) demum ad 16-20 mm.

92. *Cerastium alpinum*, L.—On grassy alpine slopes and rocks, ascends to the summit of Ben Lawers ("Fl. Perthsh." 81). Northern precipices of Cairn Gorm, at 1160 m. (A. Ley, 1874, in Herb. Brit.). It is found on mica-slate rocks on most of the higher Scottish mountains (Syme, "Engl. Botany," ii. 85). Ben Ein at 1006 m. and upwards (E. S. Marshall, 1889, in Herb. Brit.). I am unable to separate from the type *C. lanatum*, Lamk., "Encycl. Meth." i. 680 (1783), *C. pilosum*, Horn., "Hort. Hafn." add. 965 (1819), *C. latifolium* (non L.) Lamk. *l.c.* (1783), *C. villosum* Baumg., "Enum. Stirp. Transsilv." i. 424 (1816), *C. alpinum*, var.

piloso-pubescens, Syme, *l.c.*, *C. mutabile*, var. *alpicola*, Grenier, "Monogr. Cerast." 71 (1841). There is a series of intermediates varying in the amount of indumentum, until it is reduced to a minimum in *C. alpinum*, var. *glabrum*, W. "Sp. Plant." ii. 815 (1799), an arctic and high alpine form not found on the Scottish mountains. Ben Dearg (in Ross-shire) up to 1006 m. (G. C. Druce, 1902).

Var. *compactum*, Bab. Man. ed. 8 (1881).—At 1026 m. on Ben Nevis (J. Sadler in "Trans. Proc. Bot. Soc. Edinb." xiii. 50-54 [1878]). Ben Ein, at 1006-1066 m. (E. S. Marshall, 1889, in Herb. Brit.), and associated with the other forms of *C. alpinum* on Ben Lawers (E. S. Marshall *ex* F. B. White, "Fl. Perthsh." 81). Stob-Coire-an-Easain, Glen Spean, at 1037 m. (E. S. Marshall, 1896, in Herb. Brit.). On the highest parts of Snowdon (Banks, 1773, in Herb. Brit.).

Syn.—*C. latifolium* (non L.) Smith, "Fl. Britannica," 501 (1800), Hartman, "Skand. Fl." ed. 11, 239 (1879); *C. tomentosum* (non L.) Hudson, "Fl. Anglica," 176 (1762); *C. arcticum*, Lange, in "Fl. Danica," t. 2963 (1880); *C. alpinum*, var. *arcticum*, auctt. recent.

J. M. Norman, in "Vidensk. Selsk. Forhandl. Christiania," 1893, ("Fl. Arctic. Norveg." p. 16), considers this plant to be a hybrid. Certainly its characters are not very distinctive.

93. *Cerastium trigynum*, Vill. (1789). — First found on Ben Nevis by James Dickson in 1792 ("Trans. Linn. Soc." ii. 290 [1793]). Upon mountains to the north of Invercauld (J. F. Mackay ex Smith, "Engl. Flora," ii. 305). Specimens in herb. Sowerby, used for the figure of *Stellaria cerastioides* in "English Botany," t. 911 (Aug. 1801), labelled in J. F. Mackay's handwriting, "On Ben Nevis, 1794," that is, two years after its first discovery by Dickson. Ascends to 1153 m. on the Grampians of Inverness-shire (Watson, "Cyb. Brit. Comp." 124). Ascends to 1220 m. on the Grampians of Aberdeenshire (Dickie, 29).

Var. *nivale*, Williams. Ben Nevis (?). To this probably belongs an example in Herb. Brit. labelled by G. Don, "On Ben Nevis by the side of rivulets: this is a rare plant." It differs from the type chiefly in the leaves being pilescent instead of glabrous. Also on Braeriach, on the western side, in Glen Ennich (G. C. Druce in "Journ. Bot." 1889, 203).

Syn.—*C. nivale*, G. Don, *ex* Nyman, "Consp. fl. Eur." 110; Groves in Bab. "Man." ed. 9, 67.

94. *Stellaria uliginosa* Murr. (1770).—Ascends to 1000 m. in wet places on Glas Thulachan (F. B. White), and to 1005 m. on the Grampians of Inverness-shire (Watson, in Herb. Kew.). Descends to sea-level in Cork.

Fam. 26. Polygonaceæ.

95. *Rumex acetosa*, L.—Ascends to the summits of Ben Lawers and Ben Alder (F. B. White), and to 1037 m. in Glen Spean (E. S. Marshall, in "Journ. Bot." 1897, 70). Ascends to the summits of Carn Tual and Beenkeragh, and descends to sea-level (H. C. Hart).

96. *Rumex acetosella*, L.—Common on the mountains of the Breadalbane district, up to 1006 m. ("Fl. Perthsh." 261). Summit of Ben Lawers, where, however, "it rarely flowers" (R. Brown, 1794, in Herb. Brit.). Ascends to the summit of Carn Tual (H. C. Hart). Descends to sea-level in Cork.

97. *Oxyria digyna*, Hill.—Ascends to 1190 m. on Ben Lawers ("Fl. Perthsh." 262). Ben Lawers (Herb. Brit. ex herb. Gourlie, 1841). Ascends to 1216 m. on the Grampians of Aberdeenshire (Watson). Descends to 168 m. in Kerry. Summit of Snowdon (Herb. Brit. ex herb. Mrs. Robinson).

98. *Polygonum viviparum*, L.—Ascends to the summit of Ben Lawers (Watson, "Geogr. Distrib. Brit. Pl." [1835], 73; Hamilton, in Herb. Brit.). Descends to 150 m. in Sligo.

Fam. 27. Salicaceæ.

99. *Salix caprea*, L.—Attains a higher level in Scotland than any of the other tree-willows, but falls far short of 1000 m. Common in woods and on river-banks, it ascends to 610 m. on hills of the Atholl district of Perthshire, which is the limit of its altitudinal range in Britain. The sallow descends to sea-level in Cork.

100. *Salix Lapponum*, L.—Ascends to 1130 m. on Loch-na-gar (Dickie). A really alpine willow which rarely descends below 610 m. by mountain rocks and streams.

101. *Salix myrsinites*, L.—On mountain ledges high up on Ben Achallader;—the first reference in this List to this mountain. First recorded as a British plant, "upon the Highland mountains, as upon Ben-Achulader, in Glenurchy," by J. Stuart (Lightfoot, "Fl. Scotica," ii. [1777], 599).

102. *Salix herbacea*, L.—One of the most abundant plants towards the summits of nearly all the Highland mountains which exceed 730 m. in height ("Cyb. Brit." ii. 407). Common on ledges and ridges on many of the higher mountains (F. B. White). On the summit of Cairn Gorm of Derry (Dr. J. W. H. Trail). On the summits of the loftiest mountains . . . in a micaceous soil (Smith, "English Fl." iv. 200). Ascends to the summit of Ben Lawers ("Fl. Perthsh." 279), and of Ben Macdhui (Watson, 1832, in Herb. Kew.). Ascends to 1026 m. on Ben Nevis

(G. Sadler in "Trans. Proc. Bot. Soc. Edinb." xiii. 50-54 [1878]), and to 1130 m. on Ben-na-Bourd (Watson, 1832, in Herb. Kew.). On the ridges of Ben Dearg, in Ross-shire (G. C. Druce in "Ann. Scott. Nat. Hist." 1903, 232). Descends to 265 m. in Donegal.

103. *Salix reticulata*, L.—Ascends to 1067 m. on the mountains of the Breadalbane district ("Fl. Perthsh." 280).

NEW AND RARE MOSSES FROM THE WEST OF SCOTLAND.

By James Stirton, M.D.

As a first item in this paper I shall describe a moss which shows characteristics similar to those indicated in *Cynodontium Jenneri* (Sch.) alluded to in the number of these "Annals" for April 1906, as well as to those of *Ceratodon vialis* (Strn.) described in the "Annals" for April 1905. In these, the cells have areas almost exactly four times those of their prototypes. Why such a difference should invariably hold I cannot explain. The late Prof. Schimper of Strasbourg, the greatest bryologist of his time, recognised this peculiarity, and gave effect to it by elevating *C. Jenneri* from its prototype *C. polycarpum* to the rank of a species. I have followed suit as regards *Ceratodon vialis*, whose prototype is the world-wide *C. purpureus* (L.). I now add a third, whose prototype is the rather common *Dicranoweissia cirrhata* (L.).

Dicranoweissia Sutherlandi (Strn.). In rather lax, convex tufts of a deep green above, dark brown or nearly black below; stems slender, simple or dichotomously branched, from a third to an inch in length; leaves rather closely arranged around stem, crisped and curled when dry, widely spreading or arcuato-recurved when wet, especially near and at apex, from a slightly or scarcely wider base, lanceolate, acute, margin in lower half, more especially on one side, reflexed in the middle from .022-.05 mm., plane and entire thereafter, not papillose; nerve pale, then of a peculiar fulvous colour from near base almost to summit, narrow, latit. near base from .04-.05 mm., thin, tapering, and vanishing below acute apex; cells at central base hyaline, oblong, attached with thickish walls, .04-.06 by .011-.016 mm., nearly

of the same size throughout base or lowest fourth, a little shorter towards margin, gradually lessening upwards transversely into the large chlorophyllose, sharply quadrate cells, .013-.018, or even .02 by .01-.014 mm.; apothecia on a rather short pale seta, elliptical, or narrowly so, lid slightly convex, red, prolonged into a slender yellow or reddish acumen from a half to nearly the length of capsule, teeth long, red, 16, barred and papillose. Propagula are seen rather frequently attached to the lower ends of leaves, elliptical, (4-6)-septate, with 2-4 irregularly longitudinal septa, chlorophyllose, then nearly hyaline, .13-.22 by .04-.055 mm. There are still two, if not three, minor differences between this moss and its prototype which I have not fully investigated, to the discussion of which I may return.

On the bark of an old apple tree in the garden of Southbar house, near Renfrew, the property of Mr. R. Sutherland, to whom I have dedicated this moss; near New Galloway, by Mr. J. M'Andrew; detected in one of my more recent collections from Ben Lawers.

As my experience of the nature of mosses increases, I am becoming more strongly impressed to the effect that there is an alternation of generation between these propagula and spores, that the propagation of spores implies a greater vital energy on the part of the plant to produce them, and that accordingly it becomes necessary at certain intervals for such an alternation to occur in order to restore the balance of energy, and that during this stage of comparative quiescence these propagula are produced, and serve the purpose not only of allowing this quiescence to continue, but to increase the vegetative powers of the plant by generating new and improved individuals. Besides, I am becoming of the opinion that differences in the common areolation of the leaf, such as are indicated above, serve the purpose, *inter alia*, of diverting this energy in new directions, so as to produce, by means of these propagula, variations in type, and ultimately to serve the purpose of producing new varieties, as well as of giving new types, a proportion of which become permanent. My thoughts in this direction have been strengthened by observing that *Ulota phyllantha*, which has hitherto been almost entirely

propagated by means of these propagula, is now beginning to produce capsules in greater proportion as time goes on; while the propagula, although still produced, are seldom matured, but fall off at an early stage, and at times are scarcely perceptible at the apices of leaves.

Last year, during the months of August and September, at Onich on Loch Linnhe, I spent a considerable portion of my time in investigating its moss flora. What interested me most was the presence, in great profusion, of species belonging to what is now recognised as the genus *Mollia*. Although I scarcely agree with the extended limits proposed for this genus, it is a fairly natural one. The section of this genus to which I wish more particularly to draw attention is that in which *M. tortuosa* may be reckoned the type. One of the main features of distinction in this section is the peculiar acumen from the apex of the leaf. This has very generally been reckoned a mere extension of the nerve; but it differs in constitution very materially from the nerve, wherein the long, very slender, tube-like cells, traversing the latter in a dense, opaque medium, are very characteristic. This acumen presents a flat, narrowly triangular space, with the acute apex upwards. It is much broader below than the nerve at its junction with the latter, and shows besides a clear, homogeneous, hyaline or tawny matrix, in which are seen long, narrowly elliptical or fusiform cells rather widely detached from one another, containing at first chlorophyll, then becoming merely granular, and not infrequently showing a nearly translucent appearance.

In *Mollia tortuosa* this acumen is much longer than in the others allied to it, and varies in length from .15 mm. to four times that length, and shows besides very generally bluntish hyaline spines on its surface. In this section such is almost unique. For the second time in all my lengthened experience of cryptogamic botany this otherwise very common moss was discovered in fine fruit. Along with it, and often growing intermixed, was detected *M. thrausta* (Strn.). This moss is readily distinguished from the former by the long, narrow, nearly linear upper part of the leaf, length 1.5-.2 by .12 mm., terminating in a very short, nearly triangular acumen of the same structure as already indicated, length

from .03-.09 mm. The leaves besides are very fragile, scarcely an entire apex to be found except amongst the apical leaves or those recently formed. This moss was named by Lorentz at a later date *M. tortuosa*, var. *fragilifolia*. It is, however, a species proper. The tufts of this moss are dense, but the stems are short, varying in length from a quarter to half an inch long, and almost always fastigiato-ramose above, while the whole plant presents a dull, non-glistening aspect, quite a contrast in this respect to the others. As I have already stated, it grows often in close relationships to the former, but preserves its peculiarities intact.

Another moss under this section was also discovered near Onich in fine fruit, viz. *M. inclinata* (Hedw.), the first fertile specimen gathered in this country. It is especially known by its bent capsule, which besides is nearly twice the breadth near the base that it shows near the summit. Besides the two or three stations already known in Great Britain, I have to record another from Craig Challeach, Killin.

In connection with mosses of this tribe, I have to state that *M. aggregata* (Strn.), discovered near Tarbert in Harris, is in all likelihood merely a curious form of *M. fragilis*, where the margin is rendered entire and smooth by the extension upwards to apex of a single marginal row of hyaline cells from the basal areolation. I have *M. fragilis* from Ben Lawers, where it is plentiful, showing at times this marginal peculiarity, viz. extending far up the leaf, although in no one instance actually reaching the summit.

This gives another illustration of the curious relationships of mosses of the west coast of Scotland more especially, to those on the eastern shores of Labrador, where indeed *M. fragilis* (Drum.) was first detected by Drummond himself.

In addition to the mosses to which reference has already been made, I have to record two others under a different section of the same genus, of which *M. brachydontia* may be said to be the type, and where the acumen is nearly identical in structure with the others.

Mollia intumescens, n.sp.—In large, very dense, generally convex tufts, as much occasionally as 1 foot in diameter, of a bright green colour above, with a narrow belt just beneath of a pale yellow, the rest below of a dingy, dark or dusky

red, slightly radiculose; stems very slender, pale, from 1 to 2 inches long, simple or dichotomously branched; leaves rather closely arranged around the stem, incurved when dry, spreading somewhat but straight when wet, concave throughout in front, clasping at base, narrow, slightly expanded and oblong at the point of attachment, then lanceolate and tapering to a narrow point on nerve, rarely slightly convex there, nerve pale, slender, smooth, and projecting behind; latit. near base, .04-.06 mm., tapering upwards, the acumen or extruded portion very long, one-eighth or one-fourth the length of leaf proper, flat, breadth at its junction below with nerve about .045 mm., tapering to an acute point, length from .15-.34 mm., containing the detached narrow cells in a clear homogeneous matrix as already described; margin of leaf slightly undulated, finely crenulated, plane, but very generally inflexed on both sides in the upper third to the extent of .013 mm., while the nerve and acumen remain in a straight line; cells at central base attached, long, narrow, hyaline, .06-.08 by .006-8 mm., nearer or at margin, of still narrower cells as well as a little *longer*, all ending gradually and transversely into the upper dense, close, quadrate cells, at first .007-9 mm., nearer apex .005-8 mm., minutely papillose, but here and there papillæ scarcely perceptible. Only archegonia with very few paraphyses have been seen at the apices of stems, with the inner perichætal leaves much shorter and a little broader. On earth in a wood behind Onich, plentiful.

The next is quite unlike the preceding in general appearance, and there is, besides, a wide divergence in the minute organisation of the leaves, which, however, in general contour show a rather strong resemblance to one another.

Mollia conspersa.—In large laxly aggregated tufts or groups, of a dingy or dusky green colour above, rufous or rusty-red below, slightly radiculose; leaves laxly disposed around the stem, almost interruptedly so, with detached rosettes of large leaves at intervals, and minute, rather acute leaves between, incurved when dry, widely spreading, almost reflexed when moist, oblongo-lanceolate, from a rather wider, pale or hyaline, somewhat clasping base, acutely acuminated above, pagina of either side ceasing at an acutish

angle on the nerve, which is excurrent in a sharply pointed acumen of the same structure as in the preceding, breadth at point of attachment to leaf from .045-.06 mm., and length from .12-.24 mm.; nerve pale, strong, at length reddish, almost convex in front, prominent and smooth behind, latit. near base, ·07-·1 mm., tapering and ceasing at base of acumen, margin plane, crenulate and papillose; basal hyaline cells occupying one-third of leaf, oblong or oblongo-hexagonal in double layer, attached, large, .055-.085 by .01-.015 mm., becoming narrower towards margin, but nearly as long, ceasing transversely upwardly, but not infrequently a single marginal row of basal cells proceeding farther up than the rest, cells immediately above the basal very dark, with numerous bright points, oblong and detached, .02-.03 by .006-9 mm., the upper cells appearing granular and chlorophyllose at first sight, but rendered very obscure on both sides by crowds of papillæ, exactly as in *Tortula muralis*; accordingly upper part of pagina is thickened to the extent of .025 mm., or nearly double the thickness near the base or lower third. Such cells can only become clearly defined by making thin cross sections of the leaf, when they are seen to have their long diameter in an antero-posterior direction or across the pagina, and are nearly hyaline, length from .015-.02 mm., the latter dimension in cells near the nerve. Unless such a section is made the contained particles of chlorophyll are apt to be mistaken for cells. The upper third of the pagina of both sides is very generally incurved so as to allow the margins to approach one another, while the nerve and its extension remain in a straight line. On the ground in several places near the sea, Onich, September 1908.

I have given a detailed description of the minute structure of the leaf, as I strongly suspect that this is a *Tortula*. The absence of fruit renders me uncertain.

As an instance in an opposite direction as regards this acumen, I shall describe another species under the same genus where this acumen is of the same constitution as those already described, but where it is always short and stump-like, and tends to disappear entirely even on leaves of the same stem, when the nerve is seen to cease below the round summit of the leaf.

(*To be continued.*)

SAXIFRAGA CÆSPITOSA, L., AS A SCOTTISH SPECIES.

By Arthur Bennett.

Dr. Williams' note (*l.c.* p. 109) on this interesting species seems rather bare, and I propose to offer a few notes on its distribution in Scotland.

Dr. Trail in his 'Top. Bot. of Scotland,' "Ann. Scot. N. Hist." (1898), 168, gives,

90?. 92?. 94. 96. 97. In 'Add. and Corr.,' *l.c.* (1906), p. 40, no further note is added.

90. Forfar.

This seems to have been recorded on the supposition that one of Don's plants was to be referred here.

92. Aberdeen S.

"In August 1830 Mr. M'Nab of the Edinburgh Botanic Garden found at the base of the precipice (east side of Ben-a-Buird) a tuft of *S. cæspitosa*, portions of which he gave to me, as I was near when he happened to find it."—"Macgillivray's Nat. History of Deeside" (1855), p. 127.

"Beinn-a-Bhùird consists of two tops, the north one being 3924 ft. (Aberdeen and Banff); and the south one 3860 ft. (Aberdeen). They are $1\frac{3}{4}$ miles apart."[1]

94. Banff.

Formerly referred to Aberdeen, but correspondence with Mr. F. Webb and Mr. H. C. Watson caused Mr. Watson to refer it to Banff. The specimens were collected on 3rd August 1830, on Ben Avon, by Dr. Martin Barry, and I possess two of the specimens then gathered. They are most certainly the true arctic plant of Greenland !, Iceland !, and Lapland.

The group of mountains called Ben Avon comprises four heads in Banff (3075 to 3554 ft.), and two in Aberdeen and Banff (3625 and 3662 ft.), Ben Avon itself being 3843 ft. in altitude (Munro, *l.c.*).

[1] H. I. Munro in "Scot. Mount. Club Journ." (1891), p. 300.

96. EASTERNESS.

"Mountain north of Loch Laggan," Dr. F. B. White, *in litt.*

"Glen Spean, August 1886, with Scottish Alpine Bot. Club," A. H. Evans, *sp.*

The name of the mountain was withheld, but it varies from 3422 ft. to 3437 ft. This exactly matches Dr. Barry's specimens.

97. WESTERNESS.

In Mr. Borrer's herbarium at Kew are specimens gathered by Joseph Wood "among the rocks near the summit of Ben Nevis." These Dr. B. Syme considered to be the true plant. I have not seen them.

I have a specimen named "S. cæspitosa, *L.*, alt. 3500 ft., Ben Lawers, Perthshire, Aug. 1892, A. B. Hall." I cannot so regard it, but it may be the subsp. *grœnlandica.*

With reference to the Carnarvon specimens, I possess two gathered by Dr. Roberts of Bangor (evidently very old, as the ink is much faded), given me by Mr. Griffiths of Bangor. They are localised from "nr. Twll-du'," no date.

According to the "Biog. Index of Brit. and Irish Botanists" (1893), p. 143, this Dr. Roberts died before 1828. They do resemble the Ben Lawers example, and may so belong, but are not the same as Dr. Barry's specimens.

Then with regard to Irish specimens so named from the coast of Donegal (Crosfield, *leg.*), by Mr. N. E. Brown with a ! appended, Mr. Baker wrote on these, "Crosfield's Saxifrage is exactly *affinis* of Don and Mackay."

Mr. Brown adds, "certainly not."

Here again I say not the true arctic *cæspitosa*, nor like it.

Thus there seem to be certainly two counties (Banff and Inverness) in which the true plant has occurred.

With regard to its first record, Mr. Clarke's, "Smith, Fl. Brit. ii. 455, 1800," refers only to the Welsh specimens. Smith also in his "Eng. Fl." ii. (1828), 274, has only Welsh and Irish plants; and expresses the opinion that Hooker ("Fl. Scot." 1821) has confounded many things under that name. Hooker ("Brit. Fl." 1830, 196) has a long note on Smith's remarks, but no Scotch locality. But in his third ed.

(1835), 201, he gives "Aberdeenshire, Dr. Graham," adding in the fifth ed. (1842), 130, "Ben-na-Bord." This is probably M'Nab's habitat. This seems to be the first separate Scotch record under the name, but still mixed with *S. decipiens*.

Babington in all the editions of the Manual, 1843 to 1904, has this mixture, adding in his first "Westmoreland, Dickson!" So it would seem that the first actual record for the true plant is by Watson ("Cyb. Brit." i. 1847, 417), made on the strength of Dr. M. Barry's Ben Avon examples; authenticated by Dr. B. Syme in "Eng. Bot." 3rd ed. iv. (1865), p. 79, where the plant is well described.

SOME REMARKS ON *EUPHRASIA* AND *RHINANTHUS*

By Rev. E. S. Marshall, M.A., F.L.S.

Mr. Druce and Mr. Beeby call attention (pp. 101-2, 106) to Dr. Ostenfeld's having combined *Euphrasia scottica* (Prof. Wettstein so spelt it, and Mr. Townsend arbitrarily altered the spelling), of which *E. paludosa*, Towns. (non Br.), is a synonym, and *E. foulaensis* with *E. minima*. As I know *E. scottica* and *E. foulaensis* pretty well, and am not at all disposed to consider them as belonging to one segregate, I venture to briefly give some reasons for keeping them apart. Well-developed specimens, according to my experience, are always quite readily separable at a glance; stunted plants may be more difficult. Unfortunately, I have but a very slight acquaintance with *E. minima*, though I collected the typical yellow-flowered form of the Swiss Alps many years ago. But *E. scottica* normally occurs in *wet* ground, especially on heaths, and is semi-parasitic on *Carices*; whereas *E. minima* chooses Grasses for its host-plants, and does not appear to show any special fondness for boggy places. Differences of colour, texture, etc., which strike the eye at once in living specimens, disappear when they are dried; and I believe that it is safer to follow Wettstein and Townsend in regarding *E. scottica* as distinct.

With respect to *E. foulaensis* I have no doubt. In Scot-

land it grows in two different habitats ; being found both near sea-level and on mountains, from about 2000 to 3700 feet (I collected it on Ben Lawers so long ago as 1887). With characteristic *E. scottica* it can hardly be confused, either fresh or dried ; being, as Wettstein says ("Mon." p. 140), nearest to *E. latifolia* ; from which it is distinguishable by its usually smaller size, fewer branches, much longer capsules, and by being far less hairy. It also approaches some coast-forms of *E. curta* in general appearance.

It is, however, probable that two distinct Scottish forms have been referred by Wettstein to *E. foulaensis*. Early in 1904 Mr. Townsend sent me specimens and detailed drawings of an Eyebright from Norway, which he intended to publish and figure as *E. minutiflora*, n. sp. These at once struck me as being practically identical with plants gathered abundantly in 1897 by Mr. Shoolbred and myself on heathy banks near Melvich, W. Sutherland, which had always seemed to me considerably different from the other specimens named *E. foulaensis* by Wettstein ; and, on receiving my three herbarium sheets of this, Mr. Townsend agreed that they were his proposed species. Soon afterwards his health began to fail ; and both his drawings and types and my own specimens have unaccountably disappeared. Among his botanical correspondence subsequently sent to me, I found my letters dealing with this subject. The main distinction from *E. foulaensis* seems to lie in the flowers, which are somewhat smaller, with the tube nearly or quite included in the calyx, and of a beautiful violet-blue, as in *E. Vigursii* ; I think that it is also a taller, more branched, and somewhat narrower-leaved plant than the ordinary coast-form of *E. foulaensis*, but have no precise recollection and no further examples. It is sure to occur in other localities in northern Scotland.

Rhinanthus stenophyllus is considered by Mr. Beeby to be an "autumnal" variety of *R. minor*. In England it does, upon the whole, bloom some weeks later ; yet I have specimens from Warminster, S. Wilts (so named by Dr. von Sterneck), gathered in flower and young fruit on 10th June 1903 ; and in N. Scotland (W. Sutherland, E. Ross), it begins to blossom quite early in July—little, if at all, later than *R. minor*.

According to Sterneck's monograph of *Alectorolophus*, Chabert published his names *R. Perrieri* and *R. minor β rusticulus* simultaneously ("Bull. de l'Herb Boiss." 512, 1899). I think that Mr. Druce's contention is quite arbitrary, and that the original specific name under this genus holds good; though Sterneck, under *Alectorolophus*, was free to choose.

WEST MONKTON RECTORY, TAUNTON.
17*th May* 1909.

ADDITIONS AND CORRECTIONS TO THE TOPOGRAPHICAL BOTANY OF SCOTLAND.

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

(*Continued from p.* 48, *No.* 65, *January* 1908.)

ERICACEÆ.

Pyrola media, *Sw.*, 102.

PLUMBAGINACEÆ.

Armeria maritima, *Willd.*, *var.* planifolia, *Syme*, 112.

POLEMONIACEÆ.

Gilia capitata, Sims, 83 cas.

BORAGINACEÆ.

Amsinckia angustifolia, Lehm, 83 cas.
Echinospermum minimum, Lehm, 83 cas.
Symphytum orientale, L., 83 cas.
Anchusa undulata, L., 80 cas.
Alkanna lutea, A. DC., 83 cas.
Nonnea alba, DC., 83 cas.
Mysostis palustris, *With.*, *var.* strigulosa, *Mert. and Koch*, 94.
Echium violaceum, L., 83 cas.

CONVOLVULACEÆ.

Convolvulus althæoides, L., 83 cas.

SOLANACEÆ.

Physalis Alkekengi, L., 83 casual, as seedlings.

SCROPHULARIACEÆ.

Mimulus Langsdorffii, Donn., var. *guttatus*, DC., 83.
Veronica acinacifolia, L., and *V. triphyllos*, L., casuals in 83.

Euphrasia curta, *Fr.*, 112.
Rhinanthus grœnlandicus, *Chabert*, 112.
R. Drummond-Hayi, *F. B. White*, 112.

LABIATÆ.

Salvia viridis, L., 83 cas.
Ajuga pyramidalis, *L.*, 102. *A. Chamæpitys*, Schreber, 83 cas.
Lallemantia iberica, Fisch. and Mey., 83 cas.
Sideritis montana, L., 92 cas.

PLANTAGINACEÆ.

Plantago lanceolata, *L.*, *var.* depressa, *Rostr.*, 112. *P. albicans*, L., 83 cas.

AMARANTHACEÆ.

Amaranthus Blitum, L., and *A. spinosus*, L., casuals in 83.

CHENOPODIACEÆ.

Chenopodium opulifolium, Schrad., 83 cas.
Atriplex tatarica, L., 83 cas.
A. laciniata, *L.*, 112.

POLYGONACEÆ.

Rumex pulcher, L., 92 cas.

EUPHORBIACEÆ.

Euphorbia falcata, L., and *E. taurinensis*, All., casuals in 83.
Ricinus communis, L., 83 cas., as seedlings.

URTICACEÆ.

