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*Yours sincerely
Howard Saunders.*

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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. Corn-crakes 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 unsuspecting 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 Green-shank, 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 schænobaenus*.—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 Palæartic 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 œlebs*.—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 GROSBEEK, *Carpodacus erythrinus*.—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 seaweed 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 plumialis*.—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, *Strepstilas 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, *Hematopus 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.
- SNIBE, *Gallinago caelestis*.—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.

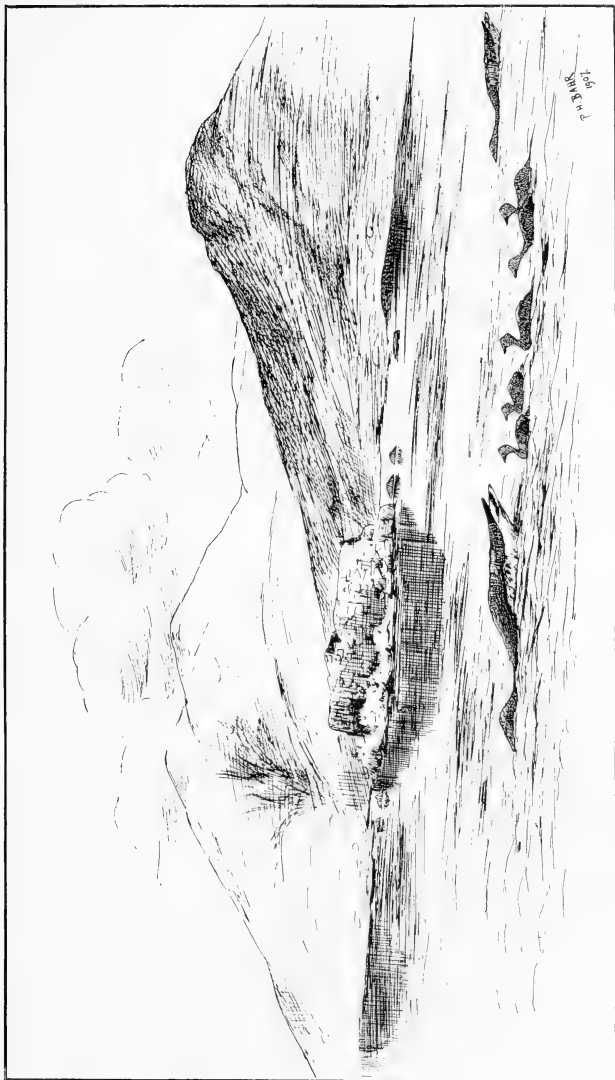
SOME BIRD NOTES FROM THE OUTER HEBRIDES DURING A MONTH SPENT THERE, MAY-JUNE 1907.

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

PLATE II.

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

OYSTER CATCHER, *Haematopus 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 phaeopus*, 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.
<i>Ringed Plover</i> . . .	6	12	9
<i>Pewit</i> . . .	3	12	4
<i>Oyster Catcher</i> . . .	4	8	3
<i>Dunlin</i> . . .	4	16	16
<i>Lesser Tern</i> . . .	3	6	1
<i>Red-throated Diver</i> . . .	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. *Patrobis 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 aeneipennis*, 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 chrysolinus*, 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. *Megarathrus 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.—1 1 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 ; *Scydmaenus 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 nunda*, 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, $1\frac{1}{2}$ 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 Freeburn¹ on the Findhorn (96, Easternness), 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 $2\frac{1}{2}$ 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 half-way 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. ad-junctella*, "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.]

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 alpinism 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 *Kæleria 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 lowland 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; Invershin 107.

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

Caltha radicans, *Forster.*—By the river at Invershin, 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.*—Invershin, East Sutherland 107.

