The Annals

OF

Scottish Natural History

A QUARTERLY MAGAZINE

WITH WHICH IS INCORPORATED

"The Scottish Naturalist"

EDITED BY

J. A. HARVIE-BROWN, F.R.S.E., F.Z.S.
MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION

JAMES W. H. TRAIL, M.A., M.D., F.R.S., F.L.S.
PROFESSOR OF BOTANY IN THE UNIVERSITY OF ABERDEEN

AND

WILLIAM EAGLE CLARKE, F.L.S., F.R.S.E.
KEEPER OF THE NATURAL HISTORY DEPARTMENT, THE ROYAL SCOTTISH MUSEUM, EDINBURGH

1910

EDINBURGH
DAVID DOUGLAS, CASTLE STREET
LONDON: R. H. PORTER, 7 PRINCES ST., CAVENDISH SQUARE

The Annals
of
Scottish Natural History

No. 73] 1910 [JANUARY

WHALING IN SCOTLAND FOR 1909.

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

THE only return I have got this year is from Herr Carl Herlofsen of the Bunaveneader station, Harris. I am sorry to say that he writes that the Sperm cow-whale reported to have been caught in 1905 was a mistake; it should have been marked as a bull instead of a cow. This, to me, is disappointing, as it just leaves us where we were, that cow Sperms do not come to northern latitudes. Where do they stay, and why are the young bulls driven by some impulse to see the world? The bulls got off the Scottish coast are invariably small, seldom exceeding 58 feet in length, the largest being the Norrona bull of 68 feet got in 1903, and the Bunaveneader bull of the same size in 1906. Judging from what Beale says, I fancy the big bulls keep with the cows, and the young bulls travel for some reason of their own, and get into colder and more invigorating latitudes.

The results of the whaling from Bunaveneader station are, as usual, very interesting from the variety of whales got there :—

B. sibbaldii . .	17 bulls,	averaging	72.9 feet.
Do. . .	13 cows,	,,	68.2 ,,
B. musculus . .	54 bulls,	,,	58.7 ,,
Do. . .	59 cows,	,,	57.8 ,,

B. borealis	44 bulls,	averaging	43.25 feet.
Do.	12 cows,	,,	43 ,,
Megaptera	4 bulls,	,,	42 ,,
Do.	1 cow,	,,	41 ,,
B. biscayensis	9 bulls,	,,	44 ,,
Do.	13 cows,	,,	45.8 ,,
P. macrocephalus	7 bulls,	,,	47.2 ,,

The *B. sibbaldii* included some enormous ones—bulls of 85, 85, and 82 feet long, and a cow of 81 feet.

The largest Sperm Whale was 49 feet.

The *B. musculus* had bulls 76, 74, 74, 72 feet, and cows 71, 70, 70, 70 feet.

The two largest *biscayensis* were of 51 feet each.

In one of the Sperm Whales there was a small quantity of ambergris, which sold for over £200.

The Shetland stations are unwilling to give information, partly on account of the trouble it causes, and partly on account of the annoyance they have had from those who have tried to get up agitation against them on behalf of the herring fishers by distorting facts or inventing libels.

I did not hear of anything of great interest being brought ashore in Shetland except three *Megaptera* at Olna station. The other three stations only got *B. musculus* and *B. borealis*.

Whales do not seem to be decreasing in numbers, but are said to be shyer and not so easily approached. The cold and stormy season was against whaling and all other fishing.

ON THE OCCURRENCE OF THE EASTERN PIED CHAT (*SAXICOLA PLESCHANKA*) IN SCOTLAND—A NEW BRITISH BIRD.

By Evelyn V. Baxter and Leonora Jeffrey Rintoul.

Plate I.

On October 19th, 1909, we were engaged in migration work on the Isle of May, and on that particular day we were rather inclined to be in a desponding frame of mind, as the wind which had been light off the East for one day before,

Saxicola pleshanka (*Lepech.*). Female.

had gone back into the West again; and we had always found that the West wind brought us few treasures. However we did our usual rounds without seeing anything unusual till noon, when, among the rocks on the East side, we put up a Chat, which we at once decided was not a Common Wheatear. It was considerably darker than *S. œnanthe*, looked smaller, and seemed to show less white patch on the rump when it flew; it was restless and rather wild, flitting from one rock to another in a hurried manner. Then began a most exciting chase, up and down the steep declivities and among broken jagged rocks until, at last, a lucky shot laid the quarry low. On picking it up, we found that we had got a bird quite unknown to us; nor did Saunders's "Manual" and various other books help us, for we could find no description which corresponded with it. Full of high hopes we consigned it to Mr. Eagle Clarke at the Royal Scottish Museum, to whom it also presented difficulties (added to by the fact that the bird was a female in autumn plumage), and being uncertain of its identity owing to want of adequate material with which to compare it, he sent the bird to Dr. Hartert at Tring, and to our great satisfaction our capture was pronounced by him to be a bird new to the British List, being the Eastern Pied Chat, *Saxicola pleschanka* (the *S. morio* of some authors), but of the white-throated form usually considered a distinct species, the *S. vittata* of Hemprich and Ehrenberg, now considered by Dr. Hartert to be merely a variety of *S. pleschanka*. The usual habitat of this species, according to Dresser, is Eastern Europe (Cyprus, Crimea, Lower Volga), east to Kashmir, S.E. Siberia, Tibet, Mongolia, and N. China; wintering in India, Abyssinia, and Arabia. It has also occurred in Italy and Heligoland. Our specimen proved to be a female; it is 5.7 inches in length, wing 3.6 inches. Head dull greyish-brown with faint indications of darker streaks; eye-streak buffish-white; ear-coverts brownish-black, much streaked with greyish-brown; mantle black, each feather broadly margined with greyish-brown, lighter at the tips; rump and upper tail coverts white; central pair of tail feathers black with basal third white, remaining tail feathers white broadly tipped with black, the outer ones more so than the inner; primaries,

secondaries, and wing-coverts blackish-brown with narrow pale brown margins; sides of the neck white tinged with buff; throat and centre of abdomen white; chest warm buff; flanks and under tail-coverts pale buff; axillaries black; under wing-coverts black, with paler edges; eyes, bill, feet, and toes black.

BIRD NOTES FROM THE ISLE OF MAY —AUTUMN 1909.

By Leonora Jeffrey Rintoul and Evelyn V. Baxter.

This autumn (1909) we again returned to the Isle of May, spending six weeks there from 13th September to 28th October. During our stay on the island we saw 91 species of birds, in spite of the fact that for a large part of the time the weather conditions were very unfavourable for migration observations. The first fortnight was characterised by the prevalence of light easterly winds, and many interesting birds put in an appearance, though there were no great numbers of any one kind.

We landed on the island about 2 p.m. on 13th September and at once set out to see what birds were present. We found few kinds, but among them was a Barred Warbler (*S. nisoria*) ♂, a Blackcap (*S. atricapilla*) ♂, and a Scarlet Grosbeak (*C. erythinus*) ♀. This was an encouraging beginning, and by next day a Whinchat (*P. rubetra*), a Bluethroat (*C. suecica*) a bird of the year, a Pied Flycatcher (*M. atricapilla*), and a White Wagtail (*M. alba*), had arrived. We also saw a Whimbrel (*N. phæopus*), which species we saw every day till 25th September, one to three birds at a time.

The 15th was a very poor day, but on the 16th we saw several Lesser Whitethroats (*S. curruca*) and a Yellow-browed Warbler (*P. superciliosus*), the latter in the lighthouse garden. It was an extremely restless little bird, flitting here and there and uttering its curious note, a loud ringing "pee," audible a long way off; it was an extraordinarily strong note for so small a bird. In the afternoon a Great

Spotted Woodpecker (*D. major*) appeared; it hopped and flapped clumsily from one grassy mound to another, feeding on the red ants which abound there. Next morning we put up a very wild Bluethroat in one of the gardens, saw several Redstarts (*R. phœnicurus*), a female Blackcap, several Garden Warblers (*S. salicaria*), and a Lesser Whitethroat. The first Brambling (*F. montifringilla*) of the season was observed and several Pied Flycatchers had come in.

On the 18th September there were more Blackcaps, all with the chestnut head, a Chiff-chaff (*P. collybita*), a Spotted Flycatcher (*M. grisola*), and a Pied Flycatcher. Quantities of Swallows (*H. rustica*) and House-martins (*C. urbica*) were circling round above the island, or sitting in long rows on the telephone wires; this is the only time we have seen any great numbers of these birds on the island. By next morning almost all the Hirundinæ had left, and the only new species that had come in was a Stonechat (*P. rubicola*). The 20th brought nothing of special interest, except that we procured a specimen of the Greater Wheatear (*S. œnanthe leucorrhoa*) with a wing measurement of 105 millimetres. On the 21st a Missel-thrush (*T. viscivorus*) and a Grey Wagtail (*M. melanope*), occurred, and next day we recorded a Lesser Whitethroat, a nice little flock of eight Siskins (*C. spinus*) and a Golden Plover (*C. pluvialis*).

After a poor day on the 23rd we had a fine lot of birds on the 24th, the new arrivals including Redstarts, a lot of Whitethroats (*S. cinerea*), several Lesser Whitethroats, a Garden Warbler, a Goldcrest (*R. cristatus*), another Yellow-browed Warbler, a good many Siskins, a Pied Flycatcher, a Brambling and several Tree Pipits (*A. trivialis*). We were much puzzled by the mysterious way in which one particular bird baffled our attempts to solve its identity. We saw a Warbler in a small patch of nettles and proceeded to try to walk it up, with no result; we returned in half-an-hour or so and saw the bird again, but on trying to make its nearer acquaintance it again vanished; this happened several times, and we could not think where the bird had gone to, for if it had flown out of the patch

of nettles we should have seen it. However, the mystery was soon solved; as we were standing quite silently just above a rabbit-hole, out of the burrow came a Common Whitethroat which, on seeing us, retreated far down the hole again, and we saw it several times afterwards taking covert in the same way.

25th September was a day with light east wind and fog in the morning and evening; it was one of our red-letter days. On going out we found more Wheatears, Redstarts, and Garden Warblers, a Yellow-browed Warbler, the first Chaffinch (*F. cœlebs*) of the season and many Bramblings and Siskins. A few Pied Flycatchers were also present, and down in Mr. Ross's garden a Red-breasted Flycatcher (*M. parva*). This bird's behaviour was very like that of the Pied Flycatcher, it flitted about in the same way, and, when it settled, ducked, jerking its wings. It was not very shy, and when procured was found to be a male. This is the first record of this bird in the Forth Area. We saw several White Wagtails and Tree Pipits, a Reed Bunting (*E. schœniclus*), and a Little Bunting (*E. pusilla*) which we were fortunate enough to secure; this bird is another first record for "Forth." It was not at all wild, and uttered a gentle little twittering song as it stood on the ground. Four Golden Plovers were running about on the high part of the island.

Sunday 26th was another good day, Redwings (*T. iliacus*) and Ring Ouzels (*T. torquatus*) had arrived, one of the latter being in beautiful summer plumage. We also observed the largest male Wheatear we have ever seen, evidently *S. œnanthe leucorrhoa*, Redstarts, a Whitethroat, two Lesser Whitethroats, a good many Willow Warblers (*P. trochilus*), and two Yellow-browed Warblers. These last-named are self-assertive little birds; one of them wanted to sit on a twig that had already been appropriated by a Lesser Whitethroat, and the impertinent mite hustled and bustled poor *curruca* till it had to quit, leaving *superciliosus* in possession. The Garden Warblers were feeding on large caterpillars, which looked very like those of *M. brassica*. Several times when we flushed one of these birds out of the cabbages, it rose holding a big larva in its beak,

flew to the wall and there proceeded to demolish its prey. When put off the wall it still stuck to its caterpillar, carried it off and no doubt ate it elsewhere. There were a good many Siskins about and very tame, a Spotted Flycatcher, a Tree Pipit, two White Wagtails and a Little Bunting, —which when put up out of some thistles sat on a wall, erecting the feathers of its head and uttering repeatedly a peculiar single note,—several Swallows, a Carrion Crow (*C. corone*), and a Dunlin (*T. alpina*), the last-named feeding on the grass among a large flock of Starlings.

On 27th September we saw only one Ring Ouzel, and the Warblers were much the same as yesterday except that we saw three Yellow-browed Warblers instead of two. A couple of Hedge Accentors (*A. modularis*) had arrived, White Wagtails and Tree Pipits were still on the island, and a small flock of Common Scoter (*Œ. nigra*) were seen in the sea off the North Ness.

The second fortnight of our stay opened in a promising manner, a light east wind blowing for the first two days, but after this the wind changed and we soon had a succession of fresh or strong southerly and westerly winds preventing much migration being seen on the island.

There were a great many Turdinæ on 28th September. Blackbirds (*T. merula*) and Thrushes (*T. musicus*) abounded. Redwings and Ring Ouzels were present in some numbers, while the scolding note of the Missel Thrush was heard and the bird was seen flying from one point of vantage to another. The Warblers seen included a Lesser Whitethroat, a good many Blackcaps and Garden Warblers, a Willow Warbler, a Chiff-chaff, and two Yellow-browed Warblers. There were still a good many Siskins, which species was much more plentiful on the Isle of May this autumn than in 1907 or 1908. On the 29th there were still a lot of Thrushes and Blackbirds, the other three members of this family having left ; also a good many Robins (*E. rubecula*), a few Redstarts, a Lesser Whitethroat, several Garden Warblers and Siskins, and two Wrens (*T. parvulus*), the first of the season. 30th September and 1st October were poor days ; we saw the last Lesser Whitethroat of the year on the former day, and the last Redstart on the latter. On

2nd October another Yellow-browed Warbler appeared; we found it hopping about among the oat stooks in one of the gardens; a good many Bramblings had come, and we saw the last of the Siskins. A Merganser (*M. serrator*) and a Jack-snipe (*G. gallinula*) were also seen.

On 4th October a flock of 38 Grey Geese passed over the island flying up the Firth, and next day we saw a Peregrine (*F. peregrinus*), and this fine falcon was also seen on the 10th. The 7th was the last day on which we saw the Common Wheatear (*S. œnanthe*), and on the 8th some Tree-sparrows (*P. montanus*) appeared; the new-comers were in very beautiful plumage, decidedly brighter than those that we had seen throughout our stay. Razorbills (*A. torda*) passed in flocks going south, and some southward movement was seen almost every day after this till we left.

We saw a Sandwich Tern (*S. cantiaca*) on the 9th October, and a Purple Sandpiper (*T. striata*) came to the lantern that night; this species occurred in small numbers off and on throughout our stay, but this was the only time it came to the light.

On 10th October the wind had fallen considerably, being now light off the south. Enormous flocks of Redwings kept coming in all day, the island was swarming with them, and the air seemed full of them too. One heard their note everywhere and put the birds up from behind every rock and tuft of grass. When we first went out in the morning we saw only a few Bramblings, but flock after flock came in, till by mid-day there were large numbers in every part of the island, and by afternoon the flocks were huge; there must have been thousands of these birds present.

Next day Redwings and Bramblings were still numerous, and a Wigeon (*M. penelope*) was swimming in one of the small pools. A Teal (*A. crecca*) on the 12th finishes the list of interesting items for the second fortnight.

The third fortnight of our visit began with high southerly and westerly winds and continued thus, with little intermission, till 23rd October, after which we had light northerly winds. On the 13th October a Tree Pipit and two Shore-larks (*O. alpestris*) were our chief records. We found the Shore-larks pretty shy, and very much given to rising and

flying away when we were still some distance off, but each time they rose they uttered their peculiar call-note, a high wild "Hi-yi-yi," quite unlike any other bird-note we know. Next day there was still one on the island, and we saw the first Brent Goose (*B. brenta*) that we have seen at the May; while the day after, the first Long-tailed Duck (*H. glacialis*) ♂, appeared close to the island, and we saw this species several times subsequently. On 16th October we again saw a Shore-lark and at 8.30 p.m. heard a great thud on the roof: on going up next morning to see what had struck, we found a Water-rail (*R. aquaticus*) lying dead on the leads. About 4 a.m. on the morning of the 17th the first Fieldfares (*T. pilaris*) of the season came to the lantern, as did a Blackcap, a Garden Warbler, and a few Thrushes; and on going out next morning it was evident that there had been a big Thrush immigration, as the island was full of them. Several Tree Pipits had also arrived and a Merlin (*F. æsalon*).

On 18th October there were a very great many Redwings, and we found that a good many had been killed at the light. We also saw a Ring Ouzel, a male Blackcap, a Willow-warbler and a Goldcrest. A Greenfinch (*L. chloris*) had put in an appearance, and an adult Common Gull (*L. canus*) came to the lantern at 7.30 p.m. 19th October provided the crowning hour of our life here, in the shape of an Eastern Pied Chat (*S. pleschanka*)—a new bird for Britain—as we have recorded in a separate article, *q.v.* A Blackcap ♂ and several Greenfinches are perhaps worth mentioning. The next two days we saw nothing noteworthy, but on the 22nd we got another Greater Wheatear, and next day a Mallard (*A. boschas*) and a Lesser Black-backed Gull (*L. fuscus*) were added to the list.

On 24th October another Yellow-browed Warbler had arrived, and was seen flitting about the rocks. At the south end of the island, we saw an immature Glaucous Gull (*L. glaucus*) and a Grebe in winter plumage, probably *P. auritus*. The last species we added to our autumn list was the Black Guillemot (*U. grylle*), of which species we saw two birds in winter plumage in the sea close to the island on 27th October. When we arrived on the island there were very few Eider (*S. mollissima*) to be seen, but

their numbers increased steadily till a very large flock was present. There were not so many waders this year as on our two preceding visits, and we saw fewer Arctic Skuas (*S. crepidatus*) harassing the Kittiwakes.

The frequent occurrence of Eastern species was very marked this year on the Isle of May, while many of our common species were present in very small numbers; for instance, we saw quite as many Yellow-browed Warblers as we did Willow-Warblers. The Eastern Pied Chat is an East-European, North-east African, and West and Central Asiatic species, the Yellow-browed Warbler has not been found breeding west of the Urals, the Red-breasted Flycatcher inhabits Central and Southern Europe, while the Scarlet Grosbeak and Little Bunting are North-east European and Asiatic species; and yet all these birds occurred on this small island so far to the west of their breeding-grounds; in the case of the Yellow-browed Warbler we saw at least ten different birds, and among them were females, all those hitherto recorded from the Isle of May being males.

With the exception of the Thrush, Redwing, Brambling, and Swallow, we saw no large number of any one kind of bird; Siskins were more plentiful than usual, but not in great quantities, and many birds, notably the commoner Warblers, were fewer in number than in other years. Common Whitethroats and Willow-Warblers were very scarce, Sedge-Warblers were conspicuous by their absence, and, to jump to another family, we saw no Snow Buntings at all.

It is once more our pleasant duty to thank the Commissioners of Northern Lights very heartily for having again accorded us the privilege of watching the autumn migration from this favourable station; to thank Mr. and Mrs. Maceachern, and Mr. and Miss Maccuish for their kindness and help while we were on the island, and also Mr. and Mrs. Ross and all our other kind friends for the help they gave us in allowing us to hunt their gardens and in many other ways. We greatly enjoyed our stay on the island, which was more successful ornithologically than either of our former visits. Special thanks are due to Mr. Eagle Clarke for his kindness in assisting us with the identification of our Chat, and for all the trouble he has taken to help us.

THE COTTON-SPINNER (*HOLOTHURIA FORSKALI*)—AN ECHINODERM NEW TO THE FAUNA OF SCOTLAND.

By James Ritchie, M.A., B.Sc.

There was recently presented to the Royal Scottish Museum, by Mr. A. Johnston, Mallaig, a Sea-Cucumber discovered in a crab-creel off Mallaig, towards the southern end of the Sound of Sleat. The soft character of the creature, which was over $6\frac{1}{2}$ inches long, its colour—on the dorsal surface very dark sepia, relieved by yellow in the interstices between the papillæ, the ground-work of the lower surface pale yellow, with sandy yellow to brown markings—and the arrangements of papillæ and pedicels, all indicated *Holothuria forskali*, Delle Chiaje. Examination of the exceedingly minute spicules confirmed the identification.

Holothuria forskali occurs in the Mediterranean and northwards. In British waters, which, under the name of *Holothuria nigra*, it was long thought exclusively to inhabit, it has been found on the south coast of England, and on the west to St. George's Channel, while many records tell of its presence on the west coast of Ireland, even to Co. Donegal.[1] Its presence in Scottish waters appears, however, to have escaped observation.

In introducing the Cotton-Spinner to the fauna of Scotland, I quote from an early description by Peach,[2] to show in what appropriate manner its English epithet became attached to it. He says quaintly: "This Holothuria is called by fishermen a 'Nigger,' and at times a 'Cotton-Spinner'; it is held by them in great detestation, from its throwing out what they call 'cotton,' of which more by and by, and from its slimy nature, and also because where the 'Niggers' are numerous and get into the crab-pots, it is very rarely that either crabs or lobsters are caught, and therefore they kill all that come near with their knives, because they

[1] Nichols, "Proc. Irish Acad." (3) xxiv. B., p. 245.
[2] C. W. Peach, "Ann. Mag. Nat. Hist." xv. 1845, p. 171.

do not like to touch them. This is not wonderful, for their appearance is anything but prepossessing. . . .

"It is extremely irritable, and on being touched or disturbed, throws out a bunch of white tapered threads about an inch in length, and one-eighth in thickness, . . . they stick to everything they touch, and from these the animals are called 'Cotton-Spinners' by the fishermen. This small bunch is drawn into a large mass of threads, so small that the finest sewing-cotton is not equal to it, and is no doubt one of the means of defence provided for its preservation; for I have seen a crab so completely entangled in it as not to be able to move, and a fish only able to get away after a long struggle."

Prof. F. Jeffrey Bell notes that in the neighbourhood of Falmouth, Cotton-Spinners are known to the fishermen as "Sea-Cows."[1]

The Royal Scottish Museum, Edinburgh.

THE OCCURRENCE OF A RARE CRAB, *PAROMOLA CUVIERI*, IN SCOTTISH WATERS.

By James Ritchie, M.A., B.Sc.

For many years there has existed in the collection of Crustaceans in the British Museum a fragmentary specimen, a "detached carapace, six inches in length, and the two chelipeds" of *Paromola cuvieri* (Risso), regarding which an accompanying portion of a letter tells that: "The crab shell was found on the shore of Ensay, a farm on the west coast of Mull, belonging to Lord Compton." Other than this scrappy note nothing is known of the specimen, and its occurrence remained unrecorded until Mr. J. N. Halbert mentioned it in discussing the first appearance of *P. cuvieri* in Irish waters.[1] Referring to the Mull specimen he says: "Possibly this occurrence has been regarded as somewhat

[1] "Proc. Zool. Soc.," London, 1884, p. 563.
[2] See J. N. Halbert, "Irish Naturalist," xvii. 1908, pp. 129-132.

insufficient for definitely including the species in the Scottish fauna. In view of the recent captures, however, it is highly probable that the crab will eventually be found in deep water off the western coast of Scotland."

Recently a specimen has been received by the Royal Scottish Museum which fulfils Mr. Halbert's prophecy, confirms the earlier record, and gives *Paromola cuvieri* a definite place among Scottish crustaceans. The specimen was forwarded to the Museum by Mr. L. G. Esson of Aberdeen, by whom it had been obtained from a trawl-boat which had captured it alive between the Flannan Islands and the Butt of Lewis, on 10th October, 1909. It is a moderately sized male, the detailed measurements of which agree very closely with those of the specimen recorded by Halbert.

Length of carapace (including rostral spine)	$6\frac{1}{2}$ inches.
Breadth of carapace	$5\frac{1}{8}$,,
Length of abdomen	$6\frac{1}{4}$,,
Length of right cheliped . . .	$21\frac{3}{4}$,,
Length of legs 2, 3, and 4, about . .	17 ,,
Length of fifth pair	7 ,,

Yet even this great size is considerably short of that attained by mature specimens in the Mediterranean Sea, where carapaces eight inches long are not uncommon.

The recent Scottish example is complete but for the absence of the second walking leg on the left side, and of the dactylopodite of the third walking leg on the right, the latter having evidently been lost for some time. Like the Cork example it is encrusted by many epizoites, most evident of which are small specimens of a delicate bivalve, Anomia, abundantly scattered over the carapace and legs, while a few twisted Serpula worm-tubes cling to the perpendicular side of the carapace, and rare zoophytes—a polyzoon, *Bicellaria ciliata* (L.), and two indeterminable species of Campanularian Hydroids, one of which is probably *Clytia johnstoni* (Alder)—straggle in the neighbourhood of the rostrum or on the limbs.

Since Mr. Esson forwarded the specimen to which reference has just been made, he writes to say that he is aware of the existence in Aberdeen of another specimen of

Paromola cuvieri, which also was captured off the west coast of Scotland.

Paromola cuvieri, like its near relatives, lives in moderately deep water, and for long was supposed to exist only in the Mediterranean Sea, and in the adjacent parts of the Atlantic Ocean, from the neighbourhood of the Canary Islands to the Coast of Portugal. In 1908, however, a

Paromola cuvieri (Risso), from between Flannan Islands and Butt of Lewis. (About $\frac{1}{7}$ natural size).

stray specimen was found alive in a shore pool on the south of Ireland, some distance to the west of Cork, and in recording this Halbert refers also to specimens dredged, during the investigations carried out by the Fisheries Branch of the Irish Department of Agriculture, 68 miles south-west of Ireland, in water from 627 to 728 fathoms deep.

The occurrence of the present specimen off the Butt of Lewis widens considerably the northern boundary of the tract within which *Paromola cuvieri* is known to live.

The Royal Scottish Museum, Edinburgh.

SCOTTISH *PHORIDÆ*, WITH TABLES OF ALL THE BRITISH SPECIES, AND NOTES OF LOCALITIES

By J. R. Malloch.

During the last ten years or so, considerable attention has been given to the study of this family, and, though a great deal remains to be done yet, the amount of knowledge we now possess is sufficient to justify me in placing before Dipterologists a brief outline of the genera and species, with notes of localities, so that should anyone have the necessary time and patience to pursue the study of these minute flies their labours may be lightened. In the generic divisions I have included those sub-genera which I created when I broke up the rather heterogeneous group *Phora*, Latr. ("Journ. Nat. Hist. Soc.," Glasgow, 1909). I do not intend to deal exhaustively with those species in the large section now known as *Aphiochæta*, Brues, as our knowledge of these is not such as to permit of very exact divisions being created, but it may be advisable to separate certain groups so that they may be reduced to a more workable size.

The *Phoridæ* may be at once known from all other *Diptera*, except the *Bibionid* genus *Scatapse* perhaps, by their peculiar neuration. The costal vein extends in very few cases beyond the middle of the wing, is considerably thickened, and generally bears on its anterior surface a projecting fringe of hairs. For the purposes of this paper, and to facilitate reference to Dr. Wood's detailed descriptions of the species in the "Entomologists' Monthly Magazine," the other thick veins which join the costal vein at different points in its course are referred to as the first, second, and third thick veins. The second, which looks like a fork of the third, is the radial vein, and in some genera it is absent. The thin veins, which are also of considerable importance in distinguishing species, cross the body of the wing, and are sometimes very inconspicuous. Various writers have tried to place the *Phoridæ* in lists in their 'natural' position, and the general body of opinion seems to be that their place is

between the *Lonchopteridæ* and the *Platyptezidæ*. The order in which the genera appears in this paper is not intended to indicate their rotation in the list.

Table of Genera.

1. (2.) Thick, flattened species, frons, legs, and costa without bristles, third vein unforked (=second vein absent). *Platyphora*, Verr.
2. (1.) Body of the usual arched shape.
3. (4.) Footpads and empodium absent, fourth thin vein absent, four pairs of fronto-orbital bristles, very minute species. *Metopina*, Mcq.
4. (3.) Footpads and empodium present.
5. (6.) Frons without bristles, vertical row present, costa fine haired. *Gymnophora*, Mcq.
6. (5.) Frons with bristles, costal bristles present.
7. (8.) Post-antennal and lower frontal bristles absent, three pairs of fronto-orbital bristles, and one pair of upper frontal bristles present; second vein absent, mid-tibiæ with row of outer bristles, eyes bare. *Trineura*, Mg.
8. (7.) Post-antennal bristles present, not more than two pairs of fronto-orbital bristles, eyes hairy.
9. (10.) Arista apical; antennæ with third joint slightly pointed in ♀, long and pear-shaped in ♂, only the vertical and upper frontal horizontal rows in addition to the post-antennal bristles present, second vein absent. *Conicera*, Mg.
10. (9.) Arista dorsal, head bristles in three horizontal rows of four each, post-antennal bristles present.
11. (24.) Post-antennal bristles reclinate.
12. (22.) Mid tibiæ with two strong bristles at base.
13. (23.) Second vein present (third vein forked).
14. (15.) Fourth thin vein abbreviated or indistinct, tibial armature weak. *Trupheoneura*, Mall.
15. (14.) Fourth thin vein generally distinct and always reaching the margin of the wing, or else all thin veins abbreviated (*Phora abbreviata*).
16. (17.) Third thick vein with short bristles. *Chætoneura*, Mall.
17. (16.) Third thick vein bare.
18. (21.) Scutellum with four bristles.

19. (20.) Sub-apical spine on mid tibiæ weak and small, situated on outer side near the tip, hind tibiæ with a row of small bristles on the outer hinder side in addition to any stronger bristles that may be present; anal protuberance long and finger like; first thin vein almost straight at base. *Phora*, Latr.

20. (19.) Mid tibiæ with sub-apical spine always well developed, and situated on the outer side at about one-third from the apex; hind marginal small bristles absent; first thin vein strongly bent at base. *Spiniphora*, Mall.

21. (18.) Scutellum with two bristles, one hind tibial bristle, sub-apical mid tibial bristle weak or absent; frontal bristles strong. *Stenophora*, Mall.

22. (12.) Mid tibiæ with one basal bristle; frontal bristles weak. *Parastenophora*, nov. nom.

23. (13.) Third thick vein unforked, second vein absent. *Hypocera*, Brues.

24. (11.) Post-antennal bristles not reclinate.

25. (26.) Post-antennal bristles erect. *Beckerina*, nov. gen.

26. (25.) Post-antennal bristles proclinate. *Aphiochæta*, Brues.

Platyphora, *Verr.*

Lubbocki, Verr. easily distinguished from all other *Phoridæ* by its *Platypteza*-like shape, and the absence of bristles. The only specimens I have seen were from New Forest (King).

Gymnophora, Mcq.

arcuata, Mg. The only species of the genus is easily recognised by the bare frons and legs. The wings have the thick veins much thickened, and the whole insect including the wings is extremely dark. Very common among ferns and undergrowth. I have seen it from various parts of Scotland, and take it here commonly.

Conicera, *Mg.*

1. (2.) Third antennal joint in ♂ about $2\frac{1}{2}$ times as long as its basal breadth. *atra*, Mg.

2. (1.) Third antennal joint in ♂ about $1\frac{1}{2}$ times as long as its basal breadth. *similis*, Hal.

Both species are about equally common, but owing to their somewhat similar appearance, they are not readily distinguished. I have taken both species at Bonhill and Cardross, and have seen *atra* from Cambridge, so that this species, at least, has a wide range.

Trineura, *Mg.*

1. (4.) Hind tibiæ with only one outer bristle on the basal half.
2. (3.) Fore tarsi much dilated; mid tibiæ with five to seven outer bristles in ♂ and three in ♀, larger species. *velutina*, Mg.
3. (2.) Fore tarsi hardly dilated; mid tibiæ with about five outer bristles in ♂, and two or three in ♀. *aterrima*, F.
4. (1.) Hind tibiæ with two outer bristles. *Schineri*, Beck.

The species of this genus may always be known by their velvety black colour, even in the net.

Velutina, Mg., is common almost everywhere, as is *aterrima*, F. I meet with them in almost every consignment of *Phoridæ* that reaches me from correspondents.

Schineri, Beck, is the scarcest of the three, but I have a good series taken near Bonhill, and I have seen it in the collection of Mr. Henderson, also from Clyde.

Hypocera, *Brms.*

This genus is distinguished from the other genera with reclinate post-antennal bristles, and two horizontal rows of four frontal bristles by the absence of the second vein. There are several well-defined sections in the genus which, while lending themselves to easy divisions, seem to point to the fact that they are not congeneric. It is, however, not desirable to increase the number of sub-genera beyond the present number merely to separate one or two species, more particularly when the present genus is not extremely bulky.

Table of Species.

1. (2.) Third thick vein with several large bristles at the base. *mordellaria*, Flu.
2. (1.) Third thick vein without large bristles, or with a single bristle.
3. (6.) Frons with a distinct ocellar tubercule.
4. (5.) Fore tibiæ with from two to four bristles in a row. *incrassata*, Mg.
5. (4.) Fore tibiæ with only one bristle. *carinifrons*, Ztt.
6. (3.) Frons without a tubercule.
7. (8.) Hind legs very stout, no bristle at base of third thick vein. *femorata*, Mg.
8. (7.) Hind legs long and slender, a large bristle at base of third thick vein.

9. (10.) Hind tibia bare (sometimes one weak bristle may be present about the middle). *citreiformis*, Beck.

10. (9.) Hind tibiæ with two bristles on the outer side. *vitripennis*, Mg.

mordellaria, Flu., seems to be confined to England; the only specimens I have seen were from the New Forest.

incrassata, Mg., I have seen this from the north of Scotland and the south of England, but have not met with it myself.

carinifrons, Ztt., seems to be generally common. I have met with it in abundance at Bonhill, and have seen it from the north of Scotland and also from England.

femorata, Mg.—This seems to be scarce, but generally distributed. Dr. Wood has taken it at Tarrington, Hereford, and has seen it from the north of Scotland. I meet with it occasionally at Bonhill, having a series of about a dozen specimens.

citreiformis, Beck., seems to be generally distributed. I generally obtain about half a dozen in a season at Bonhill off Umbelliferæ, and Dr. Wood records it from Hereford.

vitripennis, Mg.—I met with this species in abundance on an old moss-grown wall at Bonhill in June 1908. The insects were just emerging, and many were immature. Mr. J. E. Collin has bred it from bees' nests.

The European species of this genus are, besides the above, *coronata*, Beck., *Bernuthi*, Egg., and *agilis*, Mg. The species *agilis*, Mg., may be more properly referable to *Chætoneura* as the second vein is sometimes present. I have not seen any of these three species, but they may be turned up yet in Britain.

Chætoneura, *Mall.*

Generic description: Antennæ normal; arista dorsal; frontal bristles in two horizontal rows of four each; postantennal bristles reclinate; palpi normal; costa to beyond middle of wing, fringed; third thick vein with short bristles, second vein present; first thin vein distinctly bent at base; four thin veins present; the mid-tibial bristles are three in number, two basal and one sub-apical all sub-equal in size. Type: *thoracica*, Mg.

Table of Species.

1. (2.) Halteres black. *curvinervis*, Beck.

2. (1.) Halteres pale (yellow).

3. (4.) Thorax sometimes pale; hind tibiæ with four bristles, a pair in the upper third, one in the middle of the hind margin, and one close to the tip on outer side, costa thickened. *thoracica*, Mg.
4. (3.) Thorax black, costa normal.
5. (6.) Hind tibiæ with five or six bristles. *urbana*, Mg.
6. (5.) Hind tibiæ with only two bristles. *fennica*, Beck.

curvinervis, Beck, a very common species under carrion, in the spring and early summer. Probably to be met with everywhere.

thoracica, Mg., generally distributed, and sometimes common. I have bred it from moles' nests. The darkening at the tip of wings is, I find in all my specimens, confined to the ♀ ♀, the male showing a hardly perceptible yellower tinge.

urbana, Mg. I bred this along with the last from moles' nests. It is not a rare species. I meet with it every season in fair numbers while sweeping.

fennica, Beck. The rarest of the genus. I have only met with 4 ♂ ♂ and 1 ♀ at Bonhill.

Spiniphora, *Mall.*

Generic description: Antennæ normal, arista dorsal, frontal bristles as in *Chætoneura*, mid tibiæ with three equally strong bristles situated, two on the basal third, and one on about the base of the apical third on the outer side, costa moderately long, second vein present, third thick vein bare, first thin vein bent at base, four thin veins present. Type: *maculata*, Mg.

Table of Species.

1. (6.) Scutellar bristles, four in number, of equal size.
2. (3.) Wings with a spot at origin of the first thin vein; mid tibiæ with two inside spurs. *maculata*, Mg.
3. (2.) Wings unspotted; mid tibiæ with only one spur.
4. (5.) Costa to about the middle of wing; hind tibiæ with four bristles. *Bergenstammi*, Mik. (= *domestica*, W.).
5. (4.) Costa to beyond the middle; hind tibiæ ♂ with three bristles. (The ♀ has several extra bristles on the upper side.) *dorsalis*, Beck.
6. (1.) The anterior scutellar bristles reduced to mere hairs; hind tibiæ with two bristles. *erythronata*, Strobl.

The species of this genus seem to be confined to England. I do not remember to have seen any Scotch specimens of any species.

I regret that I have to sink Dr. Wood's species, *domestica*, as only a synonym of *Bergenstammi*, Mik. I do so because, in a lot of *Phoridæ*, sent me by Dr. Jenkinson of Cambridge, there is a pair taken in cop., which represents both species. Dr. Wood had some doubt about their being distinct species, but the evidence was so strong that such was the case that he decided to describe *domestica* as new. The ♂ has only one pair of dorso-central bristles, while the ♀ has two pairs. In *maculata*, which I have only seen from Cambridge, I find that there are always two pairs of dorso-central bristles.

(*To be continued.*)

DALYELL'S SCOTTISH HYDRACHNIDS.

By Wm. Williamson.

The Hydrachnids have not contributed much in past years to the Natural History literature of Scotland. It was therefore with a hope that something worth might be in store that I turned to Dalyell's "Powers of the Creator," which Mr. Wm. Evans kindly brought under my notice. In this I have been greatly disappointed, and, but for the record of localities and some species which can be recognised, it seems to me that Dalyell's contribution is of little value. Notwithstanding that, at the date of publication (1851), Hydrachnidæ had been divided into genera, Dalyell, nevertheless, preferred to revert to Müller's arrangement because he considered it more suited to the popular nature of his work. Had he followed out, instead of deprecating as he did, the minutiæ which the writers later than Müller gave attention to, we might possibly have had a contribution of some value. The only dates he gives for his observations are 1802 and 1809, and if, after the long interval between that and the date of publication, he depended on memory for his facts, then some of his statements may be accounted for. It would be interesting to know what caused the "fits" which he observed some hydrachnids to have taken, or how they managed to nibble the stems of equisetum (? limosum), or how many females contributed their quota of eggs to the mass which weighed down the leaves of a privet dipping in the water, and of which one twig with

eggs accounted for close on ten thousand larvæ. Even the predatory habits of hydrachnids are magnified in an extraordinary degree.

Only thirteen species are accounted for in the two plates accompanying the text, in which some of the species are not even mentioned. In addition to these *Hydrachna papillator* is mentioned, but not figured, in connection with some low temperature experiments.

Hydrachna cruenta.—This was established by Müller, but exactly what species he had before him has never been satisfactorily determined. In 1884 Krendrowsky redescribed the species. Dalyell records *H. cruenta* burrowing in the mud of a small pond at Canty Bay. His figure of the imago is insufficient to assist in determining the species, but he figures the larva hatched out from eggs laid by his *H. cruenta.* This does not show the peculiarly characteristic form of *Hydrachna* but rather that of the Hygrobatidæ. On the strength of this we may conclude that Dalyell's species does not belong to the genus *Hydrachna* but to some other genus. A figure of one of the limbs is also given, but it is faulty as it does not show the segments, and its equipment of hairs is certainly drawn from imagination.