Humulus Lupulus, L., 84.

CUPULIFERÆ.

Betula verrucosa, *Ehrh.*, and B. pubescens, *Ehrh.*, both in 81.
"B. alba, *L.*," Alnus glutinosa, *L.*, and Corylus Avellana, *L.*, are all recorded as existing native plants in Shetland within last century, on evidence regarded by Mr. W. H. Beeby as sufficient.
Quercus Robur, *L.*, *vars.* pendunculata, *Ehrh.*, and sessiliflora (*Salisb.*), both in 81.

SALICACEÆ.

Salix Caprea, *L.*, 112.
S. Caprea × phylicifolia (laurina, *Sm.*), 94.
Populus alba, *L.*, 81.

MONOCOTYLEDONS.

ORCHIDACEÆ.

Listera cordata, *R. Br.*, 78.
Epipactis palustris, *Crantz*, 102.

LILIACEÆ.

Polygonatum multiflorum, *All.* For 85 read 84.
Allium oleraceum, *L.*, 84.

PALMÆ.

Phœnix dactylifera, L. Seedlings sometimes spring up on rubbish near towns, *e.g.* in 83 and 92; but they do not survive a winter.

TYPHACEÆ.

Typha angustifolia, L., 81†.
Sparganium ramosum, *Huds.*, *var.* microcarpum, *Neum.*, 102.

ARACEÆ.

Acorus Calamus, *L.*, 84.

ALISMACEÆ.

Butomus umbellatus, *L.*, 109 († ?).

NAIADACEÆ.

Potamogeton polygonifolius, *Pour.*, *var.* cancellatus, *Fryer*, 112.
P. alpinus, *Balb.*, *var.* lacustris, *Marss.*, 90 (Lunan Burn).
P. heterophyllus, *Schreb.*, 97; *var.* intermedius, *Tisel.*, 111.
P. nitens, *Web.*, *var.* maximus, *Ar. Benn.*, 89, 103.
P. lucens, *L.*, 73.
P. upsaliensis, *Tisel.*, 87.
P. polygonifolius × prælongus (× Macvicarii, *Ar. Benn.*), 97.
P. crispus × perfoliatus (× Cooperi, *Fryer*, 86).
P. crispus × prælongus (× undulatus, *Wolfg.*), 86.
P. obtusifolius, *Mert. and Koch*, 74, 98.
P. pusillus, *L.*, *var.* acuminatus, *Ar. Benn.*, 86.
P. vaginatus, *Turcz.*, 112.
P. filiformis, *Nolte*, 98.

(*To be continued.*)

ZOOLOGICAL NOTES.

Bird Migration: a new Scottish Enquiry.—An enquiry into the migration of birds is being inaugurated by the Natural History Department of the Aberdeen University, under the direction of our friend Professor J. Arthur Thompson. Following the plan which has been carried out with some success on the Continent, it is proposed to "ring" the legs of as many migratory birds as possible in the hope of obtaining information as to where our British summer visitors pass the winter, and as to the routes followed by them to reach their cold weather retreats. It is equally desirable that we should know where our winter visitors pass the summer. If such information can be

obtained a most important advance will undoubtedly have been made in our knowledge. We hope that Scottish naturalists will lend their hearty co-operation. Rings and full instructions may be obtained on application to Professor Thompson, The University, Aberdeen.

Hawfinch in Fife.—On the 21st of April while walking down the avenue here, I saw a bird that was absolutely new to me, and returned to the house for my Zeiss glass. Aided by this, I had a long look at him as he sat on the same tree with a Greenfinch and a Starling. He was nearly as big as the latter, and I could make out the conspicuous white shoulder-band, and the bill which took up nearly the whole front of the head. When it flew away, it showed some white about the rump. I have no hesitation in recording the occurrence of the Hawfinch at Tayfield.—Wm. Berry, Newport, Fife.

Nesting of the Hawfinch (*Coccothraustes vulgaris*) **in East Lothian.**—On 9th May last (1909) a Hawfinch's nest, containing five eggs, was discovered in a wood near East Linton (further indication of the locality I am not at liberty to give). It was placed in a holly at about ten feet from the ground where two branches left the main stem. Outwardly it was made of twigs of honeysuckle intermixed with grey lichen (*Ramelina*), the inside being neatly lined with fine rootlets. Unfortunately, from some unknown cause—perhaps a visit from a squirrel—two of the eggs had holes in them when the nest was shown to me by the discoverer some days later, and neither of the birds was then seen, though I heard one of them calling in the vicinity. On 23rd May a second nest, doubtless made by the same pair of birds, was found about 60 yards from the site of the first one. It was also in a holly at about the same height, and was composed of similar materials. Disaster, I am sorry to say, overtook this nest likewise, for when I visited it about a fortnight later in the hope of seeing young birds, it was found empty, with only the remains of an egg adhering to its edge.

Though young Hawfinches have on several occasions, beginning with Mr. Eagle Clarke's record in this magazine for October 1894, been captured near Edinburgh, this is, so far as the records show, the first time the nest and eggs have been found in the Forth area. From the Tay area Mr. W. Berry has recorded ("Annals," 1904, p. 11) a nest in north-east Fife.—William Evans, Edinburgh.

Bramblings in Solway.—After the end of December in any season the Cock o' the North, by which title the Bramble Finch is known throughout Solway, occurs so fitfully and seldom that the appearance of a considerable flock of these birds on 1st March is an incident worth recording. On this date a bare, frost-hardened, wind-swept stubble field that I happened to pass on the outskirts of the town held a very restless assemblage of Bramblings, Greenfinches, some Chaffinches, and a few Yellow Hammers. I estimated

the number of Bramblings as at least 800 to 900—a comparatively small flock when we recollect the huge swarms of this bird that sometimes assemble here on a November day when beech nuts are plentiful. Spring visits of this species are scarce and most unusual. Next day we had a heavy general fall of deep snow. Were the Bramblings and their feathered companions flying in advance of the coming storm?—ROBERT SERVICE, Maxwelltown.

Golden Oriole in Renfrewshire.—A Golden Oriole (*Oriolus galbula*) was observed flying about in a garden in Renfrewshire during the first half of May. It was afterwards found dead and was sent to me. Mr. Kirk, of Glasgow, by whom the bird has been mounted, informs me that it is a young male.—W. HORTON, Glasgow.

Blackbird and Thrush laying together.—From time to time one finds irregularities in the nesting of our commoner birds, *e.g.* two females of one species deposit their eggs in the same nest, or the eggs of different species occur in the same nest.

As a rule the stranger is easily detected. One would usually account for its appearance by supposing that the parent, forced to lay away from its own nest, had temporarily occupied the first suitable one that offered. In support of this is the fact that eggs are often found laid at random under hedges or bushes or even in the open. I have seen eight eggs in a Rook's nest, Pheasant eggs among Partridges, Tufted Duck's with those of the Shoveller. Recently, 4th May, the gardener at "The Cottage," Nethercraigs, by Paisley, showed me on a piece of waste ground near the house a Blackbird's nest containing six eggs of which three were of the Song Thrush. The nest, finished the previous week, had been closely watched. The birds were observed to lay on alternate days, and fought for the privilege of sitting. On 4th May the female Blackbird occupied the nest. From later observation it appears that the quarrelling of the parent birds did not cease as incubation advanced. In these fights the female Thrush usually succeeded in driving off the female Blackbird, but of the males the Blackbird proved the stronger. When the eggs hatched, a battle royal occurred which left the Blackbirds in possession for the time. The end of this curious venture came one Sunday when the nest was harried by a band of mill workers. There were in it then five young birds; whether the sixth egg hatched or not I have been unable to ascertain.—JAMES WATERSTON, Edinburgh.

Yellow-browed Warbler in Dumfriesshire in Spring.—At Lockerbie on the 11th of April, I had the pleasure of watching one of these singularly interesting birds for fully half an hour, as it flitted along a hedge, occasionally making short flights in the air to catch some insect on the wing. I got within about four feet of the little creature while it was busily engaged searching for food, and was

able to identify it beyond doubt. I was first attracted by the bird's peculiar note, with which I am quite familiar from my Fair Isle experiences which extend over several autumns.—GEORGE STOUT, Glasgow.

[We have no hesitation in accepting this record, for Mr. Stout is, to our knowledge, quite familiar with this bird. The record is of great interest as being the first known instance of the occurrence of *Phylloscopus superciliosus* in spring in the British Islands and for the mainland of Scotland.—EDS.]

Early appearance of the Swift.—Is the Swift inclining to spend a longer time with us? In my ornithological notes, dating back to 1881, I find the Swift usually makes its departure some time in August and returns in the second week of May; but here are my records for the last few years, made at Duddingston:—

Swift first seen,	18.5.03	last seen,	10.9.03
,,	12.5.04	,,	13.9.04
,,	7.5.05	,,	15.9.05
,,	2.5.06	,,	2.9.06
,,	...	,,	7.9.07
,,	3.5.08	,,	17.9.08
,,	28.4.09	,,	...

I have never noted the first appearance of the Swift in April till this year. April 28th was a cold day with occasional showers of sleety hail; the day following was also cold, when I again noted Swifts careering round the Manse.—WILLIAM SERLE, Duddingston.

Hoopoe in Skye.—In the *Scotsman* Mr. A. R. Macdonald records the occurrence of a Hoopoe (*Upupa epops*) at Waternish on the 27th of April. There appears to be only one previous record for the Island, namely that in *The Field* (27th Nov. 1880) of one in October in the Sconser Deer Forest.

Little Bittern in Orkney.—According to the *Orkney Herald* for 19th May, Mr. Cowan, Tankerness House, received a Little Bittern (*Ardetta minuta*) from Binscarth, where it was caught alive. It died soon after capture and was forwarded to Edinburgh for preservation, and is an adult male. It is said to be the second known occurrence of this species in Orkney. The only other example was shot as long ago as 1806, in the Island of Sanday.

Solway "Gray Geese."—We have had quite a remarkable number of Wild Geese on the green grassy shores and fields of the Firth margins. Barnacles were, of course, in their usual numbers, but it is of the Gray Geese I wish to make a note. For several years past the Bean Geese and the Pink Foot Geese have been fairly numerous, and the prevailing species. Since the end of September, however, when the Gray Geese began to come in, the Gray Lags have been the dominant species and very numerous

indeed they were at times. I have not seen or handled a single example of the Bean or Pink Foot, although I have reports of such. But so few sportsmen or gunners have distinguished betwixt the various species, that an identification, except on authority, should be received with scepticism. Practically no impression was made on the numbers of Geese present by the many gunners who made trial of their powers of stalking. But the birds became extremely timid and wary. A well-known gunner wrote to the local newspapers on the approach of close time to protest against the "absurdity" of protecting these preternaturally wary fowl as they—the birds—could do it so effectively themselves! Our long green merses and interminable flats afford no cover, and the peculiar atmosphere that hangs over the Solway on winter days seems actually to magnify the form and render more visible the crawling, crouching body of the would-be shooter.—ROBERT SERVICE, Maxwelltown.

Marked Pintail.—I have been handed a ring taken from the leg of a female Pintail shot by a gunner friend near Carsethorn, at the estuary of the Nith, about the 17th of February. The ring is a plain roughly-cut band of soft zinc which clasps by means of catch and notch, and is stamped "1908." Pintails have been rather frequent in the Solway waters this winter, the first being reported from Baldoon Sands in Wigtownshire on 9th October, and the last from Southerness on 28th February. No others with rings were reported.—ROBERT SERVICE, Maxwelltown.

Nesting of the Gadwall in Scotland.—Early in June of this year two nests of the Gadwall (*Anas streperus*) were found on a loch in the S.E. of Scotland. They were placed among rushes about 50 yards away from the water's edge, and contained 5 and 7 eggs respectively. The Duck was seen going off the nest, and specimens of the eggs and down were sent to Mr. Eagle Clarke who confirmed the identification. The down contained several unmistakable breast feathers of the female Gadwall. This is the second authenticated case of the Gadwall nesting in Scotland. It is to be hoped that many more instances of the nesting of this interesting Duck may be recorded in the near future.—LEONORA JEFFREY RINTOUL and EVELYN V. BAXTER.

Long-tailed Ducks in Orkney in Summer.—During the whole of the summer of 1905 a pair of Long-tailed Ducks (*Harelda glacialis*), male and female, remained on the Loch of Stenness, Orkney; another pair were there in July and August 1906, and hardly a summer passes but one or two pairs remain behind. Probably they are pricked birds unable to make their migration journey owing to their injuries, and one at least of these has even been in its winter plumage then, without doubt owing to this cause. It is very unlikely that such birds would nest there owing to their condition. They leave Orkney about the middle of April as a rule, and have then

lost almost all their winter plumage. A male and female which I shot on 6th April were very dark in colour; but a male sent to a friend of mine much later, shot on 12th May 1908, was not nearly as dark, although birds shot on 25th and 29th April that year were even darker than my specimens. During that spring (1908) they were very late in departing owing chiefly to adverse winds, and there were a fair number on the sea as late as 12th May and for several days after that date.—H. W. Robinson, Lancaster.

Little Crake in Ayrshire.—On the 29th of March a fisherman saw a bird moving about in his boat, which was lying in Girvan Harbour. On stepping into the boat he found that the bird could not fly, being in an exhausted condition, and he picked it up and brought it to me. I gave it water, slugs, chopped worms, and scraped beef, and left it for a few hours. On my return I found it had fed freely, principally on scraped beef, and was quite lively. On examining it carefully, with the aid of a friend interested in natural history, we came to the conclusion that it was a Little Crake (*Porzana parva*), an identification which was afterwards confirmed by Mr. Charles Kirk, taxidermist, Glasgow.—James Aird, Girvan.

Green Sandpiper in Solway.—A good specimen of this species was shot on the banks of the Ae, parish of Kirkmichael, Dumfriesshire, and brought to me for identification on 20th January. Of late years this species has put in so few appearances that this one is worth a record.—Robert Service, Maxwelltown.

Great Crested Grebe at Duddingston Loch, Edinburgh.—For the first time since I came here six years ago I have detected the Great Crested Grebe on Duddingston Loch yesterday, 14.3.09. I was scanning a flock of Pochards and Tufted Ducks that were sunning themselves on the water below the Manse, when my binoculars rested on a fine specimen of this Grebe busily preening its feathers. I was within fifty yards of it, so did not go nearer to disturb it. I did not catch a sight of it this morning, but it may easily be at the far end of the loch.—William Serle, Duddingston.

The Red-necked Grebe in Orkney.—As the Red-necked Grebe (*Podiceps griseigena*) is said to be rare in Orkney, perhaps the following notes may be of interest. On 2nd March 1904 I saw several on the Loch of Harry, all but one being in full winter plumage as far as I could see, the exception showing himself, through my glasses, to be just commencing to change into his summer plumage. So rough was it on the loch and so wild were the birds that I was unable to get within shot of them. They were all single birds with the exception of two, which appeared to be paired. On 28th February 1905 I again saw a pair on this same loch in winter plumage, and again failed to get nearer than 150 yards. I fully believe, from what my boatman told me, that they are there every

winter. He knew the Slavonian, Great Crested, and Little Grebes, and wondered as to the identity of these birds, seeing that they were too large for Slavonian yet not large enough for Great Crested. Neither he nor I have ever seen them on any of the other lochs, but on 10th April 1908 I saw a single bird of this species on the sea in the Bay of Ireland.—H. W. Robinson, Lancaster.

Munida bamffia (*Penn.*) **in the Firth of Forth.**—The long-armed Munida seems to be rare in the Firth of Forth, or at any rate seldom obtained (*cf.* Dr. Scott's "Catalogue of Forth Crustacea"). It may, therefore, be worth while to record the following recent occurrences. Early in 1908 I examined one which had been taken in a crab-creel off North Berwick, and I have a fine specimen that was captured by the same means in the vicinity of the Bass on 14th January 1909. —William Evans, Edinburgh.

[Two Firth of Forth specimens of *Munida bamffia* occur in the collections of the Royal Scottish Museum. Regarding one, no more exact locality than "Firth of Forth" is given; but the other was obtained on the beach at Gullane on 1st November 1904.—Eds.]

Nemotelus uliginosus, *L.*, **in Forth.**—Besides the well-known locality for this fly near Aberlady, repeated in Messrs. Carter and Waterston's paper in the "Annals" for April last, I have taken the species at Charlestown in the West of Fife; both sexes, 16th July 1904.—William Evans, Edinburgh.

BOTANICAL NOTES AND NEWS.

The Floras of the Faröes and Iceland compared with that of Scotland.—To Mr. Arthur Bennett's interesting note "Plants of the Faroe Isles not occurring in Great Britain," etc. in the January number of the "Annals," I should like to add some few remarks.

Mr. Bennett gives 8 species which occur in the Faröes, but not in Great Britain. He quotes them from my papers on the Flora of the Faröes, with "Additions and Corrections," etc. 1907, and "the Land-Vegetation of the Faröes," 1908; but if he had consulted my principal list, viz. "The Phanerogamæ and Pteridophyta of the Faröes," 1901, he would have found that the *Draba hirta* given by him as one of the eight species, is *D. hirta*, f. *rupestris* (R. Br.), the same plant as *D. rupestris*, R. Br., of the British Floras (Babington, "Manual," 9 ed. p. 34). There are, then, only 7 Faröese species absent from great Britain. Among them is *Epilobium lactiflorum*, Haussku, which I suspect will be found in the Scottish mountains.

Mr. Bennett's list of Faröese species absent in one or more of the vice-counties—Shetland, Orkney, Caithness, Outer Hebrides—contains also records for Iceland, and with regard to the occurrence or

not in this last country there are some few mistakes: *Montia lamprosperma* is common in Iceland and the only species there of the genus; also *Polystichum lonchitis* is common in Iceland. As to the *Alectorolophus* (*Rhinanthus*) species Mr. Bennett gives *R. grœnlandicus*, *R. pubescens*, and *R. fallax* as occurring in the Faröes—but of these three forms I have only *A. grœnlandicus*, which I record also from Iceland (1901, p. 55); *A. minor* occurs also in both countries. The comparison by Mr. Bennett of the altitudes of the plants in the Faröes and in Scotland would have been much extended if he had used my paper from 1901, in which many records of altitude are given. Among the 17 species used for comparing the altitudes more than half the number are rare plants in the Faröes: five are found only in one or two places. It would have been much better to have taken the common species of arctic (alpine) origin for comparison. As to *Saxifraga nivalis* Mr. Bennett quotes: "Subalpine latitude, *i.e.* lower regions, and exceptionally on the mountain-plateaux," but this must be a misreading. I have (1908, p. 901) "Alp. lat." (*i.e.* "alpinus, sensu latiore"), and that means (see p. 896) "species found on the mountain plateaux, and also exceptionally in the lower regions."—C. H. Ostenfeld, Copenhagen.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—April-June 1909.

[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 Cats in Inverness-shire. A. R., *The Field*, May 15, 1909, p. 244. Refers to a specimen about six months old, trapped at Struy, and a full-grown female trapped at Glendee.

Antlers of Scottish Red Deer. A. R., *The Field*, June 19, 1909, p. 1075. Account (with photograph) of a horn 42¼ inches long from the Monar Forest, Ross-shire.

Notes on the Birds of West Renfrewshire (Caldwell District), 1908. T. Thornton Mackeith, *The Zoologist*, June 1908, pp. 228-231.

Notes from Millport Marine Biological Station. Richard Elmhirst, F.L.S., *The Zoologist*, June 1909, pp. 201-203. Deals with (1) the Whelk as Food of the Cod; and (2) Feeding Habits of the Conger-Eel and some other Fish in captivity.

Preliminary Notice of the Cephalopoda collected by the Fishery Cruiser "Goldseeker," 1903-1908. By G. S. Russell, M.A., *Ann. and Mag. Nat. Hist.*, May 1909, pp. 446-455. Sixteen species are described, three of which are new to science, all obtained on the east and north coasts of Scotland, round the Shetlands, and between the Shetlands and the Faeroes.

Some Notes on the Lepidoptera of the "Dale Collection" of British Insects, now in the Oxford University Museum. James J. Walker, M.A., R.N., F.L.S., *Ent. Mo. Mag.*, May 1909, pp. 106-110. Notes on various Scottish specimens.

List of Lepidoptera captured recently in "Ross-shire." Dorothy J. Jackson, *Ent. Record*, May 1909, pp. 115-117. Seventeen species of Rhopalocera and thirty-three of Heterocera are recorded in this instalment of the paper, which is to be continued.

Omalium foraminosum, Mäklin, in Scotland. D. Sharp, *Ent. Mo. Mag.*, June 1909, p. 135. Recorded for Rannoch and Thornhill.

On the British Species of Phora (Part II.). John H. Wood, *Ent. Mo. Mag.*, June, 1909, pp. 143-144. Phora obscuripennis and beckeri recorded as Scottish.

Notes on the British Dragonflies of the "Dale Collection" (II.). W. J. Lucas, B.A., F.E.S., *Ent. Mo. Mag.*, April 1909, pp. 79-83. Agrion hastulatum referred to as having been taken in Sutherland in 1842 by Richard Weaver.

Raphidia maculicollis. W. J. Lucas, B.A., F.E.S., *Entomologist*, June 1909, pp. 129-130. A Nethy Bridge specimen referred to.

Studies on the Structure and Classification of the Digenetic Trematodes. By William Nicoll, M.A., D.Sc., *Quart. Journ. Micro. Sci.* vol. 53, pt. 3, May 1909, pp. 391-487, pls. 9 and 10. The material worked out in this lengthy paper is of Scottish origin.

BOTANY.

A New Hybrid Saxifrage from Scotland. By Rev. E. S. Marshall (*Journ. Bot.* 1909, pp. 98-99). *S. nivalis* × *stellaris* (*S. Crawfordii*, n. hybr.), gathered by F. C. Crawford on 7th August 1902, in Corrie Sneachda, Cairngorm.

Notes on Carex canescens, Lightf. By Rev. E. S. Marshall (*Journ. Bot.* 1909, pp. 107-108). Var. *tenuis*, Lang, from Clova and Glen Callater; var. *fallax*, Asch and Graelm in Mid-Perth, E. Perth, Forfar, W. Inverness, E. Ross; *C. canescens* × *echinata*, probably is the plant reported as *C. helvola* by Mr. Druce from Ben Lawers.

ENCALYPTA CILIATA, VAR. SUB-CILIATA, WARNST. By H. N. Dixon (*Journ. Bot.* 1909, p. 109), gathered by G. Stabler in Aberdeenshire "in the eighties."

HIERACIUM SILVATICUM, GOUAN, VAR. TRICOLOR, W. R. LINTON, IN BANFFSHIRE. By Ed. S. Marshall (*Journ. Bot.* 1909, p. 110), from limestone rocks near Tomintoul.

OBITUARY OF SIR GEORGE KING, F.R.S., with portrait (*Journ. Bot.* 1909, pp. 120-122).

OBITUARY OF ALEXANDER WHYTE, F.L.S. (*Journ. Bot.* 1909, p. 155).

EUPHRASIA MINIMA. By W. P. Hiern (*Journ. Bot.* 1909, pp. 165-172), found in England on Exmoor as a yellow-flowered plant. The relations between *E. minima*, *E. scottica*, and *E. foulaensis* are not discussed.

NOTES ON THE TRAP-FLORA OF RENFREWSHIRE. By G. F. Scott-Elliott (*Ann. of Andersonian Nat. Soc.* iii. Glasgow, 1907). The trap is porphyritic of O.R.S. age. Sequence of vegetation is:—(1) Lichen stage, crustaceous (*Lecidea*, *Lecanora*, etc.), and foliaceous (*Parmelia*, *Cladonia*, etc.). (2) Moss stage, *Rhacomitrium*, etc., and lichens, in tufts, forming a soil and protecting the rock. (3) Vaccinium stage, the soil is tenanted by *Vaccinium*, *Calluna*, heath grasses, etc., living in crannies or in the humus. In wet situations sphagnum accumulates, and *Eriophorum*, *Scirpus cæspitosus*, etc., occupy the surface. In dry situations (3) is followed by (4) Herbaceous stage, on disintegrating rock with rapid drainage, with *Scabiosa*, *Thymus*, *Campanula rotundifolia*, *Teucrium*, *Viola*, etc. (5) *Ulex* stage, *Ulex*, *Cytisus*, *Pteris*, etc., dominant. (6) Rosaceous stage, shrubby and arboreal Rosaceæ replace *Ulex*, etc. This stage is followed by trees of oak, etc.

LE PLANCTON DES LACS ÉCOSSAIS. By H. Bachmann (*Arch. des sc. phys. et nat. Genève*, xx. 1906, pp. 359-361). Relates to nine lochs, of which (except Loch Leven) the plankton was examined living. Always present were *Cryptomonas*, *Mallomonas*, and *Chlamydomonas*, all very frequent in the Swiss lakes also. The organisms dominant in the Scotch lochs were:—Leven, *Asterionella gracillima*; Earn, *Clathrocystis*, sp.; Lochy, *Tabellaria fenestrata*, var. *asterionelloides*; Oich, *Ceratium hirundinella*; Ness, *Asterionella gracillima*; Uanagan, *Uroglena volvox*; Morar, *Staurastrum*; Lomond, *Clathrocystis*, sp. The lochs that communicate with one another retain their characteristics, as do the Swiss. The author notes the numerous Epiphytes in the plankton and the constant presence of two species of Bacteria on the colonies of Clathrocystis.

BOOK NOTICES.

A NATURALIST IN TASMANIA. By Geoffrey Smith, M.A. (Oxford: The Clarendon Press, 1908.) Price 7s. 6d. net.

As the result of a six months' residence in Tasmania during the spring and summer of 1907-8, Mr. Smith has produced an interesting little volume dealing with the animal and plant life which came under his notice. The main object of his visit was to make a special study of the fauna of the freshwater lakes of the island—an important piece of biological investigation,—and a large section of his book is devoted to describing the results of his researches, a number of his discoveries among the crustaceans being figured. The author proves himself to have been an enthusiastic all-round observer, and he discusses engagingly on animal life generally; the egg-laying mammals Platypus and Echidna coming in for special notice, as do also Parrots and other birds. Graphic descriptions are given of the scenery and vegetation, mention being made of the more interesting plants met with. In the introductory chapter the author writes on the lost Tasmanian aborigines, their character, and the causes of their extinction, etc.; and discusses the vexed question of their origin. In his final chapter he treats of geographical distribution of animals and plants, with special reference to the survival of the ancient types to be found in Tasmania and Australia. The book affords a most interesting and welcome sketch of the natural history of a remote but important part of our empire, as well as contributing materially to our knowledge of its freshwater fauna. It is well illustrated by plates reproduced from a series of excellent photographs, and forms an attractive volume. G. G.-M.

DIE TERMITEN ODER WEISSEN AMEISEN: EINE BIOLOGISCHE STUDIE. By K. Escherich. (Leipzig: Dr. Werner Klinkhardt, 1909.) Price (sewn) 6 marks or (bound) 7 marks.

It is impossible, in the space at our disposal, to do proper justice to this well-written and beautifully illustrated account of the White Ants or Termites. But we can cordially recommend it as worthy of perusal. Written in an easy style of German and by an acknowledged authority on the subject, it cannot fail to interest the lover of Insects, especially when regard is had to the remarkable social and building habits possessed by these creatures. The first chapter gives a sketch of the various personalities found in a Termite colony, and this is followed by accounts of their reproduction, nest-building, feeding habits, the relations of White Ants to other members of the animal kingdom (including man himself), and other fascinating subjects. A very useful systematic summary of Termites is given in the form of an appendix, while an additional section concludes the volume with short supplementary paragraphs on various topics, with

an excellent bibliography and index of authors. The work is embellished by a beautiful drawing, reproduced by the three-colour process, of the royal cell of *Termes bellicosus*, showing the queen surrounded by her progeny and guarded by her soldiers.

Internationale Revue der gesamten Hydrobiologie und Hydrographie. Edited by R. Woltereck. (Leipzig: Dr. Werner Klinkhardt.) Subscription, 30 marks per annum.

By the publication of this periodical another is added to the long list of magazines which have for their object the furtherance of Natural Science, and, in spite of the difficulties to which the ever-increasing complexity of biological literature gives rise, the addition is to be welcomed on account of its endeavour to unify our disjunct knowledge of the physics and biology of the waters. The periodical, which appears in two-monthly parts, is to be devoted to the publication of articles dealing with the investigation of the physical characters and biological content of waters salt and fresh, of the great oceans, of seas and of ponds, of rivers and of springs. But the goal that is kept in view throughout, is less the furtherance of any of the many separate branches of science with which such a study is concerned, than the welding of those loose links into a solid chain — the comprehensive science of Hydrobiology and Hydrography.

Among the original contributions to the first volume may be mentioned "A Hydrobiological Introduction," by Professor August Weismann, and a paper on "The Distribution of Organisms in the Hydrosphere as affected by varying Chemical and Physical Conditions," by Sir John Murray. Besides that devoted to original contributions the volume contains two other exceedingly valuable sections: the first made up of short articles dealing with the results of recent hydrobiological investigations—and here the work of the Scottish Lake Survey bulks largely; the other bringing together the latest information available, by means of summaries of researches published in contemporary journals. The volume is illustrated by numerous plates—one of them containing beautifully coloured representations of *Daphnia*—and many text-figures.