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

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

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

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

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

V. tricolor, *L.*—Very beautiful at Invershin, also at Altnaharra 108; **var. vivariensis* (Jord.), Invershin 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 Ivershin *107. Plentiful on the coast at Tongue, Bettyhill, etc. 108.
- **C. semidecandrum*, *L.*—Invershin 107.
- C. arvense*, *L.*—In fields between Invershin and the coast *107.
- Stellaria Holostea*, *L.*—On the cliffs of Ben Hope 108.
- Arenaria leptoclados*, *Guss.*—Invershin *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; Invershin, 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.*—Invershin 107.
- V. tetrasperma*, *Moench.*—Invershin *107.
- Pyrus Aria*, *Ehrh.*—Growing out of the limestone precipices of Blar nam Fiadhg 108.
- Alchemilla vulgaris*, *L.*, var. *filicaulis* (*Buser*).—*Invershin 107; var. *glabra*, *DC.*, Ben More, Canisp *108.
- Rosa tomentosa*, *Sm.*—Invershin, 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 Fhurán, Canisp 108.
- Gnaphalium supinum*, *L.*—Ben More 108 and 107.
- Bellis perennis*, *L.*—A discoid form occurred at Altnaharra 108.
- Matricaria inodora*, *L.*, var. *phæocephala*, 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. *subtenuis* (*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. sphaerocarpa*, *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. Andrzejovii, *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.
Oenothera purpurea, *Curt.*, and *Æ. 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 Cornucopia, 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. *concinatum*, 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 nibe* 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 *Linnaeus*, 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. varicolor, *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. microcladium*, *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 Beauy 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*, *Dianthæcia capsincola*, *D. cucubali*, *Epunda nigra*, *Agriopes aprilina*, *Aplecta herbida*, *Hadena protea*, *Gonoptera libatrix*, *Eugonia alutaria*, *Acidalia aversata*, *Hybernia ruficapraria*, *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 symphælis*, *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*, *Amphipyra tragopogonis*, *Agriopes aprilina*, *Plusia festuæ*, *Hypæna 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 crategata*, *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 rufecolus** (*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 rufecolus*, 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 juvenicus* is not the true *S. juvenicus*, *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 *juvenicus*. 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*, *Panæolus separatus*, *Hygro-
 phorus 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. Banks.

GELECHIA SOLUTELLA, Z., AB. CRUTTWELLI, N. AB. By Eustace R. Banks, 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. Banks, *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 Drumadrochit (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 Microphotographs. 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.



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[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 :—

	<i>B. musculus.</i>	<i>B. sibbaldii.</i>	<i>B. borealis.</i>	Sperm.	<i>B. biscayensis.</i>	<i>Megaptera.</i>	Bottle-nose.
Norrone Co. . .	87	1	24	...	...	...	1
Shetland Co. . .	39	...	18				
Alexandra Co. . .	83	...	19				
Buneveader 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.		
Norrone	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
Buneveader	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.

Norrøna 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 1892¹ 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 Bunevener 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 Bunavener 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.	Norrna Station	.	.	.	1
1904.	Alexandra	„	.	.	1
1905.	Olna	„	.	.	1
	„	Buneveader 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 Buneveader 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 shy 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.

LAPPLAND 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 ornithology 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 naevia*.—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-BREADED 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 clangula*.—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, *Ædemia fusca*.—An adult male was observed in one of the bays on 17th September. This is the second Fair Isle record.

158. COMMON SCOTER, *Ædemia 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 numerous 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 unanimitis*, 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 ruficornis*, 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, 19th 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 chelicerae 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 *chelicerae*, 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 chelicerae 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 chelicerae, and I occasionally watched a False-scorpion move off, still carrying its prey in its chelicerae. 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 chelicerae, then again withdrew its pedipalps. At 9.10 it repeated this performance, and began to move off backwards, carrying the mass in its chelicerae 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 chelicerae, 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 chalconica, *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, a.
Salvia officinalis, L. Leith, a.

LILIACEÆ.

- Allium carinatum*, L. Linlithgowshire, ε.
A. neapolitanum, Cyr. Warriston (escape), a.
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-Ventii*, 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:—

"Annuæ. 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 brevior), 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 lator*, 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, $\frac{2}{3}$ - $\frac{3}{4}$ 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 scabropunctatæ. Palea glumam fertilem æquans, 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.—Invershin 107; Inchnadamph, Altnaharra, etc. 108.