Hydrachna extendens.—This also was established by Müller, and later it was taken by Latreille as the type of his genus *Eylais.* Dalyell's figure is more informative than the previous one. The epimera bear some resemblance to those of *Eylais extendens*, but, what is more important to us, he shows distinctly the oral disc peculiar to *Eylais.* From one or two of his observations I believe this to be *Eylais extendens* (Müll.).

Hydrachna crassipes.—The figure of this species, with its posterior papillæ, shows it, without doubt, to be *Unionicola crassipes* (Müll.).

Hydrachna varia.—This must be added to the list of species which cannot be now identified. The name apparently is appropriate as the figure shows it to be at variance with all other hydrachnids, being figured with *five* pairs of legs.

Hydrachna ferox, *H. sparsa*, *H. spinifer.*—These are only figured but not described. The figures afford no information beyond the colouring of the mites.

H. punctata, which is in a position similar to the three foregoing species, is recorded from the Braid Hills Pond. The separate figure of the palpus does not show the segments.

Hydrachna placida is described by Dalyell as, "body, tending to globular, about half a line in diameter; eyes, two on the

anterior surface, black, considerably apart; limbs with scanty hairs; colour greyish-brown, lighter on the middle of the back. Taken in a small pond on Braid Hills." The paucity of hairs on the limbs is suggestive of a species of *Hygrobates*.

Hydrachna caudata and *H. albator* are undoubtedly *Arrhenuri*.—The figures show distinctly the generic subdivisions to which each species belongs, but the absence of one or two details does not allow of a closer verification of the specific names.

Hydrachna geographica and *H. maculata* may correspond, the first to *Hydrachna geographica* (Müll.), and the second to *Limnesia maculata* (Herm.), though in the latter the colour is yellow instead of red.

Summarising the foregoing, the result appears to be as follows:—

Dalyell's Species.	Equivalent in Present Day Nomenclature.
H. cruenta	non *Hydrachna cruenta* (Müll.), Krend.
H. extendens	*Eylais extendens* (Müll.).
H. Crassipes	*Unionicola crassipes* (Müll.).
H. caudata	? *Arrhenurus caudatus* (Geer.).
H. papillator	? *Arrhenurus papillator* (Müll.).
H. albator	? *Arrhenurus albator* (Müll.).
H. geographica	? *Hydrachna geographica* (Müll.).
H. maculata	? *Limnesia maculata* (Herm.).
H. varia. *H. ferox.* *H. sparsa.* *H. spinifer.* *H. punctata.* *H. placida.*	Species named by Dalyell, the identification of which is not possible.

4 Meadowbank Terrace, Edinburgh.

THE FALSE-SCORPIONS OF SCOTLAND.

By Robert Godfrey, M.A.

(*Concluded from p.* 163, *No.* 71, *July* 1909.)

Obisium muscorum, Leach, 1817.

O. muscorum was first recorded for Scotland in 1817 by Leach, who adds to his original description of the species the remark,—"In montibus Caledoniae vulgatissime, in Anglia rarius." Leach was in

Edinburgh for a time, taking his M.D. degree in 1812, so that the mountains he refers to are probably the Pentland Hills. His type specimen, still preserved in the British Museum, is marked "Scotland."

At the present day this is without doubt the most abundant and generally distributed of all our False-scorpions, occurring from the edge of the tide to the inland moorlands and mountains. At the mouth of the Avon, between Stirling and West Lothian, it lives among the refuse at high-water mark; and in Mid and East Lothians tenanted nests of the species situated in similar positions have come under my notice in the autumn months. In woods *O. muscorum* lives among the masses of dead leaves lying in damp situations, and on open ground it is obtained in abundance under stones. I have taken it among damp earth on the Castle Rock in Princes Street Gardens, Edinburgh, and on the slopes of the Pentlands at Dreghorn. Inland, its area of distribution ranges over the woodlands and even the open moors, but, so far as my observations go, it stops short at the border of the true mosses. In the wild forest of Rothiemurchus it is quite common; and in some parts of Scotland it ascends to a considerable height, being numerous for example on the range that lies between Glen Ogle and Edenchip Glen in Perthshire to a height of 1500 feet at least, and on the slopes of Ben Cailleach in Skye. It occurs also under the bark of trees, both living and dead, and is the only species I have so far found in such situations in Scotland.

Throughout the middle and the southern portions of Scotland its distribution will probably prove to be universal. Mr. James Waterston informs me that he has found the empty nest on the island of Arran, and I have examined tenanted nests on Island More, a small island in Loch Fyne, near Lochgilphead, and on the Maiden Island, Oban; I have also seen this species on the Rough Island, in the Solway Firth. Mr. Wm. Evans, in his notes, calls the species "ubiquitous." Unless, however, the nest is known, the real abundance of the species will never be suspected; as an illustration of this I may mention that during a fortnight in Argyll in July 1901, although seventy-one nests—most of which were already empty—came under my notice, only one solitary individual was observed moving free.

Obisium muscorum is abroad nearly the whole year round; the only month in which I have not found it active is October, but this gap is most likely due to insufficient observation alone. Its habits, during a free state, do not present any features conspicuously different from those of its allies. It is more active than the blind species, but less so than *Chthonius rayi*. Its degree of activity depends greatly on the place of its abode, those under stones being much less active than those living among dead leaves and brackens.

In the former situation, after the stones have been turned up, it gives an observer abundant opportunity of watching it; when disturbed it draws back its pedipalps to the sides of its fore-body and runs backwards, and it may repeat this backward run several times before it loses fear of danger and begins its forward advance with outstretched pedipalps and open pincers. In the latter situation, however, it moves so rapidly that the observer is more eager to catch it than to watch its actions.

The only prey which I have seen *O. muscorum* carrying has been two species of springtail.

Its nest-building habits are by far the most interesting, and, being somewhat easily investigated, they prompt us to correct lines of observation in other species. The nest of *O. muscorum* in its finished state resembles a blob of earth or sand corresponding closely with the surface on which it rests. The favourite site is on the under side of a stone, but other localities—such as a piece of bark, the face of a rock covered with sheltering herbage, or a compact bed of moss growing on a tree stump—may be chosen. At Crieff I once found on the white inner surface of a piece of rotten fir-wood lying on the ground a nest formed of tiny granules of rotten wood harmonising most beautifully with its surroundings. But, wherever placed, the nest harmonises so well with the adjacent material that to the uninitiated it resembles merely a piece of dirt accidentally lying where it is. This wonderful harmony arises naturally from the method employed in the construction of the nest. When the female chooses the site of her future home, under a stone let us say, she forms on the surface of the stone a little domed arch —about four millimetres in diameter—out of the particles of earth and sand on which the stone is resting. She gathers the particles in a moist condition and attaches them together so carefully that even at this stage the nest is quite firm, and practically impervious; the inner surface is also beautifully smooth. After some days she spins on the inner side of the dome and over the enclosed surface of the stone, a close firm lining of the finest silk, which renders the whole structure compact and durable, and probably keeps it dry. When on a stone the dome-shaped roof of the nest is complete and free from attachment to any other object; but in cases where the nest is placed between close-fitting flakes of bark on a tree it may be attached above as well as below, that is to say to the two flakes between which it is placed; in such cases the built part of the nest consists merely of a very narrow ring of earth and rotten wood, within which, as well as on the two surfaces of bark to which it is attached, is the white silk lining.

Nest-building for the purposes of reproduction begins in February, but is not in full swing till March, and new nests rarely contain any traces of silk either on the inner surface of the dome or on the

surface of the stone before the latter half of March. The earliest date on which I have found a female in her nest is February 14 in Dumbartonshire, but from March 10 onwards I have found them commonly.

Inside this nest the female remains till her young are fully developed and ready to forage for themselves. The eggs, twenty to thirty in number, are produced normally about the middle of March, and appear at first as a small white mass attached to the genital aperture on the under side of the hind-body; this white spot gradually expands, till, after the middle of May, it envelops the whole hind-body with the exception of the upper surface, and the creature is then embedded in the swollen embryonic mass, which projects below, behind, and round the sides of the hind-body, and forms a margin equal in breadth to the cross diameter of the hind-body itself. At the beginning of June the tiny white youngsters attached to the female can be distinctly made out, and by the middle of June they are ready to give up that attachment to their parent which has been maintained throughout the entire development from the egg to the perfect False-scorpion, and to go forth from the nest on a free life. The earliest date on which I have seen the young moving free is May 25, at Castlecary.

A note on the adult and young from my West Lothian notebook, June 25, 1901, may be of interest here. "Nests of *O. muscorum* were fairly common on a rocky patch by the wayside near Preston House, but they were for the most part empty and generally wasted, as if to indicate that they were no longer required. Eventually one with an opening in it proved to contain young. The little creatures, a dozen or so in number, were venturing forth from their retreat, and as they wandered among the tiny cracks and crevices of the stone, they went through the antics of the adult perfectly. In moving about they held their pincers well forward, and kept opening and shutting them; and even when there was nothing to cause any suspicion, they would suddenly dart backwards in the manner so characteristic of this group of creatures, as if an enemy lurked in a part of the stone they had touched. They ran backwards rapidly, and far too, considering their size. They were very light in colour, with a greenish hue most pronounced on the carapace and with a pinkish tinge on the pincers. The adult was not to be seen, being probably out on a hunt for food. I found other nests closed, which contained the adult and her young. The young of one of these nests, on its being opened, soon shewed that they were ready for active life, as one after another came forth to enjoy its new freedom, and seemed to be intent on wandering away without any intention of returning. One brood consisted of twenty-four individuals."

At the beginning of July *Obisium muscorum* is again laying, but

this late-laying group is probably quite a different set of creatures from the spring-laying group. So far as I have observed very few individuals take part in the autumn laying. August 12 is the date at which I have found this autumn brood able to begin a free life.

In the yearly cycle of *O. muscorum's* history, autumn is marked off as the time for moulting. The presence of False-scorpions' remains in nests in autumn and winter had been puzzling me a considerable time, and the explanation of moulting did not occur to me till I discovered the creatures in the act. While endeavouring to discover *Chelifer latreillii* under the bark of trees at Aberlady on September 26, 1903, I came on the nests of *O. muscorum* under the bark and between different layers of the bark. Several were opened without result, but ere long occupied nests were discovered containing specimens of *O. muscorum* in process of casting their skins. One creature was caught in the act, and in another case the living *muscorum* was resting in the nest beside its cast skin. In the case of the half-moulted individual the liberated head was facing in the opposite direction from the discarded head skin, but the creature was motionless and may have died in the process of moulting. In the cast-off moult found in the other nest there was no trace of the hind-body, but the fore-body remained nearly intact, with the basal joints of the legs and the position of the eyes prominently marked; the pedipalps attached were perfect to the very tips of the pincers, and the skin of the cheliceræ was observable inside the skin of the fore-body, having been drawn into that position during the animal's retreat. As usually happens with all creatures after their moult, *O. muscorum* shows very little colour, with only a faint greenish tinge on the carapace, pedipalps, and legs, and a dirty brown abdomen; it is also very tender and listless and not at all anxious to move. As soon as its skin hardens sufficiently, the creature leaves its nest and resumes its active life.

The period of moulting is not constant. The normal period is August and September, but even as early as June 21 I have seen half-grown light-coloured individuals inside nests which, in my opinion, they were using for moulting purposes.

One other question remained for solution, "Does *O. muscorum* hibernate?" My opportunities of looking for these creatures in winter had been so meagre that I could not infer from the absence of any personal records in my note-books that they do not hibernate. I rather inclined to believe that they did, and during the winter of 1903-4 in Ayrshire, when laid aside from active work, I set myself to solve this problem. I opened many nests of the species, only to find them either empty or containing the cast skins of last autumn's moult, but at length on March 18, 1904, I obtained what I sought. On that day I found a very immature specimen inside its nest alive

and active when disturbed, and as this was the only individual in such an immature condition that I had ever seen in winter, I had no difficulty in concluding that it was hibernating in the nest from which I took it. I did not find the adult in its nest in winter, unless when it had already retired to lay its eggs. On March 31, 1904, however, I did find in a nest a specimen smaller than the average and quite unswollen, but I knew from the absence of silk in this particular nest that the creature was busy constructing it. In the following year I found an immature individual in a nest in West Lothian on March 10.

In Kirkcudbrightshire, however, in 1907 we obtained several immature individuals hibernating in their cocoons on January 5, and Alistair Urquhart found an adult hibernating in its cocoon on January 2. All my information goes to prove that only in rare instances does the adult *O. muscorum* hibernate; even in midwinter the species can be obtained quite numerously by shaking the dead leaves that accumulate in the woodlands.

The nests of *O. muscorum* resist wear and tear admirably, and remain attached to their original position long after they have been deserted; in some cases they are tenanted by mites or other creatures, and repeatedly I have found a cake of minute black eggs in these nests, showing that some other animal has discovered how suitably the discarded False-scorpion's nest serves its own purpose as well.

Chthonius tetrachelatus (Preyss.), 1790.

As a Scottish species *Chthonius tetrachelatus* was first made known by Mr. Wm. Evans, who took two specimens under a piece of wood in an old orchard at Culross on April 26, 1901, and six more on August 17 of the same year under stones at the foot of one of the pit-bings near Kinneil, Bo'ness. No further records were made till 1904, in which year I obtained the species in the counties of Ayr, Perth, Argyll, and Midlothian. Since then it has been detected in the counties of East Lothian, Fife, Ross, Renfrew, and Kirkcudbright; and our present knowledge indicates that *Ch. tetrachelatus* is, next to *O. muscorum*, the most abundant and widely-distributed of our Scottish species.

Its haunts are mainly in natural ground, both on open hillsides and in woodlands. At Kilminning, in Fife, it swarms under stones lying on a fine pebbly sub-soil a few yards above high-water mark, as many as ten individuals occurring under one stone. At Portincross in Ayr, on the Maiden Island and at Shirvan in Argyll, and at Cambo in Fife, it was found in the neighbourhood of the sea, but not within the influence of the tide; in these localities it occurs under stones imbedded in the soil.

Besides occupying haunts in the open, however, *Ch. tetrachelatus*

is a close attendant on man, and lives and flourishes commonly in hothouses, as well as more rarely about farm steadings. I first ascertained this fact in the orchid-house of Stronvar, Balquhidder, July 21, 1904; there the potted plants are set individually on the top of inverted flowerpots to be beyond the ravages of slugs, and the False-scorpions live inside the empty inverted pots. In the hothouses of the Edinburgh Botanic Gardens it occupies similar retreats and is found also under bricks and other objects lying on the ground and on the shelves; individuals of the pale yellow colour conform very remarkably to the similarly-coloured bricks and flowerpots on which they are resting and can with difficulty be detected unless they move. This species, as well as *Ch. rayi*, came under my notice on a log in the stackyard of Newhouse Farm, Dunbar, in May 1906.

In moving slowly, *Ch. tetrachelatus* keeps its pedipalps forward, with the pincers expanded, and moves them very neatly as necessity requires to enable it to pass through narrow places. If it is interfered with, it retracts its pedipalps towards the sides of the fore-body and runs backwards in a series of short jerks. It shows the same tendency as *Ch. rayi* to turn round quickly and face an obstacle behind it, though specimens liberated from their nests are less active in doing so than those moving free.

I have seen this species with prey on a single occasion only, near the town of Interlaken, Switzerland, in Sept. 1902; the creature was carrying the food in its cheliceræ.

Chthonius tetrachelatus forms a nest for the various purposes of moulting, hibernating, and bringing forth its young. Externally the nest cannot certainly be distinguished from those of other *Chthonii* and of *O. muscorum*, and even internally it often shows similar features. I have found the nest (Sept. 15) formed wholly of earth without any lining, and infer that this species, like *O. muscorum*, begins by making the earthen cell on the stone. Thereafter a beautiful white silk lining is added to the inner surface of the earthy dome and to the surface of the stone. In many nests this is the whole structure; but in the perfect nest formed for the purposes of moulting and reproduction, a silk cocoon of exquisite texture, and quite separate from the first lining, is made inside the silk-lined nest, and the *Ch. tetrachelatus* lies snugly hid within this inner cocoon. I have seen as many as twelve occupied nests under a single stone. On one occasion, Sept. 7, 1905, I found a *Ch. tetrachelatus* contenting itself with a narrow deep opening in a stone for its nest, the entrance of which it had covered over with a layer of silk alone.

In September this species is commonly found moulting inside the double-lined nests; the creature casts off the skin of fore-body, legs, and pedipalps in one piece, and after moulting is much

lighter in colour; it leaves the cast skin in the nest and emerges again to resume its free life.

Adults as well as young hibernate solitarily inside their nests. As early as mid-September and as late as mid-April solitary young may be found inside these hibernating nests; the adults do not seem to retire so early, but in midwinter and in spring they too are lying up in their nests. In hothouses this species may not find it necessary to hibernate, or at least to remain as long inside the nest; in the Edinburgh Botanic Garden hothouses I have found the creature free on February 28. But in the open it is certainly the rule for the species to hibernate, as no specimens living free have come under my notice in midwinter. In January 1907, at Kippford, Kirkcudbrightshire, Aird and Robert Whyte and I opened many nests containing the hibernating False-scorpions. In January and March 1904, I found three nests occupied in Ayrshire. In April 1906, at Oban, I took three immature individuals out of nests—one on April 11, and two on April 18—and an adult out of a nest on April 10. And also in the spring of 1905, on the island of Grand Bé, in Brittany, I found this species in nests on March 31 and April 19.

I admit, however, that I may have passed over free individuals in midwinter, as the nest is much more conspicuous than the creature itself, and often the creature when seen to emerge from the nest is barely distinguishable on the stone. On being released from its hibernating nest, the animal is active enough; sometimes it emerges slowly but at other times it darts off swiftly backwards. One under observation happened to be touched behind by a large mite, and it promptly turned round to face the cause of disturbance; the same individual, while I watched it, cleaned its nippers in its chelicerae.

So far I have discovered an autumn brood only in *Ch. tetrachelatus*. At Shirvan, Lochgilphead, on Sept. 15, 1904, I detected two very immature specimens moving along a crack in a stone, and I kept a sharp lookout thereafter for the brood nest. At length on the 20th, I opened a double-lined nest which contained a female and eight young within the inner cocoon, and on the following day I got another similar nest containing also a female and eight young. In 1905, at Kilminning in Fife, the young were abroad by Sept. 7. The young are white or colourless, with a faint pink tinge on the nippers.

Chthonius orthodactylus (Leach), 1817.

This rare species, about which nothing seems to be known in Britain beyond the records of its occurrence, has been taken in two localities in the "Forth" area—at Morningside, Edinburgh, and at Aberlady, East Lothian—by Mr. Wm. Evans.

Chthonius rayi, L. Koch, 1873.

The first Scottish record of *Ch. rayi* is from Oban, where Mr. Wm. Evans found a specimen in April 1894. Seven years later, April 27, 1901, he took the next Scottish specimens, six in number, at Kincardine-on-Forth under pieces of wood on the banks of a muddy ditch. One of these he gave me, in the hope that I might procure the species on the south side of the Forth at Bo'ness, where I was then stationed; and on June 24 I found a very immature specimen that had apparently just entered on a free life among some wet loose earth in a wood near Dykenook, Kinneil. I took my first adult specimens on May 16, 1902, under stones near Dalgety heronry in Fife, and since that date I have taken the creature quite commonly on the Fife shore.

Our present knowledge indicates that on the east coast this species is widely distributed along both shores of the Forth, and is found also north of Fife Ness in the "Tay" area, and that on the west it has a great stronghold at Balmacara in Ross-shire—where about two hundred specimens were taken in the autumn of 1906—and haunts in Argyll and Kirkcudbright.

Chthonius rayi, in my experience in Scotland, has mainly a maritime distribution, occurring under stones and on the sandy soil at high-water mark, as well as in the shore woodlands. The most likely spots in which to find it are on the under surfaces of stones which lie along the margin between the shore and the adjoining fields or plantations; in such localities it is often found associated with *Chernes dubius*, and occasionally with *O. muscorum*, and exceptionally with *I. cambridgii*.

The only inland record I have in Scotland is that of one obtained near Dalbeattie by Aird Whyte. In this connection, however, Mr. Wallis Kew, who considers *Ch. rayi* the commonest False-scorpion in England, says that he has found it in suitable places wherever he has searched for it—that is, in England—and he believes it to be as common inland as near the coast. That *Ch. rayi* will yet be proved to be a common species inland in Scotland also is hinted at by its present occurrence in haunts that have no immediate connection with the sea. For, like its congener, *Ch. tetrachelatus*, it is an attendant on cultivation, and lives in conservatories and in farm steadings as well as in the open woodland or hillside. George Barbour and I have taken it in a tomato-frame and in a conservatory attached to Kirkmay House, Crail; Aird and Robert Whyte have procured it in the hothouses of the Edinburgh Botanic Garden, and I have obtained it in the stackyard of Newhouse Farm, Dunbar.

In Scotland *Ch. rayi* has not been detected on trees, but in Brittany, where the species abounds everywhere, I found one under

the thick bark of an ivy-clad willow, about five feet from the ground, on April 10, 1905.

When moving, its normal line of progression is forward; so long as it is undisturbed, it goes slowly, keeping its nippers expanded as it proceeds; but, on being disturbed, it runs rapidly in either a forward or a backward line. I have seen one, disturbed by a centipede, run rapidly forward, and when again overtaken, as it was in the course of the next second or so, repeat the rapid motion. On the other hand, when touched by a pin from behind, it may dart rapidly backwards over the obstruction. But its normal procedure, when interfered with from behind, is to give a sudden jerk round so as to face the object of annoyance, and at the same time make a hasty retreat of a quarter-inch or half an inch from the cause of the disturbance, and if still suspicious—which is not usually the case—to continue its backward run. By tormenting it with a pin from behind, I have caused the creature to display these sudden "right-about turns" repeatedly. In its backward run, it has the pedipalps retracted to the sides of the fore-body, but keeps its nippers directed outwards a little on either side from its head.

Twice I have observed *Ch. rayi* with its prey, the victim on each occasion being a mite. On April 17, 1905, in Brittany, I watched one carrying a mite in its chelicerae, and turning the mite about in both chelicerae. Again on Sept. 29, 1905, I saw an immature *Ch. rayi* with a mite, near Kinkell, Fife; and as shortly before, during my examination of the same stone, I had noticed a mite come in contact with a young *Ch. rayi* and escape again, I believe I just missed seeing the capture made.

I had long suspected that the breeding habits of this species would be similar to those of *O. muscorum*, but it was not till September 1903 that I discovered, in their stronghold at Fife, this most interesting part of their economy. I happened to turn up a stone on which there were three individuals; one of these was extremely active, and, in its efforts to escape from me, it entered a cranny where another *Ch. rayi* was lying hid. Across this cranny there had originally stretched a silk covering, but this had been ruptured and only its remains were now clinging to the edge of the cranny; the creature within the cranny was a female with her embryonic mass attached to her under surface. She was living in the simple recess, but she probably found that such a convenient cranny fitted her purposes as well as a nest formed on the flat surface of a stone would have done. I searched on, and after finding a young *Ch. rayi* newly emerged appearing merely as a white speck moving on a stone, and another *Ch. rayi* a little farther advanced, I turned up a stone containing three *Ch. rayi* and three *Ch. dubius*. On this stone there was a conspicuous nest of the same style as that of *O. muscorum* but double the size. On examination this proved to be two nests adjoining each

other ; in one of them was the empty cocoon of an Ichneumon with the remains of a *Ch. rayi* beside it, and in the other was a *Ch. rayi* with her embryonic mass attached. A third nest contained a female *Ch. rayi*, with eight young ones just beginning an active life and living free beside her. This nest measured four millimetres across by three millimetres high.

On September 15, 1905, at Kilrenny, Fife, I again found *Ch. rayi* inside a nest with her embryonic mass attached, and in August 1906 I opened a nest at Balmacara, Ross-shire, which contained the adult and fourteen free young. In the latter district, on August 27, I saw on a stone a young *Ch. rayi* just beginning its free life.

Externally the nests are formed of sand and earth particles and chance ornaments, and they are lined with white silk internally. They appear to me to be more conspicuous than those of *O. muscorum*, but otherwise they are quite similar to the nests of that species.

My previous discovery of the newly-emerged youngster in June leads to the supposition of a spring brood also ; the presence in Brittany of swollen individuals apparently on the point of laying, on April 17, 1905, seems to lead to the same conclusion, although I found no nest of this species in Brittany in spring. In 1907, Aird and Robert Whyte obtained occupied nests in Fife on March 23, and in Midlothian on April 2, but on the individuals in these nests the egg-mass was not apparent, and these nests may have been hibernating nests.

Chthonius rayi makes a nest for the purposes of moulting and hibernation also. On September 28, 1903, at St. David's, Fife, I took from a nest a half-grown individual which showed by its light colouring that it had recently moulted ; and at Balmacara, on August 21, 1906, we opened a nest containing a newly-moulted *Ch. rayi* together with the discarded moult.

Our observations on the hibernating habits are few, but satisfactory. On November 26, 1904, during a spell of frost which had lasted several days, I spent some time in their Fifeshire haunts, and found two nests with inmates. These creatures were almost inert, owing probably to the extreme cold, but, on being disturbed by me, they moved their great nippers a little. I was thus satisfied that *Ch. rayi* hibernates inside its nest, and, moreover, I failed to find any specimens moving freely that day. Aird Whyte confirmed this matter of hibernation, by finding an adult in its nest near Dalbeattie on January 3, 1907.

The young *Ch. rayi*, on leaving the nest, is almost colourless, of a light yellow hue, with a pink tinge on the two first pairs of appendages, most pronounced on the chelicerae and on the fingers of the pedipalps.

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.* 234, *No.* 72, *Oct.* 1909.)

Fam. 31. Graminaceæ—*continued.*

138. *Poa Balfouri*, Parnell (1842).—On rocky ledges at high levels on the mountains of the Breadalbane district ("Fl. Perthsh." 352).

139. *Poa nemoralis*, L.—From sea-level to considerable elevations on the mountains of the Breadalbane district ("Fl. Perthsh." 352).

140. *Deschampsia cæspitosa*, Beauv.—Ascends to 1130 m. in damp places on the mountains of the Breadalbane district ("Fl. Perthsh." 344). Summit of Ben Avon (W. Gardiner, 1844, in Herb. Brit.).

Var. *pseudoalpina*, Syme, "Engl. Botany," xi. (1872).—On the ridge of Ben Dearg, in Ross-shire, at 1000 m. and higher (G. C. Druce in "Ann. Scot. Nat. Hist." 1903, 233).

141. *Deschampsia alpina*, Roem. & Schult.—At 1000 m. and more on wet rocks on the mountains of the Breadalbane district, and up to 1130 m. on Ben Alder (White), Ben Alder (Watson). Ascends to 1020 m. on Ben Nevis, between the upper end of the ravine and the spring (J. Sadler in "Trans. Proc. Bot. Soc. Edinb." xiii. 54). Ascends to 1010 m. on Ben Dearg, in Ross-shire (G. C. Druce in "Ann. Scot. Nat. Hist." 1903, 233). Ascends to 1130 m. on the table-top of Ben-na-Bourd (Watson, 1832). Up to the summit of Cairn Gorm (R. T. Mackay, *ex* Dickie, 202). On Carn Tual it ascends to 1028 m. ("Cyb. Hib." ed. 2, 418). Descends to 640 m. in Mayo.

142. *Deschampsia flexuosa*, Trin.—Ascends to 1130 m. on Ben Alder (White), and to 1150 m. on Loch-na-gar (White, in "Scot. Nat." i. 123 [1871]), and to 1130 m. on Ben-na-Bourd (Watson, 1832). Up to the summit of Carn Tual ("Cyb. Hib." ed. 2, 419). Descends to sea-level in Londonderry.

143. *Agrostis tenuis*, Sibth. (1794).—Up to the summit of Ben

Lawers ("Fl. Perthsh." 342). Up to the summit of Carn Tual ("Cyb. Hib." ed. 2, 416). Descends to sea-level in Cork.

Syn. *A. vulgaris*, With. (1796).

144. *Agrostis canina*, L.—Up to the summit of Carn Tual ("Cyb. Hib." ed. 2, 415). Descends to sea-level in Kerry.

145. *Alopecurus alpinus*, Smith (1803).—Discovered by Don on the mountains about Loch-na-gar ("Engl. Botany," t. 1126). On the other hand, however, Smith states in "Engl. Flora," i. 80 (1824), that Brown discovered it on the mountains about Loch-na-gar, "who informs me that he communicated it to Mr. G. Don." This latter statement is also favoured by the label on Brown's specimens in Herb. Brit., which states that the plant was discovered by him in 1794, and that it was communicated by him to Don. Don, however, appears to have suggested the name ; as on the original drawing in Herb. Mus. Brit., Smith remarks, "*alpinus*, Don thinks a good specific name." Smith also says ("Engl. Flora," i. 80), "no foreign author appears to have noticed this species." Ascends to 1190 m. on Braeriach (G. C. Druce in "Journ. Bot." 1889, 203), and to 1100 m. in Aberdeenshire (Watson), by alpine springs and rills.

146. *Phleum alpinum*, L.—Ascends to 1190 m. on Braeriach (G. C. Druce, *l.c.*), and to 1130 m. on Ben Lawers ("Fl. Perthsh." 342), by alpine springs and rills. Ben Lawers (Don, fasc. i., 1804, n. 5).

147. *Anthoxanthum odoratum*, L.—Ascends to 1030 m. on the Grampians of Inverness-shire and Aberdeenshire (Watson). Descends to sea-level in Cork.

PTERIDOPHYTES.

Fam. 32. Selaginellaceæ.

148. *Selaginella selaginoides*, Link (1841).—Ascends to 1067 m. in damp and marshy places on the mountains of the Breadalbane district ("Fl. Perthsh." 377). Descends to sea-level in Dublin.

Fam. 33. Lycopodiaceæ.

149. *Lycopodium alpinum*, L.—Up to 1090 m. on Braeriach (Dr. J. W. H. Trail, 1902). "It grows near the summits of almost all the high mountains of the Highlands and Hebrides abundantly" (Lightfoot, "Fl. Scotica," 690 [1777]). In dry places ascends to the summit of Schiehallion, and to 1122 m. on Ben Lawers and the mountains of the Breadalbane district ("Fl. Perthsh" 376), and descends to 122 m. in the Carse of Gowrie. Descends to 427 m. in Donegal.

Var. *decipiens*, Syme.—In the great corrie of Ben Avon, at 1000 m. (Marshall and Shoolbred, in "Journ. Bot." 1906, 161). Found also high up on Ben Lawers (G. C. Druce; J. Carroll, 1864, in Herb. Brit.).

150. *Lycopodium annotinum*, L.—On the summit of Cairn Gorm (Hook. "Fl. Scotica," 159). In the great corrie of Ben Avon, at 1000 m. (Marshall and Shoolbred, *l.c.*).

151. *Lycopodium selago*, L.—In dry places, on heathy moors, and frequently on rock ledges, it ascends to the summit of Schiehallion, and to 1122 m. on Ben Lawers and the mountains of the Breadalbane district ("Fl. Perthsh." 376). It also ascends to the summits of Loch-na-gar and Ben Macdhui (Dickie, 235). Summit of Ben Macdhui (Wm. Gardiner, 1845, in Herb. Brit.). Summit of Ben Ime (J. R. Lee). Up to 1220 m. on Ben Nevis ("Cyb. Brit." iii. 296). Ascends to 1027 m. on Carn Tual (More).

Fam. 34. Ophioglossaceæ.

152. *Botrychium lunaria*, Swartz (1800).—Ascends to 1021 m. on mountain-ledges in the Breadalbane district ("Fl. Perthsh." 372). Descends to sea-level in Cork.

Fam. 35. Polypodiaceæ.

153. *Cystopteris montana*, Desv.—Wet rocks near the top of Ben Dothaidh (Marshall and Shoolbred in "Journ. Bot." 1894, 168), on mossy alpine rock ledges. Ascends to 1100 m. on the Grampians of Aberdeenshire ("Cyb. Brit. Comp." 409).

154. *Cystopteris fragilis*, Bernh.—Ascends to 1075 m. on Ben Lawers (White). "Omnium Filicum maxime boream versus progreditur" (Bernhardi). On damp rocks. Descends to sea-level in Kerry.

Var. *dentata*, Hook "Sp. Filicum," i. 198 (1846).—Stob Ben Ein at 1005 m. (E. S. Marshall, 1889, in Herb. Brit.).

155. *Phegopteris polypodioides*, Fée. — Ascends to 1090 m. among loose stones on the mountains of the Breadalbane district ("Fl. Perthsh." 370). Ascends to 1005 m. on the mountains in the west portion of Inverness ("Cyb. Brit." iii. 254). Descends to 150 m. in Kerry.

156. *Polystichum lonchitis*, Roth.—Among large stones and in clefts of rocks it ascends to 1065 m. on the mountains of the Breadalbane district ("Fl. Perthsh." 367). On the mountains of the Breadalbane district (Herb. Brit. *ex* herb. Mrs. Robinson, 1847). On a rock close under one of the high summits between Ben Lawers and Craig Chailleach, at 1005 m. ("Cyb. Brit." iii. 260). Descends to 350 m. in Sligo.

157. *Lastrea dilatata*, Presl.—Ascends to 1052 m. on rocks on the mountains of the Rannoch district ("Fl. Perthsh." 369).

Var. *alpina*, T. Moore, "Ind. Filicum" (1857).—Ascends to 1130 m. on the Grampians of Inverness-shire (Watson in herb.; Hooker *f.* "Stud. Fl. Brit. Isl."); and to the summit of Ben Ime (J. R. Lee).

158. *Lastrea montana*, T. Moore.—A dwarf specimen on the extreme summit of Ben Ime, near the cairn (J. R. Lee in "Ann. Andersonian Nat. Soc." iii. 124 [1908]).

159. *Athyrium alpestre*, Rylands (1857).—Ascends to 1065 m. in damp shaded places on the mountains of Breadalbane district ("Fl. Perthsh." 371); Ben Lawers (G. Don, 1794, in Herb. Brit., but no height given); Corrie Sneachda, on Cairn Gorm, at 1005 m. (E. S. Marshall, 1898, n. 2190, in Herb. Brit.); Corrie-an-Lochan, on the north side of Braeriach, up to 1065 m. (E. S. Marshall, 1898, n. 2191, in Herb. Brit.). "In July 1841 I gathered two fronds of this fern in the great corrie of Ben Alder" ("Cyb. Brit." iii. 253); Ben Macdhui (A. Croall, Pl. of Braemar, 1854, n. 68—in Herb. Brit. and Herb. Kew.). Among stones and on rocks in alpine districts, frequently on Highland mountains up 1220 m. in Inverness-shire (Watson). Ascends to 1065 m. on the mountains round Braemar (Crombie, "Braemar," p. 61). Most or probably all these records refer to the var. *obtusatum*, Syme, "Engl. Botany," ed. 3, xii. 114 (1886). This fern does not seem to develop sori so freely in Perthshire as it does in Aberdeenshire (Prof. Trail).

160. *Athyrium flexile*, Syme (1886).—Ascends to 1100 m. in damp shaded places on the mountains of the Breadalbane district ("Cyb. Brit. Comp." 412).

161. *Asplenum septentrionale*, G. F. Hoffm. (1795).—The earliest record of this fern as a British plant is by Lloyd in Gibson's edition of Camden's "Britannia" (1695). He found it on the summit of Carnedd Llewelyn: and it certainly grows now near Llanrwst (J. E. Griffith, 1895). In support of this, we find in Hudson, "Fl. Anglica," ed. 1 (1762), p. 383, and ed. 2, p. 450—"ad cacumen montis Carndedh Lhewelyn prope Lhan-Lhechyd in agro Arvoniensi invenit D. Lhwyd." Smith, "English Flora," iv. 295, merely repeats Lloyd's record "on the mountains of Carnarvonshire." Watson, "Cyb. Brit. Comp." 414, says that the fern ascends there to 3000 feet. In Scotland it is not an alpine plant. The amended spelling of the generic name is adopted here as given by Ascherson and Graebner, who point out that "Asplenium" is wrong and meaningless and for this reason preferred by nomenclaturists.

162. *Blechnum spicant*, Smith in "Mém. Acad. Roy. Sc. Turin." v. 411 (1793).—This reference is three years earlier than the one attributed to Withering (1796) in all recent British plant-lists.

Watson ("Cyb. Brit." iii. 284) says that this fern gets up to 1190 m. in East Highlands. As it does not seem to occur much above 1000 m. in Aberdeenshire and Perthshire, there only remains Inverness-shire, and confirmatory evidence is desirable before accepting this altitude as correct. The fern, however, ascends to 1006 m. (near the summit) of Ben Ime (J. R. Lee in "Ann. Andersonian Nat. Soc." iii. 122 [1908]). Descends to sea-level in Cork.

163. *Cryptogramme crispa*, Brown, *ex.* Hook., "Gen. Filicum," 60, t. 115 B. (1842).—Ascends to the summit of Ben More, in Ross-shire (G. C. Druce, 1881, in Herb. Brit.). Mr. Druce has written on the label "summit of Scuir Ouran, at about 3700 ft." The mountain referred to is evidently Scuir Fluouran, whose summit, however, rises only to 3505 ft., and is the Gaelic name for Ben More. Of the three recent Lists issued, the London Catalogue ed. x. is the only one which gives this plant correctly. *Cryptogramma* means "hidden words," and would at least require a neuter specific name. *Cryptogramme* means "hidden lines," and is Hooker's amended spelling of the generic name, and is the Greek compound which Brown of course intended to write, as there were no "hidden words" concealed in the frond of the fern. Mr. G. C. Druce gives as the authority for the generic name "Br. in Flinders' Voy. 767." The work referred to is Franklin's Voyage to the Polar Sea, not Flinders' Voyage to Australia—two points of the compass which are literally poles apart. Brown's type-species of the genus which he distinguished and defined was *Cryptogramma acrostichoides*, which is the Arctic American form of *C. crispa* of this country (= *Osmunda crispa*, L.). In his own annotated copy of the second edition of "Sp. Plant." in the Linnean Library, Linnæus has altered this name by a scratch of the pen to *Pteris crispa*. It is the *Adiantum album crispum alpinum* of Ray's "Synopsis." On the mountains of the Breadalbane district it ascends to 1122 m. in exposed stony places, and on alpine rubbles on Ben Lawers, Ben More, Ben Ein, and Ben Heasgarmich (White), but does not get up to 1000 m. in any of the other districts of Perthshire. The Parsley Fern is very common all along the Snowdon range among loose stones; where, like *Asplenum septentrionale*, it was first recorded as a British fern by Lloyd in Gibson's edition of Camden's "Britannia" (1695). According to the zonal distribution indicated by Watson ("Cyb. Brit. Comp." 408, n. 1378), it ascends to 1016 m. on Snowdon, Carnedd Llewelyn, and Carnedd Dafydd. In Ireland, where this fern is very rare, it descends to 90 m. above sea-level in Antrim (Rev. C. F. D'Arcy); but this low level is discounted by the fact that it occurred among fallen rocks below Fair Head (1897).

Fam. 36. Hymenophyllaceæ.

164. *Hymenophyllum peltatum*, Desvaux (1827).—Forms carpets

among the loose boulders on the summit of Beenkeragh (Hart, 1881, in "Proc. Roy. Irish Acad." 1882, p. 578). Descends to 92 m. in Antrim (Rev. C. F. D'Arcy).