Insect Stories. By Vernon L. Kellogg. London, George Bell & Sons, 1908. Price 5s.

The author of this entertaining little volume is a well-known authority on Insects, and the writer of an important text-book on the subject. Consequently anything he writes, even if adorned with picturesque phraseology, and adapted for very youthful readers, may be regarded as thoroughly reliable. There are thirteen of these "Insect Stories," which is an unlucky number for the reader—who will wish for more! The stories cover a large field and are pleasantly told, and the volume forms a charming gift-book for

boys or girls who show a leaning towards the pursuit of nature-knowledge.

A Treatise on Zoology. Edited by Sir Ray Lankester, K.C.B., F.R.S. Part VII. Appendiculata. Third Fascicle: Crustacea. By W. T. Calman, D.Sc. Pp. viii. and 346. (London: A. and C. Black, 1909.) Price 15s. net.

The value to the general student of the accounts of the Crustacea which have appeared almost simultaneously in three English text-books, can scarcely be overestimated, for the need of an English treatise dealing with this important class has long been acutely felt. That the present volume has been written by so well-known an authority as Dr. Calman is a guarantee of thoroughness, and the thoroughness is especially noticeable in his accounts of structure and development, although enough is said regarding its definition, zoological history, habits, palæontology, and affinities, to render the account of each group remarkably complete.

Several changes from the classification adopted in most other treatises are noticeable: chief of these being the suppression of the comprehensive sub-class Entomostraca in favour of many sub-classes, which, on account of their heterogeneity and negative characters as a whole, cannot form a unity in a natural system.

Throughout the volume are scattered facts of the greatest interest to the general reader. Thus in the pages discussing the morphology of the Decapoda we find striking examples of convergence: as, for example, where a long eyestalk is due to the lengthening now of the first segment (*Podophthalmus*), now of the second (*Macrophthalmus*); or again, where similar respiratory siphons are developed in different families, at one time from the antennules (*Albunea*), at another from their flagella (*Solenocera*), or again from the flagella of the antennæ (*Corystes*). We learn that the truly terrestrial Decapods, such as the Cocoa-nut Crab (*Birgus*), have been derived from marine, and not, as would seem most reasonable, from fresh-water types, and that, confirmed land-lubbers though they appear to be, they pass their early stages in the ocean. Interesting, too, are the references to "relict" faunas, otherwise marine genera being represented in the now fresh-water areas of N. Europe and America (*Mysis relicta* occurs in Ireland)—but we note that no mention of them is made in the index.

As in the whole series, binding and type are excellent, and the volume is illustrated by numerous figures mostly adopted from the original papers of recognised authorities. A valuable list embodying the most important works dealing with the group discussed is appended to each chapter.—J. R.

The Annals
of
Scottish Natural History

No. 72] 1909 [October

REPORT ON SCOTTISH ORNITHOLOGY FOR 1908.

By John Paterson.

While there is no lack of interest in the year to which this Report relates when regarded as a whole, there are some quite remarkable features about the second quarter, concerning which the first quarter gave no hint. The spring migration of species largely represented in Scotland throughout the year, such as the Lapwing and Curlew, began early, and March gave us, in its second half, such species as the Lesser Black-backed Gull, White Wagtail, Wheatear, and Sand-Martin, when we look for them in a normal year. With the advent of April there was a great change, and this month proved more barren of results than any that can be recalled by the present generation of Scottish Ornithologists. For a period of fully three weeks the stream of migration was arrested. The conditions that obtained in Scotland do not account for this extraordinary state of matters, as while the weather continued during this time very cold, it was dry and bright, very suitable for farming operations and encouraging to the ornithological observer. We have frequently had a good show of April visitors when the weather was little better. The cause must then be sought beyond our borders, and this is not hard to find. While

locally the conditions in respect of geniality may have left the fastidious something to desire, they were much worse in England, and appeared in that country to become exaggerated as the month progressed, culminating in the Easter snowstorm — the worst of which was experienced as late as 25th April—of which the curious will find full particulars in Symons's "Meteorological Magazine" (vol. xliii., No. 508, May 1908). The natural corollary of this state of affairs was the deficiency in the mean temperature over the whole of the United Kingdom, "the deficit being greatest (three to four degrees) over Eastern and Central England (*l.c.*, p. 75)." How these conditions were reflected on the ornithology of England we have learned, partially at least, in Mr. W. Warde Fowler's note in the "Zoologist," May 1908 (p. 177), Mr. J. H. Gurney's "Ornithological Report for Norfolk (1908)" in the same Journal in April 1909, and the Rev. A. Ellison's 'Bird Life in a Spring Snowstorm' ("British Birds," vol. ii., 1908-9, p. 301). Through this zone, where such untoward conditions prevailed, our summer visitors could not penetrate, and there is evidence that such disaster had overtaken some of them, that they never reached the destinations in these latitudes for which they had set out. A deficiency in the numbers of the Swallow and House-Martin has been reported, though this is, rather curiously perhaps, unsupported, but the numbers of the Spotted Flycatcher were decidedly below the average, while complete disaster seems to have overtaken the Sedge-Warbler. Independent unsolicited testimony from all quarters places this last fact beyond doubt. Why this species should have suffered so signally we may never know, but possibly its appearance in England may have synchronised with the boreal outburst in the end of Easter week. We learn from Mr. Gurney's report above quoted that "the deficiency in Reed and Sedge Warblers was pointed out to Mr. Bird on the Broads."

For information regarding the paucity of summer visitors in April in Scotland, the reader must refer to the notes under Willow Wren, Swallow, etc., in the following pages, and the narratives under Spotted Flycatcher, Sedge-Warbler, etc., will be found to contain some curious matter regarding what obtained later in the year.

One outstanding feature of the spring migration was the unprecedented inrush and confusion of species which took place in the last day or two in April, and first day or two in May, when, as a result of a change of conditions, all those then due and those that had survived among the species overdue arrived together. A pointed illustration of the late inrush may be given. The dates available relating to the appearance of summer visitors in the "Clyde" area at least equal in amount those for the whole of Scotland. Taking "Clyde," then, as a unit, to illustrate the country generally, it is found that between 26th April and 4th May, a period of nine days, there were recorded in the year under review the first appearances of *eleven* species ("The Glasgow Naturalist," part iii., p. 71), in 1909 *two* species (*l.c.*, p. 73). It is due to Mr. D. Macdonald, who has sent admirable schedules for several years from Mull, to say, that he considers the spring migration to have been retarded and deflected, but the present writer has come to the conclusion that it was arrested and partially strangled in central and south-eastern England. The table showing the difference in the numbers of pairs of migrants observed in a small area at Tunbridge Wells in 1907 and 1908, with its remarkable deficiency in the latter year, if true of central and southern England as a whole, is perhaps significant of more than its authors have realised ("British Birds," vol. ii., 1908-9, p. 326).

The autumn emigration from the west coast at any rate was remarkably retarded, judging from the narrative given by Mr. Anderson from Tiree (p. 51), and Mr. Macdonald's notes. This is accounted for by the latter as being a result of a mild autumn, while the former attributes it to the continuance for six weeks of strong south-east winds, as the birds nearly all disappeared when the wind changed to the west (p. 51). The great annual immigration of the Redwing, which is the most impressive feature of our returns, took place on the 16th and 17th of October, wind S.S.E., and was observed at many stations from Sule Skerry to Cathcart (Renfrew). The autumn witnessed a great irruption of the Goldcrest, of which we have had no such striking illustration for years past. The observations run from 10th September till 9th November, and the period of intensity synchronised

with the great immigration of the Redwing, 17th-19th October.

Fair Isle reports for the year, it will be observed, are confined to the species new to the Island's fauna.

Cordial thanks are tendered to all contributors. Very many of the schedules received leave nothing to be desired. Information has been received from the following among others :—The Light-Keepers, Sule Skerry ; John S. Tulloch, Lerwick ; Annie C. Jackson, Swordale ; Leonora Jeffrey Rintoul and Evelyn V. Baxter, Largo ; William Berry, Tayfield ; John Maccuish, Isle of May ; Lewis Dunbar, Thurso ; Thos. F. Dewar, M.D., D.Sc., Forfar ; Wm. F. Little, Crosswood Reservoir, West Calder ; William Evans, Edinburgh ; S. E. Brock, Kirkliston ; Robert Anderson, Flannan Islands ; Robert Agnew, Monach ; D. Macdonald, Tobermory ; R. Clyne, Butt of Lewis ; Robert Service, Dumfries ; James Bartholomew, Beattock ; T. Thornton MacKeith, Caldwell ; John Craig, Beith ; Dr. Niel Fullarton, Lamlash ; Rev. J. D. W. Gibson, Carmichael ; John Robertson, Robert, Hugh W., and Thomas Wilson, Alex. Ross, Robert Henderson, R. M. Buchanan, W. Rennie, Angus M'Leod, Glasgow ; A. Shanks, Dalry.

TURDUS VISCIVORUS (Mistle-Thrush).—Pairing, Gilston (Fife), 6th February ; appear in Mull (6) on 12th. First egg, Gilston, 10th April, and last in full song, Lee Castle (Lanark), 6th June. In passage, Swordale (E. Ross), 23rd August, 17th October ; Isle of May, 23rd September, and 7th October ; Mull, 4th till 21st October, feeding on rowans.

T. MUSICUS (Song-Thrush).—Movements at Isle of May, 21st to 26th March (p. 7). Laying begins, Scotscraig, 20th March. Young newly hatched, Kilchattan (Bute), 19th April. Last in song, 11th July, Kirkliston, and regains song there 8th September. On the Isle of May, 10th September till 28th October, in varying numbers (p. 7).

T. ILIACUS (Redwing). — Last mainland observations in spring, 11th and 12th April, Lochwinnoch and Giffnock (Renfrew) respectively, and Gilston (Fife) (20) on 16th. The most impressive feature of the ornithology of Scotland in this year is the narrative of the contributors to this report of the great immigration of the Redwing in October. The first mainland observation was on the 5th at Cathcart (Renfrew), followed

by Kirkliston, 6th, and Swordale, 15th, where on the following day the countryside was alive with them. "In one particular valley flock after flock kept arriving—they were accompanied by Bramblings." At the Butt of Lewis a large number was flying round the lantern at night on the 6th. On the 14th, at Lerwick, there was a big rush with fog. On the 16th and 17th, great numbers were seen at Sule Skerry, S.S.E. wind, haze; and at the Isle of May on the 16th also there was a great rush. On the 17th at Cathcart, judging from call notes, more passed over than on any other night during the season; very dark with light easterly wind. On the 18th they are reported at the Flannans in thousands, and at Monach in hundreds. A large body arrived in Mull on the 20th, remaining in considerable numbers throughout the winter till the 31st of March 1909. On the 23rd an enormous rush was observed on the Isle of May, and another from 7 P.M. on that day till daybreak the following morning. On the 29th there were again thousands observed at the Flannans.

T. PILARIS (Fieldfare).—Small parties were observed at seven localities on the mainland and light-stations between the 2nd May at Bridge of Weir (Renfrew), and 9th at Beith (Ayr). The first observation in autumn is on 20th October in Mull. Thousands are reported at the Flannans on 5th November and Butt of Lewis on the 10th—these are the only important movements noted. Mr. Craig remarks that at Beith there were more Redwings than Fieldfares this year, and in West Sutherland they were not nearly so numerous as during the autumnal immigration in the preceding year (pp. 47-8), and these observations are borne out by the lighthouse returns. When boreal conditions set in, 29th and 31st December, considerable movements of the species were noted, at Lahill (Fife), Dunure (Ayr), and Mull.

T. MERULA (Blackbird).—This species is reported in song between 6th February at Kirkliston, and 5th July, Mearns (Renfrew). One with a yellow head was seen at Gilston (Fife) on 27th February, and the first egg is reported from the same place on 27th March. At Beith two broods were raised in the same nest. It was singing again at Caldwell on 21st September. No great movement of this species has been reported for several years past.

T. TORQUATUS (Ring-Ouzel).—Isle of May, 26th April; Arran, 27th; Mull, 28th; Kinnelhead (Beattock), 30th, all single birds or pairs. Latest in autumn, Isle of May on 28th October (3).

Saxicola œnanthe (Wheatear).—Corkindale Law (Renfrew) and Levencorrach (Arran), 28th March; Isle of May, 1st April; Duddingston and Torduff (Pentlands), 6th. Markedly scarce in Mull as a nesting species this year, and Mr. William Rennie says he saw none on his frequent visits to Alloa and Bo'ness, where in former years he could always depend on seeing them in suitable places. There are decidedly more references than usual to the occurrences of this species in October, and in November it is reported on 1st and 3rd at Butt of Lewis, 2nd at Wick, while in Tiree it was still fairly numerous (p. 51) in the first week in November.

Pratincola rubetra (Whinchat).—Kirkliston, 4th May; Isle of May, 5th (p. 8); Mull and Kinnelhead (Beattock) 6th; Beith, 9th (three pairs); Garnkirk (Lanark), 10th. Almost daily on Isle of May, 19th September till 4th October (p. 8). Latest seen on mainland, Kirkliston, 25th September.

P. rubicola (Stonechat).—8th October, Isle of May, one (♂) (p. 8).

Ruticilla phœnicurus (Redstart).—Isle of May, 1st May (p. 9); Kinnelhead (Beattock), 2nd; Carmichael (Lanark) 3rd; swarming on the lantern in the Isle of May (p. 9) on 4th and 5th; Mull, 5th; Carmyle (Lanark), 7th. Autumn reports at lighthouses, 23rd August (Isle of May) (p. 9) till 26th October (Butt of Lewis) (p. 48).

R. titys (Black Redstart).—22nd October, East Neuk o' Fife, one (♂) (p. 49); 6th November, South Uist (1) (pp. 4-5).

Cyanecula suecica (Arctic Bluethroat).—22nd September to 5th October, Isle of May, several (p. 9).

Erithacus rubecula (Redbreast).—27th April a great many at Isle of May, and numerous till 6th May (p. 9). In June at Scotscraig, Fife, a Robin constantly fed a young Blackbird, which had just left the nest. Last in song in summer on 30th June, it began its autumn song in Mull, 21st August. At the Isle of May in passage, 6th September till 3rd November (pp. 9-10). Huge numbers everywhere at Crail 17th-20th October.

Sylvia cinerea (Whitethroat).—Gilston (Fife) (2), and Kirkliston, 7th May. Rouken Glen (Glasgow) and Beith, 10th. Mull, 12th, one (♂). At Kilchattan (Bute) on 3rd June, a nest with young newly hatched. Last heard singing at Cathcart, "the usual farewell twitter," 2nd August. Last seen and in song (!) at Kirkliston on 4th September. Many more seen at Isle of May this autumn than last (p. 10). Reported from the Flannans (1) on 1st November, and Lerwick on 5th.

S. CURRUCA (Lesser Whitethroat).—24th, 25th, 27th September, Isle of May, single birds.

S. ATRICAPILLA (Blackcap).—Kinnelhead (Beattock), 2nd May; Rouken Glen (Glasgow), 10th, pair (♂ and ♀); Kirkliston, 14th, and young leave nest, 14th June. On ten dates in autumn between 20th September, Isle of May, and 26th October, Butt of Lewis.

S. HORTENSIS (Garden Warbler).—Rouken Glen (Glasgow), 10th May (1); Kirkliston, 16th. Young leave nest at last named on 18th June. At various lighthouses 20th September (Isle of May), till 26th October (Monach).

S. NISORIA (Barred Warbler).—Several in the autumn in the Fair Isle (p. 73).

S. SUBALPINA (Subalpine Warbler).—The second British example taken on the Fair Isle in 1908 (p. 72).

REGULUS CRISTATUS (Golden-crested Wren).—Building at Rouken Glen (Glasgow) on 11th April. An interesting immigration took place in the third week of October. Numerous on the Isle of May, 17th, several at the Butt of Lewis, and great numbers at Lerwick, on 18th, and from 19th to 21st at Crail and neighbourhood, great numbers. From September till December inclusive, reported from many localities in small numbers, the greatest movement being in October as noted in detail above. A number got by Mr. Evans from Barnsness and Isle of May lighthouses were of the British race ("Brit. Birds," ii. pp. 232-3.)

PHYLLOSCOPUS SUPERCILIOSUS (Yellow-browed Warbler).—22nd, 24th, 25th September, and 3rd October, single birds on the Isle of May, all males (p. 11).

P. RUFUS (Chiffchaff).—20th April, Dalry (Ayr); 27th, Lerwick; Found nesting at Tobermory, Mull, for first time in June. At Isle of May, Lerwick, and Monach Isle on 5th, 21st, and 27th October respectively, also 7th November, Outer Hebrides (p. 3).

P. TRISTIS (Siberian Chiff-chaff).—At Kirkwall two noticed on 25th January, one secured early February ("Ann. Scot. Nat. Hist.," 1908, p. 80).

P. BOREALIS (Eversmann's Willow-Warbler).—At Fair Isle on 28th September, one (♂) (pp. 1-2). New to the British fauna.

P. TROCHILUS (Willow-Wren).—The April records are sufficiently extraordinary to justify insertion in detail:—Gilston (Fife) (1), 14th; Caldwell (1), 15th; Kirkliston, 23rd (1), and only another one in April there; Rouken Glen (Glasgow), 25th,

(1); Mearns (Renfrew) 26th (1); East Linton, 29th (1) (Evans); Dreghorn, 30th (1) (Evans); Isle of May, 30th (2), and numerous there next day (p. 11). Became generally reported, 1st to 3rd May. In Mull on 2nd May, one in sixteen miles, but general next morning. This record is eloquent regarding the conditions in the sister country which the Willow-Wrens had failed to penetrate. In song till 12th July, Mearns (Renfrew). Last mainland observation, 27th September, Caldwell, one among rasps. At Butt of Lewis on 26th October (p. 48).

P. SIBILATRIX (Wood-Wren).—A few seem to have penetrated to Dunoon by 20th April, but this is exceptional. Kirkliston, 8th May; Braidwood (Lanark), Row (Dumbarton), and Kilchattan (Bute), 9th; Darnley Glen (Glasgow), 10th; Mull, 11th, one (♂), and found later nesting at Lochbuie, Carsaig, and Duart (Mull).

HYPOLAIS ICTERINA (Icterine Warbler).—Got in the Fair Isle (p. 73). New to Scotland.

ACROCEPHALUS PHRAGMITIS (Sedge-Warbler).—Possil (Glasgow), 3rd May (1), but no more there till 14th. At Caldwell and Balgray (Renfrew) on 10th, Kirkliston, 11th. Very scarce at Possil Marsh, where the largest number seen by Mr. Wm. Rennie between 17th May and 14th July was five on 16th June. On 17th June Mr. MacKeith could only find two nests in two hours at Loch Libo: he says, "I think the special feature of the season is the great scarcity of the Sedge-Warbler." In Bute "much scarcer than usual, many situations which in former years harboured a pair or more were untenanted" (John Robertson). Mr. John Craig, writing to me from Beith, says on 4th June, "Strange to say, I have never seen or heard a Sedge-Warbler." In his "Notes" under date 6th July, Mr. Robert Service asks if his "observation that these birds, usually so conspicuous and vociferous, are this season extremely scarce, is confirmed by other observers of our local bird life." A very unambiguous reply is supplied in the foregoing details, which further illustrate the value of co-operation for the exercise of which this report supplies the opportunity. The first notice of its scarcity came from Kirkliston.

LOCUSTELLA NÆVIA (Grasshopper-Warbler).—At Dalry (Ayr), 9th May, Darnley Glen (Glasgow), 10th, and one (♀) on the Isle of May on 21st September.

L. LUSCINIOIDES (Savi's Warbler).—Occurred at the Fair Isle in the spring (p. 73). New to Scotland.

ACCENTOR MODULARIS (Hedge-Sparrow).—Sings, Mull, 3rd February. Young, at Gilston, when newly fledged, still had

spots on the spurs of the tongue. Last in song, Kirkliston, 30th July, and regains it there on 17th September. On seven occasions between 28th September and 8th October at the Isle of May.

A. COLLARIS (Alpine Accentor).—One observed on the Fair Isle in the autumn (p. 73). New to Scotland.

CINCLUS AQUATICUS (Dipper).—In Mull, 14th February, nest nearly complete. On 20th April young of first brood left nest, and on 27th June second brood left. General laying time 6th-19th April. One on the shore at Crail on 19th October.

ACREDULA ROSEA (Long-tailed Titmouse).—Common in winter 1907-8 in Mull, but not found nesting 1908. Building at Darnley (Glasgow), 11th April.

PARUS MAJOR (Great Titmouse).—In song, Mull, 10th January, lays at Kirkliston, 20th May, and last in song there, 18th June. On 2nd December at Largo uttering its spring-note again.

P. ATER (Coal-Titmouse).—Sings at Kirkliston, 6th February till 18th June, and young away there, 22nd. Two got at the Bass Rock, 28th September (p. 49).

TROGLODYTES PARVULUS (Wren).—Laying at Kirkliston, 9th May, and last in song there, 23rd August. Regains song, 17th September. A few at the Isle of May 3rd, 7th, and 8th October, one at Monach 26th, and half a dozen occurrences in November at the Flannans.

MOTACILLA LUGUBRIS (Pied Wagtail).—Numerous at Lamlash, 22nd February, returned to Largo (Lahill), 15th March, common on river Kelvin, 22nd. Laying at Kirkliston, 29th April. Swarms in the fields at Largo, 6th September. Almost daily on the Isle of May, 10th September till 2nd October (p. 12).

M. ALBA (White Wagtail).—At Lerwick, 11th March; Stromness, 17th ("Ann. Scot. Nat. Hist.," 1908, p. 181); river Kelvin near Glasgow, 22nd. Five Clyde reports April and Mull, 24th (1), and 27th (2). Lerwick, 5th and 8th May; Dornoch 23rd (1). Supposed nesting Killilan (N.W. Highlands) ("Ann. Scot. Nat. Hist.," 1908, p. 253). Ten reports in autumn from all points between 30th August, Largo, and 25th September, Bunessan (large numbers at last).

M. MELANOPE (Grey Wagtail).—Laying, Kirkliston, 15th April; young on wing, Caldwell (Renfrew), 15th May; eighteen on shore together at Fairlie (Ayr), 23rd November.

M. FLAVA (Blue-headed Yellow Wagtail).—Probably bred near Aberdeen ("Ann. Scot. Nat. Hist.," 1908, pp. 253-254). Added to the Fair Isle fauna during the year (p. 72).

M. RAII (Yellow Wagtail).—Beith (Ayr), 1st May; Duddingston, 4th, two pairs (Evans); Thornliebank (Renfrew), 3rd; Possil and Cathcart (Glasgow), 5th.

ANTHUS TRIVIALIS (Tree-Pipit).—Rouken (Glasgow), 26th April; Caldwell, 27th; Kirkliston, 2nd May; Mull, 3rd (about 12). Last in song, Kennishead (Renfrew), 7th July. Breeding, Glenshee district at 800-900 ft. elevation ("Ann. Scot. Nat. Hist.," 1908, p. 181). Kirkliston, 4th September, last mainland observation. Iona, a few passing south on 21st and 26th September. Flannans, 25th, one sent. Isle of May, 26th and 28th (one each) (p. 12).

A. PRATENSIS (Meadow-Pipit).—Mull, arrived on moors, 12th February (6); returned to Caldwell, 21st March; numerous on river Kelvin, near Glasgow, 22nd. In song at Mearns (Renfrew), 19th July. Large flocks at Swordale, 10th September. In Isle of May, from 10th September till 8th October, almost daily; one singing, 15th September. Many at Butt of Lewis, 18th, and going south at Iona, 21st-25th.

A. CERVINUS (Red-throated Pipit).—Twice observed in the Fair Isle in autumn (p. 72). New to Scotland.

A. RICHARDI (Richard's Pipit).—Several in autumn in the Fair Isle (p. 72).

ORIOLUS GALBULA (Golden Oriole).—Near Markinch, about 10th May, one (♀) found dead ("Ann. Scot. Nat. Hist.," 1908, p. 180). On Fair Isle (p. 71) in spring and autumn.

LANIUS EXCUBITOR (Great Grey Shrike).—Mull, 12th February (1); Auchencairn (Arran), 8th April (1); Gilston (Fife), 22nd (1) ("Ann. Scot. Nat. Hist.," 1908, p. 180); Turnberry (Ayr) one observed 25th. On 17th October at Latheronwheel, Caithness, ♂ shot; at Isle of May one (♀) caught, 25th (p. 13).

MUSCICAPA ATRICAPILLA (Pied Flycatcher).—Spiggie (Shetland) (1) ("Ann. Scot. Nat. Hist.," 1908, p. 183); observed near Glendoune (Ayr), 14th June. At Sule Skerry, on 22nd September, (1) (p. 48), and one at Flannans on same date. From the 19th till 28th daily, except 27th, on Isle of May, including many on 24th and 25th (p. 13). One observed at Airdrie Wood, Crail, on 20th and 21st October.

M. GRISOLA (Spotted Flycatcher).—Isle of May, 7th May (1) (p. 13); Colinsburgh and Kirkliston, 8th; Carmichael (Lanark), 9th; Balgray (E. Renfrew), 10th. "A very scarce nesting species indeed" in Mull, "the very opposite of last year." Very rare at Kinloss, where last year "were many in all the wooded parks within three or four miles of this place." Nesting at Kirkliston, 3rd June, and has second brood there, 11th July; nest with

five pale blue eggs without markings at Beith, not a Pied Flycatcher's. Plentiful, 4th August to 3rd September, Largo. Last at Swordale, 12th September. Last on Isle of May, 25th and 26th September (p. 13).

M. PARVA (Red-breasted Flycatcher).—Butt of Lewis, 1st November, one (p. 48). Outer Hebrides, 3rd November, one (p. 3).

HIRUNDO RUSTICA (Swallow).—On 12th April one at Beith, and on same date one at Cambuslang. Thereafter until 25th inclusive, not a single report! From 26th till 3rd May inclusive, reports from sixteen localities chiefly on and from 30th April. Lays at Kirkliston, 16th May. On 4th July, at Mearns (Renfrew), in a nest in which young had been brought out this year were four eggs of the second laying slightly incubated. At Kirkliston young still in nest on 21st September, and on October 1st, in Mull, second brood of a pair left with their parents. Corsock (Kirkcudbrightshire), 22nd November.

CHELIDON URBICA (House-Martin).—Abundant, Lamlash, 30th April; 1st May, Dalry (Ayr), and same date Colinsburgh (1); other five localities on mainland, 2nd and 3rd respectively. In Mull two pairs arrived, 11th. On 27th June completes nest at Mearns (Renfrew) in five days. At Mull second brood left nest, 30th August. One in Mull on 5th November.

COTILE RIPARIA (Sand-Martin).—On 31st March at Lamlash (3); at Rouken Glen (Glasgow) on 5th April, one, but this species not again seen there till 3rd May (several). On 13th April at Duddingston (1) (Evans). Chiefly observed from 27th April till 7th May. Monach on 26th October.

LIGURINUS CHLORIS (Greenfinch).—Sings at Colinsburgh on 24th February, and nest and two eggs there, 16th April. 19th July, at Mearns, nest in hedge built almost entirely of sheep's wool. Flocking in large numbers at Mull on 22nd August. Last in song at Kirkliston on 24th August. A lot on the Isle of May on 17th October (p. 14). Several at Butt of Lewis on 9th November.

COCCOTHRAUSTES VULGARIS (Hawfinch).—At the Grove Gardens (Galloway), 9th April, ♀ accidentally trapped ("Ann. Scot. Nat. Hist.," 1908, p. 253). At Tyneholm, Pencaitland, 3rd July, young ♂ (p. 48). At Lauder (Berwick), ♀ and one young in August (*l.c.*, pp. 252, 253). One in spring on the Fair Isle (p. 71).

CARDUELIS ELEGANS (Goldfinch).—Cathcart (Renfrew), 21st March (5); Williamwood (E. Renfrew), 22nd May (♂); Symington (Lanark), 4th July, two pairs.

C. SPINUS (Siskin).—Small number on Isle of May, 22nd September till 28th October (p. 13). At Butt of Lewis on 9th October (1). At Swordale (E. Ross) on 25th October (1). In Mull on 11th November, seven feeding on seeds of *Centaurea nigra*, the first time Mr. MacDonald has seen it in Mull.

PASSER MONTANUS (Tree-Sparrow).—On 8th June, two near Ardmillan (Girvan). Pair seen by the shore at Swordale, 20th July. Isle of May, 10th September—8th October, a small party 5-3. At Swordale on 13th October, a few.

FRINGILLA CŒLEBS (Chaffinch).—Sings at Colinsburgh and Kirkliston on 6th February. Nest and one egg at Swordale on 6th May. Last in song, 2nd July. Flocks at Scotscraig, 10th July. At Isle of May, a lot in the big rush of 28th October (p. 14).