M. palustris, Rell., 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 Oyke 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. *sphaerostachya*.—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. subcærulea (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*.

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, Björqs 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 Björqs 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. *microcladium*, 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 acuminate, 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. zelandicum* 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. zelandicum* 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. zelandicum, Beeby.—N. Confined to a tract near North Roe, about 2 x 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 Björge of Skelberry on the one side, or to Burga Taing on the other—to *H. Schmidtii* or to *H. zelandicum*. 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-scapijera*, 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 Kirkeudbrightshire.—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 leucorhoa*) 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. LANDBOROUGH 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 revision 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., \times *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 Heagsarnich 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* (Læstæd.), 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 *caspiosa*. 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 *Hierochloa 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 westrae, 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.

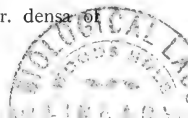
ON THE AGE OF THE REPTILE FAUNAS CONTAINED IN THE MAGNESIAN CONGLOMERATE AT BRISTOL AND IN THE ELGIN SANDSTONE. By Friedrich Baron Huene, D.Sc. *Geol. Mag.*, March 1908, pp. 99-100.

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 CREMATUM, GRAY., 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.*, xlvii., 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.



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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 Levenorrach, 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 OENANTHE (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. *OCIDENTALIS* (Black-throated Wheatear). At the Fair Isle on 25th September a fine male (p. 81).
- PRATICOLA 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 PHOENICURUS (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. *TITVS* (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. RAI** (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 *loc.* 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*.
- COCCOTHTRAUSTES 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 eggshells 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 Tirlleum 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.).

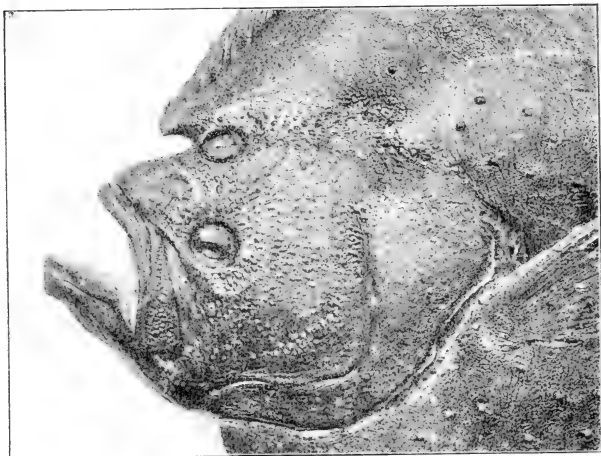
Of those cases of which I have been able to see descriptions, this resembles most closely that of a Brill recorded by Cunningham and MacMunn³ from notes supplied them by

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 $13\frac{1}{2}$ 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, $13\frac{1}{2}$ 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).

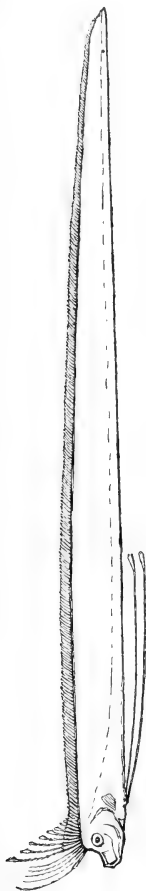
One 12⅓ ft., came ashore alive at Dunnet Bay, Caithness, July 1877.

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.

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, Ron-
 achan, 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.	
<i>Cheiridium museorum</i>	x								x					x	x	x	x				x		
<i>Chernes nodosus</i>														x	x	x	x						
<i>dubius</i>		x												x	x	x	x						
<i>panzeri</i>		x					x														x		
<i>Chelifer cancrroides</i>							x																
<i>latreillii</i>														x			x						
<i>Ideoroncus cambridgii</i>	x			x		x			x	x													
<i>Obisium maritimum</i>	x			x					x	x													
<i>muscorum</i>	x	x	x	x	x		x	x	x	x			x	x	x	x	x	x					
<i>Chthonius rayi</i>	x			x						x				x	x	x	x						
<i>tetrachelatus</i>	x			x				x	x	x			x	x	x	x	x						
<i>orthodactylus</i>													x	x	x	x	x						