Syn. *Trichomanes peltatum*, Poiret (1808); *Hymenophyllum unilaterale*, Bory (1810); *H. Wilsoni*, Hook., "Brit. Fl." (1830).—First recognised as a British fern specifically distinct from *H. Tunbridgense* by Wm. Wilson, who compared the two plants growing together near Killarney in 1829. Hooker says, in the work cited, "No one, I believe, was aware of their real differences, till Mr. W. Wilson found them both growing at the Lakes of Killarney, and distinguished them specifically." Wilson himself contributes a note on the two plants in "Journ. Bot." 1834, p. 317. Whether the plants known under the other three names exactly agree with the Irish fern I must leave fern-specialists to decide, but I give by contrast the differences in the original descriptions. Desvaux says that the plant described by him is identical with those described by Poiret and Bory, but that does not dispose of the claims of the Irish fern. *Trichomanes peltatum* was first found in Mauritius, and *H. unilaterale* shortly afterwards in the island of Réunion. Further, Messrs. Groves query the identity of Bory's fern with the Irish plant distinguished by Wilson (see Bab. "Man." ed. 9, 532). However, pending further inquiry, I have given the name which occurs in the three recent British Lists; though I think that Messrs. Groves have some grounds for inferring that the Mascarene fern may not be identical with that from Killarney.

T. peltatum.—Rhizome fibrous; fronds lanceolate; pinnæ pinnatifid; pinnules dentate.

H. unilaterale.—Rhizome filiform; fronds linear-lanceolate; pinnæ digitato-pinnatifid; pinnules serrate.

H. Wilsoni.—Rhizome capillary; fronds narrowly oblong; pinnæ pinnatipartite; pinnules spinously serrulate.

As far as ferns vary, the last seems somewhat different.

Note.—The "Herb. Brit." frequently mentioned is the separate British Herbarium in the Botanical Department of the Natural History Museum, London, S.W.

PLANTS OF SOME SOUTHERN SCOTTISH COUNTIES.

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

In August last I visited for a short time the interesting headland known as the Mull of Galloway in Wigtownshire,

investigating the interesting coast, as well as exploring the extensive sandhills from Dunragit to Sandhead. The weather was magnificent, the air bracing, the scenery attractive, and I found good accommodation at Drummore.

Among the interesting plants observed was a form of *Vicia sylvatica*, which occurred abundantly on the shingle north of Drummore for a mile or so, and is identical with the plant which I saw twenty-five years ago on the opposite coast near Port William, which I described in the "Naturalist" as var. *condensata*. It grows in compact tufts, one or two feet across; the leaves are smaller than the type, are firm, almost coriaceous in texture; the flowers are larger than the type, and are arranged in sub-capitate racemes, and the standard is darker coloured, often indeed suffused with brownish purple. I will try and raise plants from seeds to test the permanency of these characters in cultivation. Another interesting shingle plant was *Scutellaria galericulata*, L., also with larger flowers, of a purer blue, the corolla clothed with longer and more patent hairs, the under-surface of the leaves covered with a short canescent growth. On examining my herbarium I found the only specimens matching this came from the shingle of Jeantown, W. Ross-shire. I was about to describe it as var. *littoralis*, but the description by Bentham of var. *pubescens* in De Candolle's "Prodromus" will probably cover it. Bentham gives it for North America, "scarcely from Europe."

The locality at Stranraer which yielded many casuals twenty years ago still affords a considerable number, but *Vicia varia* and *V. lutea* seem to have disappeared.

A small rubbish heap at Drummore also yielded many adventitious species, noticeably *Asperugo procumbens*, *Asperula arvensis*, and *Melilotus indica*. The abundance of *Eryngium maritimum* at Drummore, the plentiful occurrence of *Inula crithmoides* at the Mull, of *Pneumaria maritima* at Port Logan, of *Anchusa sempervirens*, which was quite naturalised in several places at Drummore, of the curious form of *Teesdalea*, which has the rosettes of leaves almost ball-shaped, growing in the hollows of Torrs sand dunes were also pleasing features.

We made a short expedition into Dumfriesshire to see

the solitary tuft of *Woodsia ilvensis* which still survives. May it long continue.

We then went to Peebles to walk eastwards along the Tweed, and were rewarded by finding a grass (*Festuca heterophylla*) new to Scotland, but unfortunately in a position which imperils its claim to indigenity, since planted shrubs are near. Several new county records were made, but probably these were mostly known to local botanists who have omitted to record them.

Galashiels was next visited in order to examine the curious Australian and other casuals which Miss Ida Hayward has investigated with such commendable industry. These aliens necessarily vary from year to year, and the low temperature of this somewhat sunless summer has not been favourable to their growth. Thanks, however, to that lady's kind hospitality, we were enabled to see the Australian *Rumex Brownii* and *Senecio lautus*, with numerous European species of *Medicago* and *Erodium*. In this neighbourhood I saw a plant hitherto unfound by me in Scotland, namely, *Cratægus oxyacanthoides*, Thuill., which grew on the border of the Duke of Buccleuch's policy of Bowhill. Here, of course, its indigenity is open to question, since it occurred with *C. Oxyacantha* in a planted hedge of considerable age and size.

Dryburgh Abbey and its vicinity were also seen ; but a walk along the river near that place was summarily stopped by the owner, to whom we had paid three shillings to see the Abbey and its tomb of Scott.

Ettrick Bridge End, with its interesting river bank and marsh, was explored, and a visit made to the Rhymer's Glen, Cauldshield's Loch, where a curious form of *Hypericum humifusum* grows, and to Faldonside. The veteran (Mr. W. B. Boyd) botanist's beautiful garden was a source of great joy. Never have I seen such splendid specimens of Sedges,—*Carex Grahami*, *C. atrofusca*, *C. fusca*, *C. punctata*, *C. alpina*, etc.,—all most luxuriant in growth, even in ordinary garden soil. Here, too, we saw *Erica Craufordii*, which seems to be only a very double-flowered form of *E. Tetralix*, and × *E. Stuarti*, Linton, which can scarcely be a hybrid of *E. Mackayi* and *E. mediterræa*, as its namer suggests, since

the flowering-times of the two supposed parents scarcely overlap. *Dryopteris remota*, discovered by Mr. Boyd on Lomondside, was flourishing well, and the curious *Sagina Boydii* was also in good condition. One may put on record the fact that this plant was found in Mr. Boyd's vasculum at Braemar after an expedition to Ben A'an; but the exact locality where Mr. Boyd gathered it has never been ascertained. That it was from the neighbourhood is not to be questioned.

In the following list of localities an asterisk * signifies an addition to "Topographical Botany," † an introduction and × a hybrid. The numbers refer to the counties in "Top. Bot."—72 Dumfries, 74 Wigtown, 77 Lanark, 78 Peebles, 79 Selkirk, and 80 Roxburgh.

†Clematis Vitalba, *L.*—Plentiful on Dryburgh Abbey, a seedling plant growing high up on the walls, *80.

Ranunculus Lenormandi, *F. Schultz.*—Ditches near Stonykirk 74.

R. Steveni, *Andrz.*—Near Galashiels *79.

Caltha radicans, *Forst.*—Near Horsburgh Castle *78.

Berberis vulgaris, *L.*—Very common about Galashiels 79, 80; near Peebles 78.

Papaver Rhœas, *L.*—A form with deep dark blotch at base of petals on shingle at Drummore, alien doubtless, 74.

Fumaria Boræi, *Jord.*—Moffat 72; Symington 77; Sandhead 74; Peebles *78; Galashiels *79; Dryburgh 80.

Cheiranthus Cheiri, *L.*—Dryburgh 80.

Radicula sylvestris, *Druce.*—Common by the Tweed, Dryburgh, 80; also at Galashiels (Miss Hayward) *79.

R. palustris, *Moench.*—Tweedside *79.

†Cochlearia Armoracia, *L.*—Tweedside, 78, 79, 80.

Brassica nigra, *Koch.*—Galashiels *79.

Lepidium campestre, *Br.*—Tweedside, Peebles, *78.

†Vogelia paniculata, *Med.*—Stranraer 74.

Raphanus maritimus, *Sm.*—Along the coast towards the Mull of Galloway 74.

Viola sylvestris, *Reichb.*—Tweedside, opposite Abbotsford, *79.

V. canina, *L.*—Torr Sands 74.

Polygala oxyptera, *Reichb.*—Correifron *72; near Torrs 74; Ettrickside *79.

P. serpyllacea, *Weihe.*—Ettrick Bridge *79; near Fairydean 80.

P. vulgaris, *L.*—North of Galashiels 80; near Ettrick 79.

†Saponaria Vaccaria, *L.*—Stranraer 74.

Silene Cucubalus, *Wib.*—Peebles 78.

S. maritima, *With.*—Plentiful on Correifron, 72, up to 1800 feet.

Lychnis dioica, with pure white flowers, near Peebles 78; Dunragit 74.

Cerastium tetrandrum, *Curt.*—Torrs Warren, Mull of Galloway, 74.

Stellaria media, *With.*, var. *Boræana* (Jord.).—Peebles *78; Galashiels *79; Dryburgh *80.

(*To be continued.*)

ALIEN PLANTS.

By James Fraser.

The following fifty Alien Plants were seen by Mr. M'Andrew and myself during the year 1909. This list brings the number of such plants seen by us since 1903, and recorded in the "Annals of Scottish Natural History" yearly since 1904, up to about nine hundred and twenty.

A star in front of a name indicates a new British record.

RANUNCULACEÆ.

Nigella arvensis, *L.* Leith, several.

CRUCIFERÆ.

Goldbachia lævigata, *DC.* Leith, several.
Iberis intermedia, *Guersant.* Portobello, one.
I. umbellata, *L.* Portobello, two or three.
*Isatis aleppica, *Scop.*, *var.* pamphylica, *Boiss.* Leith, several; Portobello, one.
Moricandia arvensis, *DC.* Portobello, one.

RESEDACEÆ.

Reseda lutea, *L.*, *var.* laxa, *Lange.* Pettycur, one clump, with pendulous fruits and flat leaves, which seems to be this variety.

CARYOPHYLLACEÆ.

*Arenaria stellarioides, *Willd.* Leith, two.

HYPERICACEÆ.

Hypericum Androsæmum, *L.* In a roadside hedge between Innellan and Dunoon, one plant.

MALVACEÆ.

Lavatera arborea, *L.* Ailsa (Craig), plentiful. At Elie, Fifeshire, it is now known to occur only behind some cottages in Earlsferry, where it was pointed out to us by Mr. Rupert Smith, Edinburgh.

GERANIACEÆ.

Geranium columbinum, *L.* Two plants at Morningside, Edinburgh, by Mr. M'Andrew. Several at Ballantrae, Ayrshire.

LEGUMINOSÆ.

Lathyrus odoratus, *L.* At Pettycur, Fifeshire, and at Portobello, several.

Lotus decumbens, *Poir.* Leith, several.

*Trigonella cœlisyriaca, *Boiss.* Leith, two.

ROSACEÆ.

Potentilla supina, *L.* Leith, one.

SAXIFRAGACEÆ.

Ribes alpinum, *L.* West of South Queensferry, in policies, plentiful.

CRASSULACEÆ.

Sempervivum tectorum, *L.* On roofs and on wall tops near Kirkcaldy, Fifeshire, several.

Tillæa Vaillantii, *Willd.* Galafoot, one plant, found by Miss Hayward, Galashiels.

ONAGRARIÆ.

Clarkia pulchella, *Pursh.* Leith, two or three.

CUCURBITACEÆ.

Cucumis sativus, *L.* Portobello, several, in flower and fruit.

CORNACEÆ.

Cornus stolonifera, *Michx.* Near Kirkliston, two or three; west of South Queensferry, plentiful.

CAPRIFOLIACEÆ.

Sambucus racemosa, *Willd.* Arniston, Midlothian; and near Kirkliston, East Lothian, several.
Symphoricarpus racemosus, *Michx.* Near Kirkliston, several.

RUBIACEÆ.

Asperula taurina, *L.* Abercorn, West Lothian, a large colony.

VALERIANACEÆ.

Valerianella dentata, *Pollich.* Portobello, several.

COMPOSITÆ.

Ambrosia maritima, *L.* Leith, two or three.
*Erigeron linifolius, *Willd.* Galafoot, several.
Madia glomerata, *Hook.* Leith and Pettycur, two or three.
Picris hieracioides, *L.* A small colony at the Docks, Burntisland, by Mr. M'Andrew.
*Volutarella Lippii, *Cass.* Leith, a single plant.

CAMPANULACEÆ.

Specularia hybrida, *A. DC.* Leith, several.

HYDROPHYLLACEÆ.

Phacelia campanularia, *A. Gray.* Leith, several.

POLEMONIACEÆ.

Collomia linearis, *Nutt.* Leith and Pettycur, one plant in each.

CONVOLVULACEÆ.

Cuscuta racemosa, *Mart.* A dodder which seems to be this species was found in considerable quantity at Portobello, on *Medicago lupulina*, and on a *Polygonum* (? *Polygonum aviculare*).

BORAGINACEÆ.

Eritrichium australasicum, *A. Br.* Galafoot, one plant, by Miss Hayward.
Pulmonaria officinalis, *L.*, *var.* alba. Near Kirkliston, several.

SOLANACEÆ.

Solanum miniatum, *Mert. and Koch.* Leith, several.
S. triflorum, *Nutt.* Leith, one plant.

SCROPHULARIACEÆ.

*Orthocarpus purpurascens, *Benth.* Leith, several.

VERBENACEÆ.

Verbena officinalis, *L.* One fine plant at Burntisland Docks, by Mr. M'Andrew.

LABIATÆ.

*Dracocephalum thymiflorum, *L.* Leith, one plant.
Melissa officinalis, *L.* Leith, one.
Salvia sylvestris, *L.* Leith, several.
Satureia hortensis, *L.* Leith, one.

CHENOPODIACEÆ.

Chenopodium Botrys, *L.* Galafoot, one.
Kochia scoparia, *Schrader.* Pettycur and Leith, one plant in each.

LILIACEÆ.

Ruscus aculeatus, *L.* Hermitage, Edinburgh, several.

GRAMINEÆ.

Agrostis lachnantha, *Nees.* Galafoot, several. First found by Miss Hayward.
Setaria verticillata, *Beauv.* Portobello, two.
Sorghum vulgare, *Pers.* Plentiful in the neighbourhood of Leith Docks, but did not flower.

LEITH, *December* 1909.

CRITICAL REMARKS UPON THE *CYPERACEÆ-CARICOIDEÆ* AS TREATED IN "DAS PFLANZENREICH" BY GEORGE KÜKENTHAL.[1]

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

THIS very elaborate, accurate, and excellently printed monograph of the Genus Carex and its allies marks a substantial advance in our knowledge of this somewhat difficult group. The full and clear diagnoses are in Latin,

[1] May 18, 1909. 981 Species and 128 figures. Leipzig. Price 41.20 marks.

a fairly complete synonymy is given, and brief details of distribution. A clavis is given for each section. The figures and details are good, and at last we have under the covers of a single work a description of the Sedges of the world; a monument to the painstaking work and clear judgment of the author. The nomenclature of the species follows the Vienna Actes, and as a rule is in accord with that of the "British Plant List." There are a few exceptions which we may note in passing, and the novelties to our published Floras may also be mentioned.

The allied genus *Kobresia* is spelt *Cobresia*. The founder Willdenow spelt it with a K, and this is universally followed by British writers. Persoon ("Syn." ii. (1807) 534) altered it to *Cobresia* because it was named in honour of Pauli de Cobres. This spelling is used by Ascherson and Graebner, and is allowed, but wrongly allowed, I hold, by the Vienna Rules, which give great latitude for such changes, e.g. *Bartsia* may be altered to *Bartschia* because it was named after Bartsch. In the first instance the change is very troublesome, because all the literature is practically indexed under K, not C; and we are glad to find that Dalla Torre, in the "Genera Siphonogamorum," adheres to the original spelling; a practice which has so much to be said in its favour. Our British species is called *Cobresia caricina*, Willd., since Kükenthal queries the identification of *Carex bipartita*, Allioni, with it. But Ascherson and Graebner, Dalla Torre, and Britton and Browne all agree in so identifying it, and write *Kobresia* (or *Cobresia*) *bipartita*, Dalla Torre, as in my List.

Carex vesicaria, L.: under this is put var. *alpigena*, Fries, from Ben More and Glen Lyon (Marshall). *C. Grahami* is also put as a variety from Clova (Boyd) and Ben More, Meall Ghaordie, Ben Cruichben (Marshall). Under *C. vesicaria* he also puts, as a sub-species, *C. saxatilis*, L. It is satisfactory to find the Linnean name is retained for this plant, instead of the later *C. pulla*, Good. Var. *dichroa*, Anders., is treated as a form of *C. saxatilis*.

The name *C. rostrata*, Stokes, is used by Kükenthal, but surely wrongly, since there is no doubt that *C. inflata*, Huds., has priority. Hudson may have quoted wrong synonyms,

but this will not invalidate the name, as there can be no doubt that his plant, of the second edition of "Flora Anglica," is this species. Under this Kükenthal puts var. *brunnescens* (Anders.) from Scotland (Marshall and Druce); forma *sparganiformis* (Murr.), Scotland (Druce), and var. *utriculata* (Boott.), which is the plant wrongly called *C. rhynchophysa* in "Lond. Cat.," ed. 9, from Ireland. *C. rostrata* × *vesicaria*, Perth.!, Glen Callater (Marshall). Kükenthal makes no allusion to Bennett's variety *gracilis* of *C. lævigata* (*C. helodes*, Link.). *C. binervis*, Sm.:—Kükenthal gives a var. *alpina*, Drejer, "Rev. Crit." (1841), 56; and under this both my Scottish *nigrescens*, and Linton's *Sadleri*, originally described as *C. frigida*, from Glen Callater, by Sadler, but which was not that continental species. My *nigrescens* is a less extreme alpine form than Sadler's plant. Kükenthal cites for var. *alpina* my plants from Loch Ceannmor, 1214, Glen Callater, 23,006, Perth, 500, 571; also Callater, 2990 (Marshall). *C. distans*, L.; with this *C. neglecta*, Dégl., the maritime form, is considered to be synonymous. C. B. Clarke believed the Linnean *C. distans* to be *C. binervis*, Sm., and has suggested the name *C. Vikingensis* for our plant, but this view is wisely rejected by Kükenthal. *C. Hornschuchiana*, Hoppe, is the name retained for the plant for which our recent British lists use *C. fulva*, Host., a combination not given in "Pflanzenreich," but possibly overlooked. It has priority over Hoppe's name.

C. flava, L., is kept distinct. Under it there is a var. *pygmæa*, Anders. Lange named a Scottish specimen of mine *pumila*, Anders., a *lapsus calami* unfortunately followed in my List. Kükenthal also has a forma *rectirostris*, Peterm.; this latter name was given by Fernald to my specimen of Townsend's var. *argillacea*.

C. lepidocarpa is given full specific rank, since it keeps true in cultivation, and natural hybrids occur, of which I have sent Kükenthal several of *C. flava* × *lepidocarpa* from Perth, Glen Callater, Forfar, etc., and Marshall has sent others of *lepidocarpa* × *Hornschuchiana* from Caithness, Sutherland, and Orkney.

C. Oederi, Retz is also kept distinct; but, while I have

used the name in a restricted sense for the small-fruited plant, Kükenthal includes *C. Oederi*, var. *oedocarpa*, Anders. (=*flava*, var. *minor*, Towns.) and var. *argillacea*, Towns., an arrangement more closely approximating to the last edition of the "Lond. Cat." To my eyes *C. flava*, var. *minor*, Towns., seems to be more closely related to either of the other two species than to the small-fruited plant, which I name *C. Oederi*, Retz, and that was Townsend's idea; but of course Kükenthal speaks with far greater authority and knowledge than I possess. He gives as a "forma" *C. subglobosa*, Mielich., Lough Neagh (Druce), 509.

C. extensa, Good.: a new variety of this to our British Lists is described, viz. *Ecklonii*, Kük., from Port Patrick, Wigtown (C. Bailey). But the older name for it appears to be *C. extensa*, Good., var. *latifolia*, Boeck., in "Linnæa," lxi. (1877), 289. *C. pilulifera*, L., the var. *Leesii*, Ridley, is reduced to forma *longibracteata*, Lange.

C. glauca, Scop., is used instead of *C. flacca*, Schreb., but I think under the idea that *C. glauca* was established in Murray's "Stirp. Gotting." (1770), p. 76. There it is, I believe, only an unnamed description; the earliest name is Schreber's. Bennett's var. *acuminata* receives no notice; and our other varieties are reduced to forms.

C. vaginata, Tausch, in "Flora," iv. (1821) 557. For this, the oldest name, Kükenthal, in defiance of the Vienna inconsistent Rules (which demand the use of the oldest specific, but not the oldest varietal name), writes *C. sparsiflora*, "Steud. Nom.," 2nd ed. (1841), 296, because it was *C. panicea*, var. *sparsiflora*, Wahl., "Fl. Lapp." (1812), 236. The var. *borealis* (Anders.) is treated as synonymous with the type, as is the var. *intermedia* of *C. panicea*; while *tumidula* and *conferta* are reduced to forms. The var. *planifolia*, Kohts, is put as synonymous with *C. magellanica*, not as a var. of *C. limosa*, as in my List. The Ben Heasgarnich locality is not given under *C. atrofusca*, Schkuhr. The name *C. alpina*, Sw., is retained (following Ascherson and Graebner); the identity of *C. Halleri*, Gunn., with it is queried: our three British Lists use *C. Halleri*. *C. Buxbaumii*, Wahl. (also following A. and G.), is used despite the older *C. polygama*, Schkuhr, which is cited

without doubt as synonymous: the Arisaig locality is not given; nor is the fact that it represents *C. canescens* in the Herb. Linn. *C. Hudsonii*, Benn., is used instead of the earlier *C. elata*, All., on account of the uncertainty of Allioni's plant; but is there justification for this? Under *C. gracilis* an additional variety to my List is given, viz., var. *sphærocarpa* (Uechtr.), from Sussex (Marshall), 2610. The hybrid *C. gracilis* × *Hudsonii* (*super-Hudsonii*) is given from Ranworth, Norfolk (C. E. Salmon).

C. aquatilis, Wahl., a nova forma, *angustata*, Kük., from Forfar (Somerville), and Easterness (Marshall), is described. Var. *sphagnophila*, Fr., from Clova (Boott.), S. Aberdeen (Druce) 1218, etc., is also given. The var. *epigeios* (recorded by Bennett) is made synonymous with *stans* (Drej.) Boott., but is not cited for Scotland. Does it really occur there?

Hybrids of *C. aquatilis* × *rigida* and *C. aquatilis* × *Goodenowii* are from Scotland; *C. aquatilis* × *Hudsonii*, Ireland (R. W. Scully); *C. aquatilis* × *salina*, Wick (Marshall). *C. cæspitosa*, L., is given, on A. Bennett's information, from Shetland (Beeby), and Yorkshire (Perceval); but we still lack precise information of its occurrence as British. *C. Goodenoughii*, as the spelling is altered to here, has a var. *recta* (Fleisch), A. and G., which is a common British form; var. *juncea* (Fries) also frequent, var. *strictiformis* (L. H. Bailey), Altnaharra (Marshall); var. *subcæspitosa*, Kük., Rosslare, Ireland (Marshall), and *stenocarpa*, Kük., based on my specimens from Glen Fiagh. The last is also found in many other Scottish localities. *C. Goodenowii* hybridises with *rigida*, Forfar, Argyll (Marshall); and with *gracilis*; but no British localities are given, not even for × *C. elytroides*, Fr., which A. Bennett recorded from Anglesey; nor is the occurrence in Britain of *C. trinervis*, Dégl., also recorded by Mr. Bennett, alluded to; but doubts have been expressed as to the identity of this, and therefore it is bracketed in my List till confirmed. Neither is there any reference to *C. hebridensis*, A. Benn., which is put under *C. spiculosa* in "Lond. Cat." as a var. Kükenthal considers *C. spiculosa* itself only a hybrid of *Goodenowii* and *salina* = *super-salina*, Kük., but he does not refer to a Scottish locality. Under *C. rigida* the var. *infer-*

alpina has been changed to *concolor* (Br.), Kük.; but here again in opposition to the Vienna Rules, which do not insist on the permanence of the earliest varietal name—that is, the combination *C. rigida*, var. *infer-alpina*, Laest., dates from 1839, *C. rigida*, var. *concolor*, only from 1909. The name *C. leporina*, L., is wisely retained, but our varieties are reduced to forms.

C. lagopina, Wahl., is used instead of *C. Lachenalii* Schkuhr. Of this he considers *C. helvola* to be a hybrid with *canescens*. He has seen it from Loch-na-gar (Syme) 1212, (Druce) 22966, (Marshall) 2979, 2980, Clova (Balfour), Ben Lawers (Druce)!, the three counties as given in my List. *C. stellulata*, Good., is used, although Britten contends that *C. echinata*, Murr., is the proper name. The var. *grypos* is retained, but no British station given.

C. canescens, L., is correctly used by Kükenthal for *C. curta*, Good.; the var. *fallax*, F. Kurtz, from the Scottish Highlands (Druce), the var. *tenuis*, Lang (first recorded by me in this Journal, 1897, p. 128, from Glen More), and the var. *robustior*, Blytt, Scotland (Marshall and Druce), are included, as are the hybrid with *stellata* from Canlochan (Ewing), and Ben Lawers (Druce), and *super-canescens* (my *C. helvola*, var.) from Ben Lawers (Druce). *C. contigua*, Hoppe, is used instead of *C. muricata*, L., as in the "Lond. Cat."; but I followed the British Museum Seed List in retaining the Linnæan name, notwithstanding the specimen named *C. muricata* in the Linnæan herbarium, which is *C. Pairæi*: the description and references appear to support the use of the Linnæan name. I have put *Leersii* as a var. under *muricata*; but Kükenthal calls *C. Pairæi* by the name *C. echinata*, Murr.; under this he puts *C. Leersii* as a var. The variety has been collected in England by Marshall, 3765, and the type by myself in Cornwall. Surely if there is a case where confusion would be created by the exchange of names this is one. If *echinata*, Murray, is so ambiguous it would be well to drop it; but this shall be treated more fully elsewhere.

C. divulsa, Good., the correct authority is Stokes in With. "Nat. Arr.," of 1787. It will be observed that Kükenthal has not supported the erroneous suggestion that *C. divulsa*

is the *C. canescens* of the Linn. Herb. The synonym *C. canescens*, Huds., is, however, not cited by Kükenthal.

C. diandra, Schrank, var. *major*, Koch, = *Ehrhartiana* Hoppe ;—to this is also referred *C. pseudo-paradoxa*, Gibs. *C. intermedia*, Good., is used instead of *C. disticha*, Huds., the undoubtedly earlier name, for the reason advanced by C. B. Clarke, "Journ. Linn. Soc.," xxxv. (1903), 291 ; but, despite one wrong figure cited, the reference to Ray shows that the above, not *arenaria*, is meant.

C. ligerica, Gay (recorded by Mr. Bennett), is not given as British ; and as the species awaits confirmation it is bracketed in my List.

C. divisa, Huds., var. *chætophylla*, Daveau, recently discovered in South England, is not included as British.

The hybrids *C. paniculata* × *vulpina* = *pseudo-vulpina*, Richter, from Surrey and Kent (Marshall), (I have also found *C. muricata* × *remota* in Bucks), *C. remota* × *vulpina* (= *C. axillaris*, Good.), and *C. paniculata* × *remota* (*C. Boenninghauseniana*) from Scotland, are also described.

It may be remarked that the contention which I made in this Journal in reviewing the 9th edition of "Lond. Cat." that *C. diluta*, Bieb., was not = *C. punctata*, Gaud., and for which I was rather severely taken to task, is found to be correct. Kükenthal keeps them distinct, putting two species between them. *C. diluta* is confined to East Europe, *C. punctata* reaches the West of Ireland.

C. fulva, Good., which has caused so much discussion, is referred to *C. Hornschuchiana* × *Oederi*. Three forms of this are given, viz. (*a*) nearer *Hornschuchiana*, being Goodenough's plant, and (*c*) *fulvaformis*, Zahn., Altnaharra and Orkney (Marshall), *C. flava* × *Oederi*, Glen Callater, Perth, (Druce), 549 ; and a form *C. subelatior* from Copyhold, Sussex (Mrs. Davy), are also described.

ZOOLOGICAL NOTES.

The Noctule Bat in Morayshire.—During the past few years I had been told that large Bats were seen from time to time round Elgin and Lhanbryde, but only now, 1st October, have I been able

to secure one. A fine large dark-coloured male Noctule (*Vesperugo noctula*) was sent to me from Duffus near Elgin. It measured $3\frac{1}{8}$ inches head and body, and $2\frac{1}{8}$ inches forearm. This is just the size of my English spirit specimen. It was fat, and weighed $1\frac{1}{8}$ ounce. This species may not be rare north of the Grampians, but this is the first example I have seen here. Other three species are fairly abundant in Morayshire, the Pipistrelle, Daubenton's Bat, and the Long-eared Bat.—Wm. Taylor, Lhanbryde.

[There are only a few known instances of this Bat being found in Scotland, and this is the most northerly record of its occurrence in the British Islands.—Eds.]

Black and Brown Water-Voles in the same Family. On 17th August last Mr. R. Ramsay, Fearnan, Loch Tay, sent me a family of four young (half-grown) Water-Voles (*Arvicola amphibius*) which had been dug out of a hole in his hayfield. Three of them were of the black variety, while the fourth was of the typical brown form. They were sent as young "Black Rats," with the remark that "strange to say one seems a *brown rat*, but they were all in the same nest." It would have been interesting to know what the parents were like, but they were not captured, and no information regarding them is forthcoming.—William Evans, Edinburgh.

The Length and Weight of Otters.—Apropos of my article on 'The Length and Weight of Otters,' which appeared in the "Annals" (July, 1909), I am informed by the master of the Crowhurst Otter Hounds that he killed a bitch Otter in September 1908 on the Rother near Midhurst, which weighed 22 lbs. with a total length of $45\frac{1}{2}$ inches, and which is the heaviest bitch Otter I have ever heard of. His hounds also killed, on 20th April this year at Hartfield, on the Medway, a dog Otter of $28\frac{1}{2}$ lbs., which measured 51 inches in length. The Essex pack which killed the enormous 34 lbs. dog Otter on the tidal waters of the Deben in East Suffolk last year (1908), as mentioned in my article, have beaten this record by killing on the same river near Kettleburgh, on 20th September this year, an extremely fat old dog Otter of 35 lbs. whose total length, as measured with a 2-feet rule, was 52 inches, whilst his carcase, minus pelt, mask, rudder, and pads, actually weighed 24 lbs., the normal weight of an adult dog Otter! On 8th September this year the Argyleshire and East of Scotland Pack killed an exceptionally fine dog Otter in East Lothian, close to where the Humbie Burn joins the Keith, which easily pulled down the Salter's Spring Balance to its limit of 29 lbs., and was undoubtedly heavier than this.—H. W. Robinson, of Lancaster.

Some Rare Birds in Unst, Shetland.—During several autumn visits to the island of Unst, I have, among other birds, obtained the following which, I trust, are worthy of record in the "Annals."

Greenland Redpoll (*Acanthis hornemanni*). — One shot

between 9th and 19th October 1905, about the same time as Mr. Eagle Clarke obtained specimens in Fair Isle. It was a single bird, and I observed no others.

Greater Redpoll (*Acanthis rostrata*).—Several specimens obtained from a flock during October and November 1907. Some of these birds were shot below high-water line on the shore.

Northern Bullfinch (*Pyrrhula pyrrhula*).—I saw a male in splendid plumage in November 1905.

Tengmalin's Owl (*Nyctala tengmalmi*).—On 8th January 1908, a female, apparently injured, was captured on a stone wall and forwarded to me. Its stomach contained the remains of a sparrow.

Some of the other birds which came under my notice in 1907 were, a Great Grey Shrike on 7th October; Wood Pigeon on 20th October and 4th November; Turtle Doves (two) on 21st October; and Great Snipe on 6th October.—Erick Hamilton, Liverpool.

Some further Remarks on the Visitation of Crossbills.—During a visit to Fair Isle last autumn, I gathered the following additional information relating to the summer visits of Crossbills (*Loxia curvirostra*) to the island. This I chiefly obtained from my bird-watcher there, Stewart Stout. The birds were seen in the greatest abundance on 10th July when they were in large flocks. These flocks, however, appear to have at once broken up, for after this date, though plentiful, the visitors were in scattered parties, and were abundant down to 26th August. Later they became gradually scarcer; in September only two or three were seen, and the last representative of the hundreds once present on the island was an immature male, which was seen on 2nd October, feeding on the head of a thistle. During their sojourn they frequented all parts of the island: the faces of the great cliffs, the cultivated land, the grassy slopes, and the high bleak, heathery ground. On the latter they fed on the unripe fruit of the crowberry; elsewhere on seeds of grasses and other plants, and on the heads of thistles. Very many of these visitors, however, perished, for numerous dead or dying birds were found in the plots of potatoes.

At the Flannan Islands the last of the invaders was observed on September 22nd.

Some surprise has been expressed that comparatively few birds were recorded for the mainland of Scotland. It may be pointed out, however, that there are obvious reasons why this should be the case. Thus, almost immediately on their arrival from the north, most of the visitors would find themselves in a land entirely congenial to their requirements, namely, one abounding in extensive pine woods. Here they would fail to attract notice, for these same Highland forests are the home of great numbers of native Crossbills.

Mr. Francis G. Gunnis has informed me that they were very plentiful at Gordonbush, in East Sutherland; and adds the interesting remark that a lot of them were caught in the nets protecting strawberries.—Wm. Eagle Clarke.

Occurrence of Yellow-browed Warblers in East Ross-shire.—On 23rd September I observed, and afterwards obtained a Yellow-browed Warbler (*Phylloscopus superciliosus*). The bird in question was searching for insects among the currant bushes in a garden on the coast of East Ross-shire. It was fairly tame, and did not seem to mind my presence. The bird proved to be a male. The weather at the time was fine, rather hazy, the wind being south, light. On 27th September I saw another Yellow-browed Warbler in the same garden, but it was very wild and would not admit of approach, but flew over the garden wall and disappeared. In the afternoon I located it again in a field of turnips near by, and after a long chase the bird was procured. It turned out to be a female.—Annie C. Jackson, Swordale.

[These are the first records for the autumn of the occurrence of this interesting migrant on the mainland of Scotland.—Eds.]

Migration of Redwings, etc.—On the early morning of 18th October, between the hours of 12 P.M. and 4 A.M., there was a great rush of birds at Tarbatness Lighthouse, many killing themselves against the lantern, and later in the morning 411 were picked up. The wind was east, light, and the night, or rather morning, was very wet, also hazy.

The great majority of the birds were Redwings. The birds collected consisted of 367 Redwings; 1 Fieldfare; 6 Blackbirds; 3 Ring Ouzels; 3 Goldcrests; 9 Bramblings; 20 Starlings; 1 Jack-snipe.—Annie C. Jackson, Swordale.

Grasshopper Warbler and Greater Wheatear at Mull of Galloway Light.—A male Grasshopper Warbler (*Locustella nævia*) was obtained at Mull of Galloway Lighthouse on 24th April, and on the 12th August a male of the Greater Wheatear (*Saxicola leucorrhoa*). Both birds were sent to me by Mr. Henderson, lightkeeper.—Annie C. Jackson, Swordale.

The Greater Wheatear (*Saxicola œnanthe leucorrhoa*, Gmel.) **in Forth.**—Mr. Eagle Clarke's observations on this northern race of Wheatear at Fair Isle ("Annals," 1908, p. 81) have caused me to re-examine a large *œnanthe* which I shot on the coast at Luffness Links, East Lothian, on 25th September 1885. It is a beautiful adult male having a wing measurement of 106 mm., and clearly belongs to the above race. I have noticed similar large Wheatears on this coast on several occasions in autumn.—William Evans, Edinburgh.

Golden Oriole in Dumfriesshire.—On 30th April 1909, Mr. Charles Vere caught an adult male of this species at Penton Lynns (Canonbie). After being caged it only lived one day, so it was sent to Mr. Raine, taxidermist, Carlisle, for preservation. I have personally seen the specimen, which is now in Mr. Vere's possession. —Hugh S. Gladstone.

Nesting of the Great Spotted Woodpecker in West Fife.—A pair of this species safely hatched off their young this spring on the estate of Brucefield, belonging to Lord Balfour of Burleigh, in the West of Fife. Two specimens of the Great Spotted Woodpecker have previously been obtained on the estate of Westgrange which adjoins Brucefield in the same district of Fife. One of these occurrences, as recorded in the Proceedings of the Royal Physical Society, took place on 3rd April 1877, and the other, hitherto unrecorded, on 25th January 1902.—J. J. Dalgleish, Brankston Grange, Alloa.

Quails in East Lothian.—Quails (*Coturnix communis*) were reported to have been heard in June in two spots not very far from Haddington, but though I visited the places I could not hear or see them. But several pairs did nest not far from Tranent in the cornfields, where their sharp, penetrating cry was heard continually. On the evening of 3rd August I made a round of the places where they were, with Dr. Ritchie of Tranent. We located the cry in three if not in four different fields. They were heard almost daily from 10th July till 23rd August. How much later they were there I cannot say, for I was unable to pay another visit myself to the locality.—H. N. Bonar, Saltoun, Pencaitland.

"Ringed" Arctic Tern at Barns Ness Lighthouse (Forth). —In September last I was asked to identify a Tern with a ring on its leg, which had been found unable to fly owing to an injured wing, at Barns Ness Lighthouse, near Dunbar, on the night of 23rd August. It was an immature Arctic Tern (*Sterna macrura*), and had on its left tarsus a metal ring inscribed "Country Life, London, No. 516." I communicated with "Country Life," and ascertained that the bird was ringed at the Farne Islands by Mr. Riley Fortune on 17th July (cf. "Country Life" of 16th October 1909). Flocks of Terns, the light-keeper tells me, were observed flying round the dome of the lighthouse during the evening of 23rd August, the wind at the time blowing from the south-east.

I may mention that there has been sent to me a Storm Petrel (*Procellaria pelagica*) which was found in a dying state at Barns Ness Lighthouse on the morning of 18th October.—William Evans, Edinburgh.

Beautiful Variety of the Black-headed Gull.—A gull was obtained here on the 9th of December which was remarkable for the beautiful rosy pink colour pervading all the white portions of

its plumage except the tail. This tint, which was deepest on the abdomen and flanks, included the entire shafts and webs of the two outer primaries, the basal portions of the shafts of the rest and of the secondaries, and the bases of the grey feathers of the mantle. I sent the bird to Mr. Eagle Clarke for his inspection and opinion on it. He tells me that the specimen, a female, was quite remarkable for the extent and depth of the rose-colour permeating its plumage. Mr. Howard Saunders, in describing a similar specimen obtained at Wells, Norfolk, in November, remarks (Cat. Birds, Brit. Mus., xxv. 212) that such instances must be considered unusual. I have since seen two others.—Alice Fowler, Inverbroom, Ross-shire.

[I have also seen rosy-coloured Black-headed Gulls at Oban, as I have elsewhere made note of.—J. A. H.-B.]

Porbeagle Shark in the Moray Firth.—A male Porbeagle shark (*Lamna cornubica*), 8½ feet long, was caught at Nairn on 30th October last. I went to examine it, and took the following measurements:—From point of snout to pectoral fin, 27 inches; length of pectoral fin, 16 inches; greatest breadth of tail, 28 inches. It had the large, high anterior and very small posterior dorsal fin of the species. It was bluish grey above and dirty white below. It belongs to the variety with small teeth. I have also found the variety with large teeth in the Moray Firth. The difference in the teeth is certainly not a sexual character. Dr. Traquair was kind enough to demonstrate that for me in the Royal Scottish Museum some years ago.—Wm. Taylor, Lhanbryde.