F. MONTIFRINGILLA (Brambling).—At Colinsburgh huge flock, 20th February, and very numerous there and at Largo from 22nd March till end of April. At Largo, 4th May (1); Swordale, two (♂); 6th May, Butt of Lewis (2). In autumn, a few on 7th September at Sandbank, Holy Loch (Clyde), 25th, two at Isle of May, and on 9 days from 26th till 8th October, there. In N.W. Mull, 50 or so on 4th November, 100 next day. A number at Inchnadamph (West Sutherland) on 25th October, a district to which they are new (pp. 47-8).

LINOTA CANNABINA (Linnet).—On Isle of May, 19th September, 6th, 7th, and 8th October (1, 3, 1, 1). Enormous flocks on 26th October at Swordale, and huge flocks on 26th November at Largo.

L. LINARIA (Mealy Redpoll).—Single birds on Isle of May on 13th and 18th January, 8th February, and 12th March. Two at the Flannan Islands on 7th September, and two on 16th. Two at Butt of Lewis on 8th November.

L. RUFESCENS (Lesser Redpoll).—A few at Killiechronan pine woods, Mull, on 18th April. Crail, about a dozen on 24th October, flock of over a hundred at Sandbank (Clyde) on 8th November, and a small flock at Swordale feeding on nettle seeds on 17th December.

L. FLAVIROSTRIS (Twite).—In N.W. Mull on 19th July, thirty or so already flocking. At Fairlie (Ayr), on 26th December, flock of over a hundred.

PYRRHULA EUROPÆA (Bullfinch).—In Mull, 14th March, 7th April at larch buds. One at Lahill (Largo) on 5th April. At Skelmorlie (Ayr), hatched out about 5th August, and pair feeding four young at Caldwell, 8th August. One at Monach, 18th October. Fairly common in N.W. Mull, 8th-15th November, at seeds of *Rumex crispus*, *Spiræa Ulmaria*, *Senecio Jacobæa*, and *Scabiosa succisa*.

P. ERYTHRINA (Scarlet Grosbeak).—At Isle of May on 12th September, one (♀) adult (p. 14).

L. BIFASCIATA (Two-barred Crossbill).—One at Fair Isle in spring (p. 71).

EMBERIZA MILIARIA (Corn-Bunting).—At Lerwick, 17th May, large flock. At Kirkliston local birds disappeared in late August, returning towards the end of the following March. At Butt of Lewis three on 18th October. On 2nd November a good many in flocks at Wick. Seventy or more at Dumfries, 12th December.

E. CITRINELLA (Yellow Bunting).—Sings at Kirkliston, 13th February, Colinsburgh, 20th. Laying at Kirkliston, 16th April. Still feeding young on Craneflies near Largo, 14th August. Last in song, Kirkliston, 24th.

E. CIRLUS (Cirl Bunting).—One (♂) young, killed by a cat at Thurso on 9th January, preserved for Dunrobin Museum.

E. RUSTICA (Rustic Bunting).—Single birds on both passages at the Fair Isle (pp. 71-2).

E. PUSILLA (Little Bunting).—One at Sule Skerry, 22nd September, captured and sent for identification (p. 48).

PLECTROPHENAX NIVALIS (Snow-Bunting).—At the Flannan Islands six observations in March, four in April, two in May, one on 19th June. Largest number about a hundred on 16th March. In autumn there, first one observed on 7th September, and regularly till 5th October in ones and twos; numbers increasing thereafter.

STURNUS VULGARIS (Starling).—Largo, 18th January, thousands; Glenorchard, Glasgow, have left, 12th March; Flannans in small parties, 10th-30th; Sule Skerry, 24th, several; Isle of May, 26th, great flocks (p. 15); same locality, 1st April, rush all night; at Kirkliston, young spend three weeks in nest (April); Fenwick (Ayr), not less than five thousand flew over E. to W. on 27th July; on the Isle of May, 10th September to 8th October; Flannans, 18th October, thousands, and numerous till 24th, and from 28th October till 30th November small parties.

PASTOR ROSEUS (Rose-coloured Starling).—One adult male at Fair Isle in spring (p. 76). One seen about half a mile E. of Reay on 2nd July ("The Field," 11th July 1908, p. 91). Clayock, near Georgemas, one (♂) shot, 7th July.

CORVUS MONEDULA (Jackdaw).—Isle of May, great flocks for some days about 26th March (p. 15). Kirkliston, 17th April, lays. At Swordale enormous flocks, 18th September. At Largo large flocks, 29th November.

C. CORONE (Carrion Crow).—Young thirty-three days in nest at Kirkliston on 14th April.

C. CORNIX (Hooded Crow).—Great flocks on Isle of May on 26th March (p. 15). A lot at Largo on 27th November.

C. FRUGILEGUS (Rook).—Courting antics at Largo, 19th February; building Kirkliston 26th and laying there 14th March. Great flocks on Isle of May on 26th March (p. 15). Two at the Flannans on 10th and 14th March and 6th April. A large flock on the Isle of May on 28th October (p. 15).

ALAUDA ARVENSIS (Sky-Lark).—Kirkliston, sings on 21st January. At Salen, N.W. Mull, on 25th March, which is late; song heard next day. Last in song, Kirkliston, 21st July. Song regained, 12th September, Kirkliston.

CYPSELUS APUS (Swift).—Caldwell, 29th April (1); Beith, 1st May; Burdiehouse (Edinburgh), 1st; Killermont (Glasgow), 2nd, half a dozen; Leven, same date (1); Barnton, 3rd (1); Lamlash, Carmichael (Lanark), Kirkliston, and Duddingston (many), 4th; Forfar, 5th May, many, and Swordale same date. Largo, 1st September (1); Kirkliston (2) on 2nd; Butt of Lewis (2) on 24th, Flannan Islands on 24th and 25th.

CAPRIMULGUS EUROPÆUS (Nightjar).—Lamlash, 4th May; N.W. Mull, 18th, one (♂).

IYNX TORQUILLA (Wryneck).—Isle of May, 20th September (1); 26th, same place, one (p. 16).

DENDROCOPUS MAJOR (Great Spotted Woodpecker).—Sandside, Reay, 6th March, one (♂) shot. Bridge of Allan, 21st April, one found dead ("The Field," 2nd May 1908, p. 748).

UPUPA EPOPS (Hoopoe).—Geanies, Ross-shire, one on 9th September ("The Field," 19th September 1908, p. 547).

CUCULUS CANORUS (Cuckoo).—Caldwell, 27th April; Bishop Loch (Glasgow), 28th; Dalry, 29th; Auchencairn (Arran), 30th, seen and heard. Beith and Largo, 1st May; Erskine and Crosswood, 2nd. Dunipace invaded ("Annals of Scot. Nat. Hist.," 1908, pp. 181-2). Cairnie, last week of June, one seen repeatedly eating larvæ of *Abraxas grossulariata* off gooseberry bushes. Beith, young one with call-note like Meadow Pipit's, but uttered more rapidly. Last heard, Mull, 3rd July. A bird of the year procured on Isle of May on 20th August (p. 16).

ASIO OTUS (Long-eared Owl).—On 15th March at Kirkliston, nest and three eggs. Mr. Brock says it appears to leave its nesting haunts there partially at least in winter.

A. ACCIPITRINUS (Short-eared Owl).—A few in spring, first week in March till first week in May, on the Isle of May, and again there in autumn, 24th September till 13th November. Beattock, 2nd May; Kilchattan, 30th May; Caithness, 16th October.

SYRNIUM ALUCO (Tawny Owl).—Kirkliston, 20th April, nest and three eggs.

NYCTALA TENGMALMI (Tengmalm's Owl).—Shetland, 4th January, an adult (♀) ("The Field," 4th April 1908, p. 583).

SCOPS GIU (Scops-Owl).—One near Largo, 16th May ("Annals of Scot. Nat. Hist.," 1908, pp. 180 and 183).

CIRCUS CYANEUS (Hen-Harrier).—Brawl Castle, one (♀) on 31st January: "very rare now."

BUTEO VULGARIS (Buzzard).—Fairlie (Ayr), one on 27th September. A pair appeared at Swordale on 30th October and continued there till 26th December.

AQUILA CHRYSAËTUS (Golden Eagle).—One observed at Swordale on 28th October.

FALCO CANDICANS (Greenland Falcon).—One from the Flannan Islands, 8th March ("Annals Scot. Nat. Hist.," 1908, p. 183).

F. ISLANDUS (Iceland Falcon).—An adult killed in December in the Flannan Islands ("British Birds," February 1909, p. 310).

F. PEREGRINUS (Peregrine Falcon).—At Possil Marsh, near Glasgow (pair, ♂ and ♀), 29th April. Pair arrived at Swordale on 17th October, with Redwings, whom they hunted.

F. ÆSALON (Merlin).—Butt of Lewis, a pair on 30th April; and on 27th August there, two caught in the engine-room, which they entered in pursuit of a Wheatear. Again seen at same place, 2nd November, and "have been numerous about lately (29th December)." One on Isle of May, 26th September to 8th October (p. 16).

PANDION HALIAËTUS (Osprey).—May, Loch Spiggie (Shetland), one ("Annals of Scot. Nat. Hist.," 1908, p. 183).

BOTAURUS STELLARIS (Bittern).—Whittingehame, 8th January, one (♂) captured alive ("Annals Scot. Nat. Hist.," 1908, p. 120). Aberlady, 6th April, one (*loc. cit.* pp. 183-4).

ANSER CINEREUS (Grey Lag-Goose).—3rd November, 40-50 in stubble near Walten Loch, Caithness, and on following day a large "gaggle." In November and December "grey" geese very numerous, Dumfries, with marked preponderance of Grey Lags. Several which visited the Fair Isle were of this species (p. 74).

A. ALBIFRONS (White-fronted Goose).—Arrived three weeks later than usual at Tiree, "having been kept back by continuous S.E. winds" (p. 51). Arrived much later than usual, Barra and South Uist (p. 3).

A. SEGETUM (Bean-Goose).—On 16th February at Bardowie Loch, near Glasgow, one, the sole record for the year.

BERNICLA LEUCOPSIS (Barnacle-Goose).—Parties up to fifty in number at the Flannan Islands from 17th March till 11th April. Hundreds arrived there to stay on 2nd November; large flock in the Outer Hebrides on 3rd November, and very large flock, South Uist, 6th; huge companies in Solway in December.

B. BRENTA (Brent Goose).—A "good lot" in Cromarty Firth on 2nd January, and large flocks in Outer Hebrides on 3rd November (p. 4).

CYGNUS MUSICUS (Whooper Swan).—In the Outer Hebrides on 3rd November, thirteen flying over (p. 4). Considerable number at South Uist on 6th November (p. 4). Five on loch near Butt of Lewis on 7th December. Crowds in Tiree (p. 51).

C. BEWICKI (Bewick's Swan).—At Bishop Loch (Glasgow), nineteen on 23rd February. Three reappeared there in October, which went off, and two which appeared in November went off likewise. Crowds in Tiree in end of year (p. 51).

ANAS BOSCAS (Mallard).—Nest and ten eggs at Kirkliston, 9th April. Enormous flocks at Largo, 20th November, the "greatest number we have ever seen."

A. STREPERA (Gadwall).—One shot on the Dee at Castle Douglas, 6th January ("Annals Scot. Nat. Hist.," 1908, p. 119). Two pairs under observation on a loch in the East of Scotland (*loc. cit.* p. 254). Caldwell, 18th October (3). Young male shot, Tayport, 14th November (p. 49). One shot, Loch Spynie, 25th.

SPATULA CLYPEATA (Shoveler).—Lochwinnoch (Renfrew), 16th May, one male. Increasing yearly as a breeding species at Tiree ("Annals Scot. Nat. Hist.," 1908, p. 252). At Glenorchard (Glasgow), 18th September, two. At Kilconquhar Loch, two on 13th October.

DAFILA ACUTA (Pintail).—Increasing as a nesting species at Spiggie, Shetland ("Annals Scot. Nat. Hist.," 1908, p. 184). At Gad Loch, Lenzie, 14th November (1). At Edderton, Ross-shire, one, with a Danish metal-ring, shot ("The Field," 5th December 1908, p. 104).

NETTION CRECCA (Teal).—Seen on six days at Isle of May, 12th September to 7th October. At Sule Skerry, on 21st October, two.

MARECA PENELOPE (Wigeon).—Nest in heather with six eggs, 28th May, Awe. Brood of ten near Dornoch Firth, 27th June. Reappeared in Cromarty Firth on 11th August, a small flock. Two flocks on 13th at Swordale (E. Ross). Reappeared at Hopetoun on 27th September.

FULIGULA FERINA (Pochard).—Last seen Linlithgow, 13th March; N.W. Mull, 5th April (2). Watten Loch, Caithness, a lot on 9th July. Reappears Linlithgow Loch, 25th September; Loch Libo, 13th October. At last named on 18th October (44), 22nd (55), 4th November (120), 15th (220), 6th December (120).

F. MARILA (Scaup Duck).—Glen Dam (E. Renfrew), 18th September (1).

CLANGULA GLAUCION (Golden-eye).—Loch Leven, 16th May and 5th June, eighteen; Loch Coulter (Denny Hills), 10th June, nineteen (p. 50). Glen Dam (E. Renfrew), 18th September, one (♂ juv.).

HARELDA GLACIALIS (Long-tailed Duck).—On the Spey, forty miles inland, in October, one (ad. ♀) (p. 49). Balcomie (Crail), 21st October, four or five.

SOMATERIA MOLLISSIMA (Common Eider-Duck).—At the Flannan Islands, at Sule Skerry, at Butt of Lewis, and in N.W. Mull, small movements, 8th March-17th April. Bred in June at Colvend, Kirkcudbrightshire; young in down seen there in July. At the Flannan Islands in decreasing numbers from September till 12th November (2).

ŒDEMIA NIGRA (Common Scoter).—A large flock off Graemsay, Orkney, in first week of March ("Brit. Birds," ii. p. 166). At Lendalfoot (S. Ayr) great flocks of Scoters; supposed this species going south on 2nd November—a very uncommon sight, none of the Scoters being numerous there at any time.

MERGUS MERGANSER (Goosander).—Twenty to twenty-eight passed the winter at Linlithgow Loch; last appearance there, a pair, 20th May (p. 50). Reappeared there 21st August (1), but no increase till 23rd November (15). At Loch Libo (Caldwell), 9th November till 5th April (1), in varying numbers, usually three, four, or six.

M. SERRATOR (Red-breasted Merganser).—At Largo, a lot displaying on 19th February; several still there, 6th May. At Cromarty Firth, one with eighteen young on 14th July. At Largo on 10th November, about 30; and in Barra Sound, early in November, 300 in one small bay (p. 4).

M. ALBELLUS (Smew).—At Dalswinton, Dumfriesshire, on 6th January, two immature.

Columba palumbus (Ring-Dove).—Flock of about 100 at Monturpie, Largo, 6th May. Noticed in increasing numbers as a breeding species in the island of Shapinshay, Orkney, in 1907 and 1908 ("British Birds," 1909, p. 345).

C. œnas (Stock-Dove).—On 26th April two nests at Cathcart on the Cart, which is here the county boundary. One of the nests was in Lanark and the other the first found in E. Renfrew. Four pairs located at Blantyre (Lanark), where it was reported to be nesting in 1906 (p. 115).

Turtur communis (Turtle-Dove).—One on 3rd October at the Flannan Islands.

Tetrao tetrix (Black Grouse) × Lagopus scoticus (Red Grouse).—Immature male hybrid, killed 6th October in Glen Trool, Kirkcudbrightshire ("Brit. Birds," ii. p. 386).

Coturnix communis (Quail).—One heard near Fentons, East Lothian, 6th June (Evans).

Crex pratensis (Corn-Crake).—Dalry (Ayr) and Braid Hills, 1st May; Kirkliston, 2nd; Auchencairn (S. Arran), 3rd; and throughout the country from 4th to 10th.

Rallus aquaticus (Water-Rail).—One in N.W. Mull on 26th March, where it is rarely met with in spring; one at Monach Island, 26th October.

Fulica atra (Common Coot).—In hundreds in the sea and on shore of Cromarty Firth on 2nd January. At Colinsburgh, 4th April, nest with five eggs; hatched, 27th; the old bird killed a water-vole in the water, 1st May; young begin to get white breast, head being still red, 16th May; young begin to get white frontal shield and second family hatched, 30th June.

Glareola pratincola (Pratincole).—Adult female on 13th July at the Flannan Islands ("Annals Scot. Nat. Hist.," 1908, p. 256).

Eudromias morinellus (Dotterel).—Small flock in East Lothian, 11th and 13th May (Evans).

Æ. curonica (Little Ringed Plover).—One shot on North Uist in October ("The Field," 20th February 1909, p. 329).

Charadrius pluvialis (Golden Plover).—Arrives on the moors in Mull, 11th March; flock at Butt of Lewis, 12th; on the moors at Caldwell (Renfrew), 20th; nest and four eggs at Beattock, 16th April.

Vanellus vulgaris (Lapwing).—On the morning of 11th February 1500-1800, which had been near Mr. Service's residence at Dumfries for three weeks, suddenly showed signs of restlessness. "In a few minutes the whole flock were on the wing, and

going through a lot of movements that they had not previously shown. By and by in a very compact body, they headed N.N.W., and were out of sight in less than another minute, going high and swiftly."

PHALAROPUS HYPERBOREUS (Red-necked Phalarope).—One taken at the lantern, Sule Skerry, on 29th October.

SCOLOPAX RUSTICULA (Woodcock).—At St. Blane's, Bute, on 19th April a nest with one egg, on 20th two eggs, and on 21st three. On 22nd, still three; and on revisiting it on 23rd a Curlew was seen to rise from the Woodcock's nest, which then contained but one egg and some fragments of shells. This was during the cold snap, and Mr. William Rennie, who sends the story, asks, "Could it be the Curlew that had devoured the eggs? and why was the Curlew there at all?"[1]

GALLINAGO CŒLESTIS (Common Snipe).—Drumming at Crosswood, West Calder, 10th February. In Mull, in mid-April, of two hundred observations on snipe drumming, about forty successful; *i.e.* the main contributory conditions to the act being fairly accurately seen. In every case the characteristic outspreading of the two outer tail-feathers was present, and the volume of sound depended on the steepness of the gradient of descent, being scarcely audible when this was but little removed from the horizontal. Pure white one, with black eyes, shot at Coll ("The Field," 5th December 1908, p. 1021).

G. GALLINULA (Jack Snipe).—Fourteen on the Flannan Islands on 14th September. Six killed at Monach, 23rd October.

TRINGA ALPINA (Dunlin).—At Gad Loch near Glasgow, 26th April, two on passage. One of the small race sent from the Flannan Islands on 14th September.

T. MINUTA (Little Stint).—Two this year's birds at Aberlady Bay (Evans), 29th August.

T. TEMMINCKI (Temminck's Stint).—Appeared at the Fair Isle in autumn (p. 74).

T. SUBARQUATA (Curlew-Sandpiper).—Three this year's birds at Aberlady Bay, 29th August (Evans). One young bird at the Glen Dam (E. Renfrew) on 25th October.

[1] I have quite a pile of material showing repeated captures of Curlews by steel traps which had been baited with eggs for Hooded or Carrion Crows. I have had these materials in my possession for some years back, and I refrained from the publishing of them, and my conclusions concerning them, lest I might do an injustice in any direction. I may now add, that since, by my orders, abundance of "grit" has been laid down where "grit" was at decidedly a low ebb before on my ground, there has been no recrudescence of Curlews being caught in steel traps baited with eggs.—J. A. HARVIE-BROWN.

T. STRIATA (Purple Sandpiper).—At the Flannan Isles until 24th March (10). Reappeared there 28th August (2). Small numbers on the Isle of May, 13th-27th September, on four days.

T. CANUTUS (Knot).—Moray Firth, several in summer plumage on 27th July. Aberlady Bay, 29th August (30 to 40) (Evans).

CALIDRIS ARENARIA (Sanderling).—A flock of a dozen with buffish throats on 27th July in Moray Firth. Largo, 9th August (2), 12th (1). Aberlady Bay, 29th August (30) (Evans). A few in Dornoch Firth on 1st December.

MACHETES PUGNAX (Ruff). — Near Dornoch Firth on 11th September, three observed, one (♂) shot. At Caerlaverock, Dumfries, 15th, one shot.

TOTANUS HYPOLEUCUS (Common Sandpiper).—Dalry (Ayr), 19th April; mouth of Endrick, Loch Lomond, 20th; Beith and Cathcart, 26th; Hogganfield (Glasgow), 27th; Carmichael (Lanark), 28th; Caldwell, 29th—all these localities in "Clyde." Crosswood (West Calder), Edinburgh (Evans) and Beattock, 30th. Observed at Linlithgow Loch on 25th September, which is later than usual, and on 26th one was killed at Tarbatness Lighthouse.

T. OCHROPUS (Greenshank).—Swordale, one by the shore on 3rd September; Dalmeny, 24th; Swordale, 12th October (2); Moray Firth, 14th November (1); Cromarty Firth, 17th December (1). One in autumn at the Fair Isle (p. 74).

T. GLAREOLA (Wood-Sandpiper).—Occurred in the Fair Isle during the year (p. 74).

LIMOSA LAPPONICA (Bar-tailed Godwit).—Flocks observed at Swordale (E. Ross) on 6th, 9th, 15th, 25th May, and 12th, 17th, 24th June. A dozen there on 20th July and a large flock on 27th. Aberlady Bay, 29th August (200) (Evans).

L. BELGICA (Black-tailed Godwit).—One frequented the west side of Iona, 21st-26th September. When seen feeding it probed in the ooze right to the proximal end of the bill, whereas the Bar-tailed species picked up their food like the Redshank. One in mid-winter at the Fair Isle (p. 74).

NUMENIUS ARQUATA (Curlew).—Party after party passing over Dumfries on 11th February, and through the night proceeding N.N.W. This movement continued at intervals to the 27th. On 10th February appeared at Crosswood (West Calder); 21st, Glenorchard (Glasgow); 24th, Beattock. Passing over Glasgow, 5th May. Leaving moors in Mull, 22nd-27th June.

N. PHÆOPUS (Whimbrel).—At the Flannan Islands observed on thirteen days from 4th May till 28th June; the largest party a dozen, on 5th June. Again on 28th August. Several at Butt of Lewis on 30th April, and large flock on 6th May. At Sule Skerry on 7th May (5). Dunbar, 8th August (1) (Evans).

HYDROCHELIDON NIGRA (Black Tern).—One (♂) obtained, Hoselaw Loch, near Kelso, on 28th April—another in its company ("Annals Scot. Nat. Hist.," 1908, p. 254). One at Peebles, 30th May (*loc. cit.* p. 254). One, immature, observed at Aberlady, 29th August (*ibid.*).

STERNA CANTIACA (Sandwich Tern).—A few at Largo, 6th May, and a few west of North Berwick, 9th (Evans). On 13th, 15th, 17th September, and 4th October, small numbers seen at the Isle of May (p. 18). On 14th October, off Barsalloch Point (Wigtown), one observed, believed to be this species ("The Field," 24th October 1908, p. 721).

S. FLUVIATILIS (Common Tern).—Eight at Possil Marsh, Glasgow, on 29th April; Aberlady, 1st May, a few; 6th, Largo, a good many; 11th, Sule Skerry, great numbers; 29th May, Butt of Lewis, many first seen. One sitting on three eggs in Fife, 4th July. Several at Hopetoun, 4th October.

S. MACRURA (Arctic Tern).—At Lerwick, 18th and 20th May.

S. MINUTA (Little Tern).—Kincraig Point, 20th May (2).

LARUS MINUTAS (Little Gull).—One shot at Newburgh (Aberdeen) ("The Field," 16th January 1909, p. 118).

L. RIDIBUNDUS (Black-headed Gull).—In summer dress, Glasgow, 16th February. The persecution of the Lapwing in autumn and winter by this species is the subject of notes in these pages (1908, p. 255; 1909, pp. 50 and 117), but none of the writers has noticed the fact to which Mr. Hugh W. Wilson draws attention, viz. that with the advent of spring the Lapwing is the aggressor—at any rate that is the case on the grass lands of Mearns Moor, where this species is common in the nesting-season, and over which great numbers of Black-headed Gulls are constantly passing to and from the great gullery at Harelaw Dam.

L. CANUS (Common Gull).—Hundreds of nests at Loch Awe on 23rd May, but only in one instance four eggs.

L. FUSCUS (Lesser Black-backed Gull).—Appears Glasgow Harbour, 18th March (2); Mull, 28th (1). Beginning to lay at Swordale, 2nd June.

L. LEUCOPTERUS (Iceland Gull).—From 8th January till 4th April, one in N.W. Mull.

MEGALESTRIS CATARRHACTES (Great Skua).—Two at Lerwick, 8th June, and one at Isle of May, 6th October.

S. CREPIDATUS (Arctic Skua).—Shurrery (Reay), 8th August, one shot, and one after Terns, Dunbar, same date (Evans); at Isle of May, single birds on six occasions, 12th Sept.-6th Oct.; Dalmeny, 12th October; Balcomie, 18-20th, single birds; Keiss, 4th November (1).

U. LOMVIA (Brunnich's Guillemot).—On 11th December one picked up at Craigielaw Point (Haddington) (pp. 75-76).

U. GRYLLE (Black Guillemot).—Small parties at Butt of Lewis on 7th March, first for season. Several at Sule Skerry on 5th April. Had left Butt of Lewis with young by 1st September.

MERGULUS ALLE (Little Auk).—One on 9th March at Gullane Point ("Annals Scot. Nat. Hist.," 1908, p. 185).

FRATERCULA ARCTICA (Puffin).—At the Flannans on 10th April, several. Great numbers at Sule Skerry on 15th. Left Sule Skerry on the evening of 8th August in great numbers, flying very high.

COLYMBUS GLACIALIS (Great Northern Diver).—Over forty in Hoy Sound, Orkney, on 6th March, and considerably over a hundred off Graemsay on 6th April ("Ann. Scot. Nat. Hist.," 1908, p. 185). One during the winter of 1908 at the Fair Isle (p. 75).

P. NIGRICOLLIS (Eared Grebe).—One got at Helensburgh in January exhibited at meeting Nat. Hist. Soc. of Glasgow.

P. FLUVIATILIS (Little Grebe).—At Isle of May, one found dead on 24th September, and one in pond there 1st-2nd October (p. 20).

OCEANODROMA LEUCORRHOA (Fork-tailed Petrel).—On the coast near the Don (Aberdeen), 5th January, one (♀) ("Annals of Scot. Nat. Hist.," 1908, p. 120). At Flannan Islands, one at lantern on 6th April. One at lantern at Sule Skerry, 5th August. Three captured at Sule Skerry on 21st September, where it is rarely seen (p. 118). One at lantern on Isle of May on October 6th (p. 19).

PUFFINUS ANGLORUM (Manx Shearwater).—Frequented Sound inside Ardnamurchan Head from end May. On 15th June several were caught and drowned on Haddock lines, baited with pieces of herring, which they stripped off before sinking to the bottom. The fishermen assured Mr. Macdonald that by using their wings, their progress under water is marvellously rapid.

1150 CATHCART ROAD, GLASGOW.

THE RECENT REMARKABLE VISITATION OF CROSSBILLS.

By Wm. Eagle Clarke, F.L.S., F.R.S.E.

The summer of 1909 will be remembered by ornithologists for its remarkable visitation of Crossbills (*Loxia curvirostra*). During late June, all July and August, these birds were widely spread over Great Britain, but seem to have come most under notice at the Northern Islands of Scotland, where forests and other cover are non-existent.

These early summer migrations are not very unusual on the part of the Common Crossbill. It has long been known, for some reason not as yet determined, that at the close of the breeding season, which is an early one, these birds and their young quit their continental forest homes to appear among us, and occur in the most out-of-the-way and, for their food requirements, unsuitable places. The irruption, however, of 1909 is remarkable for the number of the visitors, and the wideness of the area covered.

They were first detected on Fair Isle, where Stewart Stout, our bird-watcher, saw the first on the 23rd of June. Their numbers afterwards increased, as if the birds had come to the island in a series of waves, and as many as 300 were seen some days. They remained on the island throughout July, but their numbers fell off towards the end of that month. They were observed there, however, during the whole of August in small parties.

In Unst, the northern island of the Shetland group, on the 27th of June, an adult male came under the notice of Dr. Edmondston-Saxby, who, in reporting the occurrence, remarked that he had only once previously seen this bird in summer.

In the neighbourhood of Lerwick they were first observed on the following day, and from that day onwards until the 13th of August, the day on which he wrote me last, Mr. J. S. Tulloch tells me that he saw small parties, but never more than a dozen strong. He, however, heard of as many as thirty having been seen in a flock; and he had Crossbills, in

varying numbers, reported to him from Unst, Yell, North Mavine, Whalsay, Bressay, Tingwall, and several other places. Mr. Thomas Henderson, jun., saw many in the neighbourhood of Sumburgh Head, including a flock of forty birds; and he informs me that a number were taken on the fishing boats at sea to the eastwards of the Shetlands.