(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 CRITI-
CAL 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 phytogeographical 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 Nevis, 1342.9 m. |
| *Ben-na-Bourd, 3924 ft. | *Ben Macdhui, 1309.4 m. |
| *Ben Avon, 3843 ft. | *Braeriach, 1294.8 m. |
| *Cairn Gorm of Derry, 3788 ft. | *Cairn Toul, 1292.7 m. |
| *Loch-na-gar, 3786 ft. | *Cairn Gorm, 1245.6 m. |
| Cairn-na-Glasha, 3484 ft. | *Aonach Beag, 1238 m. |
| Ben Iutharn, 3424 ft. | *Aonach Mor, 1219 m. |
| Cairn Bannoch, 3314 ft. | *Ben Lawers, 1214.3 m. |
| Sgurr Soch, 3300 ft. | *Ben-na-Bourd, 1196 m. |

BANFFSHIRE.

*Ben Macdhuil, 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.

PERTSHIRE

- *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 Udlanan, 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 Udlanan (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 willow, birch, and aspen in Scotland may be of interest. The birch and the willow (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 Ruprecht¹ 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 *Racomitrium 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 *Racomitrium* 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 mucous; 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.*)

<i>Marsupella aquatica.</i>	<i>Bazzania tricrenata.</i>
<i>Lophozia Muelleri.</i>	<i>Lepidozia Pearsoni.</i>
<i>Sphenolobus minutus.</i>	<i>Scapania subalpina.</i>
<i>Anastrepta orcadensis.</i>	<i>S. gracilis.</i>
<i>Plagiochila spinulosa.</i>	

79. SELKIRK.

(*S. M. Macvicar.*)

<i>Nardia obovata.</i>	<i>C. curvifolia.</i>
<i>Lophozia excisa.</i>	<i>Cephaloziella byssacea.</i>
<i>L. barbata.</i>	<i>C. bifida.</i>
<i>Lophocolea heterophylla.</i>	<i>Scapania nemorosa.</i>
<i>Chiloscyphus polyanthos.</i>	<i>Madotheca rivularis.</i>
<i>Cephalozia lunulæfolia.</i>	

80. ROXBURGH.

(*S. M. Macvicar.*)

<i>Aneura multifida.</i>	<i>Cephalozia lunulæfolia.</i>
<i>Aplozia crenulata, var. gracillima.</i>	<i>C. curvifolia.</i>
<i>A. pumila.</i>	<i>Cephaloziella byssacea.</i>
<i>Lophozia Muelleri.</i>	<i>C. myriantha.</i>
<i>L. ventricosa.</i>	<i>Kantia Trichomanis.</i>
<i>L. bicrenata.</i>	<i>Scapania purpurascens.</i>
<i>L. excisa.</i>	<i>S. undulata.</i>
<i>L. incisa.</i>	<i>S. irrigua.</i>
<i>L. quinquentata.</i>	<i>S. curta.</i>
<i>L. Floerkii.</i>	<i>Lejeunea cavifolia.</i>
<i>Sphenolobus exsectæformis.</i>	<i>Anthoceros lævis.</i>
<i>Chiloscyphus polyanthos.</i>	

82. HADDINGTON.

(*J. M^r Andrew.*)

<i>Riccia Lescuriana.</i>	<i>Scapania compacta.</i>
<i>Lophozia badensis.</i>	

87. WEST PERTH.

Lophozia inflata. *J. Hunter.*

88. MID PERTH.

(*S. M. Macvicar.*)

Marsupella Pearsoni.

Lophozia Baueriana.

Lophozia badensis.

Scapania obliqua.

89. EAST PERTH.

Gymnomitrium alpinum. *J. Fergusson.*

90. FORFAR.

Pellia Neesiana, *G. West* and *Miss H. Ogilvie.*

Nardia Breidlerii, *P. Ewing* and *W. Young.*

Lophozia badensis, *A. Croall.*

91. KINCARDINE.

(*J. Sim.*)

Metzgeria conjugata.