Barnacles on a Whale.—Mr. Carl F. Herlofsen, of Bunaveneader, Harris, recently presented to the Royal Scottish Museum a specimen of a parasitic Copepod, *Penella* species, extracted from the side of a whale caught off St. Kilda. Growing upon the *Penella* were two specimens of Stalked Barnacle, *Conchoderma virgata* (Spengler), a species which, though of world-wide distribution, has seldom been recorded from Scottish waters. The association of *Conchoderma virgata* with *Penella* has been noted on several occasions, even where the hosts of the Copepod have been so different as whale and sword-fish.—James Ritchie, Royal Scottish Museum.

Hydrachnids in Forth and Tay.—In the previous number of the "Annals" (1909, p. 249) I recorded *Arrhenurus cylindratus*, Piersig, from the Forth district, the record being based on half a dozen females from West Lothian, which were believed to belong to this species. The capture of two males and a female on 17th September last in a pool near Lasswade, Midlothian, removes any slight doubt there may have been as to the species being an inhabitant of the district. Along with these Lasswade examples of *A. cylindratus* I captured five males of another *Arrhenurus* which

Mr. Soar says are referable to *A. tubulator* (Müll.), also, it would appear, an addition to the Scottish list.

I take this opportunity of drawing attention to an early record —the earliest I have yet met with—of Water-Mites from Scotland. It occurs in Don's List of Forfarshire Plants and Animals, published in 1813 in an Appendix to the "Agriculture of Angus," and is as follows:—"*Hydrachna globator*, *grossipes*, and some others." Presumably these are what we now call *Arrhenurus globator*, and *Unionicola crassipes*, or its near ally *U. figuralis*.—WILLIAM EVANS, Edinburgh.

A Swan Parasite from Perthshire.—On an immature female Whooper Swan (*C. musicus*) secured at Port-Allen-on-Tay, in January last, numerous parasites were detected by Mr. A. M. Rodger, Perth Museum.

Four specimens, all adult males and females, were fortunately put into spirit, and on examination these proved to be *Ornithobius cygni*, L. (= *bucephalus*, Giebel). Save that the males have segments 2-6 with the black lateral spots, these specimens are typical examples.

Piaget ("Les Pediculines," vol. i. p. 378) gives 3-6 as the normal, while Denny ("Mon. Anop. Brit.," p. 183) says "the first six segments of the abdomen with a black spot." Evidently the character is independable and varies.— JAMES WATERSTON, Edinburgh.

BOTANICAL NOTES AND NEWS.

Fungi from the Isle of May.—During two short visits to the Isle of May last September (9th and 16th), I gathered the following Fungi, which are not mentioned among those brought from the island by Misses Baxter and Rintoul in 1907, as recorded by Mr. Steele in the "Annals" for January 1908. Dr. Paul, who kindly looked over my specimens, made the remark that they were small, as one would expect in so exposed a locality.

Agaricus campestris, L. (the true mushroom).—One specimen.
A. arvensis, Schæff.—Common.
Nolanea pascua, Pers.—Two or three.
Hygrophorus conicus, Fr.—Several.
Marasmius oreades, Fr.—A few.
Lycoperdon gemmatum, Batsch.—A good many.

Several of the already recorded species—*Naucoria semiorbicularis*, *Hygrophorus pratensis*, *H. virgineus*, etc.—were also met with.— WILLIAM EVANS, Edinburgh.

Scottish Pansies. — Of the twenty-three "species" in Mr. Drabble's paper on "British Pansies" in the *Journal of Botany Supplement*, the following are named in the paper as seen by him from Scotland:—Group I. **Arvenses**, *V. segetalis*, Jordan, Selkirk (79), Kincardine (91), E. Sutherland (107), *V. obtusifolia*, Jordan, Elgin (95); *V. rurali*, Jordan, Dumfries (72), Berwick (81), Kincardine (91); *V. derelicta*, Jordan, Mid-Perth (88), Forfar (90), S. Aberdeen (92), Banff (94), Orkney (111); *V. Lloydii*, Jordan, Forfar (90), Kincardine (91), S. Aberdeen (92), W. Ross (105), Caithness (109); *V. alpestris*, Jordan, Selkirk (79); *V. lepida*, Jordan, Roxburgh (80), Berwick (81), Kincardine (91), S. Aberdeen (92), Elgin (95), Easterness (96), Westerness (97), Argyle (98), East Ross (106); *V. lutea*, Huds. (including var. *amœna*), Dumfries (72), Selkirk (79), Stirling (86), M. Perth (88), E. Perth (89), Forfar (90), S. Aberdeen (92), Westerness (97), Argyle (98), *V. Curtisii*, Forster (including *Pesneaui* and *subulosa*), S. Aberdeen (92), Clyde Isles (100), Mid Ebudes (103), W. Sutherland (108), Caithness (109).

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—October-December 1909.

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

ZOOLOGY.

Notes on the Summer Birds of Shiskin, Arran, 1909. T. Thornton Mackeith. *The Glasgow Naturalist*, vol. ii. No. 1 (Nov. 1909), pp. 20-24. Eighty-eight species are recorded.

The Stock-Dove (Columba œnas, Linn.) in the Clyde Area. Robert S. and Hugh W. Wilson. *The Glasgow Naturalist*, vol. i. pt. iv. (Sept. 1909), pp. 101-110. Gives a summary of the distribution of this species in the various counties.

Hoopoe (Upupa epops) in Lanarkshire. Geo. W. Campbell. *The Glasgow Naturalist*, vol. i. pt. iv. (Sept. 1909), p. 145. Specimen picked up near Leadhills on June 1, 1909.

Fulmar (Fulmarus glacialis) in Ayrshire and Fife. John Paterson. *The Glasgow Naturalist*, vol. i. pt. iv. (Sept. 1909), p. 145. Specimen picked up dead on July 4, 1909, on the shore between King's Barns and Cambo.

Quail (Coturnix communis) in Ayrshire and Fife. John Paterson. *The Glasgow Naturalist*, vol. i. pt. iv. (Sept. 1909), p. 145. A note on the occurrence of this species near Ayr and at Crail.

Ruff, Spotted Redshank, and Black-tailed Godwit in East Renfrew. John Robertson. *The Glasgow Naturalist*, vol. i. pt. iv. (Sept. 1909), p. 146. Notes on the occurrence of these species in August and September 1909.

The Bar-tailed Godwit (Limosa lapponica) in East Renfrew. John Robertson. *The Glasgow Naturalist*, vol. ii. No. 1 (Nov. 1909). Specimen seen in September 1909 at Waulkmill Glen Dam.

Short Sun-fish (Orthagoriscus mola) in Ayrshire Waters. John Paterson. *The Glasgow Naturalist*, vol. ii. No. 1 (Nov. 1909), p. 30. A specimen, measuring 4 feet long by 5 feet 3 inches, captured in South Ayrshire waters in October 1909.

Notes from Inverness-shire, 1909. R. Meldola. *Entomologist*, November 1909, pp. 283-284. Notes on twenty species of Lepidoptera taken at Onich in August.

A Species of the Noctuidæ new to Science. Richard South. *Entomologist*, October 1909, p. 258. This species, supposed to be new, but as yet undescribed, was taken by Mr. Esson at sugar, on a fir-tree near Aberdeen.

Evetria (Retinia) resinella, L., captured in the imaginal state. Eustace R. Bankes. *Ent. Mo. Mag.*, November 1909, p. 259. Records several specimens taken in Rothiemurchus Forest, Inverness-shire, June 1907 and 1908.

Three new British Coleoptera. Norman H. Joy, M.R.C.S., F.E.S. *Ent. Mo. Mag.*, December 1909, pp. 268 and 269. The species are Epipeda nigricans, Thoms., and Pityogenes trepanatus, Noerdl., taken at Blair Atholl, and Lathrobium dilutum, Erichs, from the side of Loch Ericht and the river Truim, at Dalwhinnie.

Some Critical Remarks on the Genus Rabocerus, Mulsant: with descriptions of two new species. By David Sharp, M.A., F.R.S. *Ent. Mo. Mag.*, November 1909, pp. 245-247. R. bishopi described as a new species, from Grantown, Elginshire.

A Fifth Proteinus in Britain. David Sharp, M.A., F.R.S. *Ent. Mo. Mag.*, December 1909, pp. 267-268. P. crenulatus, Pandellé, taken at Nethy Bridge in 1906 and 1907.

Myrmecophilous Notes for 1909. H. St. J. K. Donisthorpe, F.Z.S., F.E.S. *Ent. Record*, Nov. 1909, p. 257. Nests of Formica rufa race pratensis, Forel, described from Nethy Bridge, with a list of their coleopterous inmates.

Three Species of Diptera new to the British List. J. R. Malloch. *Ent. Mo. Mag.*, October 1909, p. 234. Records Cnemacantha muscaria, Fln., and Pegomyia seitenstettensis, Strobl, from Bonhill, Dumbartonshire, and Eccoptomera ornata, Ler., from Oxford.

On the British Species of Phora. John H. Wood, M.B. *Ent. Mo. Mag.*, October and November 1909, pp. 240-244. P. brunneipennis, Costa, recorded from Logie, near Forres, and P. pulicaria, Fln., from the north of Scotland.

A few Insects from Braemar. W. J. Lucas. *Entomologist*, November 1909, p. 282. Records seven species of Neuroptera and Trichoptera taken by Dr. David Sharp in June of the present year.

Raphidia maculicollis (Neuroptera). W. J. Lucas. *Entomologist*, October 1909, p. 259. Records a female pupa taken by Dr. David Sharp at Braemar.

On the genus Phoxocephalus. Alexander Patience. *The Glasgow Naturalist*, vol. i. pt. iv. (Sept. 1909), pp. 116-134, pls. iii. and iv. and 6 figs. In this paper notes are given of Scottish localities.

Preliminary Description of a new British Amphipod, Isæa elmhirsti, *sp. n.* Alexander Patience. *The Glasgow Naturalist*, vol. i. pt. iv. (Sept. 1909), pp. 134-135. Described from a specimen taken in the Firth of Clyde.

On a new British Marine Amphipod. Alexander Patience. *The Glasgow Naturalist*, vol. ii. No. 1 (Nov. 1909), pp. 16-19, pls. i. and ii. A more detailed description of Isæa elmhirsti, of which a preliminary notice was given in the same journal (see preceding reference). It is also recorded here from off the coast of St. Andrews.

A specimen of Ligula simplicissima, Rudolphi; with notes on the Life-history of the Ligulinæ. J. F. Gemmill, M.A., M.D. *The Glasgow Naturalist*, vol. ii. No. 1 (Nov. 1909), pp. 6-12. The minnow, within which the Ligula was taken, was captured near Greenock on May 22, 1909.

The Fresh-water Polyzoon Cristatella mucedo from Kilmalcolm. W. Cameron Davidson. *The Glasgow Naturalist*, vol. ii. No. 1 (Nov. 1909), pp. 15-16.

Contribution towards a Monograph of the British and Irish Oligochæta. Rowland Southern. *Proc. Roy. Irish Acad.*, vol. xxvii. Sect. B., No. 8 (April 1909). Records are given of a number of Scottish species, including two new to science, collected by Mr. W. Evans in the Forth Area.

Some British Earth-mites. C. F. George. *The Naturalist*, 1909. Several new species of *Trombidiidæ* are described in these articles from specimens collected by Mr. W. Evans in the Forth Area.

BOTANY.

First Records of British Flowering Plants. By W. A. Clarke, F.L.S., *Journ. Bot.*, 1909, pp. 413-416. A supplement to Author's previous comprehensive work. The only Scottish species referred to are *Cerastium alpinum*, L. and *Callitriche autumnalis*, L.

The British Pansies. By E. Drabble, D.Sc., F.L.S. Supplement to *Journ. Bot.*, Oct. and Dec. 1909, 32 pages, and plates 500-501. A full discussion of the forms in the group *Melanium*, with descriptions of 23 British "species" and "varieties" and 3 "hybrids," and illustrations of these on 2 plates. The distribution in Britain of these forms is given as far as the author has seen specimens.

Thymus spathulatus, Opiz., in Britain. By G. Claridge Druce. *Journ. Bot.*, pp. 384-385. Mentions distribution of the forms *glaber*, Mill., *ovatus*, Mill., and *præcox*, Opiz., in Scotland as shown by specimens.

Tortula aciphylla in Britain. By W. E. Nicholson. *Journ. Bot.*, 1909, pp. 374-375, on boulders above Loch-na-chat, Ben Lawers.

BOOK NOTICES.

A Treatise on Zoology. Edited by Sir Ray Lankester, K.C.B., M.A., LL.D., F.R.S. Pt. ix. Vertebrata Craniata (*Cyclostomes and Fishes*). By E. S. Goodrich, M.A., F.R.S. (London: A. & C. Black, 1909.)

The present contribution to this important series treats of the two most primitive Classes of the Vertebrata, the Lampreys and their allies, and the true Fishes. As the first volume treating of Vertebrates, it opens with a definition and description of the leading characters of these most important members of the animal kingdom. The remainder of the Part deals with, in their systematic sequence, the various Orders and their numerous component Families, recent and fossil, concerning which a great amount of information is afforded of a technical nature, on the essential characters and anatomical peculiarities of each of these major and minor groups. In addition to taxonomic definitions, information is furnished relating to their distribution in space and time, and some reference is made to life-histories. Like the predecessors of the series noticed in this Magazine, it is a learned and able exposition on its subject, and is

a most valuable addition to the library of the advanced student in natural science. The volume is profusely illustrated by excellent diagrams and figures, which cannot fail to be of considerable service to the reader.

Egyptian Birds. Painted and described by Charles Whymper. (London: Published by A. & C. Black. Price 20s.)

Among the painters of bird life, Mr. Whymper's name has long been much appreciated, but never has he been in more charming combination as author and artist than in this volume on Egyptian birds. In the modest preface, it is intimated that this book is for the amateur and not the scientist, but every ornithologist will congratulate the author on a production which meets perfectly the wants of numbers of British visitors to Egypt who are interested in bird-life. To such the book will undoubtedly add a new interest to their tour, for the wealth of bird life in that mysterious land is both rich and varied. Hitherto there has been only one standard volume available, "A Handbook to the Birds of Egypt," by Captain C. E. Shelley (1872), and as this is now "out of print" and somewhat costly, Mr. Whymper's work comes as a boon to the wandering bird-lover. Not only is the *traveller* provided for, but also the naturalist who has perforce to stay at home, for the reader of Mr. Whymper's "Egyptian Birds" will be able to enter into every ramble the author describes so well, and may behold in his charming representations many of the birds depicted in their native haunts. Mr. Whymper proves himself to be a most careful and accurate observer, and his work abounds in details of the varied habits of each bird treated of. The numerous coloured illustrations are all singularly beautiful, and seeing that they all attain to a high degree of excellence it would perhaps be invidious to select any particular one for special praise. A word of praise is also due to the publishers for producing the book in such a suitable and pleasing form, a special feature being the lightness of the volume, which is unusual in a work illustrated with 51 coloured plates.

In an appendix the author gives a useful annotated list of 356 different Egyptian birds. This will prove most useful to ornithologists visiting the country. That it is up-to-date and accurate is vouched for by the fact that Mr. M. J. Nicol is mainly responsible for it, and there is no better authority. G. G.-M.

A Guide to the Natural History of the Isle of Wight. Edited by Frank Morey, F.L.S. Pp. xx + 560. The County Press, Newport, 1909. Price 8s. 6d. net.

In this useful work, which contains a "series of contributions by specialists relating to the various branches of Natural History and kindred subjects," Mr. Morey has made a painstaking and

exceedingly valuable effort to show the present state of our knowledge regarding the plant and animal inhabitants of the Isle of Wight. In addition to the lists of species, of which the book is necessarily in great part composed (several of which are illustrated by excellent photographic reproductions of the rarer animals), space has been found for interesting chapters on the Geology and on the Meteorology of the island, and on Discoveries of Palæolithic Implements. That much good work has been done, this book, with its records of 6982 plants and animals, clearly shows. It must be invaluable to students of the natural history of the area with which it deals, and to workers interested in the distribution of British animals. For the encouragement of the former the meagre lists of several groups, particularly amongst the marine invertebrates, make clear that much important work still remains to be accomplished.

The Home-life of a Golden Eagle. Photographed and described by H. B. Macpherson. With 32 mounted plates. (London: Witherby & Co. Price 5s.)

All who are interested in our native birds will read with interest Mr. H. B. Macpherson's account of the domestic life of a Golden Eagle. The history of the young bird is given until the point when it leaves the nest and sallies forth on the wing in company with the elder birds. The author, who has noted every detail and depicted most of them, first visited the eyrie on 23rd April, on which date he found two eggs; these were hatched on 3rd May. From henceforth a careful and most instructive account is given of the habits and movements of the eaglet and its parents. The illustrations (32 in number) which supplement the observations are really a triumph in bird photography, and for excellence and clearness of detail they could not be surpassed.

Such a record of the home-life of the most romantic of our British birds can only be got at the expense of immense personal labour and fatigue, and naturalists, knowing the wild nature of its Highland home, will fully appreciate the author's heroic efforts and untiring patience, and congratulate him on his marvellous success.

A word of credit is also due to the publisher, for though the price of this little volume is very modest, yet the general "get-up" leaves nothing to be desired. G. G.-M.

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THE BIRDS OF FAIR ISLE—V. REPORT ON OBSERVATIONS MADE DURING THE YEAR 1909.

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

As a full and particular account of Birds of Fair Isle, based upon all the data which have been amassed during the past five years, is about to be published, it is only necessary, following precedent, to do little more than allude to the species, few in number, which were added to the avifauna in the year 1909.

As I have said the novelties are few in number, namely, six. But this is not surprising, for the ornis of this small island had reached the remarkable total of 185 species at the close of 1908, and it was not to be expected that this number could be materially increased as the result of a single year's investigations. One of the new birds, however, the White-spotted Bluethroat, is a most interesting species to have obtained, apart from its great rarity as a British bird. A number of uncommon species, previously recorded, renewed their visits in 1909, and in all 122 species were observed as migrants during the year; of these 91 species were observed during the spring movements, 96 during the autumn, and 70 were common to both seasons.

These statistics, though quite remarkable and satisfactory,

show a slight falling off as compared with those for 1908. This is, no doubt, due to the fact that George Stout, my trusty observer, left the island in January. His younger brother, Stewart, took his place on the 1st April, and carried on the work successfully, and to my entire satisfaction, until his departure in October ; so that practically six months' observations (fortunately not at the height of the season) were lost during the year. I again spent several weeks on the island at both seasons, devoting all my time to the investigations, and during the autumn I had the aid of George Stout.

The Duchess of Bedford visited the island in spring and again in autumn, spending some time and contributing materially to the records. I have to gratefully acknowledge Her Grace's kindness in affording me facilities for reaching the island on the occasion of both my visits.

A pleasant duty remains to be discharged. I have to express my sincere thanks to Robert Bruce, Esq., for the privilege which allowed me to visit all parts of the island, and to collect such specimens as were required for the investigations ; to the Commissioners of Northern Lighthouses for permission to reside in the Lighthouses ; and to their secretary, C. Dick Peddie, Esq., for his kind co-operation. Nor must I forget the acknowledgments due to Mr. and Mrs. Wallace, and Mr. and Mrs. Campbell, who made me most comfortable during my residence in the Lighthouses. While to my many good friends among the Fair Islanders I have to express my indebtedness for allowing me to search their crofts—the best observing grounds in the isle.

The following are the species added to the fauna during the year :—

186. Common Crossbill, *Loxia curvirostra*.— As reference has already been made ("Annals," 1909, p. 215 ; and 1910, p. 54) to the remarkable visitation of this species to the island during the past summer, it is not necessary to repeat the statements here. They were, however, of considerable interest, and it may be remarked that more birds were seen on Fair Isle than in any other similar area in the British Islands.

Since I wrote my previous notes, I have critically examined the Crossbills obtained at Fair Isle, Suleskerry, Unst, and Barra (Outer Hebrides) ; eleven specimens in all. Every one

of these is remarkable for the slenderness of its bill, when compared with Continental examples at my disposal. This marked peculiarity leads me to believe that these birds, which are of all ages, belong to a particular race; and the fact that at both Fair Isle and the Flannans adult males of the Two-Barred Crossbill were shot from the ranks of the invading birds, indicates, I think, that the two species were travelling companions from a common area. As the Two-Barred species is confined to the far northern and north-eastern pine forests of Europe (and of Siberia), it is possible that this slender-billed race of the Common Crossbill may also be a native of those regions.

187. White-spotted Bluethroat, *Cyanecula cyanecula*.—Foremost in interest among the captures of the year is that of an adult male in full plumage of this beautiful species. Not only is it new to the birds that have occurred at Fair Isle, but it is an addition to the Scottish Fauna, and is the fourth example known to have visited the British Islands. Fair Isle, too, marks the Ultima Thule of the known wanderings of this Central European summer bird.

188. Pink-footed Goose, *Anser brachyrhynchus*.—A number of these birds appeared during the wild weather which prevailed from the 7th to the 18th of October. One of these was shot, and the identity of the wary visitors satisfactorily established. This bird would appear, strange to say, to be also an addition to the avifauna of Shetland, though it must be an annual bird of passage there.

189. Bernacle Goose, *Bernicla leucopsis*.—Several single birds were seen at intervals during the first three months of the year, and two were shot; the head of one of these I received for identification.

190. Brent Goose, *Bernicla bernicla*.—An injured bird was captured in a voe on the east side of the island in October. This I had the satisfaction of examining.

191. Grey Phalarope, *Phalaropus fulicarius*.—Single birds appeared on two occasions, during the earliest days of the year, and one of these was obtained and sent to me. These are interesting records, since they indicate that the species was spending the winter not very far away.

In conclusion it may be remarked that a pair of White Wagtails reared their brood on the island during the past summer (the first time in Scotland, so far as I know); and that the Siskin was remarkable for the numbers in which it appeared in the autumn.

SCOTTISH HERONRIES, PAST AND PRESENT.

Supplementary to List in the "Annals of Scottish Natural History," October 1908, pp. 218-23.

By Hugh Boyd Watt, M.B.O.U.

Information which has been received from correspondents and from the pages of the "Annals," and other sources, enables the corrections and additions summarised below to be made in the list referred to. As was anticipated by the writer some further names should have been starred as extinct nesting-places, and these are marked * below. The large proportion of names now starred under "Tweed," and also some of those under "Forth," is due to an omission in marking certain names, which were obtained from Mr. Muirhead's "Birds of Berwickshire" (vol. ii. 1895).

The names of my informants are given with each item, and I again beg to express my thanks and obligations to them.

CORRECTIONS AND ADDITIONS TO LIST.

Dee.

*Banchory Lodge, up to 1864, then removed to Blackhall ("Zoologist," 1872, p. 3266)—[100 to 150 yards farther west. —J. A. H.-B.]

*Binn Hill of Cairnie, near Huntly, tradition, 40 years ago.—Mr. A. M'Donald, Durris.

Pitfour House, 3 or 4 nests, when last seen over 10 years ago.—Rev. Wm. Serle.

Tay.

*Lawers.—Mr. W. E. Frost.

Loch Ba, Black Mount, 9 to 12 nests.—Mr. Chas. H. Alston.

Loch Freuchie, Amulree, number of nests not known.—Mr. W. E. Frost.[1]

*Monzie, never more than one nest.—Mr. W. E. Frost.

[1] [In what kind of ground, or wood, do Herons nest at Loch Freuchie?—J. A. H.-B.]

Forth.

Information given by the Rev. William Serle and Mr. William Evans causes the majority of the names in this area to be starred, viz. :—

*Alloa Woods.
*Binning Wood (abandoned for Tyninghame—see below).
*Callander.
*Dalkeith Palace.
*Dollar.
*Dunglass Dean.
*Gartmorn Dam.
*Loch Chon.
*Loch Leven.
*Menteith, Lake of (?).
*Old Polmaise.
*Saltheugh.
*Siccar Point.
*Yester.
Tyninghame, about 20 pairs nesting.

On Mr. Evans's ("Annals," 1909, p. 116) authority there are only four nesting-places now in this large central area, viz.: Blair Drummond, Donibristle, Tulliallan (Brucefield), and Tyninghame, a deplorable state of affairs.

Tweed.

*Calroust.
*Circle Plantation.
*Clarabad Dam.
*Foulden.
*Marchmont, Polwarth.
*March Wood.
*Nesbit.
*Paxton.

Mr. A. H. Evans corroborates most of the above as extinct.

Argyll and the Inner Hebrides.

Aros House, Mull (small).—Mr. D. M'Donald, Tobermory.
Burgh or Gribun (ought not to be marked as extinct).—Mr. D. M'Donald, Tobermory.
*(?) Islay House (near), ("Zoologist," 1872, p. 3268). No present-day information.
[Iona, named in error as a nesting-place in the "Zoologist," 1872, p. 3268, by a misreading of an observation in Gray's "Birds of the West of Scotland."]
Killiechronan, Mull (small).—Mr. D. M'Donald, Tobermory.
*Rum, one nest, 1869.—Gray's "Birds of the West of Scotland."

Solway.

*Mochrum Loch.

In an undated "Description of the Sheriffdom of Wigtoun by Sir Andrew Agnew of Lachnaw and David Dumbar of Baldoon" printed in Macfarlane's "Geographical Collections Relating to Scotland," Vol. III. p. 129, 1908 (Scottish History Society), it is stated

that "in the Loch of Mochrome, there are bred a number of herons and wild Geese with other Fowls." This is the only reference to herons nesting in the three volumes of these "Geographical Collections," the contents of which cover a period of about 200 years beginning about the middle of the sixteenth century, and in which there are many curious natural history items. Judging by these records, in earlier days mermaids were of more frequent occurrence in Scotland than heronries. But perhaps it is more correct to consider the mermaids as supernatural.

THE AMERICAN BITTERN IN SCOTLAND.

By Hugh S. Gladstone, M.A., F.Z.S., F.R.S.E.

Mr. J. A. Harvie-Brown recently drew my attention to a record of the American Bittern (*Botaurus lentiginosus*) in Ayrshire in 1848. In looking through a large quarto scrapbook entitled *Miscellanea Zoologica*, formerly belonging to the late Sir William Jardine, and now in his possession, Mr. J. A. Harvie-Brown came across a cutting from the *Dumfries Herald* of 24th February 1848, quoting the *Ayr Observer* as to the recent occurrence of this rare bird in that county.

Reference to the newspaper files at the British Museum resulted in my finding the following in the issue of Tuesday, 21st February (*sic*) 1848. (The real date should have been Tuesday, 22nd February, 1848.)

The American Bittern.—"A very beautiful specimen of that rare bird the American Bittern has been brought to our office by Thomas Logan, gamekeeper to the Marquis of Ailsa. The bird, which is stuffed, and in fine preservation, was lately shot by the gamekeeper at Loch Martnaham. When killed, the stomach of the Bittern contained no less than NINE LARGE PERCH!—certainly a very good meal.

"This kind of bird is very rare in Scotland; the only specimen known is one which was killed, in 1844 on the Moor near the residence of Sir William Jardine, in Dumfriesshire, and is preserved in his collection. This species, we find, is well known to American naturalists, and is found at

different seasons of the year from Hudson's Bay to Carolina. It has various names in different States; such as Indian Pullet, Indian Hen, and Dunkadoo;—a word, says Wilson, probably imitative of its common note. In the markets of New Orleans, Audubon tells us, it is bought in autumn by the poorer classes to make gombo soup.

"In its habits and in its voice, it bears considerable resemblance to our common Bittern. It makes its nest in swamps, laying four cinereous green eggs, according to Hutchins, among the long grass. The young are said to be at first black. Audubon says the egg of this bird measures two inches in length, by one inch and a half, and is of a broadly oval shape, rather pointed at the end, and of a uniform dull olivaceous tint. Wilson says also of the American Bittern, that when fat it is considered by many to be excellent eating. A gentleman who saw the bird at our office, and who once shot one of the same species in Ireland, confirms this statement of the eminent ornithologist. The stomach is usually filled with fish and frogs. Dr. Richardson says, 'it is a common bird in the marshes and willow thickets of the far countries up to the 58th parallel. Its loud booming—exactly resembling that of the Common Bittern of Europe—may be heard every summer evening, and also during the day. When disturbed, it utters a hollow, croaking cry.'

"Comparing the specimen shot by the Marquis of Ailsa's gamekeeper with the description given of the American Bittern, in Yarrell's 'History of British Birds,' there is a perfect identity of appearance. The whole length of the bird is about twenty-seven inches; and from the carpal joint to the end of the wing, eleven inches and a half. The beak is brownish yellow; from the forehead, before, over and behind the eye, a stretch of light yellow-brown; wing-coverts, rich brown; upper tail-coverts, buff, freckled with two shades of brown; tail-feathers, almost uniform reddish brown; chin and front of the neck, a mixture of white, buff, and dark brown in streaks; ear-coverts and a line descending therefrom, yellow-brown; between this and the throat in front, an elongated descending streak of black; breast and belly buff — each feather with an elongated brown central

patch. The legs and toes are of a greenish brown colour.

"Altogether, it is a fine-looking bird, and decidedly nobler in appearance than the native breeds which haunt our fens and water-meadows. It has been, we understand, forwarded to Culzean Castle."

The Earl of Cassillis writes me from Culzean Castle (*in litt.* 19, xii. 1909) :—"There are three Bitterns here, . . . one shot in 1871 or 1872 ; another later ; and the third shot in Albania by my father. . . . There is nothing here of the American Bittern you wrote me about, as shot in 1848."

This occurrence is not mentioned by Robert Gray in his "Birds of Ayrshire and Wigtownshire," 1869, nor in his "Birds of the West of Scotland," 1871. Howard Saunders does not refer to it in his "Manual of British Birds," 1899 ; nor does Mr. J. E. Harting in his "Handbook of British Birds," 1901. It is possible, however, that this record may not have been unknown to these authorities ; but may have been purposely disregarded by them for some good reason of which I am not aware.

There can be no doubt that the American Bitterns which have visited Scotland have been aided in their passage across the Atlantic by vessels of some sort plying between America and Great Britain ; and the following list has been compiled of all recorded occurrences of this species in Scotland :—

1	1844	Mid October	Dinwiddie, Dumfriesshire	Killed on the Dinwiddie Moors near Jardine Hall. The specimen was in Sir William Jardine's collection, but I have been unable to trace its subsequent fate. It was certainly not included in the collection of British Birds sold to the Edinburgh Museum in 1876 ; and I could not trace it in Messrs. Puttick and Simpson's sale catalogue of Sir William's birds on the 17th June, 1886.

2	1847-8	Winter	Loch Martnaham, Ayrshire	Shot by a gamekeeper. Cannot now be traced.
3	1854	November	Balgownie Links, Aberdeenshire	Shot by Colonel William Fraser. Now in the University Museum, Aberdeen.
4	1862	Autumn	Latheron-wheel, Caithness	Shot by Mr. F. S. Bentley Innes. I have not been able to trace this specimen. It certainly never was "In Mus. Roy. Phys. Soc., Edinburgh?" (Harting, *Handbook Brit. Birds*, 1901, p. 448). This Society has not a museum, and never has had one.
5	1873	25th March (a remarkable date for the occurrence of this species in Great Britain)	Drumlanrig, Dumfriesshire	Shot by a Gamekeeper. Stuffed by William Hope; Edinburgh. Now in the collection of Mr. J. H. Gurney of Keswick Hall, Norwich; where I saw it in 1908.
6	1875	End of October	Islay, Argyllshire	Shot by a visitor to the Island. Stuffed by MacCulloch of Glasgow, "but has been quite lost sight of since" ("Vert. Fauna of Argyll," etc., 1892, p. 119).
7	1888	About December	Lochnabo, Pitgavenny, Elgin	A male, shot by an underkeeper. Identified by Capt. Dunbar-Brander, who writes:— "The head-keeper at Innes (Dempster) got the bird stuffed. When he left it was sold at his sale, and bought by the Westerton keeper. The latter went to Ross-shire, and took the bird with him, and I tried to get it afterwards but failed." ("Vert. Fauna of Moray Basin," 1895, vol. ii. pp. 99-100).

The specimen recorded as having been shot about 1861, in the Pentland Hills, Midlothian, which passed into the collection of Mr. Charles Cowan of Logan House ("Field," 4th March 1871), is stated by Mr. William Evans to be a Common Bittern (*Botaurus stellaris*) (Howard Saunders, "Man. Brit. Birds," 1889, p. 734).

Mr. Roderick Gillies, landlord of the Imperial Hotel, Oban, has in his possession a stuffed American Bittern which he bought from his predecessor, Mr. W. MacKenzie. This bird is said to have been caught about ten years ago at sea, aboard one of the North Atlantic liners, and cannot, therefore, be included in the list of the occurrences of this species in Scotland.

For the compilation of the above facts, I have to thank not only Mr. J. A. Harvie-Brown, but also Mr. T. N. Johnston, Mr. A. Landsborough Thomson, the Earl of Cassillis, and Mr. Roderick Gillies.

THE SUPPOSED EGGS OF THE WOOD-SANDPIPER (*TOTANUS GLAREOLA*) TAKEN IN ELGINSHIRE IN 1853.

By William Evans, F.R.S.E.

With reference to my note in this magazine for 1899 (p. 14), calling attention to Thurnall's record of finding a nest of the Wood-Sandpiper (*Totanus glareola*) in Elginshire, on 23rd May 1853, I think it right to make known the following communications which I subsequently received from the late Professor Alfred Newton on the subject.

On 6th July 1901, Professor Newton wrote me from Magdalene College, Cambridge, as follows:—"I have had occasion to look over some bundles of old letters, written to me by my late brother Edward while he was at this college, and among them I have found the enclosures I herewith send, which may have some interest for you in regard to the letters which passed between us some two years ago, concerning the supposed eggs of the Wood-Sandpiper alleged

to have been found in Scotland by the late Mr. Charles Thurnall.

"I will only add that few, if any, men had a better eye for a bird's egg than my brother, and that he was at the time perfectly familiar with eggs of the Wood-Sandpiper, for some dozens, not to say scores, of specimens obtained in Holland had passed through our hands, or been under our inspection, between 1848 and 1853—the year in which he wrote these letters."

Extracts from the enclosures referred to.

1. From letter dated 7th Nov. 1853—"Thurnall only told me about finding the nests of the two Dotterels and the Wood-Sandpiper; the former were done by watching the old birds on, and the latter he happened to find when he was walking with some ladies on a Sunday. He saw the bird get up, and he was quite certain that it was not the Common Sandpiper; he did not like to leave the eggs as there was a boy near; it was in a birch wood, by the side of a stream, and the nest was under a dead bough."

2. From letter dated 23rd Nov. 1853—"I had a most successful day yesterday, not that I got much out of Thurnall, but he was very jolly and good natured. He had given all his Grasshopper Warbler eggs away except one, which I did not like to ask for; he gave me four Goldfinch's. He has three Dotterel's and two Wood-Sandpiper's: the former are very nice eggs, the latter I do not like at all, and between you, me, and the post are only *hypoleucos*, their only likeness to *glareola* is in the shape and disposition of the blotches, but in colour and size they are *hypoleucos*, and I have very little doubt that they are only the latter; he says himself that he is not certain that the bird had a white rump, but what struck him was that the bird was spotted like *glareola*."

In a further letter to me dated 19th July 1901, Professor Newton added—"It is only a question of opinion against opinion; but I have not a doubt that my brother's was right, and that the bird seen by Thurnall was only *T. hypoleucus*. If it had been, as he imagined, *T. glareola* he would hardly

have failed to notice the white rump which is so very conspicuous a character, though he was evidently not aware of it."

These interesting letters certainly shake one's confidence in the authenticity of the eggs in question, Bond's belief in them notwithstanding.

I should say that I had Professor Newton's sanction to publish these extracts from his brother's letters, but delayed doing so in the hope that he might have been induced to send them to the "Annals" himself.

THE AQUATIC COLEOPTERA OF THE MID-EBUDES.

By Frank Balfour-Browne, M.A. (Oxon.), F.R.S.E., F.Z.S.

In the county and vice-county divisions of Great Britain adopted by the late H. C. Watson in his "Cybele Britannica," the western islands of Scotland are arranged into groups of which Mull, Coll, and Tiree and the Treshnish Islands constitute the Mid-Ebudes.

So far almost no collecting seems to have been done in the division, and all the records which I have been able to obtain—which only refer to 14 species—are for the island of Mull. It is this scarcity of records which has led me to write this paper, which is only a preliminary one, since it is founded upon four days' collecting in the island of Coll and two days in Mull in the Tobermory district last August.

I understand that Tiree differs considerably from Coll as to its soil, and that, whereas Coll is largely shallow peat, there is little or no peat in Tiree which is largely covered with sand, and this difference alone will almost certainly mean a difference in the water-beetle fauna.

Coll is a low treeless island lying about 7 miles west of Mull. It is about 13 miles long and 5 miles wide at its broadest part. It consists of innumerable hummocks of gneissic rock largely devoid of vegetation, and the highest point on the island is only 339 feet above sea-level. The island lies in a N.E. and S.W. direction, and Tiree, which

has apparently at some time been joined to it, as the channel between the two is narrow and shallow, continues the line to the south-west.

Along the side exposed to the N.W. are several patches of sand-dunes. The hollows between the hummocks of rock are apparently filled with boulder clay, and in parts, especially towards the south-western end where the ground has been drained, there is excellent grazing land, but the greater part of the island is covered with shallow peat in which are innumerable small pools where Sphagnum and Eriophorum are the dominant plants.

On the island, therefore, the "peat-moss" or "oxylophil" fauna is dominant, but some species of this group are absent owing to the absence of high ground. Other species of the group are absent or very rare owing to the majority of the peat pools being very shallow. For instance, *Ilybius œnescens*, Thoms., was only found in a few deep holes near the road to the south end of Arinagour, holes which had been dug to provide ballast for the road. *Dytiscus punctulatus*, F., only occurred in one or two deep holes, as did also *Agabus chalconotus*, Panz. The shallowness of the peat accounts for the absence of deep holes at the peat-cuttings, so that even the dominant group of the water-beetle fauna is not fully represented.

One or two ditches and pools in the sandy regions produced members of the typical freshwater-marsh fauna, such as *Hydroporus umbrosus*, Gyll.; *palustris*, L.; *Colymbetes fuscus*, L., etc., while one or two small streams on the same ground produced *Hydroporus discretus*, Fairm.,[1] and *Agabus*

[1] I have several times been asked as to the characters by which I separate *H. discretus*, Fairm., from *H. nigrita*, F., on the one hand, and *H. pubescens*, Gyll., on the other. From *H. nigrita* it is at once separated by the sculpture of the elytra. In *H. nigrita* these are punctured, but the whole surface is dull owing to its being covered with fine reticulations. (It is described by Fowler and others as being finely coriaceous.) From the punctures arise fine short hairs, but these are so inconspicuous that the insect appears to be glabrous. In *H. discretus*, the elytra are punctured, the punctures being set perhaps a little closer together than in *H. nigrita*, but the general surface is smooth and shining. From the punctures, however, long hairs arise so that the insect is evidently pubescent.