In Orkney many were observed near Kirkwall, and a small flock visited the Island of Sanday; but no dates are afforded. The most remarkable circumstance in connection with the occurrence of the Crossbills in this group of islands relates to their appearance in numbers at the remote rocky islet of Sule Skerry, which lies out in the Atlantic some thirty-three miles west of Hoy. Here one was captured at the lantern on the night of 28th June. More were seen afterwards, forty-two being the largest number. They remained on this almost desert island for about three weeks. Mr. Moore, to whom I am indebted for this information, tells me that he found several dead amid the Arctic Tern's quarters, and he is of opinion that the Terns killed them for invading the precincts of their territory.

In the Outer Hebrides[1] Mr. Robert Clyne saw a small party, containing some old males, near the Butt of Lewis on 28th June. At the outlying Flannan Islands Mr. Robert Anderson writes me that a great many visited them late in June and remained about five weeks on Eilean Mor. Mr. Harvie-Brown received information that two were seen at Lochmaddy in North Uist.

On the mainland of Scotland, eight are recorded as visiting a garden at Wick, where they sojourned for a fortnight. On 9th July a flock of about twenty alighted on a steamer off Bervie, on the Kincardineshire coast, and remained on board for several hours. Others are recorded for Fraserburgh and Hawick.

Specimens in "green" plumage—*i.e.* females and young—naturally predominated, but a fair proportion of old red males are mentioned as being present at localities where they occurred in any numbers.

In England they are recorded in varying numbers, from

[1] [Mr. Wm. Macgillivray, of Eoligary, Barra, reports the occurrence of flocks of 10, 20, and 30 Crossbills in that island since the end of June.—J. A. H. B.]

Northumberland, Yorkshire, Lincolnshire, Essex, Kent, Middlesex, Surrey, Sussex, Herefordshire, Devon, Cheshire, and Lancashire.

As to the food of these birds in the Scottish localities visited, few of which would afford their usual diet, it is interesting to relate the makeshifts that had to be resorted to. At Lerwick they were observed plucking daisies and feeding on the yellow centres of the flowers. At Fair Isle they fed on flowers and berries (last year's) growing on the high ground. At the Flannans they fed on the sea-pinks. In the garden at Wick they scooped the Green-fly off the shoots of the roses in a remarkable manner. Birds obtained at Fair Isle late in July were described as being as fat as butter.

These invaders swooped down upon our isles and shores from Northern Europe. This is certain, for a number of specimens received by me from various localities *all* belonged to the continental race, which is readily distinguished from the native Scottish bird by its smaller size and more slender bill. If further evidence were necessary to prove the origin of the visitors, it is afforded by the fact that among the flocks at Fair Isle and the Flannans, adult males of the Two-barred Crossbill (*Loxia bifasciata*) were detected and obtained. This rare visitor to our islands is a native of Northern Prussia and Siberia, and it is highly probable that it was present among the parties of the common species in fair numbers.

It is difficult to say what can have caused the birds to simultaneously quit the northern pine forests, and induced them to embark upon such adventurous voyages. We must look to our continental friends for the explanation, if such be possible. It is certain that some widespread incentive has influenced the birds, and caused this vast outpouring from their native haunts. The numerous birds reported would form a mere tithe of those which found their way to our islands, and many must have perished at sea. One came on board the fishery steamer "Goldseeker," in a dead-tired state, 95 miles E. by S.$\frac{3}{4}$S. of Anskerry Light, Orkney, on July 12th, and allowed itself to be captured.[1]

[1] Mr. John M'Kenzie *in litt.*

THE AQUATIC COLEOPTERA OF THE SOLWAY DISTRICT.

By Frank Balfour-Browne, M.A. (Oxon.), F.R.S.E., F.Z.S.

(*Continued from p.* 152.)

Hydroporus erythrocephalus, *L.*—**Dumfries, Kirkcudbright, Wigtown.**

H. rufifrons, *Dufts.*—**Kirkcudbright,** Maxwelltown L., Cargen Burn, Dalbeattie; not uncommon in a few spots, but extremely local.

H. celatus, *Clark.*—**Kirkcudbright,** Criffel (Lennon).

H. melanarius, *Sturm.*—**Dumfries, Kirkcudbright;** a peat-moss species occurring not uncommonly at all altitudes.

H. memnonius, *Nic.*—**Dumfries, Kirkcudbright, Wigtown;** not uncommon.

H. obscurus, *Sturm.*—**Dumfries, Kirkcudbright, Wigtown;** a common peat-moss species.

H. nigrita, *F.*—**Dumfries, Kirkcudbright, Wigtown;** fairly common.

H. discretus, *Fairm.*—**Kirkcudbright,** Maxwelltown L., Kirkconnell, Lochfoot, Colvend, Dalbeattie; not common.

H. pubescens, *Gyll.*—**Dumfries, Kirkcudbright, Wigtown;** probably the most abundant species of the genus in the Solway district.

H. planus, *F.*—**Dumfries, Kirkcudbright;** common on salt marshes but not so common in other localities.

H. lituratus, *F.*—**Dumfries, Kirkcudbright.** Occasionally on peat mosses, but common on salt marshes. Fowler describes it as an inhabitant of stagnant ponds, especially in woods. I have never found it in woods, and in my experience it is common on the west coast in salt marshes.

H. obsoletus, *Aubé.*—**Kirkcudbright,** Cargen burn in flood (1); Criffel (1); Dalbeattie L. (1); only three specimens.

Agabus guttatus, *Payk.*—**Kirkcudbright,** Criffel, Bengairn, and Screel; probably common on high ground throughout the district in clear burns.

A. biguttatus, *Ol.*—Solway (Lennon).

A. paludosus, *F.*—**Dumfries,** Lochar Moss; **Kirkcudbright,** Maxwelltown L., Lochfoot, Colvend.

A. uliginosus, *L.*—**Dumfries,** "Tinwald Downs," M'Nab, one specimen Dublin Museum Coll.

A. affinis, *Payk.*—**Dumfries, Kirkcudbright, Wigtown.** Fairly common, but localised so that it may occur in only two or three pools on a large peat moss, and in those pools it will be common. Both this species and the next are usually in mossy patches, and often do not turn up in the net until the pool has been thoroughly disturbed.

A. unguicularis, *Thoms.*—**Kirkcudbright,** Maxwelltown Loch and three other spots; often with *A. affinis*, but whereas that species seems to specially favour Sphagnum, *unguicularis* is more common in Hypnum, and the pools therefore are more grassy. Fairly common in the four localities where it has been found.

A. congener, *Payk.*—**Dumfries, Kirkcudbright, Wigtown;** peat mosses at quite low altitudes and in company with *A. affinis*. In other parts of Scotland I have always, so far, found this species on mountains. Not common but widely distributed.

A. nebulosus, *Forst.*—**Kirkcudbright;** a "pond" species, but occasionally found in peat-moss holes even at high altitudes, *e.g.* Criffel top. Also common on salt marshes, giving place in more brackish pools to *A. conspersus.*

A. conspersus, *Marsh.* — **Dumfries,** Caerlaverock Salt Marsh (Lennon); **Kirkcudbright,** Preston Merse, common in such localities.

A. femoralis, *Payk.*—**Dumfries,** near Moffat (Lennon); **Kirkcudbright,** Rockcliffe. Lennon only found it in one pond near Moffat Well, and I only found it in one pond at Rockcliffe.

A. arcticus, *Payk.*—**Dumfries,** near Moffat, one specimen (Lennon); **Kirkcudbright,** on the side of the Rhinns of Kells, 700 feet up, one specimen. Excepting Criffel, I have done no mountain work in the Solway district. The species is usually alpine and probably occurs on the high grounds of the district, although it does not seem to occur on the Criffel range.

A. sturmii, *Gyll.*—**Dumfries, Kirkcudbright, Wigtown;** fairly common but somewhat local.

A. chalconotus, *Panz.*—**Dumfries, Kirkcudbright, Wigtown;** peat mosses, fairly common.

A. bipustulatus, *L.*—**Dumfries, Kirkcudbright, Wigtown.**

Platambus maculatus, *L.*—**Dumfries, Kirkcudbright;** a running-water species, and common. Almost certainly occurs in Wigtownshire, although I seem to have missed it.

P. maculatus, *var.* immaculatus, *Donnisth.*—**Kirkcudbright,** R. Nith, R. Urr.

Ilybius fuliginosus, *F.*—**Dumfries, Kirkcudbright, Wigtown.**

I. fenestratus, *F.*—**Kirkcudbright,** Lotus L. (1), Carlingwark L. (fairly common). There are seven specimens in the Lennon collection, although he does not mention the species in his MS. List. This is at present the only Scottish record for this species.

I. ater, *De G.*—**Kirkcudbright,** Cullochan L. and two ponds in district; decidedly scarce.

I. ænescens, *Thoms.*—**Dumfries, Kirkcudbright, Wigtown;** peat mosses, fairly common.

Copelatus agilis, *F.*—**Dumfries,** "Queensberry Hill" (M'Nab), one specimen in Dublin Museum Coll.

Rhantus exoletus, *Forst.*—**Kirkcudbright,** Lochaber L., Lochrutton L., Cullochan L., and a few ponds in the county; common where it occurs.

R. pulverosus, *Steph.*—**Kirkcudbright,** one specimen, Preston Merse.

R. bistriatus, *Berg.*—**Dumfries, Kirkcudbright, Wigtown;** moderately common, chiefly on peat mosses, less commonly in ponds.

Colymbetes fuscus, *L.*—**Kirkcudbright,** Maxwelltown Loch, Cullochan L., New Barean L., Preston Merse, Dalbeattie, Rockcliffe, and one or two other localities; not uncommon.

Dytiscus punctulatus, *F.*—**Dumfries, Kirkcudbright, Wigtown.**

D. marginalis, *L.*—**Kirkcudbright;** from my experience, scarce!

Acilius sulcatus, *L.*—**Dumfries, Kirkcudbright;** in large, deep peat holes where there is no weed, also in large, deep quarry-holes.

A. fasciatus, *De G.*—**Dumfries,** Racks Moss, Bankend; in large, deep peat holes in company with *A. sulcatus*; common where it occurs, but decidedly local.

Gyrinus minutus, *F.*—**Kirkcudbright,** Lochaber L.; **Wigtown** (J. G. Gordon).

G. elongatus, *Aubé.*—**Kirkcudbright,** Maxwelltown L. (Lennon), Cullochan L.; this seems to be the only Scottish locality at present recorded.

G. natator, *Scop.*—**Dumfries, Kirkcudbright, Wigtown,** Drumwalt L. (J. G. Gordon).

G. Suffriani, *Scriba.*—**Kirkcudbright,** Maxwelltown (Lennon).

G. opacus, *Sahlb.*—**Kirkcudbright,** Clonyard L.; **Wigtown,** R. Cree.

Orectochilus villosus, *Müller.*—**Dumfries,** R. Lochar; **Kirkcudbright,** R. Nith, Kirkgunzeon Burn; **Wigtown** (J. G. Gordon).

Hydrobius fuscipes, *L.*—**Dumfries, Kirkcudbright,** common in ponds and on salt marshes; absent or almost so from peat mosses.

H. fuscipes, *var.* picicrus, *Thoms.*—**Dumfries, Kirkcudbright, Wigtown;** the form almost invariably found on peat mosses, where it is fairly common.

Philydrus maritimus, *Thoms.*—**Wigtown** (J. G. Gordon).

P. melanocephalus, *Ol.* — **Dumfries, Kirkcudbright, Wigtown.** A peat-moss species probably more common on high ground than on low ground.

P. nigricans, *Zett.*—**Dumfries, Kirkcudbright;** almost if not entirely confined to peaty ground. Not common.

P. minutus, *F.*—**Dumfries, Kirkcudbright, Wigtown;** a peat-moss species and common.

P. coarctatus, *Gredl.* — **Kirkcudbright, Wigtown;** fairly common but local, more common in ponds than on peaty ground.

Anacæna globulus, *Payk.*—**Dumfries, Kirkcudbright, Wigtown.**

A. limbata, *F.*—**Dumfries,** Lochar Moss; **Kirkcudbright,** Maxwelltown L., Rockliffe, near Lochfoot; **Wigtown,** near Newton-Stewart; not common.

Helochares punctatus, *Sharp.*—**Dumfries,** Lochar Moss; **Kirkcudbright,** Kirkconnell Moss, Rockcliffe; **Wigtown** (J. G. Gordon); scarce. I am not sure that this is specifically distinct from *L. lividus*, Forst., but the latter has not occurred with me in the Solway district.

Laccobius sinuatus, *Mots.*—**Kirkcudbright,** Colvend, Rockcliffe, R. Ken, Kells.

L. nigriceps, *Thoms.*—**Kirkcudbright,** New Barean L., Colvend R. Nith, R. Urr. Neither this species nor *L. sinuatus* is common in the district as far as my experience goes.

L. alutaceus, *Thoms.*—**Kirkcudbright,** fairly common.

L. minutus, *L.*—**Kirkcudbright, Wigtown,** R. Cree; perhaps commoner than *L. alutaceus.*

L. bipunctatus, *F.*—**Kirkcudbright,** Maxwelltown Loch (1), and one also in a pond in the district.

Berosus signaticollis, *Charp.*—**Dumfries,** Caerlaverock Salt Marsh (Lennon).

[B. luridus, *L.*—**Dumfries,** Rev. W. Little.]?

Limnebius truncatellus, *Thoms.* — **Dumfries, Kirkcudbright, Wigtown.**

Chætarthria seminulum, *Herbst.*—(Sharp and Lennon.)

Helophorus tuberculatus, *Gyll.*—**Dumfries** district (Lennon), two specimens.

H. porculus, *Bedel.*—**Dumfries,** Kelton and Caerlaverock Salt Marshes (Lennon).

H. nubilus, *F.*—**Dumfries,** Kelton and Caerlaverock Salt Marshes (Lennon).

H. aquaticus, *L.*—**Dumfries, Kirkcudbright;** a smaller form, presumably var. *æqualis*, Thoms., although I cannot definitely separate it from the type, is also common, especially on salt marshes.

H. viridicollis, *Steph.* (= æneipennis, *Thoms.*).—**Dumfries, Kirkcudbright;** *H. strigifrons*, Thoms., I have taken in Renfrewshire. It possibly occurs in the Solway district; but until the appearance of Mr. Edwards's paper on the 'British Helophori' ("EMM.," ser. 2. xix. Oct. 1908), I had not attempted to distinguish it. I am not yet clear in my own mind that it is worthy of specific distinction.

H. dorsalis, *Marsh* (= Mulsanti, *Rye*). — **Dumfries,** Kelton; **Kirkcudbright,** Preston Merse.

H. brevipalpis, *Bedel.*—**Dumfries, Kirkcudbright, Wigtown** (J. G. Gordon).

H. arvernicus, *Muls.* — **Dumfries,** R. Lochar; **Kirkcudbright,** Cargen Burn.

Hydrochus brevis, *Herbst.* — **Kirkcudbright,** Maxwelltown L. (Lennon).

H. angustatus, *Germ.*—**Kirkcudbright,** Maxwelltown L.; one only, (Lennon).

Henicocerus exsculptus, *Germ.*—**Kirkcudbright,** R. Nith, R. Ken; not common.

Octhebius marinus, *Payk.*—**Dumfries,** Kelton and Caerlaverock Salt Marshes; **Kirkcudbright,** Preston Merse.

O. pygmæus, *F.* — **Kirkcudbright,** Dalbeattie, Castle-Douglas; scarce.

O. bicolor, *Germ.*—**Dumfries,** Kelton; not common.

O. rufimarginatus, *Steph.*—**Kirkcudbright,** Cargen Burn (one specimen only); Lennon (MS. list) speaks of it as very rare, and there is only one specimen in his Collection.

O. auriculatus, *Rey.*—**Dumfries,** Kelton, a few specimens, but it has not been searched for!

O. lejolisii, *Rey. and Muls.*—**Kirkcudbright,** Douglas Hall, but probably to be found at every suitable habitat.

Hydræna testacea, *Curt.*—**Kirkcudbright,** R. Cairn near Irongray (Sharp and Lennon).

H. riparia, *Kug.*—**Dumfries, Kirkcudbright, Wigtown**; common in grassy ponds and grassy edges of rivers.

H. britteni, *Joy.*—**Kirkcudbright,** Cargen Burn, very common in March 1907 on some flooded meadow land. **Wigtown,** R. Cree, one only. These are the only times I have found the species in the Solway district, but I have taken it in Ayrshire and Renfrewshire.

H. longior, *Rey.* } Dr. Sharp records *H. angusta* for the Solway
H. angustata, *Sturm.* } district. It seems doubtful whether that species really occurs in Britain, the records apparently referring to *H. longior* (E. A. Newberry, "EMM." ser. 2. xviii. 172-3, 1907).

H. gracilis, *Germ.*—**Kirkcudbright**; common in almost all the small streams I examined.

H. atricapilla, *Wat.*—**Kirkcudbright,** R. Cairn, near Lincluden (Lennon).

H. pygmæa, *Wat.*—Solway (Sharp).

H. pulchella, *Germ.*—**Kirkcudbright,** R. Nith. Lennon also mentions having taken one specimen in the Glen Burn (Cargen Burn). Scarce.

Cyclonotum orbiculare, *F.*—**Dumfries,** "abundant in flood-refuse" (Lennon); **Kirkcudbright,** Maxwelltown Loch.

In the foregoing list I have endeavoured in mentioning localities to use only names to be found on the map, and the map which I have followed is Bartholomew's "half-inch." Lennon's reference to the "Glen-mill burn" refers to the Cargen Burn or Cargen Water, and if I have incidentally mentioned "Lotus Loch," it is the same as Loch Arthur. "Racks Moss" is that part of the Lochar Moss near Racks Railway Station, an easily approached part of the moss, and usually very productive. Similarly, "Bankend" refers to that part of the Lochar Moss near the village.

I have already mentioned how the personal element affects the results of any collector, so that my remarks as to the commonness or rarity of a species are quite probably unjustifiable. In such a district as the south-west corner of

Scotland most of the water-collecting is carried on either on peat mosses or about lochs, so that localities for "pond" species are not frequent. Thus *Hydroporus lineatus*, for instance, is a rarity compared to what it is in East Norfolk, but it probably occurred in every "pond" habitat I examined.

One of the best collecting areas in the district, to which Lennon introduced me many years ago, is the Maxwelltown Loch. The loch itself is now greatly reduced, and was never large; but there is some excellent marshy ground, and one or two mossy shallow ditches. In this small area I found 38 species, and several of Lennon's records also refer to this place.

Kirkcudbright, with about 110 species, has at present by far the fullest Scottish list of Water-beetles, Dumfries coming next with about 65 species; but the possibilities of the Scottish counties have, as yet, scarcely been tried. During four days last September I took 62 species in Forfarshire. The Edinburgh List, so far as I know it, contains 61 species, but such names as *Agabus Sturmii* and *chalconotus*, *Colymbetes fuscus*, *Dytiscus*, *Philydrus*, *Laccobius*, *Limnebius truncatellus*, *Helophorus aquaticus* and *brevipalpis*, and *Hydræna* are at present absent from it. Fifeshire, where I had two days' collecting last autumn, totals 58 species; and these are, I believe, the best Scottish Lists, so that there is promise of better things for those who choose to investigate.

I must take this opportunity of thanking a large number of Entomologists who, by sending me their lists of species collected in various parts of Great Britain and Ireland, have greatly assisted me in my work on the distribution of the British and Irish Water-beetles. It is due to their kindness that I have been able to discuss with some fulness the distribution of some of the more interesting species mentioned in this paper.

I must also thank Mr. Eagle Clarke, the Keeper of the Natural History Department of the Royal Scottish Museum, Edinburgh, for allowing me to use Lennon's MS. List which, with the collection, is now under his charge, and for sending me the whole of the Lennon Water-beetles to examine; and I must thank Mr. Percy Grimshaw for sending

me a copy of that part of Lennon's Register which referred to the Water-beetles.

I hope that the discovery of the Lusitanian element in the fauna of the Solway district may stimulate other entomologists to explore other districts, and I shall be greatly indebted to any who do if they will send me their lists of species.

Supplementary Note.

Since the above paper was written I have made one or two further observations on the local fauna.

Agabus uliginosus, *L.*, should be added to the Kirkcudbrightshire list. I have found it in some numbers on the Preston Merse, Southwick, in company with the halophyll species. This definitely confirms the older record of the species for the Solway district.

Octhebius auriculatus, *Rey.*, can also be added to the Kirkcudbrightshire list. I think the species is probably more common than the records indicate, but it is very difficult to find. Both at Kelton and at Southwick I can only take it at the time of the highest spring tides when parts of the merse are flooded. It seems to live in the fine silt amongst the roots of the plants, and is submerged only at the times of the highest spring tides. I am told that in Kent it is found by grubbing at the roots of the sea-lavender (*Statice*), but I have not yet been able to discover it in such a situation in the Solway district.

Hydræna atricapilla, *Wat.*, has turned up in Dumfriesshire, but seems to be very rare, although this scarcity may be due to the fact that I have not yet hit upon its proper habitat.

I have been expecting to find *Paracymus nigro-æneus*, F., in the Solway district, but have so far failed. The species occurs as far north as Argyll main and Ebudes mid, so it should surely turn up in the more southern counties of Scotland.

List of Papers Dealing with the "Solway" Aquatic Coleoptera

1. 'Localities of Scottish Coleoptera,' Rev. W. Little, "Mag. of Zoology and Botany," ii. 232-7, 1838.
2. 'Coleoptera of Scotland,' Andrew Murray, 1853.
3. 'Occurrence of *Agabus Solieri* near Dumfries and Clova,' W. R. M'Nab, "EMM.," iv. 283, 1867-68.

4. 'Notes on Coleoptera in the South of Scotland,' D. Sharp, "EMM.," iv. 107-109, 1867-68.
5. 'Coleoptera of Scotland,' David Sharp, "Scott. Nat.," i.-iv., 1871-78.
6. 'List of Solway Beetles' in "Local Parish Histories and New Statistical Account," by Rev. Dr. Weir [List probably obtained from Lennon], "Dumfries Courier," Sept. 22, 1876.
7. 'The Rarer Coleoptera of the Dumfries District,' W. Lennon, "Trans. Dumfries and Galloway Nat. Hist. and Antiq. Soc.," pp. 74-9, 1876-78.
8. 'Notes on Rare Beetles, No. II.,' W. Lennon, *ibid.*, pp. 77-8, 1878-80.
9. '*Helophorus tuberculatus* in Scotland,' W. Lennon, "EMM.," xvi. 134, 1879-80.
10. 'Some Additions to Scottish Coleoptera,' etc. etc., W. Lennon and W. D. Douglas, "Ann. Scott. Nat. Hist.," April 1892.
11. 'Coleoptera near Dumfries,' W. Lennon, "EMM.," xxxi. (ser. 2. vi.) 174, 1895.
12. 'Coleoptera in Mid-Solway,' MS. List of W. Lennon, now in the Natural History Department of the Royal Scottish Museum, Edinburgh.
13. 'Notes on Coleoptera taken in Wigtownshire,' J. G. Gordon, "Ent. Rec.," xv. 46-9, 1903.
14. 'Notes on Wigtownshire Coleoptera,' J. G. Gordon, "Ent. Rec.," xvi. 78, 1904.

ON SOME SCOTTISH SIPHONAPTERA.

II.

By James Waterston, B.Sc., B.D.

Since October 1906 I have had few opportunities of securing Siphonaptera, nevertheless, chiefly through the kindness of one or two friends, a large number of fleas have come into my hands. In recording these now, I should like to tender my best thanks to all who have assisted by sending specimens.

As before also I have to thank heartily the Hon. N. C. Rothschild, M.A., for the trouble he has ungrudgingly taken in identifying my specimens.

In the following short list I have given the county when first mentioning a locality, but not later. In other cases if no county is named, the locality is in Midlothian. All the species from *gallinæ* to *borealis* have been taken from the nests of various passerines. To avoid repetition only the host's name is indicated.

What proportion of the notices here given constitute first "records" for particular districts I cannot say. As yet little

has been done in this group in Scotland. Mr. Evans has published in the "Annals" (July 1904 to October 1906) two short papers and a note dealing exclusively with the Forth areas. There are also other scattered records, particularly in Mr. Rothschild's papers.

PULEX IRRITANS, *L.*—♀, Dennistoun Public Library, Glasgow, 22, x. '06 (R. G.).

CERATOPHYLLUS FASCIATUS, *Bosc.*—3 ♂ ♂, on *M. sylvaticus-fridariensis*. Fair Isle, Shetland, ix. '06. N. B. Kinnear. ♂ and 14 ♀ ♀ on *M. decumanus*, Edinburgh, 4, x. '06. D. MacRae.

C. PENICILLIGER, *Grube.*—13 ♂ ♂ and 32 ♀ ♀ on *M. orcadensis*, nr. Stromness, Orkneys, summer '07. Geo. Ellison.

C. WALKERI, *Rothsch.*—2 ♀ ♀ on *M. amphibius*, Whiteadder, Abbey-St.-Bathans, Berwickshire, 16, v. '08. J. Lawrence.

C. GALLINÆ, *Schrk.*—From the following nests:—♀, *Ruticilla phœnicurus*, Gorebridge, 17, vii. '06. This example was bred months later. 2 ♀ ♀, *T. merula*, nr. Colinton, 15, iv. '07. ♀, *Sturnus vulgaris*, Aberdour, Fifeshire, 20, iv. '07. ♂, *Accentor modularis*, Quixwood, Grant's House, Berwickshire, 14, v. '07. ♂ and ♀, *Phasianus colchicus*, Cowdenbeath, Fifeshire, 10, vi. '07. ♀, *Anthus pratensis*, Cowdenbeath, 10, vi. '07. ♀, *T. merula*, Edinburgh, 12, v. '08. 5 ♀ ♀, *S. vulgaris*, Edinburgh, 12, v. '08. Common at Kennetpans (nr. Kincardine-on-Forth, Clackmannanshire), 8-10, viii. '08. *M. lugubris*, *P. domesticus*, *P. cœrulens*. A ♀ also occurred among dead leaves in the orchard at the same place. Abundant, *P. domesticus*, Wilberlea, St. Andrews, Fifeshire, 18, viii. '08. *P. domesticus*, Coldingham, Berwickshire, 25, ix. '08. 200-300 collected by Mr. J. F. Cormack.

C. FRINGILLÆ, *Wlk.*—A correction. In "A.S.N.H.," 1906, p. 213, there were recorded under this name several specimens from Colinton and a single ♂ taken at Gorebridge. Later these fleas seemed referable rather to *C. gallinæ*, and, after they had been re-examined at Tring, this change was confirmed.

C. GAREI, *Rothsch.*—♂ and 3 ♀ ♀, *Gallinula chloropus*, on the Eye, nr. Grant's House, 14, v. '07.

C. FARRENI, *Rothsch.*—9 ♂ ♂, 29 ♀ ♀, *C. urbica*, Kennetpans, nr. Kincardine-on-Forth, 10, viii. '08. It is still abundant in its first Scottish locality nr. Coldingham, Mr. J. F. Cormack took over 70 there in August 1908. He was fortunate also in securing from the nests of *C. urbica*, of which he examined a large number recently flown, no fewer than 40 puparia and 2 imagines of *Stenopteryx hirundinus*, Leach.

C. HIRUNDINUS, *Curt.*— ♂ and 9 ♀ ♀, *C. urbica*, Kennetpans, 10, viii. '08. ♂ and 6 ♀ ♀, *C. urbica*, Coldingham, 25, ix. '08. J. F. Cormack.

C. NEWSTEADI, *Rothsch.*—6 ♂ ♂ and 7 ♀ ♀, *T. merula*, Aberdour, 20, iv. '07. ♀, *C. aquaticus*, on the Eye, nr. Grant's House, 14, v. '07. ♀, *C. aquaticus*, Whiteadder, Abbey-St.-Bathans; ♀, *L. chloris*, *ibid.*, 14, v. '07. 2 ♂ ♂, 9 ♀ ♀ in all, taken from nests of *T. viscivorus*, *T. parvulus*, *M. lugubris*, nr. Loganlea waterfall, 25, v. '07, by R. Cochrane. Abundant, *Scolopax rusticula*, Aberdour, 25, v. '07, James Allan; also ♂ and 3 ♀ ♀, *P. colchicus*, *ibid.* 2 ♂ ♂ and ♀ ♀, *P. colchicus*, Cowdenbeath, 10, vi. '07. 2 ♀ ♀, *T. merula*, Edinburgh. 2 ♂ ♂, 3 ♀ ♀, *Accentor modularis*, 12, v. '08, *ibid.*

C. BOREALIS, *Rothsch.*—(See "Ann. Scot. Nat. Hist.," 1908, p. 256-7.)

CTENOPHTHALMUS AGYRTES, *Heller.*— ♂ and ♀, *M. sylvaticus-fridariensis*, Fair Isle, ix. '06. N. B. Kinnear. ♂, *M. sylvaticus*, Windygates, Fifeshire, 27, x. '06 (N. B. K.). 11 ♂ ♂, 50 ♀ ♀, *M. orcadensis*, nr. Stromness, summer '07. G. Ellison. ♀, *M. amphibius*, Abbey-St.-Bathans, 16, v. '08. J. Lawrence. ♀, *Hypudæus glareolus*, Coldingham, 25, ix. 08. J. F. Cormack.