Marsupella Funckii.

Gymnomitrium alpinum.

M. aquatica.

92. SOUTH ABERDEEN.

Lophozia longidens. *J. Sim.*

93. NORTH ABERDEEN.

Lophozia Baueriana, *J. M^r Andrew.*

Kantia Sprengelii, *D. Lillie.*

96. EAST INVERNESS.

Marsupella Jörgensenii } *S. M. Macvicar.*
Diplophyllum ovatum }

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. Lepidozia Pearsoni.
 Saccogyna viticulosa. Ptilidium ciliare.

109. CAITHNESS.

Lophozia badensis }
 L. barbata } *D. Lillie.*

110. OUTER HEBRIDES.

Lophozia badensis, *P. Ewing.*
 Chiloscypus polyanthos, *J. Waterston.*

111. ORKNEY.

(D. Lillie.)

Jamesoniella Carringtoni. Cephalozia lunulæfolia.
 Lophozia Muelleri. Bazzania tricrenata.
 Sphenolobus minutus. Ptilidium ciliare.
 Chiloscypus pallescens.

112. SHETLAND.

Pallavicinia hibernica }
 Blepharostoma trichophyllum } *J. Sim.*
 Nardia compressa, *W. H. Beeby.*

(D. Lillie.)

Conocephalum conicum. L. alpestris.
 Marchantia polymorpha. L. quinquedentata.
 Blasia pusilla. Radula aquilegia.
 Lophozia Muelleri.

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, Barnookrie, 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, *Streptilas 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. LANDBOROUGH 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, $\alpha\gamma$, 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 as species), 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.



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[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 EUROPEA (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. SCHÆNICLUS (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 (*loc. 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.
- ACCIPITER 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 Lcch, 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 (*loc. cit.* 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.
- CEDEMIA 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).
- CE. 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, (*loc. cit.* 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. CENAS** (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.
- ÆDICNEMUS 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 Dumbarrie Links (Fife) with two white primaries in each wing.
- STREPILAS 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 OSTRALÉGUS** (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" (*loc. cit.* 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 Beaully 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 gully 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.

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 Scotscladder 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 WOOD- PECKERS.

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.* II 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 awaiting 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, Glenstrath-
farrar.
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.	*Dunmore.
Blair Drummond.	*Gargunnoch (Micklewood).
Binning Wood.	Gartmorn Dam.
Callander, Falkirk.	Loch Chon.
*Cambusmore.	Loch Leven.
Dalkeith Palace.	Menteith, Lake of.
Dollar.	Old Polmaise.
Donibristle.	Salthough, Cockburnspath.
Dunglass Dean, Cockburns-	Siccar Point, „
path.	Tulliallan Castle.
*Dunipace.	Yester.

TWEED.

Buncle.	Mount Teviot.
Calroust, Swindon.	Nesbit, Edrom.
Cardrona.	Ormiston House, Teviotdale.
Castle Wood, Duns.	Paxton.
Circle Plantation, Westruther.	Pennilheugh House.
Clarabad Dam, Paxton.	Pistol Plantation, Whitsome.
*Dawick.	*Portmore Loch.
Dodburn, Allan Water.	*Swindon, Bowmount Water.
Duns Castle.	The Haining, Selkirk.
Foulden.	The Hirsell, Coldstream.
Hendersyde Park, Kelso.	Thirlestane Castle, Ettrick.
Lithillum Loch, Eccles.	Thirlestane Castle, Lauder
Marchmont, Polwarth.	(two places).
March Wood, Longformacus.	Tweedsmuir.
Mertoun House.	Wells House, Rule Water.
Minto.	

OUTER HEBRIDES.

Lewis, west side.	North Uist.
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NORTH-WEST HIGHLANDS AND SKYE.