The form of *H. discretus*, which somewhat resembles that of *H. nigrita*, is at least sufficient to make one look closely at a specimen before naming it *H. pubescens*, but there are better characters for distinguishing it from this latter species. In the first place in *H. pubescens* the prothorax is smooth between the punctures except towards the anterior border where it is marked with very fine reticulations;

paludosus, F. These latter species occurred in slowly flowing ditches thick with myosotis or nasturtium, etc.; but the typical running-water fauna, e.g. *Hydroporus rivalis*, Gyll., and *septentrionalis*, Gyll.; *Agabus guttatus*, Payk., etc., common enough in Mull, did not occur at all, perhaps owing to the smallness of the streams. *Deronectes 12-pustulatus*, Ol., was fairly common in one small stream near the south end of the island, but *D. depressus*, F., is apparently absent. This latter species is perhaps to be regarded as a lake species as well as a river species, in fact the lake and river faunas are not readily separable, such species as *Hydroporus septentrionalis*, Gyll., and *Platambus maculatus*, L., being equally common in rivers and gravelly lochs.

With regard to this latter species, its absence from Coll is perhaps not altogether attributable to the poverty of the lake and river faunas. Its distribution as at present known is somewhat peculiar. It does not occur in Ireland; on the west of Scotland it has so far not occurred north of Dumbarton and Renfrew, while on the east it has been taken in Forfar, Aberdeen S., and Easterness. It has been recorded from most of the counties of England and Wales, and is perhaps to be regarded as an eastern species which is gradually extending its range. Its absence from Ireland suggests that it is one of what Dr. Scharff[1] calls the "Siberian" group, and the absence of records from the Isle of Man, Arran, Mull, and Coll suggests that it had not reached the western shores of England and Scotland at the time these islands were separated from the mainland. It must be admitted, however, that the lists of records for the Isle of Man, Arran, and Mull are at present very incomplete!

With regard to lake species, in spite of the number of small lochs, these seemed to be very scarce, *Haliplus fulvus*, F. and *Deronectes assimilis*, Payk., being the only representatives I found. Loch Cliad, where there was plenty of what

in *H. discretus* this marking extends much farther over the prothorax, sometimes to the posterior border. In *H. pubescens*, again, the sternite of the last visible abdominal segment is smooth and shining between the punctures, while in *H. discretus* it is reticulately marked.

I may also add that in *H. planus*, F., the last abdominal sternite is marked as in *H. discretus*, so that is a good character for separating small specimens of *H. planus* from *H. pubescens*!

[1] 'The History of the European Fauna,' "Contemp. Sci. Series," 1899.

seemed to be suitable ground, failed to produce either *Cœlambus 9-lineatus*, Steph., or *Deronectes depressus*, F.

The halophil fauna is apparently absent from Coll. In the brackish pools in the sea-turf at Aringour, *Hydroporus lituratus*, F., and *planus*, F.; *Anacæna globulus*, Payk.; *Helophorus aquaticus*, L., and *viridicollis*, Steph., were the only species present, and these are all *tolerant* of salt but not dependent upon it. I have felt inclined on several occasions to treat *H. planus* as a halophil, since in the Solway district and several other places it is very abundant in the brackish pools in company with such typical halophils as *Agabus conspersus*, Marsh; *Helophorus dorsalis*, Marsh (= *mulsanti*, Rye) and *Octhebius marinus*, Payk., but the species occurs equally commonly in brick-clay holes, *e.g.* in the Clyde area, often as the dominant species, from which it appears that the fine mud of the brackish pools rather than the salt is what attracts it to these.

The species confined to the east coast of England and Scotland are, as is to be expected, absent from the Mid-Ebudes, but both the northern and southern groups are represented there. With regard to the northern group *Deronectes griseo-striatus*, De G., was taken by Dr. Power in Mull, and *Dytiscus lapponicus*, Gyll.; *Agabus arcticus*, Payk. and *congener*, Payk., *Hydroporus morio*, Dej., etc., all occur on Mull, but, being mountain species, they are not found in Coll. *Ilybius œnescens*, Thoms., and *Hydroporus melanarius*, Sturm., which are probably northern in origin, both occurred very sparingly on Coll. The southern group is represented by two interesting species: *Paracymus nigroœneus*, Sahlb., I found several times on Coll and Mull, and it also occurred in Argyll Main near Oban. Its distribution in England is southern and western, and in Ireland also it only occurs in the south and west. It is a peat-moss species occurring among Sphagnum in the peat holes. In Mull it occurred up to about 300 feet above sea-level, but in the west of Ireland I found it at rather higher altitudes although it could not be called a mountain species. So far, I have failed to find it in the Solway district, which is peculiar, especially as so many other southern species occur there.[1]

[1] 'Coleoptera of the Solway district,' "Ann. Scot. Nat. Hist." 1909.

The other southern representative in the Mid-Ebudes is *Octhebius lejolisii*, Rey and Muls. I found it on Coll in the usual situation, small rock pools, but I did not look for it in Mull. I also found it in Argyll Main, near Oban, but in both places it was very much scarcer than in the Solway district or in Ireland, in fact, except for a few larvæ, I only found about five or six specimens altogether. This scarcity suggests that the Mid-Ebudes district is about the northern limit of its range. The known range of the species is from the Isle of Wight, where Donisthorpe has recently taken it, to Coll. In Ireland I have taken it at various places between Dublin and Mayo W. round the East, North and West coasts, and it probably occurs all round the island. There is at present no record of the species for the east of England or Scotland, but very few collectors have, I believe, so far found the species at all, so that it may yet occur along the North Sea border.

I took 47 species on Coll and 36 on Mull, the total number of species being 56. Out of the additional 9 species found in the latter island, 8 belong either to the mountain group or to the running-water group. I have considered *Agabus congener*, Payk., as a mountain species, although it often occurs at low altitudes, *e.g.* almost at sea-level in the Solway district, but in such cases it is usually in a mountainous district. There are, however, two specimens in the Chitty Collection at Oxford, one labelled "Sunningdale" (Berks), and the other "Belvedere" (Kent W.), and until quite recently I have regarded these two specimens as having been wrongly labelled. Dr. Sharp has now discovered the species, actually in company with *Agabus brunneus*, F., which is a southern species, in the New Forest (Hants S.), so that the Berks and Kent W. records are probably correct. Except for these three records the species has apparently not occurred in England south of Yorks Mid W., although there are one or two records, *e.g.* Norfolk and Suffolk (Stephens), which have been supposed to be erroneous.

Although I visited the crater tarn above Tobermory I failed to find either imago or larva of *Dytiscus lapponicus*, Gyll., but this may have been due to the fact that a very

strong wind was blowing which made it impossible to see the bottom. There seemed to be very little life of any kind in the loch, and even newts were scarce.

During my two days at Tobermory I confined my attention entirely to peat moss pools, except for collections made in the Tobermory river and in one or two small streams. The mountain fauna was found at from 700-800 ft.—excepting *A. congener* which was found also at lower levels—and no doubt this fauna covers all the high ground on the island. I have already referred to the occurrence of *P. nigroæneus*, and otherwise I think the list of species calls for no comment.

With regard to the previous records for Mull, I failed to find four of the fourteen species. I have already referred to *D. griseo-striatus*, and to *D. lapponicus*, which, although first found in Mull before 1867, has been taken comparatively recently (Professor T. Hudson Beare, 1903), and no doubt still occurs in its cold and lonely habitat. *Hydræna nigrita*, Germ., was taken on the island by Professor Hudson Beare in 1903, and this constitutes, I believe, the most northern of the west of Scotland records for that species.

Andrew Murray[1] mentions, on the authority of Messrs. Hislop and Syme, *Hydroporus halensis*, F., as having been taken in Mull. Previous to 1863, this species had not been separated, at least by British Coleopterists, from *Deronectes griseo-striatus*, De G.,[2] so that this record perhaps refers to the latter species, especially as Mull is far beyond the normal distribution in Britain of *H. halensis*. There is, however, the record for Raehills, Dumfries (Rev. W. Little), also given by Andrew Murray, and the record "Near Carlisle," given by Stephens.[3] Unless the latter records are wrong and refer really to some other species, they are more likely to refer to *H. halensis* than to *D. griseo-striatus*. *H. halensis* has been taken in the Manchester district (a "local" specimen is in the Reston Collection, Manchester Museum), whereas

[1] "Cat. of the Coleoptera of Scotland." 1853, p. 18.

[2] "Ent. Annual," 1863, p. 70.

[3] "Man. of Brit. Beetles," 1839, p. 66.—Mr. F. H. Day informs me that the Cumberland record given in the Victoria County History as "Carlisle, T. C. Heysham," and to which I referred in the "Coleoptera of the Solway District," *l.c.* p. 85, is really Stephens' reference, and not a record of T. C. Heysham, whose name was inserted by mistake.

I can find no authentic[1] modern record of *D. griseo-striatus* south of Mull and Easterness.

Although it is more probable that the Mull record refers to the latter species—since that species does occur there—I am not inclined to dismiss the possibility of the record referring to *H. halensis*. I have recently been inquiring into the question of "improbable" or "ectopic" records, and am now inclined to see some significance in them, although they are usually apt to be regarded as due to wrong identification.

It is obvious that species are always striving to extend their range, and I have elsewhere endeavoured to show that the water-beetles do tend to spread during the summer and are again driven back to their old haunts in the winter.[2] It is to be expected that ectopic records will occur, and there are quite a number of such records for the water-beetles.

In such a group as the halophil or maritime species for instance there are a number of species for which there are inland records which may be regarded as "ectopic":—

Species.	Number of Counties and Vice-Counties for which there are Records.	Number of Maritime Records.	Inland, County, or Vice-County Records.
Cnemidotus impressus, F. .	16	11	Surrey, Middlesex, Herts, Hunts, Leicester.
Cœlambus parallelogrammus, Ahr.	21	16	Surrey, Herts, Bucks, Leicester, Derby.
Agabus conspersus, Marsh. .	21	21	.....
Dytiscus circumflexus, F. .	13	10	Surrey, Middlesex, Leicester.
Hydrobius oblongus, Herbst.	14	12	Hunts, Leicester.
Philhydrus maritimus, Thoms.	23	23	.....
Helophorus intermedius, Muls.	12	12	.....
,, *dorsalis*, Marsh. (=*mulsanti*, Rye)	19	15	Surrey, Oxford, Stafford, Derby.
Octhebius marinus, Payk. .	28	28	.....
,, *punctatus*, Steph. .	18	17	Salop.

[1] Stephens ("Illustr. Mand." V. p. 391, and "Manual," p. 66) records *H. griseo-striatus*, De G., from the north of England ("Carlisle," in Manual), but Gemminger and Harold treat this as referring to *H. halensis*, F. They consider Stephens's *H. areolatus* to refer to *Deronectes assimilis*, Payk, although in the "Illustrations" Stephens gives it as *areolatus of Duftschmidt*—which is a synonym for *H. halensis*, F., and in the Manual Stephens gives both names for one species!

[2] 'A Study of the Aquatic Coleoptera and their surroundings in the Norfolk Broads District.' "Trans. Norfolk and Norwich Nat. Soc." viii. 1905 (Paper I.), 1906 (Paper II.).

In the above list, with the possible exception of *Cn. impressus* and *D. circumflexus*, the species are true halophils, being found chiefly in brackish pools, and although some of the records may be erroneous, it is, at least, improbable that all the inland records in the list can be accounted for on that ground. Within the maritime counties, also, there are inland records for many of the species, and they are, I think, all to be accounted for by the natural tendency of species to extend their range. That there are limits to their powers of adaptation is evidenced by the fact that most of the inland records are for single individuals, and that there is seldom more than one record for a county or vice-county.

There are also a number of other "ectopic" records such as, *Cœlambus versicolor*, Schall, in Ireland and Scotland; *C. parallelogrammus*, Ahr., and *Hydroporus flavipes*, Ol.[1] in Co. Down; *Hydroporus dorsalis*, F., and *Copelatus agilis*, F., in Dumfries, and so on, and at least some of these probably indicate migratory movements of the species which, from the fact that there are no later records, have failed.

The following list includes all the species so far recorded for the Mid-Ebudes :—

Haliplus confinis, *Steph.*—**Coll**, several in a slow-flowing weedy burn at the south end.

H. fulvus, *F.*—**Coll** and **Mull**, on several occasions.

H. ruficollis, *De G.*—**Coll**, not common.

H. lineatocollis, *Marsh.*—**Coll** and **Mull**, rather more frequent than the last.

Cœlambus inæqualis, *F.*—**Coll**, about as common as *H. lineatocollis*.

Deronectes assimilis, *Payk.*—**Coll**, in some of the small lochs.

D. depressus, *F.*—**Mull**, Tobermory river.

D. 12-pustulatus, *Ol.*—**Coll**, one stream only; **Mull**, Tobermory river.

D. griseo-striatus, *De G.*—**Mull**, in the Power Collection, British Museum.

Hydroporus lepidus, *Ol.*—**Coll**, not common.

H. rivalis, *Gyll.*—**Mull**, Tobermory river.

H. septentrionalis, *Gyll.*—**Mull**, Tobermory river.

(H. halensis, *F.*—**Mull** (Andrew Murray, Cat. 1853))?

[1] The specimen is in the Haliday Collection, Dublin Museum.

H. tristis, *Payk.*—**Coll** and **Mull**, fairly common.

H. umbrosus, *Gyll.*—**Coll**, one or two ponds only, but common there.

H. gyllenhalii, *Schiöd.*—**Coll** and **Mull**, common.

H. morio, *Def.*—**Mull** (800 feet), common.

H. palustris, *L.*—**Coll** (scarce); **Mull**, Tobermory river.

H. erythrocephalus, *L.*—**Coll** and **Mull**, scarce.

H. melanarius, *Sturm.*—**Coll**, one only; **Mull**, several on peat mosses.

H. memnonius, *Nic.*—**Coll**, not on peat.

H. obscurus, *Sturm.*—**Coll** and **Mull**, common.

H. nigrita, *F.*—**Coll** and **Mull**, not common.

H. discretus, *Fairm.*—**Coll**, very local, but common where it occurred; **Mull**, several in small trickling stream.

H. pubescens, *Gyll.*—**Coll** and **Mull**, the commonest species; it occurred in 60 per cent of the collections on **Coll**!

H. planus, *F.*—**Coll**, a few in one or two brackish pools.

H. lituratus, *F.*—**Coll**, not common.

Agabus guttatus, *Payk.*—**Mull**.

A. paludosus, *F.*—**Coll** and **Mull**, in weedy slow-flowing streams, common in such situations.

A. congener, *Payk.*—**Mull**, common at high and fairly low altitudes on the peat.

A. arcticus, *Payk.*—**Mull** (700-800 feet), common.

A. sturmii, *Gyll.*—**Coll**, scarce; **Mull**, two or three with *A. arcticus*, *congener*, etc., at 825 feet.

A. chalconotus, *Panz.*—**Coll**, scarce; **Mull**, only in one collection.

A. bipustulatus, *L.*—**Coll** and **Mull**, common.

Ilybius fuliginosus, *F.*—**Coll**, scarce; **Mull**, a few, Tobermory river, etc.

I. œnescens, *Thoms.*—**Coll**, scarce; **Mull**, once only, with *A. sturmii*, *arcticus*, *congener*, etc., at 825 feet.

Rhantus bistriatus, *Berg.*—**Coll** and **Mull**, fairly common.

Colymbetes fuscus, *L.*—**Coll**, only in one or two ponds.

Dytiscus punctulatus, *F.*—**Coll**, not common.

D. marginalis, *L.*—**Mull**, one in a peat hole.

D. lapponicus, *Gyll.*—**Mull**, taken by various collectors.

Acilius sulcatus, *L.*—**Coll**, in one deep peaty hole, several specimens.

Gyrinus minutus, *F.*—**Coll**, common on some of the small lochs; **Mull**, Tobermory district (Prof. T. H. Beare).

G. natator, *Scop.*—**Coll** and **Mull**, fairly common.

G. marinus, *Gyll.*—**Mull**, Tobermory district (Prof. T. H. Beare).

G. opacus, *Sahlb.*—**Coll**, once or twice only; **Mull**, Tobermory district (Prof. T. H. Beare).

Hydrobius fuscipes, var. picicrus, *Thoms.*—**Coll** and **Mull**, I did not find any specimens of the "fuscipes" form.

Philhydrus melanocephalus, *Ol.*—**Coll** and **Mull**, common in the peat pools.

P. minutus, *F.*—**Coll** and **Mull**, in the peat holes, common where it occurred, but extremely local.

Paracymus nigroæneus, *Sahlb.*—**Coll** and **Mull**, sphagnum pools, several specimens on both islands.

Anacæna globulus, *Payk.*—**Coll** and **Mull**, next to H. pubescens, the commonest species.

Laccobius alutaceus, *Thoms.*—**Coll**, very few specimens.

L. minutus, *L.*—**Coll**, very few specimens.

Limnebius truncatellus, *Thoms.*—**Coll** and **Mull**, not common.

Helophorus aquaticus, *L.*—**Coll**, a few.

H. viridicollis, *Steph.* (= œneipennis, *Thoms*).—**Coll** and **Mull**, fairly common in the peat holes.

H. brevipalpis, *Bedel.*—**Coll**, not common.

Octhebius lejolisii, *Rey* and *Muls.*—**Coll**, apparently very scarce.

Hydræna nigrita, *Germ.*—**Mull**, Salen district (Prof. T. H. Beare).

The above list of 59 species is certainly incomplete, and, apart from a number of common species which should be found in the district, it is probable that there are other southern species still to be discovered. For instance, the present-known distribution of *Helochares punctatus*, Sharp, is entirely western in Ireland and south-western in Scotland, except for two records, one for a single specimen taken in Midlothian by Mr. W. Evans, the other for a number of specimens taken on Moncrieff Hill, Perth (Perth Mid) by Dr. Sharp (Coleoptera of Scotland, 1871-8). It should surely occur among the western isles, as it is a peat-moss species, and in Ireland, at least, has much the same distribution as *P. nigroœneus*.

In some other groups the range of some of the southern

species extends up the west of Scotland as far as the Outer Hebrides, and there is no apparent reason why that of some of the southern Water-beetles should not also do so. At any rate there is still a great deal to be learnt as to the distribution of the Water-beetles in Great Britain and Ireland.

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3. 'D. lapponicus in the Island of Mull,' J. J. F. X. King in "EMM.," xxxii. (ser. 2. viii.), 1897.
4. MS. List of Records of Water-beetles for Salen and Tobermory Districts, Professor T. H. Beare, 1903.

SOME FURTHER NOTES ON NOCTURNAL HYMENOPTERA.

By P. Cameron.

In the October Number of the "Annals of Scottish Natural History" I gave some instances of nocturnal Hymenoptera, an essentially sun- and light-loving order of Insects. A few further examples of this habit may not be without interest, especially as they appear to follow the rule I gave, namely, that the night-haunting species were uniformly fulvous or brownish in colour, and that their compound eyes and ocelli were larger and more prominent than they are with diurnal species. In "Nature," 1886, p. 392, the Marquis G. Doria relates that the Italian traveller and natural history collector, Mr. Leonardo Fea, found in Burma an uniformly fulvous coloured *Bombus* collecting pollen or honey at night, during bright moonlight. This, however, is a habit found with *Bombi* in this country, especially during warm, bright summer nights. It may be that the species observed by Mr. Fea was not a *Bombus*, but *Xylocopa rufescens*, Sm., which is found in Burma and which is, I have reason to believe, more or less crepuscular in its mode of life. I have found recorded two examples of nocturnal habits among the *Vespidæ*, or social wasps. *Vespa doryloides*, Sauss., is a very different form from the normal species of the genus

Vespa; and, as its name implies, it has a great resemblance to the winged forms of the ant genus *Dorylus*. In the "Journal of the Linnean Society," 1859, p. 297, Dr. A. R. Wallace describes it as "a curious species of weak structure and nocturnal habits, since I only took it when attracted to the lamp at night." According to Du Buysson this species lives in old, thickly planted forests, and appears to be greatly inconvenienced by sunlight, and is only active at night.[1] From its form and colouration *Vespa barthelemyi*, Duy., has probably identical habits. The South American social wasp, *Apoica*, flies during the night collecting honey, and resting in its nest during the day, as observed by Fritz Müller and Mr. Adolf Ducke. In its body form it is more elongated than usual and has very prominent ocelli. A comparison of *Apoica virginea*, F., *Vespa dorylloides*, and the ant *Dorylus* shows great resemblance in body form, pilosity, and colouration, showing, as I believe, that their general resemblance has been produced by the habit, common to them all, of being active at night, and not, like their congeners, during the day. Among the *Mutillidæ* the genus *Photopsis* is certainly crepuscular. This genus is well represented in the south and south-west of the United States and in Mexico, the males flying about at night. All the species are very hairy, brownish in colour and have prominent ocelli.

SCOTTISH *PHORIDÆ*, WITH TABLES OF ALL THE BRITISH SPECIES, AND NOTES OF LOCALITIES

By J. R. Malloch.

(*Continued from p.* 21.)

Phora, *Latr.*

Generic description: Antennæ sometimes enlarged, arista dorsal; frontal bristles as in *Spiniphora*; mid tibiæ with two bristles at near the base, and a very small subapical bristle on the outer side; hind tibiæ with an outer hind marginal row of small bristles in addition

[1] "Ann. de la Soc. Ent. de France," 1904, p. 617.

to the larger bristles which may be present; costa to about the middle of wing; second vein present; first thin vein nearly straight at base; anal protuberance long and finger-like. Type: *concinna*, Mg.

Table of Species.

1. (4.) Hind tibiæ with very short bristles.
2. (3.) Antennæ normal; hind tibiæ with four small bristles on the front, or under side. Smaller species. *concinna*, Mg.
3. (2.) Antennæ in ♂ enlarged, in ♀ normal; hind tibiæ with three or four bristles on the outer side besides the four underneath. Larger and darker species. *crassicornis*, Mg.
4. (1.) Hind tibiæ with the usual strong bristles.
5. (6.) Thin veins end at margin of wing; halteres black; hind tibiæ with two bristles. *abdominalis*, Flu.
6. (5.) Thin veins abbreviated; halteres pale; hind tibiæ with three bristles. *abbreviata*, v. Ros.

concinna, Mg., and *crassicornis*, Mg., seem to be universally common.

abdominalis, Fln., not uncommon about carrion at Bonhill. Occasionally met with by sweeping. Inch Connachin, Loch Lomond, 4th September 1909. The ♀ has a red abdomen, but the ♂ has the whole body black.

abbreviata, v. Ros. has only been recorded from England so far.

TRUPHEONEURA, *Mall.*

Generic description: Antennæ sometimes enlarged, arista dorsal; frontal bristles in two horizontal rows of four each; post-antennal bristles reclinate; palpi and proboscis sometimes much enlarged; costa to about middle of wing; second vein present; first thin vein bent at base; fourth thin vein sometimes abruptly broken off short of the margin of the wing, never distinctly reaching it like the others; tibial armature weak, sometimes the hind tibiæ are without the bristles; genital armature generally very prominent, chitinous, and furnished with lamellæ. Type, *perennis*, Mg.

Table of Species.

1. (2.) (3.) Palpi very large, at least in ♂, curving round in front of head. *palposa*, Zett.
2. (3.) (1.) Palpi, narrow, straight and cylindrical. *trinervis*, Beck.
3. (1.) (2.) Palpi broad and leaf like (normal).
4. (9.) (12.) Scutellum with only two bristles.

5. (8.) Legs long and slender, palpi dusky.
6. (7.) Halteres pale; first thin vein leaves at beyond the fork of thick vein. *perennis*, Mg.
7. (6.) Halteres black; first thin vein leaves at the fork (*i.e.* at base of second vein). *vitrea*, Wood.
8. (5.) Legs of ordinary form, palpi yellow. *luteifemorata*, Wood.
9. (4.) (12.) Scutellum with 4 bristles of equal size.
10. (11.) Fourth thin vein indistinct, but traceable to almost, if not quite, the margin of wing; genitalia of ♂ slightly shining and projecting, the lamellæ seldom much exposed; proboscis of ♀ normal. *lugubris*, Mg.
11. (10.) Fourth thin vein broken off abruptly at about half way to margin of wing; genitalia of ♂ highly polished, much projecting, and with the lamellæ generally widely extended; proboscis of ♀ very large and projecting. *opaca*, Mg.
12. (4.) (9.) Scutellum with two strong bristles, and the two anterior bristles much reduced in size.
13. (14.) Costa thickened on the outer third; wings darkened, especially in the ♀. *intermedia*, Mall.
14. (13.) Costa not thickened on outer portion; wings clear in both sexes. *sublugubris*, Wood.

palposa, Zett., is apparently very rare, and is only recorded from England, as are also *trinervis*, Beck, *perennis*, Mg., and *luteifemorata*, Wood.

vitrea, Wood, I have taken three specimens of at Bonhill.

lugubris, Mg., is not uncommon at Bonhill in June.

opaca, Mg., I take every season at Bonhill, and I have seen it from Gorge of Avon (King).

intermedia, Mall., is a very common species at Bonhill. I have also seen it from Cambridge (Jenkinson), and Dr. Wood has taken it at Hereford.

sublugubris, Wood, I have about six specimens of from Bonhill.

Stenophora, *Mall.*

Generic description: Antennæ sometimes enlarged, arista dorsal; costa to about the middle of wing; second vein present; mid tibiæ with two bristles at about base, and the sub-apical bristle very weak or absent; hind tibiæ with one outer hind marginal bristle; the first thin vein is bent at base, and the fourth is always complete. Type: *unispinosa*, Zett.

Table of Species.

1. (2.) Mediastinal vein incomplete; second broken at its junction with the third. *pubericornis*, Mall.

2. (1.) Mediastinal vein complete.

3. (4.) Halteres black or blackish; third joint of antennæ and palpi reddish or yellow. *unispinosa*, Ztt.

4. (3.) Halteres whitish or yellow.

5. (6.) Small species (1-2 mm.) ♂ palpi very large and with a single long terminal bristle, ♀ smaller and with several terminal bristles; legs moderately stout; halteres whitish; costa not thickened on outer third. *nudipalpis*, Beck.

6. (5.) Large species (3 mm. or more) palpi normal, pointed, and with a few short marginal bristles; legs long and slender; halteres yellow; costa thickened on its outer third. *autumnalis*, Beck.

pubericornis, Mall. I took a large number of this species in the autumn of 1907 at Bonhill. They were taken on the undersides of a species of *Agaricus* on fallen timber. Mr. J. E. Collin informed me that he has it from New Forest.

unispinosa, Ztt., a very common species everywhere.

nudipalpis, Beck, as common as the foregoing.

autumnalis, Beck, so far only recorded from England. I have seen it from Cambridge.

Parastenophora, nov. nom.

I placed the single species of this genus in a genus I named *Woodia* in a previous paper, but since writing this I have been informed by Mr. Grimshaw that the name is preoccupied in Mollusca (Deshayes, 1860). I have thus had to alter the name to one which I have less liking for.

Generic description: Antennæ normal, arista dorsal; frontal bristles unusually weak and situated as in *Stenophora*; costa to about middle of wing; second vein present, first thin vein bent at base, four thin veins present; mid tibiæ with one bristle at base, hind tibiæ with no bristle on middle.

gracilis, Wood, is the only species of the genus. It is a peculiar-looking insect, and shows an approach to the next genus in that sometimes the legs are entirely devoid of bristles. The third thick vein is incrassated in both sexes. I have met with it at Bonhill, and Dr. Wood has taken it at Hereford, from which place the specimens came that the original description was drawn from.

Beckerina, nov. gen.

Generic description: Antennæ moderately large, arista dorsal; frontal bristles as in *Phora*, Latr.; post-antennal bristles erect; costa

to middle of wing, second vein present; first thin vein bent at base and reaching the margins considerably in front of the wing tip; hind tibiæ bare.

The only species is *umbrimargo*, Beck. It cannot be placed in either *Phora* as defined by Brues, or in his *Aphiochæta* because of the peculiar direction of the post-antennal bristles. Thus although it is unfortunate that a single species should have a genus allotted to it, it is, I believe, necessary in this case. I have taken the species here not uncommonly, and expect that it may occur almost all over the country. The other localities I know of it having been recorded for are Durham and Hereford.

Aphiochæta, *Brues.*

I hope shortly to be able to deal with this group, but meantime must restrict myself to giving a list of those species that I know as occurring in Scotland.

humeralis, Ztt., not uncommon at Bonhill. I know of no other British locality. Occurs among poplar trees.
sordida, Ztt., Bonhill, common in the autumn.
ciliata, Ztt., common everywhere; hybernates in decaying fir trees, under the bark.
Beckeri, Wood, Bonhill.
flavicoxa, Ztt., Bonhill and Nethy Bridge (King).
projecta, Beck, common everywhere.
conformis, Wood, Bonhill.
fuscinervis, Wood, Bonhill, possibly generally distributed.
ruficornis, Mg., Bonhill, not rare.
humilis, Wood, Bonhill, common.
pleuralis, Wood, common everywhere.
costalis, v. Ros., Bonhill, common. It is strange that so far I have not obtained a ♂.
picta, Lehm, Bonhill and Logie (Jenkinson).
rata, Collin, Bonhill, bred from old nests.
albicans, Wood, Bonhill.
parva, Wood, a common species at Bonhill.
rufa, Wood, Bonhill.
alticolella, Wood, Bonhill, common.
campestris, Wood, Bonhill, Cardross, common.
Mallochi, Wood, Bonhill, not common. I have seen this species from New Forest.
glabrifrons, Wood, Bonhill.
æqualis, Wood, Bonhill, common.
nigripes, Wood, Bonhill, common.
subpleuralis, Wood, Bonhill, common.
Collini, Wood, Bonhill, scarce.

diversa, Wood, Bonhill.
scutellaris, Wood, Bonhill.
fumata, Mall, Bonhill.
variabilis, Wood, Bonhill, not uncommon.
obscuripennis, Wood, Bonhill.
rufipes, Mg., common everywhere.
tumida, Wood, common at Bonhill.
subtumida, Wood, Bonhill.
fusca, Wood, common at Bonhill.
pulicaria, Fln., Bonhill.
angusta, Wood, Bonhill.
pumila, Mg., Bonhill.
lutea, Mg., very common everywhere.
flava, Fln., Bonhill.

Besides the foregoing, there are in my collection a large number of species that are still undetermined, and the probability is that several of them belong to species still undescribed. It is, however, necessary to have such small insects in fair series before one can venture upon introducing them as new, or even identifying them as belonging to species already described.

METOPINA, *Mcq.*

The only species of this genus in our lists is *galeata*, Hal. It is such a minute species that one rarely meets with it in collections. I have taken about a dozen specimens at Bonhill.

I have to thank Mr. P. H. Grimshaw for his assistance in respect to matters pertaining to genera, without which doubtless some errors would have occurred.

BONHILL, DUMBARTONSHIRE.

ON THE SCOTTISH SPECIES OF *OXYURA* (*PROCTOTRYPIDÆ*)—PART IV.[1]

By PETER CAMERON.

BELYTINÆ

MARSHALL in his Catalogue published by the Entomological Society of London, 1873, records 26 British species of *Belytinæ*, to which he adds 5 more in his paper in the

[1] Part iii. *antea*, p. 230, 1908.

"Entomologist's Annual," 1874, p. 146, all being species described (but briefly) by C. G. Thomson. Marshall, *l.c.*, says that the group is small, but the difficulty of procuring specimens of any species is considerable. It may be that the species are more numerous in Scotland than in England, but my impression is that the number of English species might easily be doubled, and considerable additions made to our Scottish List. Nothing seems to be known regarding the habits of these insects, but as some of the species have been found in fungi it is very probable that they are parasitic on the Dipterous and Coleopterous larvæ found so frequently in "Toadstools."

I have to record 52 Scottish species of the group. None of them appear to be common. Of the species listed by Marshall, I have only 3, but one of these, *Belyta abrupta*, is somewhat doubtful, and the other *Belyta* is a distinct variety (*depressa* var. *cursitans*). The third known species is *Ismarus campanulatus*, a species of wide distribution.

ISMARUS, Hal.

1. *campanulatus*, Schalf., Rannoch; Shiel Glen; Kingussie.

DIPHORA, Foer.

1. *nigriceps*, K., Bishopton.
2. *rufiventris*, K., Canniesburn; Cadder Wilderness.

LEPTORHAPTUS, Foer.

1. *rufiventris*, K., Mugdock Wood, Manuel.
   [*heterocerus*, K., Gloucester.]
2. *egregius*, K., Bonar Bridge; Mugdock.

BELYTA, Jur.

1. *depressa*, Thoms. var. *cursitans*, K., Bishopton. I have the type form from the London district, but not from Scotland.
2. *crassinervis*, K., var. *scotica*, K., Dumfries.
3. *costalis*, K., Clober, Mugdock; Cambuslang; Rannoch.
4. *tenuistilus*, K. Kenmuir.
5. *modesta*, K., Dumfries.
   [*marginalis*, K., has been taken by Mr. C. G. Champion at Caterham.]

6. (*Paraclista*) *pedestris*, K., Clydesdale. A specimen from Clydesdale was named *abrupta*, Thoms., for me by the Rev. T. A. Marshall; but as it has now lost its abdomen Dr. Kieffer is not certain as to its identity.

In the "Trans. Nat. Hist. Soc. of Glasgow" i. (N.S.), I have described the undernoted species of *Belyta*.

7. *lativentris*, p. 301, Clydesdale.
8. *forticornis*, p. 302, Cadder Wilderness.
9. *moniliata*, p. 303, Mugdock Wood.
10. *mullensis*, p. 304, Mull.

Oxylabis, Foer.

1. *punctulatus*, K., Cadder.

Cinetus, Jur.

1. *iridipennis*, K., var. *prolongatus*, K., Craigton Wood in fungus, another var. from Kingussie.
2. *Cameroni*, K., Clydesdale; Bonar Bridge.
3. *fuscipes*, K., Cadder.

Xenotoma, Foer.

1. *cilipes*, K., Dumfries.
2. *similis*, K., Thornhill.
3. *gracilicornis*, K., Bonar Bridge.
4. *castaneiventris*, K., Clober; Galloway. This species was formerly named *Pantoclis Cameroni*, var., *castaneiventris*, K., cf. *Brotéria*, 1907, p. 39.
5. *scotica*, K., Bonar Bridge; Kingussie.
6. *pleuralis*, K., Cadder.
7. *nigrescens*, K., Bonar Bridge.
8. *nigra*, K., Cadder Lade.
9. *filicornis*, K., Mugdock.

Pantoclis, Foer.

1. *flavipes*, K., Dumfries.
2. *soluta*, K., Mugdock.
3. *rufiventris*, K., Bishopton; Claddich, Loch Awe; Bonar Bridge.
4. *Cameroni*, K., near Stirling.
5. *trisulcata*, K., Mugdock; Kenmuir.
6. *prolongatus*, K., Thornhill.
7. *obliteratus*, K., Dumfries.

Anectata, Foer.

1. *neglecta*, K., Kilmacolm.

ACLISTA, Foer.

1. *macroneura*, K., Dumfries ; Cadder.
2. *flavipes*, K., Mugdock.
3. *microtoma*, K., Galloway.
4. *scotica*, K., Bishopton.
5. *microcera*, K., Galloway.
6. *Cameroni*, K., Bonar Bridge.

ZYGOTA, Foer.

1. *excisipes*, K., Mugdock.
2. *areolata*, K., Manuel.
3. *dentatipes*, K., Claddich.

Zygota is treated by Dr. Kieffer as a subgenus of *Aclista*.

PSILOMMA, Foer.

1. *dubia*, K., Clydesdale.
2. *flavipes*, K., Carruber Glen, Manuel.
3. *incerta*, K., Clydesdale.

ACANTHOSPILUS, Kief.

1. *brevinervis*, K., Kingussie.
2. *nigra*, K., Galloway.

CARDIOPS, Kief.

1. *rufiventris*, K., Mugdock ; Manuel.

ACROPIESTA, Foer.

1. *flavipes*, K., Dumfries.

PLANTS OF SOME SOUTHERN SCOTTISH COUNTIES.

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

(*Continued from p.* 43.)

Arenaria leptoclados, *Guss.*—Moffat 72 ; Drummore 74 ; Symington *77 ; Peebles *78 ; Galashiels *79 ; Dryburgh *80.

A. peploides, *L.*—Drummore 74.

S. maritima, *Don*, and as the var. *densa* (Jord.).—Mull of Galloway 74.

S. subulata, *Presl.*—Torrs, in some plenty, 74.

Sagina nodosa, *Fenzl.*—Near the Tweed, Galashiels 79.

Spergula sativa, *Boenn.*—Moffat 72 ; Symington *77 ; Peebles 78 ; Selkirk *79 ; and Dryburgh 80.

Spergularia rupestris, *Lebel.*—Abundant on rocks at the Mull 74; near Torrs *74.

Montia lamprosperma, *Cham.* = *M. fontana*, L. Herb.—Moffat *72; Ettrick *79; Langton, Berwick, *81; near Strathpeffer 106 (Wm. Davy); Loch Luichart (Lady Margaret Watney) 106.

Hypericum acutum, *Moench.*—Tweedside *78.

Malva moschata, *L.*, var. *alba.*—Near Cadonfoot, with Miss Hayward, *79.

Geranium sylvaticum, *L.*, *var. *parviflorum*, Blytt.—Tweedside 78; the type, Cadonside (personal authority), 79.

G. Robertianum, *L.*, *var. *modestum*, Jord.—Shingle above Drummore *74.

Euonymus europæus, *L.*—Near Whitehill *74, perhaps planted near Galashiels *79.

†Linum usitatissimum, *L.*—Stranraer 74.

†Trigonella Foenum-græcum, *L.*—At Stranraer, as in 1898, 74.

†Medicago denticulata, *Willd.*—Stranraer 74.

†Melilotus indica, *All.*—Drummore, Stranraer 74.

Anthyllis Vulneraria, *L.*—Near Waterburn *78, thus making the comital census complete.

†Trifolium pratense, L., var. *villosum.*—In some quantity near Stranraer with other casuals *74.

†T. pratense, *L.*, var. *americanum*, Harz.—Peebles *78.

†T. resupinatum, *L.*—Stranraer, as in 1898, 74.

T. arvense, *L.*—Abundant on the railway between Peebles and Galashiels 78, 79.

†T. hybridum, *L.*—Peebles 78; Galashiels 79; St. Boswells 80.

T. procumbens, *L.*, var. *majus*, Koch.—Mull *74.

Vicia sylvatica, *L.*—Tweedside *78; var. *condensata*, Terally Bay, etc., *74; *Kirkcudbright coast 73.

†V. villosa, *Roth*, approaching var. *glabrescens*, Koch.—Stranraer 74.

V. angustifolia, *Reich.*, var. *segetalis*, Koch 74.—Near Galashiels *79; a plant from the Mull differs from our described forms.

V. Cracca, *L.*, var. *incana* (Thuill).—Mull *74.

†V. bithynica, *L.*—Stranraer *74.

†V. Faba, *L.*—Stranraer *74.

†Lathyrus Aphaca, *L.*—Stranraer, as in 1898, 74.

†L. hirsutus, *L.*—Stranraer *74.

†L. Cicera, *L.*—Stranraer *74.

†Pisum arvense, *L.*—Stranraer 74.

Rosa Eglanteria, *L.*—Native, I believe, in Galloway 74; seen also in Peebles 78; Selkirk 79; and Roxburgh 80.

Rosa glauca, *Vill.*—Sandhill, etc., *74; Tweedside *78, 79, *80.

R. sarmentacea, *Woods* (*R. dumalis*, Bechst.).—Moffat 72; Symington *77; Tweedside *78, *79, *80.

R. villosa, *L.* (*R. mollis*, Sm.).—Moffat 72; Peebles 78; Ettrick 79; Dryburgh 80.

The more critical roses gathered this summer must await further study.

Potentilla Anserina, *L.*, var. *nuda*, S. F. Gray.—Port Logan *74.

P. procumbens, *Sibth.*—Not uncommon in Galloway 74.

†P. norvegica, *L.*—Near the railway, Symington 77.