HYSTRICHOPSYLLA TALPÆ, *Curt.*— ♂ and 5 ♀ ♀, on *M. orcadensis*, nr. Stromness, Orkneys, summer '07. George Ellison.

This very interesting record brings the number of siphonapterous parasites on the Orkney Vole up to five. The others are *C. gallinæ*, *C. penicilliger*, *C. mustelæ*, and *C. agyrtes*.

It is too early yet to draw any general conclusions on distribution or the like from the collections made. One fact is, however, very noticeable—the preponderance of ♀ ♀ over ♂ ♂. I have notes of the sex of 1250 specimens of various species, in which the ♂ ♂ amount only to 30 per cent of the whole. [While collecting in Orkney Mr. Ellison was struck by the same fact. The difference was even more marked. In 112 examples (of 3 species) 25 were ♂ ♂.] As regards particular forms the percentage varies. In *C. Farreni* the sexes are more evenly balanced than in any species which I have taken in numbers. Nearly 40 per cent are ♂ ♂. *Gallinæ* and *Newsteadi* show rather more than 36 per cent and 29 per cent of ♂ ♂ respectively. I have the former from 18, the latter from 21, distinct hosts.

9 WOODBURN TERRACE, EDINBURGH.

THE HIGH ALPINE FLORA OF BRITAIN.

BEING A LIST OF THE FLOWERING PLANTS AND FERNS FOUND AT A THOUSAND METRES AND UPWARDS ON THE MOUNTAINS OF THE BRITISH ISLES, WITH AUTHENTIC REFERENCES AND CRITICAL NOTES.

By Frederic N. Williams, F.L.S.

(*Continued from p.* 168.)

MONOCOTYLEDONS.

Fam. 28. Juncaceæ.

104. *Juncus biglumis*, L.—In wet places and by the sides of rills on micaceous rocks. Summit of Meall Ghaordie (John Stuart in Lightfoot, "Fl. Scotica," 1100),—its earliest record as a British plant (1777). "By the side of rivulets near the summit of Ben Lawers" (G. Don, Herb. Brit., fasc. i. n. 8, 1804). "Moist ground at very considerable heights on all sides of Ben Lawers" (R. Brown, 1794, in Herb. Brit.). In abundance on the north-east side of Beinn-dubh-Chraige, near Tyndrum (E. S. Marshall, 1888, in "Journ. Bot." 1889, p. 235),—at 1000 m.

105. *Juncus triglumis*, L.—Not uncommon in bare wet places on the mountains of the Breadalbane district, up to 1005 m. ("Fl. Perthsh." 298). It ascends to this level on Ben Lawers (G. C. Druce in "Journ. Bot." 1890, 44). Ascends to 1067 m. on Snowdon, in boggy alpine places (A. Bennett, *ex* "Ann. Scot. Nat. Hist." 1904, 196),—thus to a higher level than on the Scottish mountains.

106. *Juncus castaneus*, L.—On alpine bogs, very rare, on micaceous soil, near the summit of Ben Lawers (G. Don, 1794, and in fasc. iv. [1805]). "I have gathered it to the south, east, and west of the peak of Ben Lawers" (Syme, "Engl. Botany," x. 14 [1870]).

107. *Juncus trifidus*, L.—On alpine stony ridges and rock-ledges. First recorded in Ross-shire in 1777. "I found it upon the summits of the Highland mountains to the south of Little-Loch-Broom in Ross-shire" (Lightfoot, "Fl. Scotica," i. 184). This most probably refers to An Teallach, which is the most noticeable mountain in the locality indicated, and is considerably over 1000 m. It may also include Ben Dearg, which is not far off. Summit of Ben-na-Bourd: "on the sides and top of Ben Bourd, a high mountain about seven miles from Invercauld" (R. Brown, 1794, in Herb. Brit.). Summit

of Ben Macdhui (Wm. Gardiner, 1845, in Herb. Brit.). Ben Lawers, at about 1000 m. (G. C. Druce, in "Ann. Scot. Nat. Hist." 1900, p. 231). Not unfrequent on the higher ridges of the Braemore hills, in Ross-shire, up to 1100 m. (G. C. Druce in "Ann. Scot. Nat. Hist." 1903, 172). It is found on Loch-na-gar from 732 m. to the summit (Dickie, 168), and on the ridge of Ben Eay (G. C. Druce in "Trans. Proc. Bot. Soc. Edin." 1894, p. 160). On the table-top of Ben-na-Bourd, at 1130 m. (Watson, 1832, in Herb. Kew.), and on the summit (Watson, 1844).

108. *Juncus bulbosus*, L.—"I observed this plant in October 1804, by the side of a rivulet, near the summit of Ben Lawers, in a situation where the snow remains during the greater part of the year, and not far from the spot where I first discovered the *Juncus castaneus* in May 1794" (Don, fasc. iv. 1805). *J. supinus* (Don in Herb. Brit.).

Syn.—*J. supinus*, Moench.

109. *Luzula maxima*, Cand.—Summit of Carn Tual ("Cyb. Hib." ed. 2, 364).

110. *Luzula spicata*, Cand.—Summit of Ben Macdhui (Watson, 1832, in Herb. Kew.; Wm. Gardiner, 1845, in Herb. Brit.). On alpine ridges and rock-ledges it ascends almost to the summit of Ben Lawers ("Fl. Perthsh." 300). Summit of Ben-na-Bourd (Watson, 1844).

111. *Luzula arcuata*, Wahlenb.—Earliest record "on the most stony and barren summits of Cairngorum, and others of the Grampian mountains" (Hook. *ex* Smith, "Engl. Fl." ii. 183 [1824]). "An inhabitant only of the highest of the Grampian mountains, as Cairngorum, Ben-y-mac-duich, and others of that granitic chain, growing upon the summits and amongst the comminuted rock, where scarcely any other plant can exist. . . . So severe is the climate at the elevation at which it grows (upwards of 4000 feet above the level of the sea), that it does not always come to perfection: and in the month of August 1830, owing to the unusual quantity of snow which fell during the summer months, scarcely a perfect blossom appeared to have been formed" (Sowerby and Hooker, "Engl. Bot. suppl." t. 2688, 1 April 1831). Upon the summits and shoulders of Ben Macdhui and Loch-na-gar (Crombie, "Braemar," p. 60 [1861]). Summit of Ben Macdhui (Watson, 1832, in Herb. Kew.; G. Don, 1812; Hooker, William Gardiner, 1845, in Herb. Brit.); also from the same mountain, but no height given (A. Croall, "Pl. of Braemar," 1854, n. 54, in Herb. Brit.). Cairngorm (J. Groves, 1884, in Herb. Brit.). Summit of Ben Avon, and near the summit of Loch-na-gar (Balfour, Mackay, *ex* Dickie, 171).

112. *Luzula campestris*, Cand., var. *multiflora*, Brand in Koch, "Syn. deutsch. schweiz. Fl." Aufl. 3, p. 2514 (Liefg. 16).

Syn.—*Juncus multiflorus*, Ehrhart, "Calam." n. 127, *ex* Hoffm., "Fl. Deutschl." i. 169 (1800); *Juncus erectus*, Pers., "Syn. Plant." i. 386 (1805); *Luzula multiflora*, Lejeune, "Fl. Spa," i. 169 (1811); *Juncus intermedius*, (non Host) Thuill., "Fl. env. Paris," ed. 2, i. 178 (1799).

Ascends to 1020 m. on the mountains of the Breadalbane district ("Fl. Perthsh." 301).

113. *Luzula Sudetica*, Cand. (1815).—Head of Glen Callater, in Aberdeenshire (Syme). Alpine situations in the Breadalbane district (White). Of Syme's three varieties of *L. multiflora*, continental botanists place α and β under *L. campestris*, and keep up γ as the present plant.

Fam. 29. Potamogetonaceæ.

114. *Potamogeton alpinus*, Balbis.—Ascends to 1020 m. in the Scottish Highlands (Ar. Bennett *ex* "Journ. Bot." 1907, 374).

Fam. 30. Cyperaceæ.

115. *Eriophorum angustifolium*, Roth.—Ascends to about 1000 m. on the mountains of Breadalbane district ("Fl. Perthsh." 319). Ascends to 1100 m. on Sgorr-an-Dubh, on the west side of Glen Eunach (Prof. J. Trail, 1902).

116. *Carex leporina*, L.—North corrie of Loch-na-gar, at 1005 m., 1906 (Watson, "Bot. Exch. Club Rept." ii. 116 [1907]; Dickie, 66).

117. *Carex Lachenalii*, Schkuhr.—In the northern corrie of Loch-na-gar, at 1005 m. (E. S. Marshall and W. A. Shoolbred in "Journ. Bot." 1907, 295). Discovered on rocks in Loch-na-gar . . . 1836, by Mr. Dickie and Mr. Clark" ("Engl. Bot. suppl." 2815 [1838]). It was found on the south-west corner of the table-top at about 1070 m. Syme ("Engl. Botany," x. 100) "found it [*C. lagopina*] in 1851 plentifully by the side of a small loch on the north side of the hill, the name of the loch being, I believe, Loch-an-ean."

118. *Carex canescens*, Lightf.—Ascends to 1037 m. on the mountains of the Breadalbane district (G. C. Druce in "Ann. Scot. Nat. Hist." 1900, 231); and to 1100 m. in Ross-shire (var. *fallax*, Asch. and Graebn.). See notes on this sedge in "Journ. Bot." 1908, 369. Lightfoot's "Fl. Scotica" is the correct authority.

119. *Carex echinata*, Murray (1770).—Summit of Beenkeragh (Hart in "Cyb. Hib." ed. 2, 397).

120. *Carex atrata*, L.—Ascends to 1130 m. on the Grampians of Aberdeenshire ("Cyb. Brit. Comp." 370). In the great corrie of Ben Avon, at about 1000 m. (E. S. Marshall and W. A. Shoolbred in "Journ. Bot." 1906, 160).

121. *Carex Halleri*, Gunn. (1772).—Ascends to 1000 m. on Ben Heasgarnich, in turfy places (G. C. Druce, 1906, as *C. alpina*, in "Bot. Exch. Club Rept." ii. 246 [1907].

122. *Carex rigida*, Good.—On the very top of Snowdon (Hudson *ex* "Trans. Linn. Soc." ii. 193 [1792]). Mountain ridges and rock-ledges; ascending to the summits of all the hills on which it occurs, not infrequently forming a turf on the ridges ("Fl. Perthsh." 326). Ascends to the summit of Ben Lawers (White), of Ben Macdhui (Watson, 1832), of Ben-na-Bourd (Watson, 1844), and of Ben Ime (G. R. Lee in "Ann. Andersonian Nat. Soc." iii. 119 [1908]). Ascends to 1005 m. on Carn Tual ("Cyb. Hib." ed. 2, 400).

123. *Carex rariflora*, Smith (1813).—Ascends to 1070 m. on Loch-na-gar, in alpine bogs (E. S. Marshall, 1906, in Watson, "Bot. Exch. Club Rept." ii. 118).

124. *Carex vulgaris*, Fries (1842).—Bog near the top of Loch-na-gar (E. S. Marshall, 1906, in "Bot. Exch. Club Rept." ii. 246 [1907], *C. Goodenovii*). Ascends to 1000 m. on the mountains of the Breadalbane district ("Fl. Perthsh." 327).

125. *Carex saxatilis*, L.—Marshy places on the mountains of the Breadalbane district, up to 1070 m. ("Fl. Perthsh." 338, *C. pulla*). In a careful examination of the specimens of *C. saxatilis* in Herb. Linn. Mr. E. S. Marshall says in "Journ. Bot." 1907, p. 366:—"The type-sheet and a second unnamed sheet are both excellent *pulla*. The citation in "Spec. Plant." ed. 1, from "Fl. Lapp.," cannot be anything else; nor does the description (quoted from "Fl. Suec.") appear contradictory. Taking into account the specimen of *C. rigida* above mentioned, I am convinced that *C. saxatilis* ought to displace *C. pulla*, Good., rather than *C. rigida*, Good."

126. *Carex panicea*, L.—Ascends to 1130 m. on the Grampians of Aberdeenshire (Dickie *ex* F. B. White in "Scott. Nat." i. 119 [1871]).

127. *Carex vaginata*, Tausch.—On alpine rock-ledges and marshy places, up to 1150 m., on the Grampians of Aberdeenshire ("Cyb. Brit. Comp." 374). In the mountain form "the leaves are rather less glaucous; the glumes darker, with the dorsal green stripe not broader than the midrib and the scarious margins very narrow; and the fruit more or less tinged with purplish-brown" (Syme, "Engl. Botany, x. 134). At 1152 m. on Cairn Toul (Prof. J. Trail, 1902).

128. *Carex pilulifera*, L.—On alpine pastures ascends to 1005 m. in the Scottish Highlands ("Cyb. Brit. Comp." 377),—but not so high in Perthshire (see "Fl. Perthsh." 333).

Var. *longebracteata*, Lange "Handb. Dansk. Fl." 694 (1864).—Found up to 1067 m. on Ben Avon (E. S. Marshall and W. A. Shoolbred, 1905, in "Journ. Bot." 1906, 160). This plant is not identical with var. *Leesii*, Ridley, according to Mr. Druce, though Lange himself said he could see no difference between the two. Lees's specimen in Herb. Brit. does not seem readily separable from the Danish plant.

129. *Carex binervis*, Smith.—First recorded by James Beattie as "very common on the driest moors about Aberdeen." Ascends to 1000 m. on the Grampians of Aberdeenshire (Hooker, f.). The blackish-fruited form frequent in mountain localities (the species varies greatly) should most probably be referred to var. *alpina*, Drejer, "Rev. Crit. Car." 474 (1841). Descends to sea-level in Cork.

[In ed. 9 of Babington's "Manual," p. 455, *C. rupestris*, Bellardi, is stated to occur on lofty mountains. As far as I know, however, the highest level reached by the plant is only 793 m., on Ben Heasgarnich (White). *C. rariflora*, Smith, is stated to have been discovered by Don "among the mountains of Clova, Angus, near the limits of perpetual snow." As no point on the Clova hills is as high as 1000 m., and much less reaches "the limits of perpetual snow," an entirely unknown phenomenon on any part of the Grampian Mountains, more recent and confirmatory evidence is necessary before accepting this record.]

Fam. 31. Graminaceæ.

130. *Nardus stricta*, L.—Ascends to 1005 m. on dry pasture in Aberdeenshire (Watson). Descends to sea-level in Kerry.

131. *Festuca ovina*, L.—Summit of Ben Macdhui (Watson, 1832), and of Ben-na-Bourd (Watson, 1844). "On the ledges of the highest rock of Snowdon" (Banks, 1773, in Herb. Brit.). Near the top of Ben Lawers (G. C. Druce in "Ann. Scot. Nat. Hist." 1900, 235). Summit of Ben Ime (J. R. Lee in "Ann. Andersonian Nat. Soc." iii. 121 [1908]). Summit of Carn Tual ("Cyb. Hib." ed. 2, 429). Descends to sea-level in Cork.

Var. *duriuscula* (L.), Hackel.—Ascends to the summit of Beenkeragh (Hart, 1881, in "Proc. Roy. Irish Acad." 1882, p. 578).

132. *Festuca rubra*, var. *arenaria* (Retz), Fries, "Fl. Halland." 28 (1817).—Ascends to 1065 m. on the mountains of the Breadalbane district (MacVicar in "Ann. Scot. Nat. Hist." 1905, 173).

Var. *grandiflora*, f. *alpina*, Hackel.—Ben More (E. S. Marshall).

133. *Poa annua*, L.—Found from the base up to the very top of Ben Lawers ("Fl. Perthsh." 351). Descends to sea-level in Ireland.

134. *Poa alpina*, L.—On alpine rock-ledges near the top of Ben Lawers ("Fl. Perthsh." 352; Hooker, Carroll, 1864, in Herb. Brit.). Ascends to 1070 m. in Aberdeenshire (Dickie, 206). Loch-na-gar (A. Croall, 1854, n. 161 in Herb. Brit.). "On the ledges of rocks near the top of the highest part of Snowdon" (Banks, 1773, in Herb. Brit.). Common on the higher mountains of the Scottish Highlands. Ben Lawers (Mackay in Herb. Smith). Descends to 440 m. near Annacoona, Sligo.

Var. *Lapponum*, Læstad.—Perthshire (P. Ewing, *ex* "Fl. Perthsh." 390). See also A. Bennett in "Scott. Nat." 1889, 103.

135. *Poa laxa*, Haenke (1791).—Rocks on the Grampians of Aberdeenshire and Inverness-shire up to 1100 m. (Hooker f., "Stud. Fl. Brit. Isl." ed. 3, 493). First found on Ben Nevis (J. T. Mackay, *ex* Smith, "Fl. Britannica," 101 [1800], *Poa flexuosa*).

136. *Poa stricta*, Lindeb. (1856).—First recorded on Loch-na-gar (Syme, "Engl. Botany," xi. [1872] 116).

137. *Poa glauca*, Vahl (1790).—Ascends to 1000 m. on rocky ledges in Aberdeenshire and Perthshire (Watson, Hooker, f., White). Descends to 120 m. near Ben Lawers Inn (G. C. Druce, *ex* "Fl. Perthsh." 352).

(*To be continued.*)

EUPHRASIA AND *RHINANTHUS*.

By William H. Beeby, F.L.S.

Euphrasia.—In Mr. Marshall's note (*ante*, p. 176) he observes, "I believe that it is safer to follow Wettstein and Townsend in regarding *E. scottica* as distinct." Doubtless it was so when Wettstein's Monograph was published in 1896, but we cannot afford to ignore all the subsequent developments, although Mr. Marshall does not refer to them. In 1896 Wettstein wrote, when comparing *E. scottica* and *E. minima* ("Mon." p. 171), "The sole distinction that I can see lies in the length and form of the capsule; in *E. scottica* it is shorter than, or at most as long as, the calyx, while in *E. minima*, when mature, it distinctly overtops the calyx." Commenting on this, Townsend wrote ("Journ. of Bot.," 1897,

p. 426), "It appears that these relative proportions in *E. scottica* are not constant," a statement easy to confirm by anyone who possesses a good series of specimens. (It may be noted here that Mr. Hiern ("Journ. of Bot.," 1909, p. 170) describes the capsule of the yellow-flowered Exmoor *E. minima* as "equalling or a little *shorter* than the calyx," and figures it as being a little *shorter*!) In lieu of the discarded character, Townsend (*l.c.*) substitutes another, adding "a marked distinction seems to lie in the form of the upper leaves and bracts of *E. scottica*, which are narrower than those of *E. minima* and have a cuneate base. *E. scottica* also seems to prefer decidedly wetter situations." The new character, however, is no more trustworthy than the old one, and was moreover stillborn, being refuted by anticipation in Wettstein's plate 4, figs. 225-54, which show the leaves or bracts of *E. minima* as having sometimes quite truncate, sometimes decidedly cuneate bases; in particular the bracts, figs. 242-3, are much more markedly cuneate even than those of *E. scottica*, as shown in Townsend's figures (*l.c.* plate 379, figs. B. 1-7), said to be copied from Wettstein's Monograph, but which I fail to find there. In Shetland, according to the determinations of Wettstein or Townsend, or both, *E. scottica* occurs scattered all over the heather moor, as often as not on the ordinary dry peat and frequently where no Carices are visible; as well as on dry grassy slopes. But I think it is more *obvious* in the wetter spots, because it is there less crowded by other plants; whereas when growing among thick heather it is not so readily seen, and does not so easily form dense colonies, except here and there where there are open green spots. There only remains to be considered the form of capsule, and I find that that of the Shetland plant is usually rather more oblong than that of *E. minima* as figured by Wettstein; but the shape is somewhat variable, as it is in the Continental plant, and I have Swiss specimens bearing capsules which agree very well with some of the Shetland examples.

Notwithstanding that the plant has gradually been stripped of its characters, Mr. Marshall continues to speak of "characteristic *E. scottica*"; but it does not appear in what sense he wishes that term to be understood.

With regard to the question of habit and development. In *Euphrasia* these are easily affected by a slight change in the nature of the habitat; and until it has been shown that any variation in development is innate to the plant, and not merely a temporary state induced by an altered environment, it is futile to put it forward as a distinguishing character.

Euphrasia borealis is widely distributed and pretty common in Shetland. The normal state affects lowland pastures and is a rather large-flowered, moderately branched plant, similar to Townsend's plate ("Journ. of Bot.," 1897, fig. 374). When, however, it gets a little way up the lower hill slopes into drier and more exposed situations, its aspect is entirely changed. It becomes a dwarf (3-7 cm.), densely bushy, much branched plant with smaller flowers. On the other hand, the far less common state sometimes found in very wet peat bogs shows the opposite extreme. Here we get a plant which reaches a height of 32 cm. with a stem often quite simple or with but one pair of short branches placed low down, or more rarely with two or three pairs. The flowers are perhaps the largest of all, the lower lip measuring sometimes as much as 1 cm. in length.

Do these three phases represent true varieties or species? Or are they merely the temporary effect of changed environment? I do not know, nor is it possible to find out except by making careful experiment and growing the three plants under like conditions. But it is right to treat them simply as states, until the contrary has been proved, rather than adopt the practice of first describing your variety at all hazards, and leaving it to others to find out whether it is really distinct or not, if and when they can.

Although Prof. von Wettstein made many valuable cultural experiments, something still remains to be done with regard to the British-born names. A few experiments carefully conducted on right lines would put us in possession of facts in place of opinions. The experiments most needed are the following:—(1) To grow the disputed forms say *E. minima*, *E. scottica*, and *E. foulaensis* side by side under equal conditions, which of course involves growing them all on the same host-plant; and (2) to take the seeds from a plant of either *E. minima* or *E. scottica* and sow half of them

on Carices and half on Gramina. The result would indicate what further cultures might be necessary.

In referring to another dubious plant, Mr. Marshall speaks of it as differing from *E. foulaensis*, among other ways, in having flowers of a "beautiful violet-blue." But this is not a difference either from *E. foulaensis* or *E. scottica*; it is the characteristic colour of the original *E. foulensis*, though I have since learnt that this intense violet-blue is the predominating colour in the *minimæ* in Shetland when growing on the peat, whether the group is represented by one species or more; just as pale-flowered forms predominate on the dry grassy slopes. But neither colour is exclusively confined to either formation.

In my last Shetland paper (p. 106) I wrote that I was "strongly disposed to accept" Ostenfeld's conclusions regarding these several plants. That remark was the result of general impressions derived from many observations; but the further research and examination of specimens which this note has entailed compel me to somewhat modify that remark and to say that excluding opinions founded on undefined "characteristic" specimens, etc., I think that the bulk of the evidence at present adducible favours Dr. Ostenfeld's view, and that his arrangement can only be assailed by actual proof obtained by means of the necessary cultural experiments. I am not at all confident that the results would confirm these views; but the cultures are not suggested with the object of confirming the views of one rather than another, but in the hope that we may learn from them some facts which will enable us to estimate correctly the relative positions of these plants.

Rhinanthus.—Mr. Marshall writes: "*R. stenophyllus* is considered by Mr. Beeby to be an 'autumnal' variety of *R. minor*." Well, really, in so characterising the plant, I was practically quoting from Mr. Marshall's own article "On the British Forms of *Rhinanthus*," in which he cites Dr. von Sterneck as saying that *R. stenophyllus* "represents the typical autumn form of *R. minor*"! (Sterneck, see E. S. Marshall in "Journ. of Bot.," 1903, p. 296).

THAMES DITTON, *July* 1909.

CAREX HELVOLA, BLYTT, ON BEN LAWERS.

By G. Claridge Druce, M.A., F.L.S.

I was afraid the statement made by the Rev. E. S. Marshall in "Journ. Bot." p. 108, although quite accurate, might lead to misunderstanding; and this has been the case (see "Ann. Scot. Nat. Hist." p. 188).

Mr. Marshall says: "I think the Ben Lawers plant, found by Mr. Druce in 1897, and issued as *C. helvola*, Blytt, var., is this hybrid [*C. canescens* × *echinata*] . . . that was my first impression. . . . The *canescens* parent in this case would be *fallax*" [sic]. But this only refers to one special gathering of *C. helvola*, which as it did not agree with those previously found, I distinguished as "var." It must not be assumed, therefore, that all the Breadalbane *C. helvola* is the hybrid suggested by Mr. Marshall.

It may be well to restate the history of *C. helvola*, Blytt, as a Perthshire plant. In 1895 the Rev. W. O. Wait, a well-known bryologist, told he had recently seen *C. lagopina* on Ben Lawers. Unfortunately he had no specimen; but in 1896 he again, with Mr. N. V. Sidgwick, visited the locality, and brought me some very immature specimens collected at the end of June. They were, however, sufficiently developed to enable me to say they were not *lagopina*; and I was at first inclined to refer them to montane *canescens*, but subsequent dissection led me to believe they were nearer *helvola*. Dr. Lange of Copenhagen, to whom it was submitted, thought it must be *macilenta*, Fries ("Fl. Danica," Supp. iii. t. 168). Not being content with this determination, I sent him another specimen, when he replied: "The young [plants] of *C. canescens* are very difficult to decide; there is little difference between *C. canescens*, *C. macilenta*, and *C. helvola*. Your specimen is intermediate between the two latter, possibly sooner the *C. helvola*." As there was still doubt, I deferred publication until I had obtained further material. In August 1897 I went to Lawers and found the plant in Mr. Wait's exact locality in some plenty, over a limited area, about 3400 feet altitude; but, the season being backward, the specimens were still immature. A

fresh specimen was sent to Mr. Arth. Bennett, who replied "he thought I had got hold of the real thing," i.e. *C. helvola.* Dr. Christ of Basle, a well-known authority on the Carices, reported "the Scotch specimen [from Lawers] is, no doubt, the true *C. helvola*, identical with plants of Finland, Norway, and Greenland." Prof. Blytt of Christiania, son of the discoverer and namer of *C. helvola*, said: "I think you may name it *C. helvola*; it is not quite like the most typical form, but it is very like specimens collected by me in 1867 which I had determined as *C. helvola*." The Pfarrer Kükenthal, who has written the elaborate and scholarly 'Monograph of Carices' for the "Pflanzenreich," named it without any expression of doubt *C. helvola*, Blytt; and under that plant in his "Monograph" he gives my specimen (Ref. No. 22,966) gathered in 1889 from Ben Lawers, marking it with (!) signifying he had seen the specimen, as is the case with my Loch-na-gar plants. The above are my authorities, and warrant me in recording *C. helvola*, Blytt, from Ben Lawers, and including it in my "British List"; and Kükenthal also marks "Forfar!" the three counties cited for it in my "List."

Now for my *C. helvola*, Blytt, var. I visited Ben Lawers in 1898 and 1899, and collected more specimens, looking out especially for variations. One gathering (Ref. No. 1237) was distributed through the "Exchange Club" in 1898. This differed somewhat from *C. helvola*, therefore I put "var." In the specimens which I dissected I could see no evidence of *echinata*, which the Rev. E. F. Linton and Rev. E. S. Marshall suggested; but subsequently in going over some duplicates I saw that in one or two cases the *perigynia* had a longer beak. This was more evident in specimens collected in 1899, which I also sent to Kükenthal as "? *canescens* × *echinata*." On these he remarked, "Nearer *canescens* than the specimen sent last year. The spikelets are more elliptic than oval, and somewhat longer beaked than in *canescens*, otherwise the difference from *canescens*, var. *dubia*, is very slight." On the faith of my specimens from Lawers, Kükenthal in his "Monograph," p. 250, cites under *canescens* × *stellulata* = *C. biharica*, Simonk, "Ben Lawers, G. C. Druce!". Other specimens he names (*loc. cit.* p. 251)

forma *super-canescens*, Kük. = *C. tetrastachya*, Traunst. = *C. helvola*, Druce, var. In my "List," which was published before I saw the "Monograph," it appears as *echinata* × *canescens* = *C. tetrastachya*, Traunst. At the time we gathered it *C. echinata* was still flowering; *C. canescens*, as its var., was much over.

The locality has since been visited by two or three botanists; but the plant sent to me by them has been *C. canescens*, L., var. *robustior*, Anders., which I saw somewhat higher up on the hill, but in the same drainage area. Therefore if *C. echinata* is crossed with *canescens* it would be rather with the var. *robustior*, which is in the locality, than with var. *fallax*, which is not recorded for that vicinity. But the point is this: the small plateau on which *C. helvola* grew yielded one year plants which Kükenthal named, without doubt, *C. helvola*; another year the same place also yielded some doubtfully referred to *canescens* × *echinata*. In the following year plants nearer *canescens* were obtained, and I saw *canescens*, var. *robustior*, too there. Since then I am told the var. *robustior* has alone been noticed.

Can it be that a plant at first distinguished as *helvola* has been recrossed with one of its parents until the prepotent form has subjugated the weaker?

Such a case happened at Oxford with the *Linaria vulgaris* × *repens*. The advent of the alien *repens* to the native *vulgaris* led to the production of hybrids, the first year about intermediate, the second in almost all stages between, and in numbers much exceeding either of, the parents; then the gradual assertion of the native species, aided, perhaps, by the chalk-rubble being gradually covered over with other soil, till now only here and there a lingering hybrid can be found. But *L. vulgaris* does not remain quite as it was, for although no trace of the striae, or colour of *repens*, could be observed in it, yet the plant, instead of being fairly constant, shows variations in quite unexpected ways—in the width of the leaves, in the shape and direction of the spur, in the colouring of the flowers, etc.