Applecross.	Loch Lory.
Dundonell.	Loch Torridon (outer).
Fionn Loch.	Loch - na - clash - fearn, Edder-
Gairloch.	achyllis.
Glen Elchaig.	Raasay.
Killilan.	Shieldaig Island, Loch
Knoydart.	Torridon.
Loch Awe, Assynt.	Skye :—
Loch Bad a' Ghail, Coigeach.	Dalville Wood, Armadale.
Loch Beannoch, Stoir.	Dunvegan.
*Loch Cama, Assynt.	Kyleakin.
Loch Hourn.	

ARGYLL AND THE INNER HEBRIDES.

Ardimersy, Islay.	Loch a Bhaillidh, Blackwater.
Ardnamurchan.	Loch Doire a Gherrain, Ardnish.
Ards, Mull.	Loch Guirm, Islay.
Arinagour, Coll.	Loch Scridain.
Arisaig.	Loch Shiel, head of.
Benderloch.	Loch Sunart, south shore and on island.
*Burgh or Gribun Cliffs, Mull.	Loch Swen.
Erraid, Mull.	Loch Ternate, Morven.
Eigg, west side.	Morar.
Glen Finnan, Loch Shiel.	Morven. (? additional to Loch Ternate.)
Glenmore, Oban.	Pennyghael House.
Inverlussa, Jura.	Ulva House.
Kinlochmoidart.	
Kintarbet.	
Largie Castle, Kintyre (?).	

CLYDE.

Ardgartan, Loch Long.	*Glespin Wood, Douglas.
Ardgowan, Inverkip.	Hafton, Holy Loch (?).
*Balglass.	*Hamilton.
Ballimore, Loch Fyne.	*Holy Island, Arran.
Brodick Castle, Arran.	Houston House (?).
Buchanan Castle.	*Inchinnan.
Bute, North.	Inverary.
*Caldwell House.	Johnstone Castle (?).
*Caprington.	Kelburn Castle, Fairlie.
Castle Semple.	*Knox, Stewarton.
*Corbeth.	*Kilkerran.
*Craigallian.	*Killearn.
*Craigengillan.	*Kilmory.
*Craigie, Kilmarnock.	*Kilmun.
Crawford (two places).	Kintyre, Mull of (?).
*Doonside.	*Lanfine, Newmilns.
Douglas Castle.	*Loch Fergus (Loch Martna- ham).
Eglinton Castle.	Loch Goil (two places).
Erskine.	*Loch Lomond, Inch Con- nachan, and Elan-a-Vow.
*Forrestfield.	*Massan Bridge, Holy Loch.
Fullarton, Troon.	*Monkcastle.
*Gartshore, Kirkintilloch.	Mount Stuart, Bute.
*Gilkerscleuch, Crawfordjohn.	Rosneath.
*Girvan Water.	Saddle, Kintyre.
*Glenapp.	
*Glenfruin.	

SOLWAY.

Brunt Fir Wood, Dumfries.	Jardine Hall.
Castle Kennedy, Stranraer.	Langholm.
Castlemilk, Lockerbie.	*Loch Goosey.
Compton, Kirkcudbrightshire.	Monaive, Dalwhat Water.
Craigmuie, Glencairn.	St. Mary's Isle.
Dalry, Kirkcudbrightshire.	Shaw, Dryfe Water.
Dalswinton.	Shaws, River Nith (?).
Dumcrieff, Moffat.	Southwick.
Haleaths, Lochmaben.	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 Day¹ 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 ankylosed." 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.

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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.

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



P. QUADRILINEATA, SHOWING VARIATION IN THE CERATA AND VELAR PROCESSES.

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 *Proctotrupes*, 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.

SERPUS, 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.

CRYPTOSERPUS, 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 meta-thorax 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* (*Weingartneria* 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 *Hydro-lapatheum*. *Viola calcarca* 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 nigrifellus*, *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*, *Zanichellia 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 indigenuity 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 Petitiierreana* (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 indigenuity, 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*, *Scirpifolcus 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 = *Daboëcia*, *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, *Rafn.* 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. Boræi*, 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 *Couringia* 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 laevis, 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 *Epilobium hirsutum*, L. He gives the name *E. hirsutum* to the plant we know as *parviflorum*, and re-names *E. hirsutum* as *ramosum*.