Alchemilla vulgaris, *L.*, var. *glabra*, DC. (= *A. alpestris*, Schmidt).—Corriefron 72; Peebles *78; Ettrick Bridge *79; Rhymer's Glen, Dryburgh, 80.

var. *pratensis*, Schmidt.—Galashiels *79.

Cratægus oxyacanthoides, *Thull.*—In a large hedge bordering Bowhill *79.

†Pyrus Aria, *Ehrh.*—Planted at Ardwell *74.

Saxifraga stellaris, *L.*—Correifron 72; personal authority lacking in *Top. Bot.*

†Ribes nigrum, *L.*—Quite naturalised by the Tweed below Peebles *78, *80; also by the Gala *79.

†R. rubrum, *L.*—Tweedside *78.

†R. Uva-crispa, *L.*—Tweedside *78; var. *Grossularia* (L.), Tweedside *78, 80; Hedges, Galashiels *79. The gooseberry and currants look quite wild by the Tweed.

†R. alpinum, *L.*—In a hedge near Dryburgh 80.

Sedum Telephium, *L.*, var. *purpureum*, L.—Tweedside, Peebles 78; Galashiels *79; and on the opposite side of the river *80. I cannot find the characters given in "English Botany" are constant, that is, I find plants with leaves narrow at the base have flattened, furrowed fruits, and plants with leaves broad at the base have fruits neither furrowed nor flattened.

S. album.—Quite native-looking on the rocky bank of the Tweed near Langlee *80 A.

S. acre, *L.*—Not uncommon, and native, about Galashiels *79.

†Sedum in a flowerless state was abundant and quite naturalised on a wall by the river at Clovenford 79. I am growing it to see which species it is.

Myriophyllum alterniflorum, *DC.*—Tweed 78, *79, 80.

Epilobium alsinefolium, *Vill.*—Correifron 72.

Circæa lutetiana, *L.*—*78.

C. alpina, *L.*—By the Tweed near Yair 79.

Hydrocotyle vulgaris, *L.*—Peebles *78; Ettrick Bridge 79; Fairydean *80; thus completing comital census.

Conium maculatum, *L.*—Near Peebles *78.

†Bupleurum rotundifolium, *L.*—Stranraer, Drummore, *74.

Anthriscus sylvestris, *Hoffm.*—Dryburgh *80.

Oenanthe Lachenalii, *Gmel.*—Port Logan 74.

Ligusticum scoticum, *L.*—Mull 74.

Caucalis nodosa, *Scop.*—On ballast at Stranraer and Drummore 74.

†Symphoricarpos racemosus, *Michx.*—Peebles *78.

Galium austriacum, *Jacq.* (*G. sylvestre*).—Correifron 72.

†G. tricorne, *Stokes.*—On shingle, Stranraer 74.

†Asperula arvensis, *L.*—Stranraer, Drummore, *74.

Inula crithmoides, *L.*—Locally plentiful on the Mull of Galloway 74.

†Anthemis tinctoria, *L.*—Stranraer *74.

Matricaria inodora, *L.*, var. *salina*, Bab.—Port Logan *74.

Tanacetum vulgare.—Port Logan 74.

Senecio viscosus, *L.*—Symington, near the railway, 77; near Innerleithen *78; Galashiels 79.

Arctium Lappa, *L.* (*majus*).—Sandhead *74; Peebles *78; Selkirk *79; Galashiels, but in *80.

Carduus acanthoides, *L.* (*crispus*).—74.

†Mariana lactea, *Hill.*—Drummore 74.

Centaurea Cyanus, *L.*—Near Galashiels, doubtfully wild, *79.

Picris Echioides, *L.*—On rubbish, Stranraer *74.

Crepis paludosa, *Moench.*—Moffat (personal), 72.

The Hieracia await Mr. Ley's opinion.

Hypochœris radicata, *L.*—Dryburgh *80, completing comital distribution.

Taraxacum paludosum, *Schlecht.*—Ettrick Bridge *79.

Statice maritima, *Mill.*—Port Logan 74.

S. linearifolia, *Later.*—Mull of Galloway, etc. 74.

Lysimachia vulgaris, *L.*—Drummore 74.

†Steironema ciliatum, *Rafin.*—Quite naturalised by the Tweed near Horsburgh Castle *78.

Anagallis arvensis, *L.*—Peebles *78; Galashiels *79.

†A. femina, *Mill.*—Stranraer, 74.

Ligustrum vulgare, *L.*—Plentiful about Galashiels, but perhaps planted *79.

Centaurium umbellatum, *Gilib.*, var. *capitatum*, Druce.—Mull of Galloway 74.

†Symphytum peregrinum, *Ledeb.*—I doubtfully refer to this a dark violet-coloured plant seen in Galloway 74.

S. tuberosum, *L.*—By the Tweed near Peebles *78.

†Anchusa sempervirens, *L.*—In some plenty at Drummore, Broadwell, etc., quite naturalised, 74.

†Asperugo procumbens, *L.*—In some plenty at Stranraer and Drummore *74.

Pneumaria maritima, *Hill.*—Port Logan, also sparingly at West Tarbert 74.

Lithospermum arvense, *L.*—Drummore on shingle, and at Stranraer *74.

Volvulus sepium, *Medic.*—Peebles *78; Galashiels *79. Possibly of garden origin.

Convolvulus arvensis, *L.*—Peebles *78, Galashiels *79.

Solanum Dulcamara, *L.*—By the Gala at Galashiels *79.

Verbascum Thapsus, *L.*—Galashiels (Miss Hayward) *79, possibly adventitious.

†Mimulus guttatus, *DC.*—By the Tweed *79, *80.
var. *concolor* (*M. luteus* auct.).—Near Horsburgh Castle *78; Tweed *80.

Veronica didyma, *Ten.*—Galashiels *79.

V. Tournefortii, *Gmel.*—Drummore 74; Galashiels *79.

Euphrasia curta, *Wettst.*, var. *glabrescens*, Wettst.—Mull *74; Symington 77; Ettrick 79.

E. brevipila, *B. and G.*—Ettrick *79.

Bartsia Odontites, *L.*, var. *verna* (Reichb.).—Drummore *74.

Rhinanthus stenophyllus, *Schur.*—Moffat *72; Symington *77; Peebles *78; Ettrick *79.

R. monticola, *Druce.*—Near Moffat *72.

Mentha longifolia, *Huds.*—Near Horsburgh Castle *78.

M. alopecuroides, *Hull.*—Near Sandhead 74.

†M. spicata, *L.*—Galaside *79.

*M. rubra, *Sm.*—Tweedside, Peebles, in some plenty, *78; by the Gala *79.

*M. piperita, *L.*—Tweedside below Peebles *78 ; near West Tarbert 74.

*M. verticillata, *Huds.*—Near Abbotsford *79.

Thymus glaber, *Mill.*—Correifron *72.

T. præcox, *Opiz*, Mull.—*74.

*Stachys ambigua, *Sm.*—Near Peebles *78.

Clinopodium vulgare, *L.*—Tweedside *78 ; also by the Ettrick, etc. 79.

Nepeta hederacea, *Trev.*—Near Peebles *78.

*Scutellaria galericulata, *L.*, var. *pubescens*, Benth., in *DC.*, "Prod." xii. 425, "caule, foliorum pagina inferiore, calycibus, corollisque pubescentibus." On shingle at East Tarbert in great plenty *74, noticeable from its conspicuous pale blue flowers. Plant about 4 to 6 inches above shingle, flowers longer than bracts, very pubescent ; leaves on under side canescent with shaggy hairs. The same form was observed on shingle at Jeantown, W. Ross, *105.

Galeopsis Tetrahit, *L.*—In Wigton and Peebles I saw this in three distinct modifications : one, the plant known as *bifida*, Boenn. ; second, a taller plant though not so coarse as our English type, with somewhat large, pale purplish-pink flowers, the tube not very elongate ; third, growing with this a plant with pure white flowers which were smaller (when looked at from the front) owing to the narrower corolla lobes, but with distinctly longer tube, so that viewed sideways the flowers of third looked longer and larger than those of second. Is this another instance of flower-dimorphism? if so, it is curious it should be correlated with albinism. The relative length of the stamens and styles appeared to be the same in the few specimens I examined.

Teucrium Scorodonia, *L.*—Near Peebles 78.

Ajuga reptans, *L.*—Near Peebles *78, completing the comital distribution.

†Plantago Lagopus, *L.*—Stranraer 74, as in 1898.

Littorella uniflora, *Asch.*—Cauldshields (personal) 79.

†Chenopodium opulifolium, *Schrad.*—Galashiels 79.

†C. murale, *L.*—Stranraer *74.

Atriplex patula, *L.*—Moffat 72 ; Galashiels, etc. *79.

A. hastata, *L.*—Peebles *78 ; Galashiels *79.

An Atriplex at Stranraer appears to be a distinct species ; unfortunately I was too early for fruit.

Polygonum Lapathifolium, *L.*—Galashiels *79.

P. tomentosum, *Schrank* (*maculatum*) "flore albo."—With Miss Hayward, Galashiels *79. On the shingle at Stranraer *74.

P. Hydropiper, *L.*—Near Horsburgh Castle *78.

†P. cuspidatum, *Sieb. et Zucc.*—Stranraer *74.

Oxyria digyna, *Hill.*—Correifron 72.

†Humulus Lupulus, *L.*—Galashiels *79.

Betula alba, *L.*—Ettrick side *79; Allan Water *80.

B. tomentosa, *R. and A.*—Tweedside *79.

Quercus Robur, *L.*—Near Galashiels *79.

Q. sessiliflora, *Salisb.*—Moffat *72.

†Fagus sylvatica, *L.*—Planted at Peebles 78; Galashiels, etc. 79.

†Salix triandra, *L.*—Near Drummore, probably planted, *74.

†S. fragilis, *L.*—Near Terally, probably planted, *74.

S. phylicifolia, *L.*—Tweedside *78; Ettrick *79.

S. nigricans, *Sm.*—Ettrick *79.

*S. rubra, *Huds.*—By the Gala *79, probably planted.

S. purpurea, *L.*—Tweedside 78; Ettrick, looking native, 79.

S. viminalis, *L.*—Near Peebles *78.

S. Smithiana, *Willd.*—Tweedside, Peebles *78; Galashiels *79.

†Populus deltoides, *Marsh.*—Moffat *72; near Stranraer *74; Peebles *78; Galashiels *79; Dryburgh *80.

†P. nigra, *L.*—Wigton 74.

†P. alba, *L.*—Drummore 74.

Empetrum nigrum, *L.*—On cliffs at Port Logan 74.

†Humulus Lupulus, *L.*—Galashiels *79.

†Elodea canadensis, *Michx.*—Galashiels *79.

Orchis maculata, *L.*—Near Stonykirk 74.
var. *præcox*, Webster (*ericetorum*), Moffat 72; near Torrs *74; Ettrick *79; Fairy Glen 80.

Allium.—I think Scorodoprasum, *L.*, near Port Logan *74, in the vicinity of cottages. I am cultivating in order to identify it.

Butomus umbellatus, *L.*—Faldonside *79, ? native.

Potamogeton crispus, *L.*—Tweed 79.

P. angustifolius, *Presl.*—Tweed, Cauldshields 79.

Sparganium neglectum, *Beeby.*—Near Dunragit *74; Peebles *78.

Carex extensa, *L.*, var. *latifolia*, Boeck.—Port William (C. Bailey) 74, also in Co. Down; see Kükenthal's "Caricologia."

C. inflata, *Huds.*—Marsh by the Tweed *78.

C. riparia, *Curt.*—By the Tweed *78.

C. canescens, *L.*, var. *tenuis*, Lang.—Near Ettrick Bridge *79.

Several sedges are awaiting Pfarrer Kükenthal's naming.

†Phalaris canariensis, *L.*—Stranraer, Drummore 74; Peebles *78.

†P. paradoxa, *L.*—Stranraer as in 1898, 74.

†Alopecurus myosuroides, *Huds.*—Stranraer *74.

†Polypogon monspeliense, *Desf.*—Stranraer as in 1898, 74.

Agrostis alba, *L.*, var. *prorepens*, Koch.—Symington *77.

A. tenuis, *With.*, var. *pumila* (*L.*).—Mull 74; Ettrick Bridge *79; Cauldshields 80.

Arrhenatherum tuberosum, *Gilib.* — Moffat 72; Galloway 74; Peebles *78; Selkirk *79; Dryburgh *80.

Avena fatua, *L.*—Peebles *78.

Koeleria albescens, *DC.*, var. *glabra*, DC.—Mull of Galloway *74.

Glyceria plicata, *Fr.*—Peebles *78.

G. aquatica, *Wahl.*—I believe some flowerless plants by the Tweed near Dryburgh are this species, 80.

Poa compressa, *L.*—Walls and banks, Dryburgh (personal) 80. By the Gala *79.

P. pratensis, *L.*, var. *subcœrulea* (Sm.).—Mull 74.

Festuca rubra, *L.*—Peebles 78; Ettrick 79.
var. pruinosa, *Hack.*—Mull *74.

F. heterophylla, *Lam.*—By the Tweed about two miles from Peebles, growing in some quantity near planted shrubs, *78.

Bromus sterilis, *L.*—Peebles 78.

B. commutatus, *Schrad.*—Galashiels 79.

†B. arvensis, *L.*—Stranraer 74.

†B. tectorum, *L.*—Stranraer 74.

†Lolium temulentum, *L.*—Stranraer *74.

†Lolium italicum, *Braun.*—Galashiels 79.

Hordeum marinum, *Huds.*—At Stranraer as 1898, 74.

†Secale cereale, *L.*—Stranraer 74.

Taxus baccata, *L.*—Planted, I suppose, near Galashiels.

Pinus sylvestris, *L.*—A seedling plant on the rocks by the Ettrick 79.

†Larix decidua, *Mill.*—Seedling plants by the Ettrick 79.

Several plants await critical examination.

I may add that I noted 362 native and about 70 alien species in Selkirk, in Peebles 350 species, and about the same number in Roxburgh.

SOME "NEOLITHIC" MOSS REMAINS FROM FORT WILLIAM.

By H. N. Dixon, M.A., F.L.S.

A SMALL quantity of material of moss remains was sent to me last spring by Mr. Clement Reid for identification, obtained by Messrs. Maufe and Wright of the Geological Survey, and labelled as from sandy peat under the 25-foot raised beach at Fort William. Although the bulk was not large—only the contents of a large pill-box—the material had been carefully washed out, and practically consisted entirely of fragments of mosses; and the condition of preservation was such that they were unusually—for the age of the deposit—capable of determination. It will be convenient to give first a list of all the species identified, before commenting upon the whole association.

Sphagnum fimbriatum, Wils., or *S. Girgensohnii*, Russ.—A single well preserved branch-leaf of one of these species, which are, I believe, quite indistinguishable from one another by the branch-leaves alone.

Andreæa Rothii, W. and M.—A single fragment, consisting of a densely branched stem, with the leaves quite well preserved.

Dichodontium pellucidum, B. and S.—Several fragments.

Blindia acuta, var. *trichodes*, Braithw.—A fragment of a stem with a few leaves. The enlarged angular cells have been practically all eroded or destroyed, leaving only the alar spaces, which are perhaps not quite so large as one would expect in this species; the form and areolation of the remainder of the leaves is, however, quite in agreement with the plant to which I have referred it, a plant so characteristic that there can be little doubt as to its determination. Mr. W. E. Nicholson, to whom I submitted it, quite concurs.

Dicranum Bonjeani, De Not.—A considerable number of characteristic fragments.

D. Scottianum, Turn.—One or two scraps with the leaves well preserved. The areolation in this species, taken in connection with the entire leaves, is distinct, and its identification seems quite beyond question. The leaf of *D. Scottianum* shows in the upper part a layer of *short* subquadrate cells covering the

back of the smooth nerve (the "Aussenzellen" of German authors in describing the nerve-section); these are quite well shown in the Fort William plant.

Fissidens osmundoides, Hedw.—A well preserved fragment or two.

Grimmia, sp.—Three or four fragments of a *Grimmia* with narrow leaves, of the *trichophylla* type, but with the cells nearly all remaining incrassate and sinuose to the base. Mr. Nicholson suggests *G. Mühlenbeckii*, with which I think it might well be identified. I have, however, seen forms of what is probably *Grimmia robusta*, Ferg., with a similar areolation, and it is perhaps not quite safe to attempt a final determination.

Rhacomitrium heterostichum, var. (= *R. affine*, Lindb.).—One of the forms with short upper areolation and very short, inconspicuous hair-point.

R. canescens, Brid.—Frequent small fragments.

Bryum pseudo-triquetrum, Schwaeg.—Two small but well preserved fragments, one showing clearly an inflorescence which I was able to dissect and determine as ♀.

Mnium hornum, L.—A single well preserved stem.

Neckera pumila, Hedw.—Numerous small fragments.

N. complanata, Hübn.—In various forms besides the typical one. The leaves in one were rather long and comparatively acute, with the margin often denticulate for some distance downwards. Another had the leaves often very tapering and acute or even acuminate, but quite entire, the cells rather narrow. Still another had the leaves very wide above and obtuse.

Antitrichia curtipendula, Brid.—The bulk of the material consisted of this moss, often in large fragments, and perfectly well preserved with the exception of being absolutely blackened.

Thuidium tamariscinum, B. and S.—Several scraps, and one fairly complete and wonderfully preserved frond.

T. delicatulum, Mitt.—A single stem, with stem-leaves and branch-leaves in good condition and quite characteristic.

T. Philiberti, Limpr.—Several fragmentary stems. The form and arrangement of the branch-leaves was quite different from that of the preceding. That alone would not, of course, preclude the interpretation that they represented two forms of the same species; but the form of the stem-leaves admits no doubt on the matter. The filiform apex of these leaves, as is only natural, was not to be found remaining; but their outline was quite characteristic. In the smaller forms of *T. Philiberti* the stem leaves do not differ very markedly in outline from those of *T. delicatulum*; but in the larger, better developed forms,

and especially in *T. pseudo-tamarisci*, Limpr. (which I take to be only a luxuriant, tripinnate form of *T. Philiberti*), there is a very distinct difference. The stem leaves in *T. delicatulum* are (constantly, I believe) comparatively small, from a wide and short base (almost as wide as the whole length of the leaf) abruptly contracted to a proportionally short, not very tapering acumen. In the more robust forms at least of *T. Philiberti* these leaves are *very much larger*, *gradually narrowed* almost from the base into a *very long*, *tapering acumen*, terminated—in recent specimens—by the characteristic filiform point. This outline is well shown in the Fort William specimens, furnishing a complete contrast to the form of leaf in *T. delicatulum*, and leaving no doubt at all as to the identification.

Brachythecium rutabulum, B. and S.—Scanty.

B. plumosum, B. and S.—In considerable quantity and showing some variation.

Eurhynchium prælongum (L.), Hobk.—Several stems.

E. striatum, B. and S.—A fragment only.

E. myurum, Dixon.—Two forms, one the ordinary, another a larger one, with wide, obtuse and subobtuse leaves, which I should hesitate, however, to refer to var. *robustum*, B. and S.

E. myosuroides, Schp.—Frequent.

E. rusciforme, Milde.—Several fragments.

Hyocomium flagellare, B. and S.—In very small quantity.

Plagiothecium undulatum, B. and S.—A scrap merely, but quite unmistakable.

Hypnum fluitans, L.—One or two small bits.

H. uncinatum, Hedw.—A few branches.

H. falcatum, Brid.—One or two fragments. One stem which was almost certainly this had nearly all the leaf-tissue eroded away, doubtless water-worn, and scarcely more than the stout falcate nerves left.

H. cupressiforme, L.—Very little.

? H. palustre, L.—A scrap of a Limnobium was detected by Mr. Nicholson on a slide which I sent to him containing another plant. It is almost certainly *H. palustre*.

H. cuspidatum, L.

Hylocomium loreum, B. and S.—Next to *Antitrichia* the preponderating plant.

H. brevirostre, B. and S.—In quantity.

H. squarrosum, B. and S.

This collection, consisting of nearly forty distinct species, is of considerable interest from several points of view. In the first place it is decisively not a paludal or a peat-moss association. I have examined bryophytic remains from perhaps a dozen deposits of varying age, ranging from quite recent to early glacial or pre-glacial times, and I have seen reports of numerous others. In all these collections, with scarcely, if my memory serves me, an exception, not only has the paludal element been largely, indeed overwhelmingly, preponderant, but in nearly every case any other element was entirely absent, or if present it occurred in such minute proportion as to suggest an accidental introduction or a quite exceptional occurrence. The usual species comprise a large percentage of pleurocarpous mosses, such as *Camptothecium nitens*, *Hypna* of the sections *Harpidium*, *Calliergon*, etc., with a sprinkling of *Aulacomnium*, *Philonotis*, *Fontinalis*, and similar aquatic and paludal Acrocarpi. This is of course what one would reasonably expect, since these comparatively delicate, non-vascular plants would naturally require the conserving influence of peat, or of some closely similar deposit, for their preservation. Mosses in other forms of deposit would have far less chance of being preserved.

The present collection comes as a somewhat welcome relief from such associations as the above, which not only repeat themselves with a monotonous frequency, but give one a conception, exaggerated no doubt, of a dull sameness in the configuration of these northern lands in the prehistoric pleistocene periods, of unvaried peat moss, and bleak moorland and barren mountain-side. The Fort William mosses tell a very different tale. There are but few of them (*Dicranum Bonjeani*, *Fissidens osmundoides*, *Bryum pseudotriquetrum*, *Hypnum uncinatum*, *H. fluitans*, *H. falcatum*, and *H. cuspidatum*) which could be considered in any way paludal mosses; only the last three are distinctively, and not one of them is necessarily such. They are quite as frequently, and some of the rest are exclusively (*Hyocomium flagellare*, *Brachythecium plumosum*, *Hypnum palustre*, *Blindia acuta*, var. *trichodes*), the inhabitants of wet rocks in and by mountain streams; and it is quite certain that these latter, at least,

must have had such an origin. Many of the others are the ordinary plants of the drier boulders of mountainous or sub-alpine country through which such a stream commonly makes its way (*e.g. Hylocomium squarrosum*, *Antitrichia*, *Andreæa*, *Rhacomitrium heterostichum*); *Andreæa Rothii* is a very typically rupestral moss, and *Hyocomium* and the *Blindia* are distinctively and exclusively mosses of waterfalls and swiftly running mountain becks. But in addition to this we must picture the stream as flowing through woods. For *Plagiothecium undulatum*, *Hylocomium brevirostre* and *H. loreum*, *Eurhynchium striatum*, *E. myosuroides* and *E. myurum*, *Thuidium tamariscinum* and *T. delicatulum*, infallibly tell of woodland, and rocky, mountain woodland, while *Neckera complanata*, and especially *N. pumila*, must have been growing actually on the trees themselves. We may perhaps safely go a little further than this. *Thuidium Philiberti* is especially a plant of wet rock ledges or dripping cliffs; *Sphagnum Girgensohnii* (if our species be that) affects the same habitats; *Thuidium delicatulum* prefers, at least, the margins of fair-sized streams. Out of about eighteen gatherings I have made of this species in Great Britain, fifteen were from the borders of fair-sized mountain streams and one from a lake shore. I believe we may therefore confidently reconstruct the conditions under which these mosses grew as indicating a stream of some magnitude—not a mere rivulet—tumbling over boulders, and flowing, at times at any rate, between wet rocky cliffs, down a wooded mountain side or valley. We should not have to go very far from the locality where they were deposited to find, at the present time, just such conditions. I have gathered in woods on the south shore of Loch Leven, above Ballachulish, and within a confined area, nearly every moss contained in this collection, except *Thuidium Philiberti*. There, by a similar stream to the one pictured, *Dicranum Scottianum* was fruiting abundantly, *Fissidens osmundoides* was loaded with capsules, and *Thuidium delicatulum* showed its delicate fern-like fronds, while the Hylocomia and many of the other pleurocarpous mosses listed above formed the bulk of the Bryophytic vegetation of the woods.

While, however, so much is certain, I believe, as to the

origin of the mosses, it is not quite clear under what circumstances they were deposited in the bed in which they now lie. I am indebted to Messrs. Maufe and Wright, of the Geological Survey, by whom the specimens were obtained, for the following notes on the present situation and conditions of the plant bed.

"The plant-bed is exposed on the right bank of the river Lochy a mile and a half north of Fort William and 1000 yards west of the Lochy Suspension Bridge. It lies just at high-water mark, being covered by one to two feet of water at high spring tides. It contains prostrate tree-trunks up to one foot in diameter, and is overlain by coarse stratified gravel and sand up to 15 feet in thickness. This gravel and sand belongs to the so-called '25 foot raised beach' of Scotland. It reaches in this country its greatest development and altitude, but is traceable at lower levels into northern England and Ireland. In the latter country it has been proved to be throughout of Neolithic age, implements of an early Neolithic type having been obtained at considerable depths in its gravels. In many localities, both in Scotland and Ireland, implements of a later type, but still Neolithic, occur on its surface in such situations as to show that the elevation which brought the beach into its present position was, in part at least, accomplished during Neolithic times."

The presence of prostrate tree-trunks confirms the conclusion to which the moss remains point, as to a woodland origin. On the other hand, the remains of Phanerogams, with which the mosses were associated, fail to confirm this conclusion in a rather noticeable way. Mr. Clement Reid has kindly sent me particulars as to the plant remains; he writes: "I am sorry to say that they do not throw much light on climatic conditions—they are common meadow plants of wide range and are mostly badly preserved." And in a later letter he adds: "I do not quite know what to say as to the Fort William seeds. They are curiously badly preserved—much more so than the mosses. Perhaps the mosses grew on the spot, whilst the seeds came from a distance." The plants determined by Mr. Reid for the most part indicate a slow-flowing stream through meadow-

land (*Ranunculus Lingua*, *R. repens*, *Phragmites*, *Lychnis Flos-cuculi*, *L. diurna*, etc.), though Corylus and Oxalis would postulate a woodland origin for part of them. I believe that the only possible conclusion is that the bulk of the moss-remains had a different origin from that of most of the flowering plants ; and considering the unusually well-preserved condition of the former, and the badly preserved state of the latter, it would appear that the phanerogams must have been brought down from a greater distance, and that the stream must have flowed through some upland meadow valley before coming to its rocky woodland course. Or perhaps more probably the stream or river by which they were deposited was formed by the union of two streams, one of which brought down the mosses, while the other, a larger and more slowly flowing stream traversing an alluvial meadow-land, brought the phanerogams. These conditions would almost be fulfilled at the present time if only the lower slopes of Ben Nevis on its northern or western side were wooded, when either of the streams rising on that mountain, and uniting and flowing into the Lochy at Lochy Bridge, would well afford the supposed requirements. It is, I think, out of the question that the moss-remains are derived from a large area, or brought from any great distance ; in such a case they could hardly have presented the homogeneous association that they actually exhibit, while aquatic or paludal species could scarcely fail to have been in stronger evidence.

As regards the climatic conditions prevailing when this plant association was growing, the general conclusion to be drawn would be that they were very similar to those now obtaining. The presence of *Dicranum Scottianum* especially has perhaps a particular interest, as probably indicating with some certainty that, at least, no appreciably greater degree of cold prevailed. The distribution of this species is notably an Atlantic one ; it occurs in most of the groups of the Atlantic Islands, in Brittany and Normandy and the Pyrenees, in Denmark, and in Western Britain, but scarcely extends to any extent eastwards in continental Europe. (Paris indeed cites it as from Spitzbergen, but this must surely be a slip ; it is not mentioned in Berggren's "Musci Spetsbergenses," or

in any other work with which I am acquainted dealing with the arctic regions.) It is therefore indicative of a mild and equable climate, and I believe its presence may be taken as fairly conclusive that the climate of the period was at least in no degree more boreal than at the present time.

A somewhat special interest attaches to the three species of Thuidium. *T. tamariscinum* is, of course, one of our commonest and most widely-spread woodland mosses. But the case is quite different with the other two. Until 1874 *T. delicatulum* was not recognised as a European moss, though abundant in North America. In that year Lindberg detected and recorded it from a single station in Finland. Six years later Philibert found it in France, and subsequently it has been discovered to be widely spread over the European continent, though apparently not very common, and chiefly in the lower montane regions. It was unrecognised as a British moss until 1885, when it was recorded by Holt from Tyn-y-groes, North Wales ; while in 1889, Binstead gathered it in fruit at Lodore. Since that time its recorded distribution has been greatly extended, and it is entered in the "Census Catalogue of British Mosses" (1907) from 17 vice-counties in England, Wales, and Scotland (besides four doubtful records), and 6 in Ireland. Of the former, 7 are Scotch, 5 Welsh ; and of the 5 English, 3 are on the west coast, the Isle of Wight and west Yorkshire being the remaining ones. It will be seen, therefore, that its distribution with us is exclusively western and montane. It is, in fact, almost entirely a rupestral plant, though occurring occasionally on sandy debris by mountain stream and lake sides. I have only once found it elsewhere, in a bog at the foot of a Perthshire mountain, and then looking very unhappy and unlike itself.

Thuidium Philiberti has a somewhat similar history, though it is a still more recently recognised member of our moss flora. It was described from France as a new species (*T. intermedium*) by Philibert in 1893, but the name had already been preoccupied by Mitten, and Limpricht renamed it as *T. Philiberti* in 1895. It was then known from several localities in Central Europe and North America. I had gathered it on Craig Chailleach, Perthshire, in 1893, but had

not distinguished it from *T. recognitum*; and it was not till 1897 that I recognised its identity with the continental and North American plant, and recorded it for the first time as British. It is recorded in the Census Catalogue from Mid-Perth and Argyll only; and though it occurs on several of the Perthshire mountains, it is undoubtedly a rare moss, and (with us at least) confined to wet rocks in mountainous districts.

It is not very likely that anyone would suggest that these two mosses are recent introductions into Britain. Still the increasing army of invading aliens among Phanerogams (and *Splachnobryum* and *Hypopterygium* may be cited among mosses) tends to throw a more and more suspicious colour upon all fresh discoveries, and every newly recorded British plant has to run the gauntlet of a fierce fire of criticism before it is allowed a place within the charmed circle of the "native." It is, therefore, perhaps not unfortunate for the future reputation of *Thuidium delicatulum* and *T. Philiberti*, as indigenous British plants, that we can point to still existing specimens which were growing in the mountain woods of Western Scotland at the time when Neolithic man was ranging them with his weapons of polished flint in search of the bear, the wolf, the beaver, or the deer.

NOTES ON THE REVIEW OF KÜKENTHAL'S CAREX.

By Arthur Bennett.

Kobresia caricina, Willd.—*Carex bipartita*, All.—"Fl. Ped." n. 230, 1, t. 89, f. 5.

Kunth (whose work is in advance even now of later work) places this under *Elyna caricina*, Mert. and Koch = *K. caricina*, Willd.[1] Here it may be well to clear up another doubtful Carex, *i.e. C. simpliciuscula*, Wahlb., Westmoreland. Dr. Almquist wrote me that the original specimen in "Heb. Vet. Skand.," Stockholm, is *Elyna caricina*. This was founded on specimens gathered by Dawson Turner in Westmoreland.[2]

[1] Baker, "Flora of the Lake District," 218, 1885.

[2] Specimens of the Kobresia are in Balbi's herbarium at Turin named *Carex bipartita*, All., Bailey, *l.c.*

Carex binervis, Smith.

Drejer's var. *alpina* is characterised "*β alpina humilior*, spicis paullo brevioribus = *C. vesicaria*, *β alpina*, Lyngb.! in herb. Hornm., Færö ad Quivig! Lyngbye." The 56 (p. 48 in January "Annals") must be a misprint, as the number is 52, p. 474, in the original paper. Drejer remarks "Hujus plantæ modo 2 frustula mala conservata in herb. nostro deposuit Lyngb., quæ tamen satis luculenter probant plantam hujus floræ civem esse."

Carex flava, L.

Anderson in "Cyper. Scand.," p. 25, 1849, describes his var. *pygmæa* as "culmo unciali-digitali foliis multo breviori, spicis parvis subrotundatis confertis." Ascherson and Graebner place this under subsp. *Œderi*, Ehrh.

C. alpina, Siv.

There is a difficulty to face with this name. *C. alpina*, Schrk., var. in "Fl." 1, 299 (1789) = *C. sempervirens*, Vill. (1787). Then there is *alpina*, Hoppe = *C. ferruginea*, Scop.

Carex Buxbaumii, Wahl. (1803).

C. subulata, Schum., 1801; *C. polygama*, Schkr. (1801); *C. fusca*, All., "Fl. Ped." ii. (1785), 269. There is a good specimen of *Carex Buxbaumii* in Allioni's herbarium, seen by Mr. L. H. Bailey, who also saw Wahlenberg's type, and Schkuhr's; so that the name according to priority is *fusca*.[1]

C. elata, All.—The difficulty is that there is no specimen extant of Allioni's plant; and correspondence with several Italian botanists leaves it doubtful as to whether *acuta* or *stricta* is his plant.

Carex aquatilis, var. *epigeios*, Læst.

Now in the "Journal of Botany," 1897, I notice two plants so named, one the plant of Læstadius (1822), and the other of Fries "Bot. Not." (1843), p. 105. That of 1822 was the plant from Perthshire which Dr. Almquist named as such; there I express doubt of its being so. The other is a form of *salina*, which Richter, following Nyman, makes the *C. bicolor*, Nyl." Nylander[2] has no such name; it is no doubt a clerical error for *discolor*, which he has. I there say I have seen only three specimens of this *epigeios* from Scotland; *i.e.* in herb. Boswell, Kew, and my own collections. Anderson keeps up Nylander's species; Almquist and Hjelt[3] make it a form of *C. salina*, sub-sp. *cuspidata*; and Fries puts it with the stirpes *C. salina*.

[1] *C. subulata*, Michaux (1803), will have to bear the name *C. Collinsii*, Nutt. (1818).

[2] "Spec. Fl. Fenn." part iii. (1846) p. 12.

[3] "Consp. Fl. Fenn." (1895), 281.

It is a plant of Russian Lapland (*Lapponia murmanica*). The var. *sphagnophila* of *aquatilis* is very near *epigeios*, Læst., differing by its pale (not dark) scales.[1] It may be noted that Nylander, pt. ii. (1844), 23, describes *epigeios*, Læst., under that name.

C. aquatilis × *salina* (= *C. Grantii*, mihi) was first found by Mr. Grant, not Mr. Marshall, who gathered it some years after. *C. aquatilis* × *Hudsonii* (= *C. hibernica*, mihi), *C. Goodenovii*, Gay. Gay so spelt it, though it is not really the author's name. No doubt Kükenthal is right in making it *juncea* (Fr.), 1842, and not *juncella* (Fr.), 1857. The var. *strictiformis*, Bailey, *Mem. Torrey Bot. Club*, i. (1889), p. 74 (*sub-vulgaris*) is thus characterised: "Tall and lax ($1\frac{1}{2}$ to $2\frac{1}{2}$ feet high), the leaves long and narrow; staminate spike longer peduncled; pistillate spike looser and often longer than in the species, the perigynia never being so densely packed and usually being browner: Canada, Maine south to Pennsylvania. The plant stands midway between *C. vulgaris* and *C. stricta*. From the latter it is distinguished by not growing in tufts, and by its narrower and smoother leaves, and very obtuse black or brown and white-nerved short scales."

The "*C. elytroides*, Fries," of my paper was an error, the specimens representing a peculiar form of *Goodenovii*. *C. spiculosa*, Fr., has been by the Scandinavian authors considered a hybrid —probably *C. Goodenovii* × *salina* in one of its many forms. My var. forma nova, *Hebridense*, mihi, *l.c.*, I there give the date of Nylander's part ii. as 1843, but I did not then possess it; the true date is June 1844. There is no more difficult European *Carex* than *salina* to limit.

C. rigida, var. *infer-alpina*, Læst. (1839).

If Kükenthal makes this the same as *C. concolor*, R. Brown, in "Supp. App. Parry's Voyage" (1823), 218; then I think he is wrong, no doubt it is a *rigida* form; but *infer-alpina* is a much more robust form.

Carex flava, L.

It is curious that Bailey[2] has a var. *rectirostrata*, from Vancouver's Island (Macoun). He observes *C. viridula*, Boott., "Ill.," t. 523, may possibly belong here, although the perigynia are rather those of *Œderi*.

C. pilulifera, L.—The identity of the vars. *Leesii* and *longibracteata* has been denied; but Fernauld (*l.c.*, 499-504) made a careful comparison of all European and American forms, and agrees they are the same. I have no doubt I have Lange's plant.

[1] Fernald in "Proc. Am. Acad. Arts and Sciences," xxxvii. (1902), 497.

[2] "Bot. Gazette" (1888), p. 84.

C. ligerica, Gay.—Named by Bœckeler; but his work was not good, as Mr. C. B. Clarke has often shown me.

C. diluta, Bierb, and *C. punctata*, Gaud., the writer says "not the same." If so, *diluta* is wrongly named in some herbaria!

With regard to our Carices, the date 1897 is thirteen years ago. Much has been done since to make for a perfect enumeration, but all has not been done yet. In America, Prof. Bailey has discussed, described, visited Europe, and seen all the types he could; yet Mr. Fernauld comes along in 1902, and reviews and readjusts many of his conclusions. Had Mr. C. B. Clarke lived, he would have reviewed the whole genus; the present author of the Carex Monograph, in the "Pflanzenreich," owes much to my late friend.

ADDITIONS FOR 1908-1909 TO CENSUS OF SCOTTISH HEPATICÆ.

By Symers M. Macvicar.

There are 89 additions to be given since the last instalment was published in July 1908. *Lophozia longidens* has not been previously recorded for the west of Scotland. A melancholy interest attaches to the record of *Preissia quadrata* from Shetland, owing to the death of the finder, Mr. W. H. Beeby. The death of this most accurate botanist is a great loss to Scottish botany, and an especial loss to those who had the privilege of being his correspondents.

75. Ayr.

Lophozia bantriensis, *J. M'Andrew.*
Kantia arguta, *Miss K. B. Macvicar.*

78. Peebles.

Lunularia cruciata, *J. M'Andrew in litt.*
Lophozia badensis, *W. Evans.*

79. Selkirk.

(*S. M. Macvicar.*)

Marchantia polymorpha.
Marsupella emarginata.
Lepidozia setacea.
Scapania gracilis.

80. Roxburgh.

Ptilidium ciliare
Cephaloziella stellulifera } *S. M. Macvicar.*

82. Haddington.

(*J. M'Andrew.*)

Lophozia excisa.
L. barbata.
Cephaloziella byssacea.
Scapania purpurascens.
Madotheca lævigata.
Lejeunea cavifolia.

83. Edinburgh.

Aplozia sphærocarpa, *J. M'Andrew.*

84. Linlithgow.

(*J. M'Andrew.*)

Preissia quadrata.
Lophozia badensis.
Lophozia incisa.
Cephaloziella bifida.

85. Fife.

Riccia Lescuriana, *G. West.*

86. Stirling.

Cephaloziella byssacea, *S. M. Macvicar.*

87. West Perth.

Lophozia turbinata, *W. Evans.*

88. Mid Perth.

Lophozia obtusa, *D. A. Jones* and *H. H. Knight.*

89. East Perth.

Cephaloziella byssacea, *J. Fergusson.*

94. Banff.

Pallavicinia Blyttii, *J. A. Wheldon* and *A. Wilson.*

95. Elgin.

(*Miss E. Armitage.*)

Aneura latifrons.
Mylia anomala.
Ptilidium ciliare.
Scapania gracilis.
Cephaloziella byssacea, *Miss K. B. Macvicar.*

96. East Inverness.

(*J. A. Wheldon* and *A. Wilson.*)

Gymnomitrium crassifolium.
Marsupella Pearsoni.
Aplozia cordifolia.
Bazzania trilobata.
Scapania uliginosa.
S. obliqua.