Of course we must have more definite evidence as to the actual disappearance of *C. helvola* and *C. tetrastachya* (both of which Kükenthal named) from the precise locality on

Lawers. It must also be borne in mind that the two assumed parents of the latter plant are also associated on Loch-na-gar, where *lagopina* (*Lachenalii*) grows. This I gathered in 1899. To hint at want of faith in the correctness of the suggested names of the parents of some critical forms would (in these days when any plant off type is named, by some botanists, a hybrid) put oneself outside the scientific pale. In some cases, however, much faith is required—faith, we are told, is an evidence of things not seen.

NEW AND RARE MOSSES FROM THE WEST OF SCOTLAND.

By James Stirton, M.D.

(*Continued from p.* 173.)

Mŏllia subbifaria, n.sp.—In dense, somewhat extended, convex tufts, of a bright green colour above, white in a narrow belt just below, pale downwards to the base or with slight dashes of red throughout; stems pale from a half to an inch in length, simple or dichotomously divided, slender; leaves rather closely set and clasping somewhat, showing almost always a *bifarious* disposition around the stem, long, nearly oblong, with a blunt rounded summit where the pagina of each side ends abruptly and roundly on the nerve or in many cases quite round and semicircular, acumen short and triangular in outline (length .025-.045 mm.) in composition as in the others, but shewing only from one to five longish cells in a clear homogeneous matrix, or awanting entirely, when the apex is quite round and often somewhat cucullate; nerve pale, latit. near base, .07-.1 mm., tapering and ending in the apex or ceasing below it, smooth and prominent behind; cells at base hyaline, large, occupying nearly the *lower half* of leaf, oblong attached, .065-.09 by .01-.014 mm. sloping up towards margin as in *M. tortuosa*, upper cells hexagonal or merely roundish, mostly with clear narrow interspaces, .009-.013 mm., in longer diam. In 1907, near the sea at Keppoch close to Arisaig.

Since the discovery of this moss I have considerable

doubts whether *M. limosa*, described in the "Annals" for April 1905, should be retained as a species and not placed as a variety under it. However as the peculiar rosette-like manner of growth in *M. limosa* (not present in this), and as the small size appears constant in the various places where it has been found, I meanwhile retain it as such.

As tending to encourage a more critical examination of the areolation, I shall describe another moss which has evident affinities to *Leptotrichum flexicaule*, yet differs from it in several obvious particulars as well as in the areolation.

Leptototrichum cyclophyllum, n.sp.—In rather lax tufts from two to three inches in height, deep green above with a rather narrow pale or pale yellow band immediately underneath, thereafter fuscescent to the base, only slightly red-radiculose in the lower part; stems slender, simple or sparingly dichotomously divided, of a deep red colour, closely flexuose or rather zigzagging, where the divisions are only about half the length of those of *L. flexicaule* and more pronounced; leaves secund and for the greater part arcuato-incurved in the *same direction* throughout, expanded at the base in a triangular rather than in a semi-elliptical form, narrowing upwards rather suddenly, longly subulate, margin plane, entire at and near base but deeply and sharply as well as closely serrated at apex, more distantly but as deeply serrated on margin in the upper third, thence serratures become gradually shallower downwards, upper serratures have a perpendicular height from .009-.013 mm.; nerve near base, broad, flat, .075-.1 mm., tapering and becoming predominant, although a single row of narrowing paginal cells on each side seen far up, .025-.034 by .003 mm., cells at central base large, oblong with bright transparent nuclei, .045-.07 by .007-.01 mm., outwards, cells narrower to margin; upper cells are nearly as long but much narrower, viz. .04-.06 by .003-.005 mm.

On the ground beneath birch trees, behind Onich, 1908.

Four or five capsules of the previous year were secured but became lost in the vasculum.

The wide differences in the areolation of these two mosses are sufficient to keep them apart while the red colour

and short zigzagging of the stems as well as the deep, sharp serratures serve to widen this distance.

Mollia terrena (Strn.), first found in Tarbert in Harris, and described in the "Annals" for July 1900, was detected in several places in the neighbourhood of Onich. The long broad acumen in this species, formed by the abruptly rounded narrowing of the long leaf to a fourth of its breadth below, is peculiar, almost unique. The length of this acumen varies from .4 to .7 mm. And its breadth near the middle from .07-.1 mm. or about one-fifth of its length. It tapers a little upwards but continues broad to the apex which, however, is often narrowed rather abruptly to a short point by a large, pointed, pellucid cell or by several such of smaller size and then slightly granular. The narrowing nerve penetrates this acumen nearly to its middle, but its breadth there is not more than one-tenth part of that of the acumen. The margin is plane, often undulating and crenulate, while the peculiar marginal serratures extending down to near the base, are also characteristic.

I am pleased at having another opportunity of describing what can only be reckoned a much greater departure than *Grimmia fuliginea* (described in the "Annals" for July 1908) from *Rhacomitrium heterostichum*. In this instance I consider the transition from Rhacomitrium to Grimmia as almost complete. The moss still retains the peculiar greyish colour of the former, but differs from it in almost every other particular—in the areolation, in the manner of ramifying, in the configuration of the dense tufts, etc.

Grimmia subaquila, n.sp.—In dense, convex, greyish, hoary tufts; stems rather slender, for much the greater part fastigiato-ramose in the upper half, but not infrequently, merely dichotomously divided or simple, about one inch long; leaves closely arranged around stem, flaccid but appressed in a dry state, spreading a little and straight when moistened, from a rounder, wider and somewhat clasping base, narrowly lanceolate, terminating in a bluntly spinulose hair, nearly a third the length of the leaf proper; nerve pale, narrow, latit. near base .04-.05 mm., tapering upwards to apex; margin reflexed or even recurved in lower half or a little more, breadth of reflexed portion at its widest, .025-.04 mm.,

narrowing upwards, plane and entire in upper half; cells at central base long, narrow, detached, hyaline, straight not undulated, .045-.07 by .005-7 mm., shorter outwards and in 7 to 10 perpendicular rows near and at margin oblong, often constricted in the middle, cells up from base for a short distance, dark opaque, constricted in the middle, .01-.014 mm., in longer diameter, those in upper two-thirds, quadrate, minute dark and opaque, .006-.01 mm. across; margin soon thickened from below by a single transverse terminal couple of cells, farther up two such couples, only rarely are three such couples seen.

At Loch-nan-Uamb, several miles to the east of Arisaig and near Prince Charlie's Cave; on stones covered with earth, by the Rev. J. A. M'Caskill of Onich, September 1908.

It is somewhat remarkable and tends to strengthen the theory of a change of type that occasionally, in the lower part of a leaf, instead of the long, narrow, smooth cells, a minute patch is seen consisting of what may be reckoned very minute cells so arranged that if certain little gaps were filled in, the appearance of deeply sinuose cells would be portrayed. In other words this affords a faint but interesting indication of its origin.

The next moss has been under observation for five years. I have waited for the purpose of finding it in a fertile condition, but hitherto in vain. It is allied to *Anœctangium compactum*, a true alpine plant. On the contrary this has only been found on the sea-shore.

Anœctangium marinum, n.sp. — In rather large, straggling, sparsely tomentose tufts, quite a contrast, in this respect, to the other; stems about an inch long, pale or yellowish, simple, dichotomously or not unfrequently fastigiately branched above; leaves crisped when dry, straight and nearly upright when moistened, narrowly ovate-lanceolate, acuminate, conduplicate, margin plane, very minutely papillose or nearly entire; nerve pale slender, latit. near base, .04-.05 mm., tapering and excurrent in a long, tapering sharp-pointed acumen, .07-.1 mm. long, smooth and prominent behind; cells at central base, oblong, separate, .018-.027 by .006-9 mm., outwards smaller, and near and

at margin as those above, upper cells bluntly quadrate, dark, opaque, with 2 to 4 pellucid nuclei, narrowly separate, .007-.1 mm. across, a little smaller near apex. On schistose rocks. This moss has been found in several localities at considerable distances from one another, but all within what may be reckoned the same large basin, viz. Morar, Kentallen, Onich, Ardgour (M. C. Stirton), all on the shores of Loch Linnhe, an arm of the sea.

There is a remarkable variety of this moss in which the whole plant, except the year's growth of about one-eighth of an inch at the summit, is covered entirely (stems and leaves) with masses of a fine reddish-purple tomentum. This may be called var. *obrutum*.

This moss differs from *An. compactum* in the short stems, longer, narrower leaves with the nerve longly excurrent, etc.

Dichodontium flavescens (Dicks.) has puzzled me for many years. This moss has, by nearly all bryologists, been regarded merely as a form of *D. pellucidum*. Hitherto I have been content to wait, inasmuch as I could not see any decided departure towards characters that were likely to give it sufficient distinction as well as permancy of type.

Last year near Onich I picked up what was at first sight reckoned an enlarged form of this moss, but when I saw that the leaves were much longer, more slender and more slenderly and sharply acuminated, that there was entire absence of papillæ, much larger areolation, and where, moreover, the nerve passed into the acute apex, and even in the larger proportion of cases was extended a little beyond it, I felt constrained to take a different view of this moss and to raise it to the rank of a species.

Dichodontium fulvescens, n.sp.—Usually in extended rather large straggling tufts, dark green, mixed with rusty brown above, darker below; stems slender, 2 to 3 inches long, simple or dichotomously, less frequently fastigiately branched above; leaves rather laxly disposed around the stem, slightly curled and twisted as well as spreading irregularly when dry, spreading much and even becoming arcuato-reflexed when moist, from an upright, broader slightly clasping base, lanceolate, acute at apex or slightly acuminated, margin plane, sharply and deeply serrated down

almost to the clasping base where the serratures are shallower, very generally one basal margin broadly inflexed, smooth not papillose ; nerve strong, pale then reddish nearly throughout, latit. near base, .07-.1 mm., tapering and shortly excurrent, breadth near apex about .04 mm., serrated on back in upper third and often interruptedly winged or laminated, these downward serratures degenerating into nodules ; cells at central base long with rounded extremities, generally narrow but distinct and separate, .06-.09 by .006-.011 mm., broader outwards and in five to seven rows at margin as the cells above, cells upwards gradually lessening into the upper, which are bluntly quadrate or bluntly oblong or merely oval, separate and distinct, .014-.022 mm. in long diameter. In the lower leaves the nerve at times scarcely reaches the bluntish serrated apex. Barren. On the ground near the sea and generally near the bases of wettish rocks, Corran near Onich, September 1908.

This moss still bears slight evidences of its origin, but to drag it back, as some authors of the present day are still doing on account of these traces, is not scientific and certainly not in accordance with the modern trend of opinion.

ERRATUM.—Page 170, third line from foot, *for* ".2 " *read* "2".

ZOOLOGICAL NOTES.

Great Cormorant.—I lately shot a Great Cormorant in a loch near my house. A friend cut it open, and we found a kitten, eleven inches long, in the stomach. There were no signs of the kitten having been drowned before it was swallowed. It was certainly a strange thing to find in a Cormorant.—R. C. HALDANE.

White-throated Sparrow at the Flannan Islands.—On the 18th of May 1909 a male *Zonotrichia albicollis* was shot about noon, beside the lighthouse on Eilean Mor, Flannan Islands, and was sent to me in the flesh.—FRED. SMALLEY, Silverdale, Lancashire.

[This American species has occurred on several occasions in the British Islands (in Scotland in Aberdeenshire), but it has always been a moot point whether this, and other Nearctic Passeres, have not had an assisted passage from the New World. It may be pointed out, however, that it has a somewhat high northern range, since it is

found as far north as Labrador and the Fur countries, and thus it might reach our shores *via* Greenland and Iceland—not a phenomenal passage.—EDS.]

The Corn-Bunting and Chiff-Chaff in Mull.—While, relatively speaking, the Corn-Bunting (*Emberiza miliaria*) is a fairly common nesting species in the island of Iona, I have not been able to record it as such in Mull until this year, when it was fairly common, especially in the immediate neighbourhood of Tobermory. I shall be interested to note if the species remains during winter. Hitherto, I have only been able to describe it as a sporadic spring migrant.

The extension of the Chiff-Chaff (*Phylloscopus rufus*) to Mull is a limited one—one pair in 1908, and the same this year. The beech wood, near to Avos House, is the special habitat.—D. MACDONALD, Tobermory.

Heronries in Mull.—Mr. Boyd-Watt ought not to have asterisked Gribun heronry as being untenanted. From its unassailable position on the precipice, its occupancy is not likely to be endangered in the immediate future, and its past has extended for at least 100 years. Smaller heronries known to me are those near Avos House, Killiechronan, and Ulva.—D. MACDONALD, Tobermory.

Ruddy Sheld-Duck at Sule Skerry, Orkney.—An adult female specimen of the Ruddy Sheld-Duck (*Tadorna casarca*), was obtained on this Atlantic islet on the 18th of June, and was forwarded to the Royal Scottish Museum in the flesh. The occurrence of this southern and eastern European species at this remote skerry is very remarkable. It has not hitherto been known to visit any of the northern isles.—WM. EAGLE CLARKE.

Pintail in Solway: an explanation.—With reference to the note in the July number of the "Annals of Scottish Natural History," by Mr. Service, of the "Pintail" shot near Carsethorn on the Solway, Sir Richard Graham has kindly informed me that it was a Duck which came from Netherby.—JAS. BARTHOLOMEW, Beattock.

Occurrence of Black-tailed Godwit in the Cromarty Firth.—Beside the Cromarty Firth, on 23rd April 1909, I saw a Black-tailed Godwit (*Limosa belgica*) with a flock of Bar-tailed Godwits. The Black-tailed Godwit appeared to be in winter plumage. I afterwards saw the bird on 3rd and 21st May; and it was last seen on 4th June amongst a party of Knots. I again saw a bird of this species on 30th August, in company with some Bar-tailed Godwits. —ANNIE C. JACKSON, Swordale.

Black-tailed Godwit in Fife.—A Black-tailed Godwit (*Limosa belgica*), in interesting transition plumage, and the first I have ever seen here, was shot at the Morton Loch, Tentsmuir, by the owner, Mr. Christie, on the 20th of August, and sent to me. It is now in the Royal Scottish Museum.—W. BERRY, Newport, Fife.

An Adult Sabine's Gull at Lerwick, Shetland.—On the 25th of July, I saw a Gull the like of which I had never seen before. It was feeding in the park adjoining my house at Lerwick, when its peculiar plumage attracted my attention. The bird had a distinct black collar and a dark grey cap, and its tail was long and forked. Its size was about the same as that of a Black-headed Gull, and it was very graceful and active in its movements. I may be wrong, but I am fully persuaded from the descriptions of Sabine's Gull (*Xema sabini*), that the bird was an adult example of that species. My sister, who saw the bird at the same time, informs me that she observed it again a few days later.—JOHN S. TULLOCH, Lerwick.

Capture of the Sagre (*Spinax niger*) off the Shetlands.—Mr. Thomas Cook, fishmonger, Edinburgh, has presented to the collection of Fishes in the Royal Scottish Museum, a specimen of this rare shark in British waters. The example, which is about eighteen inches in length, was captured about twenty-five miles east of Shetland early in March. This species has hitherto only been obtained in the vicinity of the British Isles off the south-west coast of Ireland, where, Mr. E. W. L. Holt informs me, it is captured at depths from 100 to 400 fathoms in trawls and on long-lines.—WM. EAGLE CLARKE.

Spinous Shark (*Echinorhinus spinosus*) captured off the Isle of May.—A specimen of this uncommon fish in Scottish seas was captured in a trawl net fifteen miles east of the Isle of May on 16th July. The specimen was seven feet six inches long, and weighed one hundred and twelve pounds. I am indebted to Mr. Ross, fishmonger, Edinburgh, for these particulars, and for a sight of the fish. —WM. EAGLE CLARKE.

Cryptocephalus aureolus in Strathspey : a Beetle new to the Scottish Fauna.—I captured a specimen of this Beetle on the 8th of July on the golf course at Nethy Bridge. It was seated in the centre of a buttercup. I am assured by Dr. Sharp, F.R.S., who examined the specimen, and by other authorities, that this species has not hitherto been recorded from any locality north of the Tweed, though it is well known as an English insect. — ETHEL CLARE MAITLAND-DOUGALL, Scotscraig, Tayport.

Lepidoptera of the N.E. Highlands : a correction.—I am very anxious to correct two errors of identification which occurred in my "Notes on the Lepidoptera in the N.E. Highlands," in the April number of the "Annals," viz. *Ennychea octomaculata*, Fb., should be *Botys terrealis*, Tr., and *Sericoris urticana* Hb. should be *S. rivulana*. I am very sorry indeed to have made such a mistake. I had identified "*octomaculata*" by the larvæ, otherwise, of course, it would never have occurred.—DOROTHY J. JACKSON, Swordale, Ross-shire.

Hydrachnids (Water-mites) from the Forth Area. — In a recently published part of the "Proceedings" of the Royal Physical

Society" (vol. xvii. p. 42, footnote) I mentioned a number of *Hydrachnidæ* I had taken in the Forth Area. To these I would now add the following, the first four of which have not, so far as I know, been previously recorded from Scotland :—

Eulais georgei, Soar.—On 13th May 1908 I captured a number of immature examples of an *Eulais* in a pool on Gullane Links, which Mr. Soar considered were most likely nymphs of *E. georgei*. An adult obtained in the same pool on 28th May of the present year confirms his identification.

Gnaphiscus setosus, Koenike.—A male and several females of this species were taken at Crosswood Reservoir on the Pentlands, 31st July 1908. I have to thank Mr. Soar for their determination.

Unionicola (*Atax*) *figuralis* (C. L. Koch).—On 28th August last I got two males of this in a small loch on the Dunduff hills, near Dunfermline. I mistook them for another species, *U. crassipes* (Müll.), but Mr. Soar has pointed out to me the difference in the number of acetabula.

Arrhenurus cylindratus, Piersig.—Regarding six *Arrhenurus* ♀ ♀ from a pond at Drumshoreland, 13th June 1906, Mr. Halbert (*in lit.*) says: "There is little doubt these are the females of this species."

A. maculator (Müll.).—A ♀ from Loch Ard, 14th July 1906, is referred by Mr. Soar to this species.

Hydryphantes dispar (Schaub).—One from Loch Watson, near Doune, 22nd April 1905.

Piona rufa (C. L. Koch).—Burntisland Reservoir, common, 14th August 1908, and Gosford Ponds, 28th July 1909. Loch near Dunfermline, 28th August 1909.

P. circularis (Piers.).—♀, Kidlaw Reservoir, Haddingtonshire, 31st July 1909.

P. uncata (Koen.).—♂, Kidlaw Reservoir, 31st July 1909.

I have now a list of sixty-two Hydrachnids from this area.—William Evans, Edinburgh.

Argyroneta aquatica, *Latr.*, **in Perthshire.**—Several examples of this interesting spider were captured on Saturday, 4th September, while netting a weedy pool on Methven Moss. The species does not seem to have been observed in Perthshire before.—Alex. M. Rodger, Museum, Perth.

Two New British Diptera.—It is with pleasure that I record the following additions to the list of British Diptera, both due to the energy and enthusiasm of my friend, the Rev. James Waterston. In July last he brought to me for identification a series of specimens belonging to the genus *Spilogaster* which he could not satisfactorily refer to any species in Meade's "Descriptive List." With the aid of Stein's 'Analytische Uebersicht,' published in the "Entomologische

Nachrichten," Jahrg. xix. (1893), I have succeeded in satisfying myself that the specimens are *platyptera*, Ztt., first described in the "Diptera Scandinaviæ," tom. viii. p. 3281. This species is distinguished by its entirely black legs, indistinctly three-striped thorax, bristly hind tibiæ (three rows of setæ along the whole length), and broad wings. These interesting specimens were reared from larvæ taken at Gorebridge, Midlothian.

The second species concerned is *Scatella stenhammari*, Ztt., taken by Mr. Waterston on the window of a house in Edinburgh. I have examined this fly very carefully, and although the wings are not *quite* like Becker's figure in the Berl. Ent. Zeitschrift for 1896, yet the description fits fairly well, and the fly cannot well be anything else.—PERCY H. GRIMSHAW, Edinburgh.

BOTANICAL NOTES AND NEWS.

Additional Vice-county Records from West of Scotland.—During a few days spent in the latter part of August in a visit to the west of Scotland I met with the following, not previously recorded from the respective vice-counties :—

Barbarea vulgaris, R. Br.—One weak plant by a road in Tobermory (Mid Ebudes, 103), perhaps a casual.

Cnicus arvensis, Hoffm., var. *setosus* (Bess.).—Several examples on the shore close to a boat-wharf, near Ballachulish Pier (Argyll, 98). This form in recent years has occurred in several places in the vicinity of Aberdeen, and appears to be becoming more common, but always under conditions that suggest an alien origin. It is probably not native in Scotland.

Atriplex Babingtonii, Woods, var. *virescens*, Lange.—On the beach near Stornoway (Hebrides, 110).

Rumex crispus × *obtusifolius* (*acutus*, L.).—Near Oban (Argyll, 98).—JAMES W. H. TRAIL.

Synchitrium aureum, *Schroet.*, near Aberdeen.—Near the end of June 1909 I found this fungus in abundance on Wild Thyme (*Thymus Serpyllum*), on rather poor soil covering an old bed of shingle on the north bank of the river Dee at Murtle, a few miles west of Aberdeen. Though of frequent occurrence, on a great variety of host-plants, in various countries of Europe and of North America, I am not aware that it had been previously observed in Scotland. It produces very characteristic effects on the stems and leaves, which become thickened, and are more or less covered with the small warty dull-red galls of the parasite.—JAMES W. H. TRAIL.

Study of British Roses.—A paper on the 'Collection and Identification of British Roses,' by Rev. A. Ley and Major A. H. Wolley-Dod, in the "Journal of Botany," July 1909, will be found helpful to students of the British flora, and should enable its readers to secure good material for the recognition of the forms. To appreciate the assistance it affords, the paper requires to be carefully studied; but the authors briefly enumerate at its close the relative importance of the several features helpful in determining the various types of roses. These features are :—

	Of primary importance. Habit.	Of secondary importance. Colour of stem and foliage.
Stems	Direction.	
Prickles	(Size and shape).	Number.
Leaflets	Serration and clothing.	Number (size and shape).
Petioles	...	Clothing.
Stipules and bracts	...	Form and clothing.
Peduncles	Length and clothing.	Number.
Sepals	Direction and duration.	Pinnation and clothing.
Styles	Cohesion and hairiness.	
Disc	(Shape).	
Fruit	Time of ripening, shape and size.	Colour.

Characters inclosed in brackets might be placed under either *primary* or *secondary*, according to the group or sub-section to which the species under consideration belongs.

British Species of Taraxacum.—In the "Monographie der Gattung Taraxacum," published in 1907, by Dr. H. v. Handel-Mazzetti, the forms seen by him from the British Islands are named as below :—

1. *T. paludosum*, Lightf. [*T. officinale*, var. *palustre* (Sm.) of Babington's "Manual"]. Europe (except almost all Russia) as far north as Upsala, also Asia from Thibet and North China to Trans-Baikal Siberia and in Persia.
2. Intermediates between *T. paludosum* and *T. vulgare* [*T. officinale*, var. *udum* (Jord.), of Bab. "Man."]. Europe and Western Asia to N. India and Turkestan. "Anglia et Scotia; e locis usque ad ins. Shetland dispersis."
3. *T. vulgare*, Lam. [*T. officinale*, var. α of Bab. "Man."]. Europe and Asia, except in arctic zone: introduced by man into all parts of the world. "Anglia et Scotia, e locis dispersis."
4. *T. lævigatum* (Wild.), DC. [*T. officinale*, var. *erythrospermum*, of Bab. "Man."]. Warmer places in Europe (except in north), in Western Asia, and in Atlantic region of N. Africa; introduced by man elsewhere, *e.g.* into N. America, "Edinburgh, Ayr," and numerous localities in England.

5. *T. obliquum* (Fr.), Dahlst. [*T. officinale*, var. *lævigatum*, of Bab. "Man."].—This has almost the same distribution as *T. lævigatum*, from which it can be distinguished with certainty by its ripe fruit being pale greyish-brown instead of deep reddish-purple, or almost purple-black. "Near Arbroath," and from England also.

The author expresses the view that the numerous forms named and described by Dahlstedt and Raunkiær in recent years are not of specific value.

Forms of Senecio vulgaris.—Dr. A. H. Trow has studied these in the vicinity of Cardiff, and has tested their length of life and constancy when cultivated, and the results when they are crossed. In his "Flora of Glamorgan" (part iii. pp. 91-93), quoted in the "Journal of Botany," 1909, pp. 304-306), he names four varieties and distinguishes them as:—

1. *præcox*, requiring from date of sowing to ripening of seed a shorter period (72 days); stem while young rather zigzag, with a few very long internodes; main axis soon overtopped and displaced by a lateral branch; leaves nearly plane, not deeply pinnatifid; capitula small and slender.
2. *erectus*, requiring longer time (83 days); stem straight and erect, internodes many, rather short and stout; leaves deeply pinnatifid or pinnatisect, strikingly pectinate when half developed, yellow-green, capitula of medium size, not radiate.
3. *erectus*, var. *radiatus*, differs from *erectus only* in having 8 to 13 ray-florets in each capitulum, sometimes very long and revolute.
4. *multicaulis*, requiring longer time (90 days); basal internodes short, hence a rosette of basal leaves; dark-green leaves resembling those of *erectus* but longer; stems numerous, with upper internodes long, rendering inflorescence less compact, with capitula nearly erect, bracts long; capitula large, broad and rather short; disc florets soft yellow, browning after pollination; cotyledons of seedlings large.

Experiments in growing and crossing these forms, carried on since 1905, show that they remain constant when grown side by side if not crossed, and that when crossed they follow the Mendelian law.

The prize offered by the Edinburgh University to students in the classes of Botany for the best Herbarium of British Mosses and Hepatics (not less than 400 species and varieties correctly named), collected between May 1908 and June 1909, has been awarded to Mr. W. Edgar Evans, B.Sc., an occasional contributor to our pages. The specimens were collected entirely in the Edinburgh district and central Perthshire.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—July-September 1909.

[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.

The Origin of Highland Cattle. R. L. *The Field*, July 3, 1909, p. 45. Criticising a paper by Prof. James Wilson in the Scientific Proceedings of the Royal Dublin Society.

Antlers of Scottish Red Deer. J. G. Millais. *The Field*, July 10, 1909, p. 93. A letter to the Editor, claiming that a specimen found in the river Halladale is superior to one found at Kintail, and said to be "the largest known red deer's horn from Scotland."

Antlers of Scottish Red Deer. Further letters on this subject are printed in *The Field*, July 17, 1909, p. 144, from Henry Laver, "A. R.," and William Ross, and on July 24, p. 194, from Wm. Stirling.

Red-breasted Flycatcher in Fifeshire. W. S. *The Field*, July 10, 1909, p. 94. A pair reported to have been seen from June 20 to 24. Letter by "Hy. S." in issue of July 17 stating the birds to be Spotted Flycatchers.

Our Present Knowledge of the Fauna of the Forth Area. William Evans, F.F.A., F.R.S.E. *Proc. Roy. Phys. Soc. Edin.*, vol. xvii. pp. 1-64 d. This paper forms the Presidential Address for the Session 1906-1907, and gives a useful summary of the species recorded for the area in all groups. The total recorded in print or in the author's MS. lists is 6865.

On New and Rare Crustacea from Scottish Waters. Thomas Scott, LL.D., F.L.S. *Ann. and Mag. Nat. Hist.*, July 1909, pp. 31-36, pts. ii. and iii. Four species recorded, of which two (an Amphipod and a Copepod) are described as new to science.

Some Notes on the Lepidoptera of the "Dale Collection" of British Insects, now in the Oxford University Museum. James J. Walker, M.A., R.N., F.L.S. *Ent. Mo. Mag.* August 1909, pp. 175-181. Several Scottish records are given.

List of Lepidoptera captured recently in Ross-shire (concluded). Dorothy J. Jackson. *Ent. Record*, July 15 and

September 15, 1909, pp. 176-181 and 212-216. Records a large number of Noctuides, Geometrides, Pyralides, Alucitides, Orneodides, Crambides, Tortricides, and Tineina.

Selidosema ericetaria in Scotland. G. S. A. Baynes. *Entomologist*, September 1909, p. 235. Two males taken near Mallaig, Inverness-shire.

Further Variation in Nyssia lapponaria. E. A. Cockayne. *Entomologist*, July 1909, pp. 169-170, pl. v. Describes and figures specimens taken in the Rannoch district.

Notes on the Life-History of Olethreutes (Sericoris) bifasciana, Her. Eustace R. Bankes, M.A., F.E.S. *Ent. Mo. Mag.*, September 1909, pp. 198-201. Recorded from Aviemore.