Tilia ulnifolia, 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 *ulnifolius*. 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. I. 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 cœruleus*, 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 Rockies 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-idaea*, 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.*).

Najas 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. heterophyllum*, 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-tipping 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 Corriepron; *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 Æderi*, Retz., var. *ædocarpa*, 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, Corriebron, 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, Corriebron, 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. Chamædryis* 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), Beaulieu, 1884; Lawers, Mid-Perth.

R. mollissima, Wild., var. *pseudo-rubiginosa* (Lej.) [= *R. omissa* Déségl., var. *pseudo-rubiginosa* (Lej.)], Lawers, Mid-Perth.

var. *Andrzejovii* (Steven), Achnashellach, E. Ross.

var. *suberecta* (Woods) [= *suberecta*, Ley], a very distinct rose. Lawers, Mid-Perth; Applecross, Kinlochewe; Ullapool, W. Ross; Dingwall, East Ross; Beaulieu, E. Inverness.

R. villosa, L., var. *recondita* (Puget) [= *R. mollis*, Sm., var. *recondita* (Puget)], Speyside, Easternness; 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 MICRIPS, 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.
2 IS. 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 advan-
tage 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.

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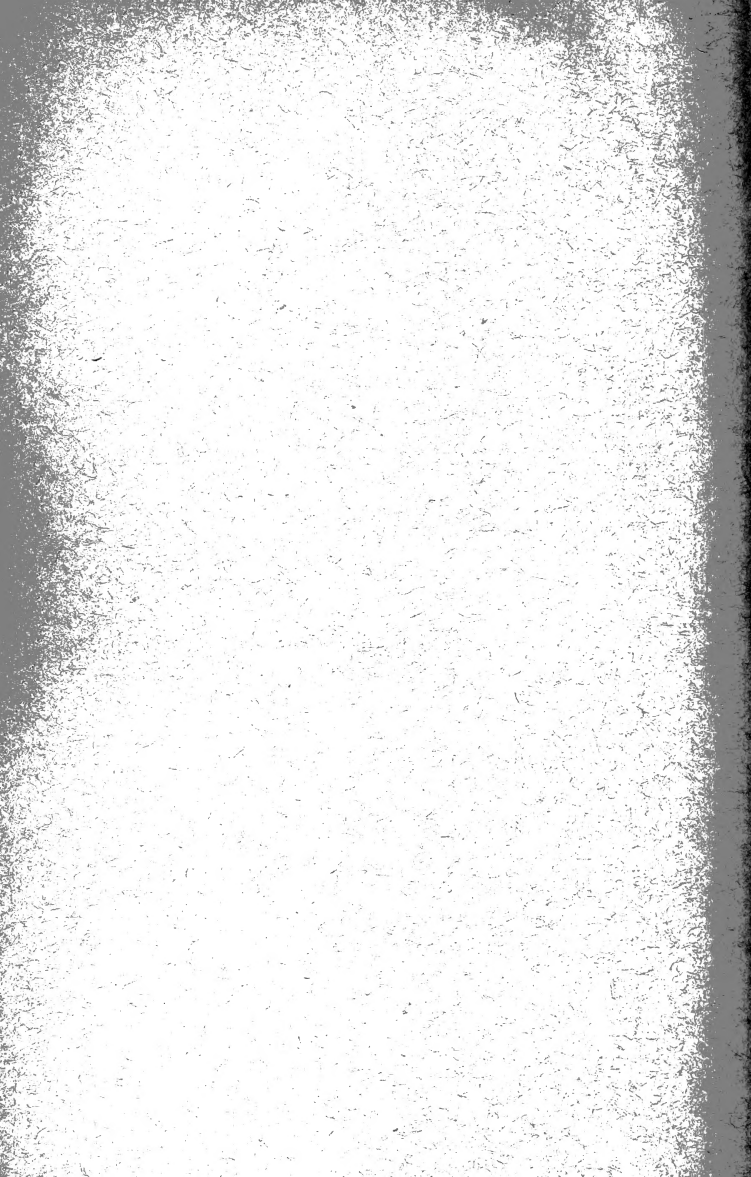
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