97. West Inverness.

(*J. B. Duncan* and *H. H. Knight.*)

Pallavicinia Blyttii.
Marsupella condensata.
Harpanthus Flotowianus.
Anthoceros lævis, *S. M. Macvicar.*
Chandonanthus setiformis.
Lophozia longidens.

98. Argyll.

Lophozia longidens, *H. H. Knight.* Cephalozia reclusa, *D. Kennedy.*

100. Clyde Isles.

(*Miss K. B. Macvicar.*)

Pellia Neesiana.
Sphenolobus exsectæformis.
Madotheca Thuja.

(*J. M'Andrew.*)

Aplozia riparia.
A. atrovirens.
A. crenulata.
Lophozia inflata.
L. Muelleri.
Marchantia polymorpha
Lophozia gracilis
L. Floerkii
} *J. M'Andrew in litt.*
Cephalozia curvifolia, *P. Ewing.*
Sphenolobus minutus.
Lophocolea heterophylla.
Scapania nemorosa.
Marchesinia Mackaii.

101. Cantyre.

(*P. Ewing.*)

Aneura multifida.
A. palmata.
Mylia anomala.
Cephalozia connivens.
Odontoschisma Sphagni.
Bazzania triangularis.
Scapania nemorosa.
Microlejeunea ulicina.
Jubula Hutchinsiæ.

104. North Ebudes.

Cephaloziella byssacea, *S. M. Macvicar.*

105. West Ross.

Cephaloziella byssacea, *S. M. Macvicar.*

108. West Sutherland.

(*D. Lillie.*)

Aneura latifrons.
Metzgeria furcata.
M. pubescens.
Aplozia pumila.
Lophozia atlantica.
Mylia anomala.
Cephalozia fluitans.
Blepharostoma trichophyllum.
Scapania aspera.
S. irrigua.

110. Outer Hebrides.

Cephaloziella byssacea, *W. West.*

111. Orkney.

Metzgeria hamata, Nardia compressa } *D. Lillie.*
Anthelia julacea, Herberta adunca } *Dr. Grant.*

112. Shetland.

Preissia quadrata, *W. H. Beeby.*

ZOOLOGICAL NOTES.

Extraordinary Fecundity of a Whale (*Balænoptera musculus*).—I have in previous papers stated that Whales have very rarely more than one calf at a birth. Still they have, as pointed out by Mr. Harvie-Brown and others, been known to have twins, but such an event is most unusual.

I have now to record a most singular instance, which was brought to my notice by Mr. T. E. Salvesen of Leith. Captain M. C. Bull, manager of some stations in Iceland, had a cow Common Rorqual (*Balænoptera musculus*) of 65 feet in length brought in. He was present when the whale was cut up, and to his astonishment it contained six fœtuses. Of these three measured 34 inches each, one 20 inches, one 18 inches, and one 17 inches.

Had the whale given birth to all six it is unlikely that more than two could have lived, the whale having only two teats.

Captain Bull has great experience in whaling, probably more than any one else. This has caused the Norwegian papers to notice what is a most curious circumstance, and can admit of no doubt.—R. C. Haldane, Lochend, Shetland.

Large Otter in "Tay."—An Otter is recorded as having been trapped on Fonab Water of the river Tummel by Mr. Jas. Cowie, which is given as "3 ft. 9 ins. in length from tip to tip," and "of the unusual weight of 25 lbs."—J. A. Harvie-Brown.

Crossbills on the North-East Coast.—Mr. A. G. Gavin records that a number of Crossbills have been caught at Fraserburgh; and fishermen have caught a number at sea. One fisherman reported that there were "hundreds" drowned, not being able to continue their flight to land. Mr. Gavin, with whom I have been in direct correspondence, informs me that these are the first that he has any knowledge of as having ever been seen upon this bleak north-eastern district of Aberdeenshire. Eight birds are reported as frequenting the gardens about Wick and feeding entirely upon green-fly (D. M'Lean *in lit.*, 22nd July 1909).—J. A. Harvie-Brown.

Albino Reed Bunting in Solway Area.—I was shown a bird in December that almost proved a puzzle as to identity. It was absolutely pure white, except that there was one minute feather on the shoulder of one wing, brown. The bill was that of a Bunting, and so were the legs and feet, and also the wing formula. So, with a little comparison, it was seen to be a Reed Bunting (*Emberiza schœniclus*). It is in the possession of the tenant of Brae of Lochrutton, and makes a very pretty and interesting specimen. It was described as having a novel and conspicuous appearance when seen flying amongst a great flock of other small birds in dark winter weather.—Robert Service, Maxwelltown.

Greater Wheatear at Mull of Galloway: a Correction.—I am sorry that a mistake has been made regarding the date of the occurrence of *Saxicola leucorrhoa* recorded in the "Annals" for January (p. 55). The bird was obtained on 12th September, *not* 12th August as stated.—Annie C. Jackson, Swordale.

Great Spotted Woodpecker near Penpont, Dumfriesshire.—I watched a bird of this species for fully fifteen minutes on 23rd December 1909. There were 4 inches of snow on the ground at the time.—Hugh S. Gladstone, Thornhill, Dumfriesshire.

Great Spotted Woodpecker in Forth and Dee.—On 12th March 1909, a Great Spotted Woodpecker was brought to Mr. Mowat, Teacher, Dunipace School, and was preserved by him for the School Museum. One was seen in Carron Glen on 18th July 1909.

In 1908, Mr. A. Macdonald wrote from The Public School, Durris, Aberdeen, to Mr. Lawson, Manager, Braemar, about a bird which appeared to be a Great Spotted Woodpecker. This now—1909—seems to have been correct, and this spring—1909—the bird continues, and it may be nesting.—J. A. Harvie-Brown.

Greenland Falcons in Scotland.—During the past winter we have had quite a visitation of Greenland Falcons, *Falco candicans*. Not only have they been observed in Scotland, but Ireland has been similarly favoured by the visits of no less than six, and as in Scotland,

more have in all probability escaped notice, and it is to be hoped the gun. The first Scottish visitor was shot at Barra on 15th December, and another was seen on Christmas Day; another was observed near Inverbroom, West Ross-shire, late in December; an adult female was shot near Pitlochry on 4th January; an adult male was shot near Blairgowrie on 23rd January; two were seen at the Flannan Islands, one in December, and the second on 25th January; another is said to have been shot on Schiehallion, "early in the year," and lastly one was seen in South Uist during most of January; making nine birds in all. For the above information we are indebted to Lady Fowler, Mr. W. L. MacGillivray, Mr. T. G. Laidlaw, and Mr. Robert Anderson.—J. A. Harvie-Brown and Wm. Eagle Clarke.

Bittern in Fife.—A very fine specimen of a male bittern (*Botaurus stellaris*) was taken near Cupar, Fife, on 11th January last. Mr. Adam Paterson, gamekeeper to Mr. Home-Rigg of Tarvit, was looking for duck on the bank of the Eden about half a mile below the town, between three and four in the afternoon, when a large bird rose suddenly. He fired and winged it. The bittern was most pugnacious, and struck out at the gamekeeper with its long, sharp bill, missing his eye by an inch. The specimen has been set up by Messrs. Small & Son, Edinburgh, who say it is the finest bittern they have had through their hands.—Henry H. Brown, Cupar.

Long-tailed Duck near Gretna, Dumfriesshire.—An adult male was killed by a fisherman on 2nd November 1909. It is in remarkably full winter plumage, and is now in the Tullie House Museum, Carlisle, as I am informed by the curator, Mr. L. E. Hope.—Hugh S. Gladstone, Thornhill, Dumfriesshire.

Stock Dove in Dee.—Mr. A. Macdonald, Durris, informs me that the Stock Dove has nested now—1909—for two years, in the Parish of Banchory Ternan, and he himself has found the broken egg-shells in the hole in the rock where they breed.—J. A. Harvie-Brown.

Hybrid Blackcock and Capercaillie in Kincardineshire.—In 1906 a brood of these hybrids was reared close to Fasque, Laurencekirk. The Capercaillie hen (the mother) was frequently seen with her progeny, which is confidently stated by the gamekeeper on the beat to have consisted of four cocks and three hens. These have since been accounted for as follows:—18th January 1907—One male was killed, and is now stuffed and in the possession of Sir John Gladstone at Fasque. 19th December 1907—One male and one female were shot. The male is now in the possession of Lieut.-Col. C. J. Cotes, at Pitchford Hall, Shropshire. The female was unfortunately not preserved. One male was picked up dead

in 1908, but was not in a fit condition to keep. 15th December 1909—One male was shot, and is now stuffed and in the possession of the writer. One female was also shot, but being only winged was unfortunately not retrieved. The above notes are especially interesting in view of the fact that so experienced a naturalist as Mr. J. G. Millais, writes:—"Female examples of this hybrid are extremely rare, even on the continent, and I do not know of a British example" ("The Natural History of Game Birds," 1909, p. 16). It seems highly probable that female examples of this hybrid, when they occur, are much more liable to escape notice than their more conspicuous brethren: but even so, it is certainly very strange that they should be stated authoritatively to be so rare. In all justice to Mr. Millais, it remains to be pointed out that in the "life-history" (if it may be so called) of the seven Kincardineshire specimens above mentioned, there is to-day no ocular proof of the previous existence of a female bird. The four males of the brood are satisfactorily accounted for; two of the females are believed to have been shot and lost; the third female would still seem to await a fate which may yet be glorious, as gaining for it the title of the first recorded British specimen of a female hybrid resulting from the cross of a Blackcock and a Capercaillie hen.—Hugh S. Gladstone, Capenoch, Thornhill, Dumfriesshire.

Capercaillie in East Lothian.—On 17th December, 1909, Mr. A. M. T. Fletcher of Saltounhall shot in his own woods a female Capercaillie (*Tetrao urogallus*), rather small and not very well nourished. Having heard that Mr. J. D. Hope, M.P., had liberated some Capercaillie a few years previously at Letham (which is only 5 miles from Saltounhall woods as the crow flies) I went to him about it. He informs me that he reared two male birds from eggs sent to him, one of which he knows was afterwards shot. But as the Saltounhall Capercaillie was a female it was certainly not the other imported bird.—H. N. Bonar, Saltoun.

Occurrence of Anarrhichas latifrons in the North Sea.— On 5th February 1910, a "Jelly Cat," *Anarrhichas latifrons*, was sent to the Marine Laboratory, Aberdeen, by Mr. Eunson, fish merchant. It was in a fresh condition, having evidently been captured quite recently. It had not been gutted. The fish, it was reported, had been landed by one of the smaller Aberdeen trawlers, which work in the North Sea, and within a comparatively short distance off Aberdeen. It measured 3 feet 5 inches in length. A small pink-coloured Trematode, found in the stomach, was diagnosed by Dr. Wm. Nicoll, Lister Institute, London, as *Lebouria idonea*, a form which is common in *Anarrhichas lupus*.—H. Chas. Williamson, Marine Laboratory, Aberdeen.

[This fish is the "Blue Sea-Cat" of the Norwegians. It differs from its allies *A. lupus* and *A. minor*, as follows:—the vomerine row

of teeth is shorter than the row on each of the palatine bones; the dorsal fin ends in an even curve down to the base of the caudal fin; the top of the frontal bones behind the eyes is at least as broad as the interorbital space; colour dark greyish brown or a lighter chocolate colour, with indistinct round, or rounded quadrangular, black spots, partly arranged in slightly marked transverse bands across the back. It occurs on the coasts of Greenland and Iceland, as well as in Norwegian Finmark. It has not hitherto, we believe, been found in British Seas.—Eds.]

Occurrence of Velella spirans, *Eschscholtz*, in Scottish Waters.—During the autumn of 1904 Mr. Wm. Eagle Clarke discovered, on the Flannan Isles, a solitary specimen of this tropical and sub-tropical Siphonophore, which he has since presented to the Royal Scottish Museum. The *Velella* was found, after a strong south-westerly gale, resting on a mass of spume with which it had been borne to the top of the cliffs almost a hundred feet in height by the force of the wind. It was perfectly fresh, of a brilliant blue colour, and examination shows that the specimen was mature, for large numbers of gonophores occur on the gonozooids or reproductive individuals. *Velella spirans* is a casual visitor to the British Isles, where it is occasionally found on the western coast, but probably only after a gale from the Atlantic. It may have been the species recorded from Scottish waters so long ago as 1771; of which Fleming in his "History of British Animals" (Edinburgh, 1828), p. 500, says that "Dr. Walker, in his MS. 'adversaria' for 1771, states the *Medusa velella* of Linnæus as having been found at Ose in Sky; and Mr. Pennant in his 'Caledonian Zoology,' prefixed to Lightfoot's 'Flora Scotica,' vol. i. 66, notices the same animal without any remark. It is impossible to determine with certainty to which of the modern species these references belong." Prof. M'Intosh also refers to its occurrence on the Scottish coast where, on the Outer Hebrides, "countless myriads of the little *Velella* are tossed in autumn on the sand" ("Marine Invert. and Fishes of St. Andrews," 1875, p. 32). On the south-west of Ireland its occurrence, as one would expect, is more frequent; for example, at Valentia Harbour, in the south-west of Kerry, there occurred in April 1899 a shoal of small specimens, in June 1900 a large shoal, and in July 1901 a solitary large specimen (M. and C. Delap, "Rep. Fisheries, Ireland," for 1902-1903, pt. 2, App. I. [1905], p. 4), while others were stranded to the west of Cork Harbour on 10th October 1903 (H. A. Martin, "Irish Naturalist," xiii. 1904, p. 27).—James Ritchie, The Royal Scottish Museum.

Ornithobius goniopleurus, *Denny*, on the Bernacle Goose.—The hosts given by Denny, and quoted by Piaget, for this Mallophagous parasite are the Canada Goose and the Goosander; and Giebel gives it from the Mute Swan. To these I can add the

Bernacle goose (*Bernicla leucopsis*), having obtained two examples off a specimen of that bird shot at Cobbinshaw Reservoir, Midlothian, on 9th October 1906, and one from a specimen killed at Barra, Outer Hebrides, in January 1910.—WILLIAM EVANS, Edinburgh.

Priapulus caudatus, *Lam.*, on the Fife Coast.—On 5th March (1910) I dug a small example of this curious Gephyrean out of the mud between tide-marks in Dalgetty Bay, west of Aberdour, Fife. Its length, with the "introvert" extended, was about $2\frac{1}{2}$ inches. The previous records from the Firth of Forth are:—two found at Leith by Dr. Coldstream prior to 1828 (Fleming's "British Animals," p. 492), one near Granton by Sir John Dalyell ("Powers of the Creator," vol. ii. p. 253), and some taken by Dr. Thomas Scott from stomachs of fishes caught in the Forth (8th Report, 1889, Fish. Bd. Scot., pt. iii. p. 332).—WILLIAM EVANS, Edinburgh.

Ascaris osculata, *Rud.*, from a Common Seal killed in the Inner Hebrides.—In August 1908 I obtained about a dozen specimens of this large Nematode from the nasal cavity of a Common Seal (*Phoca vitulina*) shot at Coll, Inner Hebrides, that month. Some of the worms were shown to Mr. A. E. Shipley, who confirmed the identification.—WILLIAM EVANS, Edinburgh.

BOTANICAL NOTES AND NEWS.

Saxifraga cæspitosa, *L.*.—In my Notes on this plant[1] I omitted to refer to Dr. Craig's notice in the *Edin. Bot. Soc. Trans.* xvii. (1889) pp. 69-72. From his account there appears to be some discrepancy as to the date of the gathering of Dr. M. Barry's specimens. On the label accompanying my specimens it is "August 6 (not 3 as printed), 1830. This is one of Barry's original specimens, see Syme, E.B." F. M. Webb, *in litt.* Dr. Craig, speaking of Mr. W. M'Nab's gathering on Beinn A'Bhuird in August 1836, says:—"The following year (1831) Prof. Graham, Mr. W. M'Nab, Dr. M. Barry and others, made a special search on Beinn A'Bhuird, but failed to find it. After the party returned, Mr. M'Nab and Dr. Barry returned and again searched the mountain, but without success. Dr. Barry remained behind, and accompanied by Mr. J. Mackenzie, gardener at Invercauld, as his guide, examined the rocks on Ben Avon facing Beinn A'Bhuird, and they were successful. The first specimen was picked by Mr. Mackenzie, so that he, and not Dr. Barry, was the real discoverer of the Ben Avon station. Dr. Barry visited this station again in 1832, and picked the plant sparingly," so it would seem that Mr. Watson's specimens were

[1] "Ann. Scot. Nat. Hist.," 174, 1909.

not of the first gathering. Dr. Craig goes on to say that "Prof. Babington in a letter remarks, 'Hooker, in 1821, seems to have had specimens gathered by Don ("Scot. Fl.," pt. i. p. 32).'" I do not agree with Prof. Babington in this; looking at Don's descriptions[1] of this, *condensata*, and *denudata*, and Smith's remarks on them, they seem to me to come under *hypnoides* and *grœnlandica*? and Hooker's *cæspitosa* was evidently an aggregate species. Dr. Craig says, "In the herbarium of Dr. Gordon of Birnie, there is a specimen labelled 'Ben Avon, Aug. 1831. W. A. Stables,' with label in his handwriting."

In the first edition of the "Species Plantarum," i, 404, 1753, Linnæus describes two Saxifrages—

"No. 24. *S. grœnlandica*. Habitat Grœnlandia, forte etiam in Pyrenæis and Helveticis Alpibus.

"No. 27. *S. cæspitosa*. Habitat in Alpibus Lapponicis, Helveticis, Tridentinis, Monspelii."

The Greenland, Iceland, and Scottish specimens (Dr. Barry and Mr. Evans) accord very well with the latter (No. 27), the Ben Lawers and Tul Dhu, Wales, may go to the former (No. 24).

Hooker and Arnott (ed. 8, 1860) evidently have No. 27 in view, as has also Bentham (ed. 1, 1858). And although so well known to be what was called a "lumper," Bentham certainly refers to the Arctic *cæspitosa* (No. 27), and not to the mixture of *cæspitosa*, *decipiens*, and *grœnlandica*.

It is difficult no doubt for anyone who has not seen the true *cæspitosa* to see why the Irish, Welsh, and Ben Lawers specimens may not be so named. Of course if you make an aggregate species including all these the matter is easily settled, in fact authors differ *ad lib.* as to this section of the genus.

In the second edition of the "Cybele Hibernica" (1898), 131, the authors remark, under *S. hypnoides*, L., var. *grœnlandica* (Eugl.), "To this, rather than to *S. cæspitosa*, L., should probably be referred the plants gathered by Mackay and Mr. Linton on Brandon." In this I quite agree with them. No doubt Prof. Babington put the Welsh and other specimens under his *cæspitosa*, as he speaks of having gathered "*S. cæspitosa in Clogwyn-y-Garnedd*" in "Journ. of Life" (1897), p. 10. And of course others may say "you are simply dealing with a super-species here, made up of many subspecies; if so, which name should it bear, '*grœnlandica*' or '*cæspitosa*'?"—A. Bennett.

Helleborine atroviridis, *W. R. Linton*, in W. Sutherland.—Rev. E. F. Linton has called my attention to a specimen sent to him as *Epipactis latifolia* from Ardskinid Point, Tongue Bay, July 1900, which I had noted as having green flowers, scarcely tinged with pink. He remarks that "it looks like *ovalis*, but that with

[1] "Trans. Linn. Soc.," V. xiii. 444-448.

these flowers and gradually decreasing, narrowing leaves it should be *atroviridis*. Not *latifolia*!" My own herbarium-specimen (No. 1930) of August 3, 1907, from the same locality, fully bears out this opinion; it is, in fact, quite like the Little Doward, Herefordshire, *E. ovalis*, Bab., which Rev. A. Ley and I recently found to be identical with authentic *atroviridis* (*ovalis* is for the most part a synonym of *atrorubens*). It follows that the hybrid found in 1900, and published as *E. atrorubens* × *latifolia*, is so only in an aggregate sense, and should be called *Helleborine atrorubens* × *atroviridis*, n. hybr.—Edward S. Marshall.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—January-March 1910.

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

ZOOLOGY.

The Wolf in Scotland and Elsewhere. J. R. M'Clymont. *The Zoologist*, February, 1910, pp. 72, 73.

On the Birds of the Glasgow District. John Paterson. *The Glasgow Naturalist*, vol. ii. No. 2 (February 1910), pp. 43-61. Notes on 179 species, 47 of which are not recorded in Gray's list published in 1876.

Some Interesting British Insects (II.). G. C. Champion, F.Z.S., and R. W. Lloyd, F.G.S. *Ent. Mo. Mag.*, January 1910, pp. 1-3, pl. i. *Criocephalus rusticus*, Dej. from Nethy Bridge, and *Pachyta sexmaculata*, L., from Aviemore and Nethy Bridge, are figured and described.

Methven Moss as a Collecting Ground for Entomology. William Wylie. *Trans. Perthshire Soc. Nat. Sci.*, vol. v. pt. i. (1908-1909) pp. 1-5. Lists given of Macrolepidoptera, rare Diptera, and a few Dragonflies.

Malacosoma neustria, L., in Kincardineshire. James Waterston. *Entomologist*, January 1910, pp. 36-37. Notes on a case of accidental introduction of this species in the egg-state, the eggs being found on a rose-bush imported from Holland.

Cemiostoma susinella, H.-S., a Tineid new to the British List, in Scotland. Eustace R. Bankes, M.A., F.E.S. *Ent. Mo. Mag.*, January 1910, pp. 8-9. Two specimens taken at Aviemore in June 1909.

Cryphalus abietis, Ratz., in Scotland. T. Hudson-Beare. *Ent. Mo. Mag.*, February 1910, p. 32. Specimen taken at Gorebridge on May 13, 1905.

Some Hymenoptera from the Highlands. Claude Morley. *Ent. Mo. Mag.*, February 1910, pp. 36-38. Records of 47 species (comprising Ichneumonidæ, Braconidæ, Proctotrypidæ, Aculeata and Tenthredinidæ).

Aculeate and other Hymenoptera in Soay (Skye). C. H. Mortimer. *Ent. Mo. Mag.*, February 1910, p. 39. Seven species recorded.

Two New Species of Anthomyidæ, in the Genus Fannia, R. D. (= Homatomvia, Bouché). J. R. Malloch. *Ent. Mo. Mag.*, March 1910, pp. 67-68. Fannia nigra, n. sp., from Dumbartonshire and F. femorata, n. sp., from Aberfoyle.

Additions and Corrections to the British List of Muscidæ Acalyptratæ. J. E. Collin, F.E.S. *Ent. Mo. Mag.*, February 1910, pp. 47-48. Cordylura atrata, Ztt., Amaurosoma brevifrons, Ztt., and Acanthocnema nigrimana, Ztt., are recorded as Scottish.

Life-History of Drepanepteryx phalænoides, Linn. Kenneth J. Morton, F.E.S. *Ent. Mo. Mag.*, March 1910, pp. 54-62. In this interesting paper the known records (including the Scottish) of the species are summarised (pp. 55-56).

List of the "Clyde" Copeognatha, or Psocidæ. James J. F. X. King, F.E.S. *The Glasgow Naturalist*, vol. ii. No. 2 (February 1910), pp. 34-36. Twenty-one species enumerated as occurring in the Clyde valley, with localities.

A Method for the Study of the Animal Ecology of the Shore. L. A. L. King, M.A., and E. S. Russell, M.A. *Proc. Roy. Phys. Soc. Edin.*, xvii. No. 6 (October 1909), pp. 225-253. Gives the results of a method employed at Millport in August 1908. The list of species obtained includes eleven not previously recorded for the Clyde.

Notes from Millport Marine Biological Station. Richard Elmhirst, F.L.S. *The Zoologist*, February 1910, pp. 69-71. Notes on the Common Hermit-Crab, Eupagurus bernhardus (L.), associated with Suberites domuncula; Moulting and Regeneration of Galathea strigosa, Fabr.; the Lobster; "Pull" of Solen siliqua; and Spawn of Oscanius (Pleurobranchus) membranaceus.

On the Distribution of the Thorny Lobster (Palinurus vulgaris) in British Waters. James Ritchie, M.A., B.Sc. *Proc. Roy. Phys. Soc. Edin.*, vol. xviii. No. 1, pp. 68-71 (February 1910). A number of Scottish records are given in this paper.

Some Medusæ and Ctenophores from the Firth of Forth. William Evans and J. H. Ashworth, D.Sc. *Proc. Roy. Phys. Soc.*

Edin., xvii. No. 6. (October 1909), pp. 300-311. Records thirteen species, several of them new to the Forth, obtained at Dunbar and Burntisland in 1908.

BOTANY.

Supplementary Records of British Rubi. By Rev. W. Moyle Rogers (*Journ. Bot.*, 1909, 340-346), completes lists begun in the previous month.

The British Roses (excluding Eu-caninæ). By Major A. H. Wolley-Dod (*Journ. Bot.*, 1910, Appendix, pp. 1-32).

British Species and Varieties of Thymus. By Rev. E. F. Linton (*Journ. Bot.*, 1909, 346-348). A few additions to records from Scotland; a form new to Britain, *T. Lövyanus* Opiz, from Ireland, is described.

British Oaks. By C. E. Moss (*Journ. Bot.*, 1910, 1-8, 33-39, pl. 502). *Q. Robur* has reflexed auricles at base of leaf-blade and has not branched hairs; *Q. sessiliflora* has branched hairs on lower surface of leaves but has no auricles; the hybrid *Robur* × *sessiliflora* has both auricles and branched hairs. (W. Perth, hb. B. M. and Dumbarton, hb. K.)

New Records in Scottish Bryophyta. By Eleonora Armitage (*Journ. Bot.*, 1910, 57-58). Seven mosses and four liverworts from Elginshire (95), two mosses from Easterness (96), and one moss from Knockdolian Hills in Ayrshire (75).

Dicranum Bergeri, Bland., in Caithness. By Cecil B. Crampton (*Journ. Bot.*, 1910, 23). New to Scotland; forms large fertile cushions near the Dubh Lochans on Kilimster Moss.

Some Highland Fungi. By Harold J. Wheldon (*Journ. Bot.*, 1909, 348-349). From Speyside, twenty-eight species named (with altitudes in most cases) of which seven seem to be new to Speyside records.

Contributions to the Study of Dumfriesshire Fungi. By A. Lorrain-Smith (*Trans. and Journ. of Proc. Dumfr. and Gall. N. H. and Anti. Soc.*, 1909, xx. pp. 170-177).

Note sur une nouvelle espéce de Pseudophacidium. By E. Boudier (*Trans. Brit. Myc. Soc.*, Season 1908, p. 81, 1 pl.). *P. Smithianum*, on *Empetrum nigrum* in various parts of Scotland.

BOOK NOTICES.

A History of the Birds of Kent. By Norman F. Ticehurst, M.A., F.R.C.S., F.Z.S., etc. With Twenty-four Plates and a Map. London: Witherby & Co., 1909. 21s. net.

Judged from the ornithological standpoint, there are few

counties in Great Britain that can equal Kent in the attractions it offers to feathered inhabitants, and none can surpass it for the observation of migratory visitors. It has a diversified surface offering suitable haunts to a great variety of species for the rearing of their broods; while its geographical position in relation to the Continent renders it unique for witnessing the comings and goings of hosts of seasonal migrants and casual visitors. That such a county should have produced many bird-men in the past is not surprising, but it has been left, we may say fortunately left, to Dr. Ticehurst to treat of its avifauna in a way that does full justice to its importance. As a history, the author has based his book upon an exhaustive examination of the abundant literature at his disposal. The nature of the edifice to be raised on such substantial foundations, however, entirely depends upon the author's personal experiences, for these alone must determine its attractive qualities and its real worth. That Dr. Ticehurst possesses these essential qualifications to an eminent degree is manifest throughout the volume. In an excellent introduction the topography of the county is well described, the nature of its avifauna discussed, migration in all its varied aspects treated of, and the work of other authors alluded to. Then follows the systematic portion of 557 pages wherein the 312 species (excluding doubtful ones), of Kentish birds are admirably reviewed. We have studied most of the books devoted to British topographical ornithology, and in our opinion the "Birds of Kent" is second to none of them. The volume is well got up, the illustrations, which are mainly from photographs of bird haunts, are very appropriate, while an orographical map of the county affords a useful appendix to a volume which is in every way well worthy of the patronage of British ornithologists.

British Warblers: A History, with Problems of their Lives. By H. Eliot Howard, F.Z.S., M.B.O.U. Illustrated by Henrich Gronvöld. Part IV. London, R. H. Porter. 21s. net.

It has been our pleasure to speak in the highest terms of praise of the previous parts of this entirely original and beautiful work. The part before us fully maintains the high standard, as regards both letterpress and plates, of those previously issued. The species now treated of are the Common and Lesser Whitethroats, the Greenish Willow Warbler, and the Siberian Chiff Chaff, to whose portraits and actions ten plates are allocated, while another plate contains excellent figures of the eggs of a number of species. We are glad to see that Mr. Howard, following in the footsteps of Prof. Newton, Mr. Howard Saunders, and other leading authorities, is including the more uncommon species as British Warblers. The question of what is a British species has, in our opinion, long ago been determined by the findings of the authors of the standard works on British Birds, and Mr. Howard's beautiful plates will help to

make the rarer species more familiar and hence less liable to be overlooked.—G. G.-M.

Report on the Immigration of Summer Residents in the Spring of 1908: also Notes on the Autumn Movements of 1907. By a Committee of the British Ornithologist's Club. London: Witherby & Co., 1909. 6s.

This Annual Report is written on the same lines as those which we have noticed favourably in past years, and hence it does not call for an extended notice. It is to be commended to all those Scottish naturalists who are interested in the subject, since it usefully links up the details relating to their own country with that of England. The report has grown in scope since its inception in 1906, and now includes records of "Unscheduled Species," and "Notes on the Migratory Movements of the Autumn," and runs to 235 pages.

The British Freshwater Rhizopoda and Heliozoa. By the late James Cash, assisted by John Hopkinson, F.L.S., etc. Vol. II. Rhizopoda, Part II. (London: Ray Society, 1909.)

The first volume of this valuable monograph was published in 1905 (*vide* "Annals" for 1906, p. 127), and now we have the second of the series of three in which it is being issued before us. Owing to the lamented death of Mr. Cash on February 20, 1909, shortly after he had finished writing out the descriptions of the species and notes on distribution, the task of completing the MS., and seeing the volume through the press, fell entirely on Mr. Hopkinson. A proof, it is interesting to observe, was read by Dr. Penard of Geneva, and Prof. G. S. West has contributed to the illustrations.

The present volume, which takes us to the end of the Arcellida, deals with 14 genera (*Difflugia* to *Zonomyxa*), and 81 species with varieties, 13 of the species being new to science. These are fully described in 166 pages of letterpress, and illustrated by an ample series of excellent figures, mostly from Mr. Cash's own drawings, on 16 plates, 10 of which are coloured, with many text-figures besides. The synonymy and references to literature to end of 1908—entirely the work of Mr. Hopkinson—are very full. Under each species is given a general statement as to the nature of the habitat, followed by a fair number of localities in various parts of the British Isles, including Scotland, both north and south. In all respects the volume worthily upholds the high traditions of the Ray Society's publications. W. E.

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OBITUARY MEMOIR OF WILLIAM HADDON BEEBY, F.L.S.

By Rev. Edward S. Marshall, M.A., F.L.S.

Readers of the "Scottish Naturalist" and its present successor will hardly need to be told that the sudden death, on 4th January, of the subject of this memoir, aged sixty, is a very serious loss to British Botany generally, and more particularly to that of Scotland; as, for many years past, his annual summer holidays had been spent in a careful and systematic study of the Flora of Shetland, and the results have been, from time to time, published in these pages. To the present writer, who is indebted to him for much help, especially in earlier days, these appear to be models of such records, combining keen observation and the fruits of long experience with close attention to detail and the most scrupulous accuracy.

Beeby made his mark while still a very young man; and he continued to add to our plant-knowledge, even after failing health had befallen him. The earliest Shetland paper from his pen known to me appeared in 1887; his discoveries there included several "first notices" of plants as British, besides the species and varieties described by himself. So far as I am aware, his only collections on the Scottish mainland were made near Aberdeen; but he was

keenly interested in the plants of North Britain, as well as of the Faeroes, Iceland, and Scandinavia, and he corresponded regularly with such students as Ostenfeld, Dahlstedt, etc. Many years ago he attended a botanical congress at (I think) Upsala; and the few excursions made on that occasion probably led up to his work in our "Ultima Thule."

For a long time I was in regular correspondence with him about the projected "Flora of Surrey," which his business engagements as a bank official and his other occupations unfortunately prevented him from completing; and I know how thoroughly he explored even the least attractive parts of that county, making full lists of the commonest, as well as of the rarer and more interesting plants; so that in some cases he had noted up to 300 occurrences of a single species! All doubtful specimens were examined under the microscope, in the use of which he was remarkably proficient; and this practice accounts for the fact that his matured opinion about any given form was very seldom wrong. Personally he was reserved in manner, and thus became less well known to his botanical *confrères* generally than any other man of equal ability with whom I have had acquaintance. In his prime he hardly knew the meaning of fatigue, and was not disheartened by the longest day's tramp over barren ground, with little or nothing to repay his trouble.

The new species and varieties from Shetland published by Beeby are as follows:—*Caltha radicans*, Forster, var. *zetlandica* (this he afterwards rightly regarded as only a leaf-form); *Hieracium Schmidtii*, Tausch, var. *fealense; H. dovrense*, Fr., var. *Hethlandiæ; H. breve; H. zetlandicum; H. demissum*, Strömf., var. *australius; H. subtruncatum; H. strictum*, Fr., var. *humilius; H. crocatum*, Fr., vars. *congestum* and *vinaceum; Taraxacum spectabile*, Dahlst., subsp. *Geirhildæ;* and *Glyceria distans*, Wahlb., var. *prostrata*. His other additions to the list for v.c. 112 (those which are starred being novelties for Britain, when first found) are mainly taken from Mr. Arthur Bennett's Supplement to "Topographical Botany," ed. 2, issued as an appendix to the "Journal of Botany," vol. xliii. (1905):—*Ranunculus*

Baudotii, Godr.; *Cochlearia micacea*, E. S. Marshall, and **C. grænlandica*, L. (vera); *Subularia aquatica; Brassica alba*, Boiss.; *Viola sylvestris*, Kit., *V. canina*, Fr. (*ericetorum*, Schrad.), and *V. lutea*, Huds. (this is queried); *Drosera anglica*, Huds.; *Elatine hexandra*, DC.; *Sagina saginoides*, Dalla Torre (*saxatilis*, Wimm.); *Spergularia marginata*, Kittel; *Arenaria rubella*, Hook.; *Hypericum pulchrum*, L., forma **procumbens*, Rostrup (this I believe to be only a dwarf, prostrate state, due to exposure); *Radiola linoides*, Roth; *Anthyllis Vulneraria*, L., var. *Dillenii* (Schultz); *Geum rivale*, L.; **Callitriche polymorpha*, Lönnr., and *C. autumnalis*, L.; *Sium erectum*, Huds. (*angustifolium*, L.); *Hieracium Schmidtii*, Tausch, var. *crinigerum*, Fr.; *H. silvaticum*, Gouan, var. *micracladium*, Dahlst.; **H. truncatum*, Lindeb.; *H. auratum*, Fr., var. **thulense*, F. J. Hanb.; **Taraxacum spectabile*, Dahlst., and var. **maculiferum*, Dahlst. (to this form he thought that most of the Scottish mainland specimens were referable); *Arctium nemorosum*, Lej. (as *A. intermedium*, Lange?); *Veronica polita*, Fr.; *V. Tournefortii*, C. Gmel. (*Buxbaumii*, Ten.); *Euphrasia borealis*, Towns.; *E. scottica*, Wettst.; *E. curta*, Wettst., and forma **piccola*, Towns.; **E. foulaensis*, Towns.; *Utricularia intermedia*, Drev. and Hayne; *U. minor*, L.; *Atriplex patula*, L. ('*erecta*'); *Polygonum viviparum*, L., var. **alpinum*, Wahl.; *Oxyria digyna*, Hill; *Rumex conspersus*, Hartm. (*domesticus* × *obtusifolius*); *R. acutus*, L. (*pratensis*, Koch, *crispus* × *obtusifolius*); *Orchis incarnata*, L.; *Potamogeton pectinatus*, L.; **P. vaginatus*, Turcz.; *P. prælongus*, Wulf.; *P. nitens*, Weber; *Ruppia maritima*, L. (*spiralis*, Hartm.); *R. rostellata*, Koch; *Zannichellia polycarpa*, Nolte; *Sparganium minimum*, Fr.; *S. simplex*, Huds.; *Luzula sylvatica*, Gaud., var. **gracilis*, Rostrup; *Eleocharis acicularis*, Roem. & Schult.; *E. uniglumis*, Schultes; *E. multicaulis*, Sm.; *Scirpus pauciflorus*, Lightf.; *S. fluitans*, L.; *Carex fulva*, Host (*Hornschuchiana*, Hoppe); *Deschampsia setacea*, Richter (*Aira uliginosa*, Weihe); *Festuca rubra*, L.; *Cystopteris fragilis*, Bernh.; and *Isoetes lacustris*, L.

In conclusion, it may be added that Beeby was strongly convinced of the value of cultivation as a test of permanent distinctness; he thus proved (to my satisfaction, at least) the

specific difference between *Valeriana officinalis*, L. (*Mikanii*, Syme) and *V. sambucifolia*, Mikan. His Shetland *Cerastium arcticum*, Lange, var. *Edmondstonii* (*C. nigrescens*, Bab., prius), which kept constant as long as it was grown in a pot of its native serpentine earth, reverted to type on being transplanted into ordinary garden soil.

West Monkton Rectory, Taunton,
6th April 1910.

REPORT ON SCOTTISH ORNITHOLOGY IN 1909.

By Evelyn V. Baxter and Leonora Jeffrey Rintoul.

As a foreword to the Report, we desire to thank very cordially all those who have rendered its preparation possible by sending schedules and notes. These contain much that is of interest, and every item is of value; we hope that those who have helped in the past will continue to do so and that other observers may be induced to give their kindly aid. Our thanks are due to Lewis Dunbar, Thurso; John S. Tulloch, Lerwick; Her Grace the Duchess of Bedford and William Eagle Clarke, Fair Isle; T. Henderson, junr., Spiggie; The Lightkeepers, Sule Skerry; John Bain, Pentland Skerries, all in the northern group of localities; to A. Harley, Kirkcaldy; William Evans, Edinburgh; S. E. Brock, Kirkliston; William F. Little, West Calder; Rev. H. N. Bonar, Saltoun; Annie C. Jackson, East Ross; John Maccuish and ourselves, Isle of May; Lewis N. G. Ramsay, Aberdeen; Arthur G. Davidson, Aberdeen; and A. Landesborough Thomson, Aberdeen, on the East; and to John Muir, Skerryvore; Robert Clyne, Butt of Lewis; Robert Anderson, Flannan Islands; Peter Anderson, Tiree; James M'Quarrie, Davaar Lighthouse; John Craig, Beith; B. S. Macmichael, Craignish; Lady Fowler, West Ross; Rev. J. D. W. Gibson, Carmichael; James Bartholomew, Beattock; D. Macdonald, Tobermory; W. E. Frost, Monach Islands; and Charles H. Alston, Loch Awe, on the West. We are indebted to the

Weather Report of the Meteorological Office for our meteorological data.

Species New to Scotland.