Anthrax paniscus, Rossi, in Scotland. William Evans. *Ent. Mo. Mag.*, July 1909, p. 166. Several localities for this species in the Forth district are given.

Panchlora nivea, L. Henry H. Brown. *Entomologist*, July 1909, p. 186. A specimen brought to Cupar, Fife, with bananas from Jamaica.

Some Medusæ and Ctenophores from the Firth of Forth. Wm. Evans, F.R.S.E., and J. H. Ashworth, D.Sc. *Proc. Roy. Phys. Soc. Edin.*, vol. xvii. No. 6 (1909), pp. 300-311. Thirteen species recorded.

BOTANY.

Some Sutherland Plants. By Rev. E. S. Marshall, F.L.S., and W. A. Shoolbred, F.L.S. (*Journ. Bot.* 1909, pp. 220-223). Several new records for both East and West Sutherland (107, 108), especially in the genus *Hieracium*.

The Collection and Identification of Roses. By Rev. A. Ley, M.A., and Major A. H. Wolley-Dod (*Journ. Bot.* 1909, pp. 247-255). An important paper.

Carex canescens, L. By G. Claridge Druce, M.A., F.L.S. (*Journ. Bot.* 1909, pp. 301-304), gives reasons for regarding this as equivalent to *C. curta*, Good., and not to *C. divulsa*, which is under *C. canescens* in the Linnæus herbarium.

Forms of Senecio vulgaris, L. By A. H. Trow, D.Sc., F.L.S. (*Journ. Bot.* 1909, pp. 304-306, extracted from his *Flora of Glamorgan*, part iii., pp. 91-93), describes four forms found near Cardiff.

Supplementary Records of British Rubi. By Rev. W. Moyle Rogers, F.L.S. (*Journ. Bot.* 1909, pp. 310-318).

COMITAL CENSUS NUMBERS. By G. Claridge Druce, M.A., F.L.S. (*Journ. Bot.* 1909, pp. 318-320).

ORCHIS ERICETORUM, LINT. = O. MACULATA PRÆCOX, WEBSTER. By G. Claridge Druce (*Journ. Bot.* 1909, pp. 322-323).

BOOK NOTICES.

THE BRITISH WARBLERS: A HISTORY, WITH PROBLEMS OF THEIR LIVES. By Eliot Howard, F.Z.S., M.B.O.U. London: R. H. Porter. Parts II. and III. Price 21s. net each.

In the "Annals" for 1907 (p. 191) we welcomed the appearance of Part I. of this important and beautiful work: important on account of the originality of the greater part of its letterpress, and beautiful with respect to the excellence and wealth of its illustrations. Parts II. and III. have since been issued, and these fully sustain the high standard of merit foreshadowed by the initial number.

It is a long time since anything so largely original has been written regarding the histories of any British birds. It is abundantly evident to those who have read these singularly interesting accounts of the more or less obscure habits of the various species of Warblers treated of, that Mr. Howard knows more about them than any other British ornithologist who has written on the subject. Some may be inclined to doubt certain of the author's deductions as to the motives of the particular actions he describes so well, but we must accept with more than ordinary respect the opinions of one who has made this subject his own, and who has laboured so long and to such good purpose. The species dealt with in the parts under notice, are the Blackcap, Radde's Bush Warbler, Pallas's Willow Warbler, Chiffchaff, and Yellow-browed Warbler. The illustrations comprise nine in colours and fifteen in photogravure, while four maps are given showing seasonal distribution. Like the letterpress the photogravure pictures (which are from the original sketches made by Mr. Howard) are highly original, and portray the birds in attitudes in which they have not hitherto been depicted.

A TOURIST'S FLORA OF THE WEST OF IRELAND. By Robert Lloyd Praeger. 8vo, pp. xii. 243, pls. 27. (Dublin: Hodges, Figgis, and Co.) Price 3s. 6d.

This must commend itself to everyone interested in the flora of the British Islands as an excellent book, containing a very large amount of information in small bulk, and remarkably clear in its exposition. The area dealt with is chiefly Ireland west of the Shannon, but takes in also the districts of Limerick and Enniskillen, thus including in its flora a number of species found elsewhere

as characteristic of South-western Europe or of Eastern North America.

A short "introduction" is devoted to a general physical description of the district, its rocks and soils, its climate, its vegetational subdivisions, its plant formations and natural growths, the character of the flora, and an outline of the progress of botanical investigation locally. This is followed by a "Topographical Section," in which each county is considered separately, the more interesting places or more convenient tourist-centres being chiefly described, and their most noteworthy plants enumerated, and references added to published sources of fuller information. Tourists will appreciate the information regarding the means of access and centres to work from and where one may reside; while the derivations and meanings of the place-names, and the brief references to past history add to the value and interest of the work.

The "Systematic Section" extends to 107 pages. In it the distribution is indicated under each species, localities being given only where the species is limited in its range, and notes being added with regard to peculiarities of distribution, while the relations to nature of soil and to man's influence are also stated. The arrangement and nomenclature "are almost without exception those employed in 'Cybele hibernica' and 'Irish Topographical Botany,'" the names in use in the "London Catalogue," ed. 10, being added where they differ from those used by the author.

A number of photographs illustrating the characteristic scenery, rock-formations and plants, sketch-maps and other illustrations in the text, and five coloured maps of the west of Ireland, reduced from ordnance surveys, and showing the orographical and petrographical features of the country, add to the value and usefulness of the book, which will be indispensable not only to botanical tourists in its area but to all botanists interested in the distribution of plants, and more especially in the British flora.

Good indexes to the several sections render access to the information it contains easy.

INDEX

END OF VOL. XVIII.

Printed by R. & R. CLARK, LIMITED, *Edinburgh.*

THE NATURALIST

A MONTHLY JOURNAL OF NATURAL HISTORY FOR THE NORTH OF ENGLAND

Cheshire	Lancashire	Nottinghamshire
Cumberland	Lincolnshire	Westmoreland
Derbyshire	Isle of Man	Yorkshire
Durham	Northumberland	

Edited by

T. SHEPPARD, F.G.S., and T. W. WOODHEAD, F.L.S.,

Museum, Hull; Technical College, Huddersfield;

With the assistance as Referees in Special Departments of

J. Gilbert Baker, F.R.S., F.L.S.	Geo. T. Porritt, F.L.S., F.E.S.
Percy F. Kendall, F.G.S.	John W. Taylor.
T. H. Nelson, M.B.O.U.	William West, F.L.S.

All Communications to be addressed—

THE EDITORS, "THE NATURALIST," MUSEUM, HULL.

Annual Subscription, 6s. 6d. Single Numbers, 6d.; by post, 7d.

LONDON: A. BROWN & SONS, Ltd., 5 Farringdon Avenue.

***MONTHLY, PRICE* 2d.**

A Specimen Copy will be sent by the Publishers to any address on receipt of a 2½d. Stamp.

THE SELBORNE MAGAZINE

AND NATURE NOTES

THE ORGAN OF THE SELBORNE SOCIETY

Edited by Prof. G. S. BOULGER, F.L.S., F.G.S.

The *minimum* Annual Subscription (which entitles Subscribers to a Monthly copy of The Selborne Magazine is 5s. All particulars may be obtained from the Honorary General Secretary, Wilfred Mark Webb, F.L.S., at 20 Hanover Square, London, W.

The Selborne Society was founded in 1885, and its objects are—

To Promote the Study of Natural History.

To preserve Wild Animals and Plants from Needless Destruction.

To protect Places and Objects of Antiquarian Interest or Natural Beauty.

GEORGE PHILIP & SONS, Ltd., 32 Fleet Street, LONDON.

No. 69] 1909 [JANUARY

The Annals

of

Scottish Natural History

A QUARTERLY MAGAZINE

WITH WHICH IS INCORPORATED

"The Scottish Naturalist"

EDITED BY

J. A. HARVIE-BROWN, F.R.S.E., F.Z.S.
MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION

JAMES W. H. TRAIL, M.A., M.D., F.R.S., F.L.S.
PROFESSOR OF BOTANY IN THE UNIVERSITY OF ABERDEEN

AND

WILLIAM EAGLE CLARKE, F.R.S.E., F.L.S.
KEEPER OF THE NATURAL HISTORY DEPARTMENT, THE ROYAL SCOTTISH MUSEUM, EDINBURGH

EDINBURGH
DAVID DOUGLAS, CASTLE STREET
LONDON: R. H. PORTER, 7 PRINCES ST., CAVENDISH SQUARE

Price 2s. 6d. Annual Subscription, payable in advance, 7s. 6d., Post free.

The Annals of Scottish Natural History.

All Articles and Communications intended for publication, and all **Books, etc.,** for notice, should be sent to MR. EAGLE CLARKE, ROYAL SCOTTISH MUSEUM, EDINBURGH; except those relating to **Botany,** which should be addressed to PROF. TRAIL, THE UNIVERSITY, ABERDEEN.

Subscriptions and Advertisements should be addressed to the Publisher, MR. DAVID DOUGLAS, 10 CASTLE STREET, EDINBURGH.

Authors of General Articles will receive 25 Reprints (in covers) of their Contributions gratis. Additional copies, in covers, may be had from the Printers, at the undermentioned rates, provided such orders accompany the Manuscript.

	25 Copies.	50 Copies.	100 Copies.
4 pages	3/6	4/6	7/–
8 „	4/6	5/6	8/6
12 „	6/–	7/–	11/–
16 „	7/6	8/6	13/6

BOOKS ON NATURAL HISTORY.

THE VERTEBRATE FAUNA OF SCOTLAND.

Edited by J. A. HARVIE-BROWN and T. E. BUCKLEY.

"We receive few books that are so grateful alike to the eye and sense as the sage-green octavos of Scottish zoological geography which come to us, one after another, from Mr. Douglas. In welcoming this delightful *Vertebrate Fauna of the Orkney Islands*, we feel but one regret, the worlds which are left for Messrs. Buckley and Harvie-Brown to conquer are growing very few. . . . We know not how to approach them. Are we to urge them on upon their splendid enterprise, or to hold them back, that our pleasure may be drawn out the longer? The same plan is pursued as in the previous volumes of this admirable series. A detailed physical geography of the islands precedes the *catalogue raisonné* of the species and habitats. Even to those, therefore, who have little zoological curiosity or knowledge, this book must be of unusual importance, if the reader has an interest in the provinces described."—*Saturday Review.*

VOLUMES ALREADY PUBLISHED—

1. **A VERTEBRATE FAUNA OF SUTHERLAND, CAITHNESS, AND WEST CROMARTY.** [*Out of print.*
2. **A VERTEBRATE FAUNA OF THE OUTER HEBRIDES.** [*Out of print.*
3. **THE BIRDS OF IONA AND MULL, 1852-1870.** By the late HENRY DAVENPORT GRAHAM. With a Memoir of the Author. Illustrated from the Author's Sketch Book. 21s.
4. **A VERTEBRATE FAUNA OF THE ORKNEY ISLANDS.** 30s.
5. **A VERTEBRATE FAUNA OF ARGYLL AND THE INNER HEBRIDES.** 30s.

6 and 7. **A VERTEBRATE FAUNA OF THE MORAY BASIN.** Two Vols. 60s.

8. **A VERTEBRATE FAUNA OF SHETLAND.** By T. E. BUCKLEY and A. H. EVANS. 30s.
9. **A VERTEBRATE FAUNA OF THE NORTH-WEST HIGHLANDS AND SKYE.** By J. A. HARVIE-BROWN and H. A. MACPHERSON. 30s.
10. **A VERTEBRATE FAUNA OF THE TAY BASIN AND STRATHMORE.** By J. A. HARVIE-BROWN. 30s.

A VERTEBRATE FAUNA OF LAKELAND, including Cumberland and Westmorland, with Lancashire north of the Sands. By the Rev. H. A. MACPHERSON, M.A. With Preface by R. S. FERGUSON, F.S.A., Chancellor of Carlisle. Demy 8vo. Illustrated. 30s.

HELIGOLAND AS AN ORNITHOLOGICAL OBSERVATORY. The Result of Fifty Years' Experience. By HEINRICH GÄTKE. Translated by RUDOLPH ROSENSTOCK, M.A. Oxon. Royal 8vo. 30s.

A TOUR IN SUTHERLANDSHIRE. With Extracts from the Field Books of a Sportsman and Naturalist. By CHARLES ST. JOHN. 2nd Ed. With Appendix on the Fauna of Sutherland, by J. A. HARVIE-BROWN and T. E. BUCKLEY. Two Vols. Crown 8vo. Illustrated. 21s.

CHARLES ST. JOHN'S NOTE BOOKS, 1846-1853. Invererne, Nairn, Elgin. Edited by Admiral H. C. ST. JOHN. Sm. 4to. 7s. 6d. net.

THE BIRDS OF THE ISLE OF MAN. By P. G. RALFE, M.B.O.U. Demy 8vo. Illustrated. 18s. net.

EDINBURGH: DAVID DOUGLAS, 10 CASTLE STREET.

CONTENTS

Printed by R. & R. Clark, Limited, *Edinburgh.*

No. 70] 1909 [APRIL

The Annals of Scottish Natural History

A QUARTERLY MAGAZINE

WITH WHICH IS INCORPORATED

"The Scottish Naturalist"

EDITED BY

J. A. HARVIE-BROWN, F.R.S.E., F.Z.S.
MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION

JAMES W. H. TRAIL, M.A., M.D., F.R.S., F.L.S.
PROFESSOR OF BOTANY IN THE UNIVERSITY OF ABERDEEN

AND

WILLIAM EAGLE CLARKE, F.R.S.E., F.L.S.
KEEPER OF THE NATURAL HISTORY DEPARTMENT, THE ROYAL SCOTTISH MUSEUM, EDINBURGH

EDINBURGH
DAVID DOUGLAS, CASTLE STREET
LONDON: R. H. PORTER, 7 PRINCES ST., CAVENDISH SQUARE

Price 2s. 6d. Annual Subscription, payable in advance, 7s. 6d., Post free.

The Annals of Scottish Natural History.

All Articles and Communications intended for publication, and all **Books, etc.,** for notice, should be sent to MR. EAGLE CLARKE, ROYAL SCOTTISH MUSEUM, EDINBURGH; except those relating to **Botany,** which should be addressed to PROF. TRAIL, THE UNIVERSITY, ABERDEEN.

Subscriptions and Advertisements should be addressed to the Publisher, MR. DAVID DOUGLAS, 10 CASTLE STREET, EDINBURGH.

Authors of General Articles will receive 25 Reprints (in covers) of their Contributions gratis. Additional copies, in covers, may be had from the Printers, at the undermentioned rates, provided such orders accompany the Manuscript.

	25 Copies.	50 Copies.	100 Copies.
4 pages	3/6	4/6	7/–
8 „	4/6	5/6	8/6
12 „	6/–	7/–	11/–
16 „	7/6	8/6	13/6

EDINBURGH: DAVID DOUGLAS, 10 CASTLE STREET.

BOOKS ON NATURAL HISTORY.

THE VERTEBRATE FAUNA OF SCOTLAND.

Edited by J. A. HARVIE-BROWN and T. E. BUCKLEY.

"We receive few books that are so grateful alike to the eye and sense as the sage-green octavos of Scottish zoological geography which come to us, one after another, from Mr. Douglas. In welcoming this delightful *Vertebrate Fauna of the Orkney Islands*, we feel but one regret, the worlds which are left for Messrs. Buckley and Harvie-Brown to conquer are growing very few. . . . We know not how to approach them. Are we to urge them on upon their splendid enterprise, or to hold them back, that our pleasure may be drawn out the longer? The same plan is pursued as in the previous volumes of this admirable series. A detailed physical geography of the islands precedes the *catalogue raisonné* of the species and habitats. Even to those, therefore, who have little zoological curiosity or knowledge, this book must be of unusual importance, if the reader has an interest in the provinces described."—*Saturday Review.*

VOLUMES ALREADY PUBLISHED—

1. **A VERTEBRATE FAUNA OF SUTHERLAND, CAITHNESS, AND WEST CROMARTY.** [*Out of print.*
2. **A VERTEBRATE FAUNA OF THE OUTER HEBRIDES.** [*Out of print.*
3. **THE BIRDS OF IONA AND MULL, 1852-1870.** By the late HENRY DAVENPORT GRAHAM. With a Memoir of the Author. Illustrated from the Author's Sketch Book. 21s.
4. **A VERTEBRATE FAUNA OF THE ORKNEY ISLANDS.** 30s.
5. **A VERTEBRATE FAUNA OF ARGYLL AND THE INNER HEBRIDES.** 30s.

6 and 7. **A VERTEBRATE FAUNA OF THE MORAY BASIN.** Two Vols. 60s.

8. **A VERTEBRATE FAUNA OF SHETLAND.** By T. E. BUCKLEY and A. H. EVANS. 30s.
9. **A VERTEBRATE FAUNA OF THE NORTH-WEST HIGHLANDS AND SKYE.** By J. A. HARVIE-BROWN and H. A. MACPHERSON. 30s.
10. **A VERTEBRATE FAUNA OF THE TAY BASIN AND STRATHMORE.** By J. A. HARVIE-BROWN. 30s.

A VERTEBRATE FAUNA OF LAKELAND, including Cumberland and Westmorland, with Lancashire north of the Sands. By the Rev. H. A. MACPHERSON, M.A. With Preface by R. S. FERGUSON, F.S.A., Chancellor of Carlisle. Demy 8vo. Illustrated. 30s.

HELIGOLAND AS AN ORNITHOLOGICAL OBSERVATORY. The Result of Fifty Years' Experience. By HEINRICH GÄTKE. Translated by RUDOLPH ROSENSTOCK, M.A. Oxon. Royal 8vo. 30s.

MY INDIAN JOURNAL. Containing Descriptions of the principal Field Sports of India, with Notes on the Natural History and Habits of the Wild Animals of the Country. By Colonel WALTER CAMPBELL, Author of "The Old Forest Ranger." Small demy 8vo. With Illustrations by WOLF. 16s.

THE BIRDS OF BERWICKSHIRE. By GEORGE MUIRHEAD. Two Vols. Demy 8vo. Illustrated. 30s. net.

THE BIRDS OF THE ISLE OF MAN. By P. G. RALFE, M.B.O.U. Demy 8vo. Illustrated. 18s. net.

EDINBURGH: DAVID DOUGLAS, 10 CASTLE STREET.

CONTENTS

Printed by R. & R. Clark, Limited, *Edinburgh.*

No. 71] 1909 [JULY

The Annals of Scottish Natural History

A QUARTERLY MAGAZINE

WITH WHICH IS INCORPORATED

"The Scottish Naturalist"

EDITED BY

J. A. HARVIE-BROWN, F.R.S.E., F.Z.S.
MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION

JAMES W. H. TRAIL, M.A., M.D., F.R.S., F.L.S.
PROFESSOR OF BOTANY IN THE UNIVERSITY OF ABERDEEN

AND

WILLIAM EAGLE CLARKE, F.R.S.E., F.L.S.
KEEPER OF THE NATURAL HISTORY DEPARTMENT, THE ROYAL SCOTTISH MUSEUM, EDINBURGH

EDINBURGH
DAVID DOUGLAS, CASTLE STREET
LONDON: R. H. PORTER, 7 PRINCES ST., CAVENDISH SQUARE

Price 2s. 6d. Annual Subscription, payable in advance, 7s. 6d., Post free.

The Annals of Scottish Natural History.

All Articles and Communications intended for publication, and all **Books, etc.,** for notice, should be sent to MR. EAGLE CLARKE, ROYAL SCOTTISH MUSEUM, EDINBURGH; except those relating to **Botany,** which should be addressed to PROF. TRAIL, THE UNIVERSITY, ABERDEEN.

Subscriptions and Advertisements should be addressed to the Publisher, MR. DAVID DOUGLAS, 10 CASTLE STREET, EDINBURGH.

Authors of General Articles will receive 25 Reprints (in covers) of their Contributions gratis. Additional copies, in covers, may be had from the Printers, at the undermentioned rates, provided such orders accompany the Manuscript.

	25 Copies.	50 Copies.	100 Copies.
4 pages	3/6	4/6	7/–
8 „	4/6	5/6	8/6
12 „	6/–	7/–	11/–
16 „	7/6	8/6	13/6

EDINBURGH: DAVID DOUGLAS, 10 CASTLE STREET.

BOOKS ON NATURAL HISTORY.

THE VERTEBRATE FAUNA OF SCOTLAND.

Edited by J. A. HARVIE-BROWN and T. E. BUCKLEY.

"We receive few books that are so grateful alike to the eye and sense as the sage-green octavos of Scottish zoological geography which come to us, one after another, from Mr. Douglas. In welcoming this delightful *Vertebrate Fauna of the Orkney Islands*, we feel but one regret, the worlds which are left for Messrs. Buckley and Harvie-Brown to conquer are growing very few. . . . We know not how to approach them. Are we to urge them on upon their splendid enterprise, or to hold them back, that our pleasure may be drawn out the longer? The same plan is pursued as in the previous volumes of this admirable series. A detailed physical geography of the islands precedes the *catalogue raisonné* of the species and habitats. Even to those, therefore, who have little zoological curiosity or knowledge, this book must be of unusual importance, if the reader has an interest in the provinces described."—*Saturday Review.*

VOLUMES ALREADY PUBLISHED—

1 **A VERTEBRATE FAUNA OF SUTHERLAND, CAITHNESS, AND WEST CROMARTY.** [*Out of print.*

2. **A VERTEBRATE FAUNA OF THE OUTER HEBRIDES.** [*Out of print.*

3. **THE BIRDS OF IONA AND MULL, 1852-1870.** By the late HENRY DAVENPORT GRAHAM. With a Memoir of the Author. Illustrated from the Author's Sketch Book. 21s.

4. **A VERTEBRATE FAUNA OF THE ORKNEY ISLANDS.** 30s.

5. **A VERTEBRATE FAUNA OF ARGYLL AND THE INNER HEBRIDES.** 30s.

6 and 7. **A VERTEBRATE FAUNA OF THE MORAY BASIN.** Two Vols. 60s.

8. **A VERTEBRATE FAUNA OF SHETLAND.** By T. E. BUCKLEY and A. H. EVANS. 30s.

9. **A VERTEBRATE FAUNA OF THE NORTH-WEST HIGHLANDS AND SKYE.** By J. A. HARVIE-BROWN and H. A. MACPHERSON. 30s.

10. **A VERTEBRATE FAUNA OF THE TAY BASIN AND STRATHMORE.** By J. A. HARVIE-BROWN. 30s.

A VERTEBRATE FAUNA OF LAKELAND, including Cumberland and Westmorland, with Lancashire north of the Sands. By the Rev. H. A. MACPHERSON, M.A. With Preface by R. S. FERGUSON, F.S.A., Chancellor of Carlisle. Demy 8vo. Illustrated. 30s.

HELIGOLAND AS AN ORNITHOLOGICAL OBSERVATORY. The Result of Fifty Years' Experience. By HEINRICH GÄTKE. Translated by RUDOLPH ROSENSTOCK, M.A. Oxon. Royal 8vo. 30s.

MY INDIAN JOURNAL. Containing Descriptions of the principal Field Sports of India, with Notes on the Natural History and Habits of the Wild Animals of the Country. By Colonel WALTER CAMPBELL, Author of "The Old Forest Ranger." Small demy 8vo. With Illustrations by WOLF. 16s.

THE BIRDS OF BERWICKSHIRE. By GEORGE MUIRHEAD. Two Vols. Demy 8vo. Illustrated. 30s. net.

THE BIRDS OF THE ISLE OF MAN. By P. G. RALFE, M.B.O.U. Demy 8vo. Illustrated. 18s. net.

EDINBURGH: DAVID DOUGLAS, 10 CASTLE STREET.

CONTENTS

Printed by R. & R. Clark, Limited, *Edinburgh.*

No. 72] 1909 [OCTOBER

The Annals of Scottish Natural History

A QUARTERLY MAGAZINE

WITH WHICH IS INCORPORATED

"The Scottish Naturalist"

EDITED BY

J. A. HARVIE-BROWN, F.R.S.E., F.Z.S.
MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION

JAMES W. H. TRAIL, M.A., M.D., F.R.S., F.L.S.
PROFESSOR OF BOTANY IN THE UNIVERSITY OF ABERDEEN

AND

WILLIAM EAGLE CLARKE, F.R.S.E., F.L.S.
KEEPER OF THE NATURAL HISTORY DEPARTMENT, THE ROYAL SCOTTISH MUSEUM, EDINBURGH

EDINBURGH
DAVID DOUGLAS, CASTLE STREET
LONDON: R. H. PORTER, 7 PRINCES ST., CAVENDISH SQUARE

Price 2s. 6d. Annual Subscription, payable in advance, 7s. 6d., Post free.

The Annals of Scottish Natural History.

All Articles and Communications intended for publication, and all **Books, etc.,** for notice, should be sent to MR. EAGLE CLARKE, ROYAL SCOTTISH MUSEUM, EDINBURGH; except those relating to **Botany,** which should be addressed to PROF. TRAIL, THE UNIVERSITY, ABERDEEN.

Subscriptions and Advertisements should be addressed to the Publisher, MR. DAVID DOUGLAS, 10 CASTLE STREET, EDINBURGH.

Authors of General Articles will receive 25 Reprints (in covers) of their Contributions gratis. Additional copies, in covers, may be had from the Printers, at the undermentioned rates, provided such orders accompany the Manuscript.

	25 Copies.	50 Copies.	100 Copies.
4 pages	3/6	4/6	7/–
8 „	4/6	5/6	8/6
12 „	6/–	7/–	11/–
16 „	7/6	8/6	13/6

EDINBURGH: DAVID DOUGLAS, 10 CASTLE STREET.

BOOKS ON NATURAL HISTORY.

THE VERTEBRATE FAUNA OF SCOTLAND.

Edited by J. A. HARVIE-BROWN and T. E. BUCKLEY.

"We receive few books that are so grateful alike to the eye and sense as the sage-green octavos of Scottish zoological geography which come to us, one after another, from Mr. Douglas. In welcoming this delightful *Vertebrate Fauna of the Orkney Islands*, we feel but one regret, the worlds which are left for Messrs. Buckley and Harvie-Brown to conquer are growing very few. . . . We know not how to approach them. Are we to urge them on upon their splendid enterprise, or to hold them back, that our pleasure may be drawn out the longer? The same plan is pursued as in the previous volumes of this admirable series. A detailed physical geography of the islands precedes the *catalogue raisonné* of the species and habitats. Even to those, therefore, who have little zoological curiosity or knowledge, this book must be of unusual importance, if the reader has an interest in the provinces described."—*Saturday Review*.

VOLUMES ALREADY PUBLISHED—

1. **A VERTEBRATE FAUNA OF SUTHERLAND, CAITHNESS, AND WEST CROMARTY.** [*Out of print.*
2. **A VERTEBRATE FAUNA OF THE OUTER HEBRIDES.** [*Out of print.*
3. **THE BIRDS OF IONA AND MULL, 1852-1870.** By the late HENRY DAVENPORT GRAHAM. With a Memoir of the Author. Illustrated from the Author's Sketch Book. 21s.
4. **A VERTEBRATE FAUNA OF THE ORKNEY ISLANDS.** 30s.
5. **A VERTEBRATE FAUNA OF ARGYLL AND THE INNER HEBRIDES.** 30s.

6 and 7. **A VERTEBRATE FAUNA OF THE MORAY BASIN.** Two Vols. 60s.

8. **A VERTEBRATE FAUNA OF SHETLAND.** By T. E. BUCKLEY and A. H. EVANS. 30s.
9. **A VERTEBRATE FAUNA OF THE NORTH-WEST HIGHLANDS AND SKYE.** By J. A. HARVIE-BROWN and H. A. MACPHERSON. 30s.
10. **A VERTEBRATE FAUNA OF THE TAY BASIN AND STRATHMORE.** By J. A. HARVIE-BROWN. 30s.

A VERTEBRATE FAUNA OF LAKELAND, including Cumberland and Westmorland, with Lancashire north of the Sands. By the Rev. H. A. MACPHERSON, M.A. With Preface by R. S. FERGUSON, F.S.A., Chancellor of Carlisle. Demy 8vo. Illustrated. 30s.

HELIGOLAND AS AN ORNITHOLOGICAL OBSERVATORY. The Result of Fifty Years' Experience. By HEINRICH GÄTKE. Translated by RUDOLPH ROSENSTOCK, M.A. Oxon. Royal 8vo. 30s.

MY INDIAN JOURNAL. Containing Descriptions of the principal Field Sports of India, with Notes on the Natural History and Habits of the Wild Animals of the Country. By Colonel WALTER CAMPBELL, Author of "The Old Forest Ranger." Small demy 8vo. With Illustrations by WOLF. 16s.

THE BIRDS OF BERWICKSHIRE. By GEORGE MUIRHEAD. Two Vols. Demy 8vo. Illustrated. 30s. net.

THE BIRDS OF THE ISLE OF MAN. By P. G. RALFE, M.B.O.U. Demy 8vo. Illustrated. 18s. net.

EDINBURGH: DAVID DOUGLAS, 10 CASTLE STREET.

CONTENTS

Printed by R. & R. CLARK, LIMITED, *Edinburgh.*