It is not by any means an easy matter to add a new species to the avifauna of a country as well worked by competent observers as Scotland. This year, however, two additions have been made, one in spring the other in autumn. Foremost among these is the Eastern Pied Chat (*Saxicola pleschanka*) a bird which is not only new to the fauna of Scotland but to that of the British Isles. A female of this remarkable visitor was procured on the Isle of May on the 19th October, and its occurrence recorded and the specimen figured in the *Annals* for January of the current year. It was in the white-throated plumage described by Hemprich and Ehrenberg as *S. vittata*. The second of these novelties is the White-spotted Blue-throat (*Cyanecula cyanecula*), a fine adult male having been obtained on the Fair Isle. This bird nests in Central Europe, has only occurred in England as a very rare straggler, and has not been recorded before from Scotland. In Heligoland, too, it has seldom been met with, except in 1877, when it occurred there in considerable numbers.

Birds New to Faunal Areas, and Uncommon Visitors.

Under this section we propose to take not only the birds which are uncommon visitors to Scotland, but any which are rare or previously unknown, in the faunal area from which they are reported. As will be seen, a large proportion of the birds which come under this heading, are recorded for the Fair Isle and Isle of May. The small size of these islands renders it possible to watch the new immigrants from day to day, while the absence of trees and shrubs limits the amount of covert in which the birds can conceal themselves. In the case of the Fair Isle we have had the advantage of the observations of a watcher, Stewart Stout, the year round.

The work which has been accomplished during the last few years has greatly changed the status of some of our

more uncommon visitors, and a number which were before considered rare stragglers have now proved to be regular spring or autumn migrants. On the whole the first dates of the appearance of these uncommon migrants have been earlier this year than heretofore.

A Black Redstart (*Ruticilla titys*) ♀ is reported from the Fair Isle on the 14th October; this bird was formerly considered rare in Scotland, and is always a good find, especially as far north as the Shetlands. There is only one record of the Red-spotted Blue-throat (*Cyanecula suecica*) in spring, namely, at Fair Isle; in autumn two occurred on the Isle of May, on the 14th and 17th September, and an adult male at Fair Isle on the 22nd September. Among the uncommon visitors the Warblers take a prominent place. On 13th September a Barred Warbler (*Sylvia nisoria*) ♂ was procured on the Isle of May, while a ♀ is recorded from Fair Isle in autumn. What may be considered one of the features of the year is the number of Yellow-browed Warblers (*Phylloscopus superciliosus*) which occurred in Scotland. One was seen in Dumfriesshire on the 11th April by Mr. George Stout, whose familiarity with this interesting little bird on the Fair Isle, makes his identification of it certain. This is the first record of the occurrence of *P. superciliosus* in the British Isles in spring, and also the first record for the mainland of Scotland. In autumn, two are reported from East Ross, on the 23rd and 27th September (the first autumn occurrence for the mainland of Scotland and first record for Moray), four from Fair Isle between the 28th September and 4th October, and at least ten from the Isle of May on dates ranging from 16th September to 24th October, on one occasion (27th September) as many as three being seen at one time. A Siberian Chiff-chaff (*Phylloscopus tristis*) was obtained from Fair Isle. A Reed-warbler (*Acrocephalus streperus*) is also reported, the fourth time this bird has been taken in Scotland, and this, as well as all previous records, comes from Fair Isle.

The Fair Isle gives us spring and autumn records of the Grey-headed Wagtail (*Motacilla borealis*), and a Richard's Pipit (*Anthus richardi*) is reported from the same station.

There are four records of the Golden Oriole (*Oriolus*

galbula): Mr. Hugh S. Gladstone reports that an adult ♂ was caught at Penton Lynns, Dumfriesshire, on the 30th April; a young ♂ was observed in a garden in Renfrewshire during the first half of May; on 10th May one was found dead at Port-Glasgow; and a bird, seen at Fair Isle on the 26th May, "about the size of a Fieldfare and all over yellow colour," was undoubtedly *O. galbula*.

On 14th September a young Red-backed Shrike (*Lanius collurio*) was found lying dead at the base of the lighthouse tower on the Flannan Islands. This is a very interesting occurrence, being the first record of this species for the Outer Hebrides.

The only record of the Red-breasted Flycatcher (*Muscicapa parva*) is a young ♂ from the Isle of May on the 25th September; this is the first authenticated occurrence of this bird in the Forth area.

A Hawfinch (*Coccothraustes vulgaris*) occurred on the Fair Isle, the second on record for the island; while on 18th May a specimen of the White-throated Sparrow (*Zonotrichia albicollis*) was shot on Eilean Mor, Flannan Islands. This American species has not been previously recorded from the West of Scotland. A Scarlet Grosbeak (*Carpodacus erythinus*) ♀ was obtained on the Isle of May on 13th September. Among the extraordinary number of Crossbills which visited Britain in the summer of 1909 were two Two-Barred Crossbills (*Loxia bifasciata*), both adult males, one from Fair Isle, the other from the Flannans; the latter is the first record of the occurrence of this bird for the Outer Hebrides.

The Buntings occupy a large place among the uncommon visitors this year, the Ortolan Bunting (*Emberiza hortulana*) occurred on Fair Isle both in spring and autumn, and a Rustic Bunting (*Emberiza rustica*) ♂ was obtained on the same island; this is the third record for Scotland. The Little Bunting (*Emberiza pusilla*) also occurred on Fair Isle, and two birds of this species are recorded from the Isle of May on the 25th and 26th September, this being the first record of this north-eastern species in the Forth area. We have only one spring report of the Lapland Bunting (*Calcarius lapponicus*), namely, from Fair Isle; an adult male

was procured on the Flannan Islands on 3rd September and a female on Fair Isle at the end of the month. Two Shore-larks (*Otocorys alpestris*) were seen on the Isle of May on 13th October, and single birds are noted there up to 16th October.

On 27th April a Hoopoe (*Upupa epops*) was taken at Waternish ; this is only the second time that this bird has been recorded in Skye ; another was picked up dead near Leadhills on the 1st June.

There are several records of Greenland Falcons (*Falco candicans*) in 1909 ; on the 1st, 2nd, and 14th December they visited the Flannans, one was shot at Barra on 15th December, and another seen there ten days later, and a bird undoubtedly of this species was seen at Inverbroom (West Ross) on the 28th. A Greenland Falcon is reported from the Butt of Lewis on 4th December, and an Iceland Falcon (*Falco islandus*) was seen at the Flannans on 1st December.

The second known occurrence of the Little Bittern (*Ardetta minuta*) in Orkney is recorded, an adult male having been taken alive at Loch Stennis on 14th May. A number of Pink-footed Geese (*Anser brachyrhynchus*) visited Fair Isle during the stormy weather which prevailed from the 7th to the 18th October, and one was shot. This is an addition to the birds known to have occurred in Shetland. On the 18th June an adult female Ruddy Shelduck (*Tadorna casarca*) was obtained at Sule Skerry. This is a first record of this species for the Northern Isles.

A Little Crake (*Porzana parva*) was found in an exhausted condition in a fisherman's boat in Girvan Harbour (Ayrshire) on the 29th March, and is the first record for Clyde. A Dotterel (*Eudromias morinellus*) was found dead at Bellshill, near Glasgow, in spring. A Great Snipe (*Gallinago major*) was procured on Fair Isle in September ; and two visits of the Green Sandpiper (*Totanus ochropus*) were noted : one was shot on the banks of the Ae, Kirkmichael (Dumfriesshire), on 20th January, and the other at Fair Isle. A Dusky Redshank (*Totanus fuscus*) occurred at Balgray Dam (Clyde), with a small party of other Waders on 18th September.

From Lerwick comes the only record of Sabine's Gull (*Xema sabinii*), it was seen by Mr. Tulloch on the 25th July.

An Eared Grebe (*Podicipes nigricollis*) is noted as having been seen at Bishop's Loch near Glasgow in 1909.

Extension of Breeding Range.

This is an important though difficult part of our Report, and under it we have to deal with five species. The White Wagtail (*Motacilla alba*) is not uncommon with us on migration, and has been known to nest occasionally in England. In 1909 it bred on the Fair Isle, this being the first time it has been proved to breed in Scotland, though its probable nesting at Spiggie (Shetland) in 1900, and at Killilan (N.W. Highlands) in 1908, has been recorded in the "Annals of Scottish Natural History."

The Corn Bunting (*Emberiza miliaria*) is recorded by Mr. Macdonald as breeding in Mull in 1909; hitherto he has only observed it as a "sporadic spring migrant" in this locality. It is curious that it should not have been found nesting in this island before, as it nests in Iona. In the spring a pair of Great Spotted Woodpeckers (*Dendrocopus major*) safely hatched their young on the estate of Brucefield, West Fife. This bird breeds in various parts of the south-east and centre of Scotland (as may be seen in Mr. Harvie-Brown's useful map in the "A.S.N.H.," 1908, p. 209) and has probably spread from there into Fife, where it has not been previously reported as breeding, though it occurs as an occasional visitor.

Early in June two nests of the Gadwall (*Anas strepera*) containing seven and five eggs respectively were found beside a loch in the south-east of Scotland. The only previous record of the breeding of this species in Northern Britain was in Peeblesshire in 1906. If unmolested there seems to be no reason why this duck should not extend its breeding range over Scotland, as several other of the Anatidæ have done in the last few decades. The Sclavonian Grebe (*Podicipes auritus*) is recorded as breeding in Scotland in "British Birds" (vol. iii. p. 380). In 1908 a bird of this species was seen in the

beginning of June on a small loch in Inverness-shire, swimming restlessly about a nest of green reeds, but was unfortunately shot. Mr. Warrand (who records the occurrence) writes: "I was cheered to learn the following year (1909) that one or two pairs had appeared on the same loch, but soon afterwards heard that the nests had been ruthlessly robbed by a private egg-collector." This bird is occasionally recorded in Scotland in spring and summer in full breeding plumage, and has been suspected of nesting in Perthshire and Benbecula (Outer Hebrides).

Nesting.

The nesting season of 1909 seems to have been a very average one, in spite of spells of inclement weather. The earliest nest reported is that of a Long-eared Owl with two eggs at Kirkliston on 28th February. By 8th April Lapwings were laying in various localities; and the Little Grebe at Kirkliston on 27th April. On 4th May a pair of Blackbirds and a pair of Thrushes were found to be using the same nest near Paisley; the hen-birds laid three eggs each on alternate days, and fought for the privilege of sitting. When the eggs hatched a great battle ensued, the Blackbirds winning; the nest was harried when it contained five young. In May two Hawfinches' nests with eggs are recorded in East Lothian; these probably belonged to the same pair of birds, for they were only about sixty yards apart, but unfortunately in both cases disaster overtook the eggs. This is the first time the nest and eggs of this bird have been found in "Forth," though young Hawfinches newly out of the nest have several times been taken near Edinburgh. On 21st May two Tawny Owlets were found in East Ross in a nest in a rabbit-hole; while in the same locality, on the 28th, a Shelduck's nest with thirteen eggs was discovered; these may have been laid by two ducks, as they were in different stages of incubation.

A Cuckoo's egg in a Willow-warbler's nest is recorded from East Ross; and at Beith one was found in a Hedge Accentor's nest, "darker than most Meadow-pipits and smaller than usual"; at the same place a Cuckoo's egg

was found in a Reed Bunting's nest. Crested Tits are fledged in Strathspey by 3rd July, and flying about the trees, the parents feeding them. From East Ross, between the 7th August and 17th November, we have records of flocks of Crossbills, "the young being fed by their parents, though they could and did feed themselves." On 25th September newly-hatched Skylarks were found in North Argyll, a very late date. On the 25th November a perfectly fresh Starling's egg was found on the ground at Old Aberdeen. From various parts of the country records come of these birds having built flat open nests usually in conifers; while in Orkney they nested among the rubble on the seashore and in rabbit burrows.

Increase of the numbers of various species nesting in this country is reported, though in some cases the difference is merely local. In the Blantyre district of Clyde a great increase of Redshanks is noted, while the increase of Woodcock nesting in the Highlands is sustained, the birds often being double-brooded. The Black-headed Gull is reported as increasing at several of its breeding places, while more Great Crested Grebes are noted as nesting in various parts of Scotland. Quite a number of old Blackbirds' nests were found near Lerwick (Shetland), several pairs of Quails nested in East Lothian, and about thirty pairs of Stock Doves built in ivy-covered cliffs in Arran.

At Kirkliston several old nesting haunts of the Sedge-warbler, which were used prior to 1908, were still unoccupied this season, while here and there are records of a decrease in the numbers of breeding Terns.

Migration.

January.—The beginning of the year gives us records of a considerable local movement caused by the severe snow-storm at the end of 1908. Fieldfares, Skylarks, Dunlins, and Lapwings are recorded in numbers from Fair Isle, and Skylarks from the Isle of May. On 15th January Fieldfares, Redwings, and Lapwings are reported from the Butt of Lewis, while next day these birds, along with considerable numbers of Skylarks and Snipe, are recorded at Fair Isle. The move-

ment of the above-mentioned species continued spasmodically to the end of the month on both East and West Coast stations.

February.—No important movement is recorded in the first half of February. On the 15th, 18th, and 24th small rushes took place at the lantern of the Isle of May, the birds seen included Thrushes, Blackbirds, Skylarks, Starlings, Lapwings, and Oyster-catchers, besides many birds in the rays which could not be identified. On the 25th from Lerwick we have the note of three Long-eared Owls (an unusual date) and a lot of Blackbirds, while great numbers of Thrushes are recorded along the shore at St. Monans (East Fife) on the same day. From our lighthouse reporters come notes of small movements of various species of Passeres and Waders throughout the month.

March.—From the 20th to the 31st the British Isles lay in a region of low pressure, during which south-easterly and north-easterly winds prevailed. In the beginning of the month little migration is reported, with the exception of an immigration of Skylarks at Fair Isle on the 2nd, and a few days later a rush of Snipe. On the 18th the first Wheatear of the season is recorded from Lendalfoot (Clyde), and on the 20th a small rush is reported from various stations, while White Wagtails arrived at Lamlash next day. By the 22nd the movement had increased in intensity: Rooks and Lapwings are recorded in great numbers at Fair Isle and the Isle of May, with Thrushes, Redwings, Skylarks, Starlings, and Golden Plover; the first Stonechats occurred at Fair Isle, while Water-rails struck the lantern at the Mull of Galloway (Wigtown) and Tarbat Ness (E. Ross), and Dabchicks (a single bird each time) were killed by striking at Tarbat Ness and the Isle of May. This migratory movement was also noted at Sule Skerry, where flocks of Snow-buntings are recorded; in addition to other species; and Lerwick, where large flocks of Rooks are noted. From the last-named place come several other records of large numbers of Rooks up to the end of the month, and a Redstart on the 28th. The migration continued in a lesser degree to the end of March.

April.—For the first ten days of April anticyclonic

conditions were the dominating factor over Western Europe. While England and East Scotland were wholly within their influence, the more western parts of the kingdom were affected by an ocean depression which occupied the northern half of the Atlantic. For the rest of the month cyclonic conditions mainly prevailed.

For the first ten days of April a good deal of migration is recorded from Fair Isle and the West Coast, but not from the East. The arrivals included Wheatears, Chiffchaffs, Willow-warblers, Meadow and Tree-pipits, Swallows, and House-martins. On the 10th numbers of Wheatears arrived at Tiree and Fair Isle, and Sand-martins at Saltoun (E. Lothian). Migrants continued to arrive on the West Coast and in smaller numbers on the East; on the 14th Yellow Wagtails and Common Sandpipers made their appearance on the West, and the latter two days later on the East Coast. On Tiree small parties of White Wagtails were seen travelling north from 15th April to 7th May. A decided immigration of Passeres over all Scotland took place from the 17th to the 19th increasing in intensity, and for the next ten days a veritable rush ensued. By the end of the month almost all the summer migrants had arrived, a very different state of affairs from what obtained at the corresponding date in 1908. Swallows and Sandpipers are recorded from all parts on the 20th, and the Cuckoo appeared on the West next day. On the 22nd Whimbrel arrived at Tiree, and Whinchats, Common and Sandwich Terns in East Fife. Next day the rush increased, and on the 24th Cuckoos are recorded in numbers in various places on both East and West Coasts. Swifts arrived at Beith on the 25th and next day at Kirkliston, while Whitethroats and Blackcaps are reported from the East Coast and Sedge-warblers from the West.

May.—The distribution of pressure during this month was mainly favourable to anticyclonic conditions over our islands. The rush continued till 9th May, slackening somewhat after that date. Numbers of the Greater Wheatear are recorded from Fair Isle on the 3rd, and on the same day a flock of about 150 Fieldfares was seen at Yester, the last mainland record. On the 4th Wood-warblers arrived

at Saltoun, and Swallows at the Butt of Lewis; on the 5th a Spotted Flycatcher is reported at Dalry, and Little Terns at St. Andrews. On the 7th a Pied Flycatcher arrived at Fair Isle with small numbers of other migrants, next day a Wryneck and a Hawfinch at the same place, and a Grasshopper-warbler at Dalry (Clyde). Although the main rush was past migrants continued to arrive and spread over Scotland; by the 15th East Lothian and East Fife had received their full quota of Warblers; while from the 12th to the end of the month Arctic, Common, and Little Terns kept arriving at Tiree. Slight movement is recorded almost every day up to the 31st from various stations, but no rush of sufficient importance to merit special notice.

June.—As we might expect there is little migration to record for June, but the month is signalised by an irruption from Europe of those gypsy migrants the Crossbills. The first was seen at Fair Isle on 23rd June, later many were recorded from our northern islands and various parts of the mainland. The birds reported from our shores only form part of a larger movement which included England, Ireland, and parts of the Continent in its range.

July.—The immigration of Crossbills continued throughout July, the greatest number being seen in the north. Among them were a couple of Two-barred Crossbills. About the middle of the month decided traces of Wader-migration are recorded, and by the end various Limicolæ were moving freely. Greenshanks, Sandpipers, and flocks of Golden Plover, Sanderling, Turnstones, and Whimbrel were seen by the shore in East Fife, and records of most of these species come also from Fair Isle and East Ross. The first influx of Willow-warblers is recorded from the East Coast.

August.—The first half of August was anticyclonic, the second half unsettled and cold. Pressure was high for the first fortnight, thereafter low. The first half of August shows a continuance of the Wader-migration, and by the 10th Passeres were also on the move, Wheatears being reported from the lanterns on the Flannan Islands and Isle of May. On the 14th and 15th Wheatears, Willow-warblers, Sedge-warblers, Whitethroats, Spotted Flycatchers,

and a young Cuckoo appeared at the lantern on the Isle of May. By this time most of the Swifts had left. After the middle of the month small numbers of migrants are recorded, on the 18th flock after flock of White Wagtails passed over Fair Isle, on the 21st this species is recorded from East Fife. Flocks of Terns were seen flying round Barnsness Lighthouse (Forth) during the evening of the 23rd, and next day Sandwich Terns, mostly adults, were seen in large numbers in Largo Bay. During the last week of August migration became more pronounced, records come from all over Scotland of the southward movement of various species of Waders, while Duck of different kinds began to return to their winter quarters. The commoner Warblers and other Passeres are recorded as on the move at Fair Isle, the Isle of May, the Flannans, Dunnet Head, and parts of the mainland. Crossbills lingered in places throughout August, but the greater number seem to have disappeared by the end of the month.

September.—The first three weeks were anticyclonic on the whole ; the first week was unsettled and changeable, but the second and third were fine and dry. The last week was very unsettled, and on the 25th there was a severe magnetic storm of world-wide distribution. Little migration is noted during the first ten days, more being recorded from the Flannans than elsewhere. From this station a Lapland Bunting is reported on the 3rd, while White Wagtails were passing Tiree on the same day. From the 11th to the 14th greater activity ensued, numbers of Terns appeared at Lerwick as migrants on the night of the 11th, and on the 12th, Greater Wheatears, Redstarts, and Whitethroats were passing the Mull of Galloway Lighthouse, specimens of each striking the lantern. On the 17th a movement of Wheatears is recorded from the West Coast at the Flannans and Butt of Lewis, and Warblers and other birds from the Fair Isle and Isle of May. From the 18th to the 20th large numbers of Swallows and House-martins were observed at the Isle of May, Meadow-pipits in great numbers at the Butt of Lewis and the Flannans ; and on the 20th, another wave of Wheatears at the last-named place and the Isle of May. On the 22nd, many arrivals are recorded—Siskins,

Lesser Whitethroats, and Whimbrels at the Fair Isle and Isle of May; Whitethroats and a Grey Wagtail at the Flannans; while from 1 to 3 A.M. on the 22nd and the next two nights, Terns passing in numbers were heard, or seen in the rays of the lantern at Fair Isle, Lerwick, and Isle of May. A big rush occurred on the 25th, numbers of Snipe arrived at Fair Isle and Lerwick, many Siskins at Fair Isle and Isle of May, and in both these places Tree-pipits, Bramblings, and Garden-warblers, along with many other common species and some rareties already mentioned. Redwings arrived at Fair Isle, and next day at the Isle of May. The rush continued on the 26th and 27th, Wheatears were numerous at the Isle of May and Butt of Lewis, and at the latter place, large numbers of Skylarks and Meadow-pipits are reported. On the 28th a large immigration of Warblers took place at Fair Isle and the Isle of May, and with them many birds of other species. Next day brought fresh arrivals to Fair Isle, including large numbers of Greater Wheatears, Bramblings, Chaffinches, Siskins, and Snow-buntings, the stream slackening on the Isle of May. The 30th shows a continuance of migration on the Fair Isle, little movement being reported elsewhere, with the exception of the arrival of great numbers of Red-throated Divers in St. Andrews Bay. Few Crossbills remain. In the latter half of September several reports of Great Spotted Woodpeckers are sent from Fair Isle and other parts of Shetland, the Butt of Lewis, and Isle of May.

October.—The general distribution of barometric pressure during this month was of a well-marked south-westerly type, but the gradient was nearly double the normal. At the telegraphic reporting stations there were only two days on which the wind did not exceed the force of a strong breeze, on twenty-one days the force of a gale was attained, and on twelve of these, it was a strong or whole gale at one or more stations. On every day of this month the weather was under the influence of one or more low-pressure systems, and observation at migration stations was greatly hampered by the strong westerly and southerly winds which prevailed. October opens with a fair amount of migration; from the 1st to the 4th (when the weather was fine) there

are records of the arrival of flocks of Geese from the Ross of Mull, Beattock, Spiggie (Shetland), and the Isle of May. A gale put a stop to a great extent to the arrival of migrants between the 5th and 9th, though a number of Snipe were seen on Fair Isle on the 7th, and a considerable influx of Blackbirds and Thrushes took place at Loch Awe during this period. The first big Redwing immigration occurred on the 10th, numbers arriving all day on the Isle of May, and at night at Lerwick and Fair Isle. A large arrival of Bramblings also took place at the Isle of May, and many Rock-pipits are reported from the Butt of Lewis. From 12 to 3 A.M. on the 11th a small rush to the lantern is recorded at Fair Isle—Redwings, Thrushes, a Ring-ouzel, Bramblings, Skylarks, and Starlings being killed, while Redwings were numerous there and on the Isle of May during the day. Another arrival of Redwings accompanied by Blackbirds occurred on the 13th; both species are reported in numbers from Spiggie (Shetland), Fair Isle, and Isle of May; Redwings are reported on the 16th from the Butt of Lewis and the Flannans. Early on the 17th a small rush took place to the lanterns of the Pentland Skerries and the Isle of May, while early next morning a big rush is recorded at the latter place, Butt of Lewis, Tarbatness, Lerwick, and Fair Isle. The great majority of birds killed were Redwings, but along with them were Blackbirds, Thrushes, Fieldfares, Ring-ouzels, Goldcrests, Bramblings, Meadow-pipits, Skylarks, Starlings, and Jack-snipe. On the night of the 18th hundreds of Redwings, Fieldfares, and Starlings are recorded as flying round the lantern all night at the Flannans, and the same species were killed at the South Lighthouse on Fair Isle. On the 23rd, Redwings and Fieldfares are reported from the Flannans, crowds of the former at the lantern at Skerryvore, and large flocks of Snow-buntings at Tiree. Towards the end of the month hundreds of Snow-buntings and Barnacle Geese are recorded at the Flannans, and Snipe were numerous at Tiree; these three species were also noted at Fair Isle. The last Crossbill is reported from Fair Isle during this month, and Great Spotted Woodpeckers from Lerwick, Fair Isle, and Dingwall.

November.—November was still, cold, and dry, and

mainly anticyclonic. From the 1st to the 6th Redwings and Fieldfares in thousands are recorded from Inverbroom (West Ross). Redwings at the Butt of Lewis and Flannans, and Snow-buntings in numbers at the latter place and Fair Isle. Slight movements are recorded from the Pentland Skerries, Butt of Lewis, Flannans, and Loch Awe, mostly of Turdinae. Very little movement took place between the 7th and 14th, but Snow-buntings are reported from various stations. Woodcock were numerous at Spiggie (Shetland) on the 10th, and the same species is reported in numbers from Glenorchard on the 15th to 17th. Large numbers of Snipe arrived at the Butt of Lewis on the 14th, and this species and Jack-snipe are recorded from the Pentland Skerries and the Flannans. The hard weather experienced at this time caused a certain amount of movement; at Aberdeen on the 14th and 15th Skylarks, Starlings, and Lapwings passed south in numbers during a snowstorm. Reports come from the Pentland Skerries, Butt of Lewis, and East Ross of numbers of Fieldfares, Song-thrushes, and Golden Plover, while Redpolls were seen at the Skerries and Iceland Gulls at the Flannans. Slight movement took place from the 17th to the 22nd, mostly among Fieldfares, Blackbirds, and Lapwings; on the 25th a large flock of Lesser Redpolls and a few Siskins arrived at Loch Awe, and great numbers of Goldcrests at the same place on the 30th. From the Flannans come reports of small numbers of birds, mostly Redwings, Blackbirds, Lapwings, and Snipe, from the 22nd to the end of the month. Great Spotted Woodpeckers are recorded from Caithness, West Ross, and East Fife.

December.—The closing month of the year was cold and unsettled. Small movements are recorded from the Flannans, Butt of Lewis, Pentland Skerries, and Fair Isle, probably caused by the severe frost on the mainland. The birds noticed were mainly Blackbirds, Redwings, Snow-buntings, Starlings, and Lapwings.

Winter.

During this season in 1908-1909, our winter migrants were present in quantity. From 1st January onwards we

have reports of large numbers of Fieldfares, Redwings, and Bramblings ; they are recorded as numerous in Mull, Fair Isle, the Isle of May, and East Fife, and in smaller numbers from various inland localities. A good many Blackbirds are reported from Lerwick, and Snow-buntings in their usual numbers at St. Andrews and Fair Isle. In January Swans are noted at Inverbroom (West Ross) and Fair Isle, and a Whooper at Morton Loch (East Fife). Barnacle Geese were in Solway in their usual numbers, but Mr. Service remarks on the absence of Grey Lags. Great flocks of the common winter duck are reported, and Pintail are recorded as being more than usually plentiful in Solway ; a flock of twenty to thirty Gadwall visited Morton Loch in January. Glaucous Gulls were frequent at Fair Isle, and Little Auks were seen there in enormous numbers from the 1st to the 5th February. Swans are reported from the Butt of Lewis in the middle of February, and large numbers of Red-throated Divers in Largo Bay.

The end of the year 1909 was a contrast to the beginning. The numbers of Redwings and Fieldfares were much below the normal, notes of the scarcity of these birds coming from both the East and West of Scotland. Many of the former were killed by the November frosts. The absence of Bramblings is noted in various parts of the country. Great Spotted Woodpeckers were unusually numerous in the last quarter of the year, reports of these species coming from various parts of Scotland. On 17th November Merlins were numerous in Tiree, chasing flocks of Fieldfares, while an unusual number of Greenland Falcons appeared during the winter.

Other winter birds appear to have been present in their usual numbers ; large flocks of Snow-buntings are recorded from the Flannans, Pentland Skerries, and Fair Isle. Brent Geese, Sheldrake, Wigeon, and Golden-eye were plentiful in our northern firths in November, flocks of White-fronted and Barnacle Geese and Golden-eye at Tiree, large flocks of Barnacles at the Flannans, huge flocks of Mallard in Largo Bay and at Crosswood Reservoir, while Gadwall were noticed in Elginshire and Tiree. Wigeon were late in returning to Solway and Craignish (Argyll), though the

Wild Geese arrived at their usual time. The flocks of Waders were present in their usual numbers. Golden Plover were numerous on 16th November in East Ross and at the Pentland Skerries, and large numbers of Snipe are reported from various stations during the month. Glaucous Gulls are noted at Fair Isle and the Isle of May, and Little Auks in numbers at the former place in December.

Food.

During the great immigration of Crossbills into Scotland in 1909 many of these birds visited localities which could not afford their usual diet, and they were therefore obliged to resort to various makeshifts. At Lerwick they fed on the yellow centres of daisies; on Fair Isle they ate last year's berries, the heads of thistles, flowers, the seeds of grasses and other plants; at the Flannans they fed on sea-pinks, and at Wick they scooped the Green-fly off the shoots of the roses. From Grantown-on-Spey they are reported as feeding on the larvae of the Pine Saw-fly, but as they are there in the midst of coniferous woods, this can hardly be attributed to a lack of their usual food, and it is suggested that the Crossbills' menu may, in the ordinary course, include the Spruce-gall aphis, Green-flies, and Pine Saw-flies. Towards the end of autumn many greatly emaciated Crossbills were found on Fair Isle, having died of starvation.

(*To be continued.*)

ON THE OCCURRENCE OF THE ROCK THRUSH (*MONTICOLA SAXATILIS*) IN THE ORKNEY ISLANDS.

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

I have received, in the flesh, for the Royal Scottish Museum, a fine adult male of this brilliantly plumaged and extremely rare visitor to the British Islands. It was captured

on the 17th of May at one of the Orcadian light stations —the Pentland Skerries, a famous islet for the visits of migratory birds.

Though this species is a summer visitor to the hill country of Western Central Europe, and has on several occasions occurred at Heligoland, yet only a single example has hitherto been captured in the British Isles, namely an adult male which was shot on the 19th of May 1843 in Hertfordshire. This specimen was seen in the flesh by the late William Yarrell, and described and figured by him in the first supplement to his "British Birds" in 1845; other occurrences have, it is true, been recorded, but both Prof. Newton and Mr. Howard Saunders have regarded them as unauthenticated. The bird also nests in localities of a rocky nature in Southern and South-Eastern Europe, Northern Africa, Asia Minor, Persia, Turkestan, Southern Siberia, and Northern China; and passes the winter in North-Eastern and North Tropical Africa, Southern Arabia, Northern India and Burma.

Its occurrence in the Orkneys, like that of many other species in our Islands, is quite remarkable, and to be attributed to deviation from the usual course followed when journeying to its accustomed summer haunts.

The Royal Scottish Museum, Edinburgh.

THE INSECT FAUNA OF GROUSE MOORS.

By Percy H. Grimshaw, F.R.S.E., F.E.S.

At the request of the Committee appointed to investigate Grouse Disease, I spent some time in the months of June and July 1908 on various grouse moors, principally for the purpose of investigating the nature of the food of grouse chicks. The contents of the crops and gizzards of several birds from a few hours to three weeks old were obtained, and in order to aid in the somewhat difficult task of identifying the insects and fragments of insects therein found, a sample of the entomological fauna of the moors was taken,

especially in the marshy hollows where the chicks were accustomed to feed. This material, carefully examined, served its purpose, and it has been thought desirable to publish the list of species separately, inasmuch as it may have a certain amount of interest from a purely faunistic point of view. The Chairman of the Committee, Lord Lovat, has very kindly sanctioned the publication of the "List" in this Journal, and in order to retain its full bearing on the question of the food of grouse, as well as that of local distribution, notes have been appended referring to such species as have been picked up by the chicks in their search for nourishment. Such species (as well as the families to which they belong) are indicated in the list by an asterisk.

The localities mentioned below are: Dunachton in Inverness-shire; Tulchan in Elginshire; Ballindalloch in Banffshire; and Burley-in-Wharfedale in Yorkshire.

Order DIPTERA.

*Family MYCETOPHILIDÆ (Fungus Gnats).

*Sciara, *spp.*—One male, Dunachton; two females, Burley-in-Wharfedale. A fragment of this genus found in one gizzard from Tulchan.

Boletina, *sp.*—One male, Burley-in-Wharfedale.

*Family BIBIONIDÆ.

*Bibio lacteipennis, *Ztt.*—One male and one female, Dunachton. A male found in a crop from Dunachton. Remains of four other Bibios were found in two crops and a gizzard from Dunachton, but the species was not determined.

Family SIMULIIDÆ (Sand-Flies).

Simulium, *spp.*—Two males and two females of an undetermined species were taken at Dunachton, and two females of another species at Ballindalloch.

*Family CHIRONOMIDÆ (Midges).

(The members of this family were found in many of the crops and gizzards examined. The majority of them belonged to the

genus *Ceratopogon*, one species (at least) of which was very common in the marshy spots frequented by the young chicks.)

Cricotopus, *sp.*—Four males and four females belonging to this genus were taken at Ballindalloch, but I have not been able to assign them to any of the described species.

Orthocladius dolens, *Wlk.* (*niveipennis*, Ztt.).—Seven specimens of each sex, Burley-in-Wharfedale.

Orthocladius, *spp.*—Two females (each of a separate species), Burley-in-Wharfedale.

Metriocnemus fuscipes, *Mg.*—One male, Burley-in-Wharfedale.

Diamesa obscurimanus, *Mg.*—One male, Dunachton; one male, Ballindalloch.

Tanypus choreus, *Mg.*—One male, Burley-in-Wharfedale.

*Ceratopogon flavipes, *Mg.* — One female, Ballindalloch. Remains of this genus were found in many of the crops and gizzards, especially at Dunachton, and as the present species is common in the marshy areas where the chicks feed, it may be the one represented.

Ceratopogon, *sp.* — Near *flavipes*, but quite distinct, neuration different, hairs on antennal joints much longer, legs darker, and whole insect smaller. Six males and eight females taken at Dunachton.

Ceratopogon femoratus, *Mg.*—One female, Ballindalloch.

Ceratopogon, *sp.*—Near *gracilipes*, Winn.—One male, Dunachton.

Family CULICIDÆ (Gnats).

Culex pipiens, *L.*—Two males, Dunachton.

*Family LIMNOBIIDÆ.

The Crane-flies belonging to this family form a large proportion of the insect food of the young grouse. There is a tolerable variety of species in the marshy ground at the sources of the various rivulets, and being fairly large insects they are attractive to the eyes of the chicks. In some cases, as noted below, their crops were absolutely gorged with specimens of the small species known as *Molophilus ater*.

Limnobia ? nitida, *Verr.*—A single male, presumably of this species, was taken in marshy ground on the moors above Carr Bridge.

Dicranomyia morio, *Fab.*—Several males, Dunachton.

Goniomyia tenella, *Mg.*—Common on the moors at Dunachton, Ballindalloch, and Carr Bridge.

*Molophilus ater. *Mg.*—This was, to me, the most interesting insect met with on the moors. It is a small species compared with other members of the family, and remarkable for its stunted wings, which, I should imagine, are perfectly useless for flight. The fly is very common in certain of the marshy areas around the sources of the rivulets, where, at the proper season, it is to be seen climbing up and down the leaves of grass and Juncus. Its white halteres are very conspicuous, while the insect itself is curiously spider-like in appearance. Hundreds of specimens were seen in one marsh at Dunachton (many of them pairing) and a large number collected and preserved both dry and in spirit. Of 26 chicks killed at Dunachton no fewer than 14 were found to have been feeding on this insect, and in 5 of these the crops contained over 100, 56, 50, 34 and 11 specimens respectively.

*Rhypholophus nodulosus, *Meg.*—Several specimens taken at Dunachton. A single male found in a crop from the same moor.

Erioptera trivialis, *Mg.*—A common inhabitant of the moors. Several examples taken at Dunachton, Ballindalloch, and Carr Bridge.

Idioptera trimaculata, *Ztt.*—Of this rare and interesting fly I took six males and one female at Dunachton.

Pœcilostola punctata, *Schrk.* — One example of each sex, Dunachton.

Limnophila meigenii, *Verr.*—A common species; many taken at Dunachton.

Limnophila lineolella, *Verr.*—Females taken at Ballindalloch and Carr Bridge.

Limnophila bicolor, *Mg.*—Common; taken in numbers and in both sexes at Dunachton and Ballindalloch.

*Dicranota bimaculata, *Schum.*—One male of this rare species captured at Dunachton. A male also taken from a crop from the same locality.

Amalopis immaculata, *Mg.*—2 males and 1 female, Dunachton.

Family TIPULIDÆ (Crane-Flies).

Dolichopeza sylvicola, *Curt.*—A few examples of this extremely beautiful fly were seen flying over a tiny stream at Dunachton, and afterwards captured.

Tipula varipennis, *Mg.*—Of this common species several examples were taken on the moor at Dunachton.

Tipula ? pruinosa, *W.*—Two males, which I believe belong to this species, were taken at Dunachton.

Tipula montium, *Egg.*—Two males taken at Dunachton. The occurrence of this species in Britain was first confirmed by Henderson ("Ent. Mo. Mag.") in 1901, who took it in the Clyde district.

Tipula oleracea, *L.*—The commonest and best known of the Tipulidæ, and popularly called "Daddy Longlegs." Taken on the moors in Yorkshire, but not noticed on the northern hills, though doubtless it occurs in plenty.

Family TABANIDÆ.

Therioplectes montanus, *Mg.*—One female captured on the moors above Carr Bridge.

Family LEPTIDÆ.

Leptis scolopacea, *L.*—One male taken at Ballindalloch.

Ptiolina atra, *Staeg.*—One male, Dunachton. This species was only added to the British List in 1904.

Family THEREVIDÆ.

Thereva plebeia, *L.*—A single female taken on the moors above Carr Bridge.

*Family EMPIDÆ.

This family is represented on the moors by several species of common occurrence, especially in the sheltered and marshy hollows near the streams. *Cyrtoma spuria*, one of the smallest species, was found in many of the crops from Dunachton, and was also found, by sweeping, to be very plentiful.

Hybos femoratus, *Mull.*—Several taken at Ballindalloch and Carr Bridge.

*Cyrtoma spuria, *Fln.*—Abundant on the moors at Dunachton, Ballindalloch, and Carr Bridge. Remains found in eight of the crops obtained at Dunachton and also in that from Glen Eunnich.

*Rhamphomyia sulcata, *Fln.*—A large, conspicuous, and abundant species, taken at Dunachton and Ballindalloch; fragments found in a crop from the former locality probably represent this species.

Rhamphomyia albosegmentata, *Ztt.*—Also common and conspicuous. Many examples obtained at Dunachton and one female at Ballindalloch.

Rhamphomyia, *sp.*—A single female of an undetermined species captured at Dunachton.

Empis borealis, *L.*—One female of this well-marked fly, Dunachton.

Empis trigramma, *Mg.*—One male, Dunachton.

Empis lucida, *Ztt.*—Seven specimens taken at Dunachton.

*Empis, *sp.*—Several specimens of a small *Empis* with black legs and yellow halteres were taken at Dunachton, but I am unable to identify it with certainty. The remains of a small species were found in the crop and gizzard of a chick from Dunachton.

Hilara, *spp.*—The members of this genus were common on all the moors visited, but I have not been able to ascertain the species.

Hemerodromia melanocephala, *Hal.*—One of each sex taken at Ballindalloch.

Ardoptera guttata, *Hal.*—Three specimens of this peculiar little fly were taken by sweeping at Ballindalloch.

Tachydromia, *spp.*—Several specimens of this genus, which I cannot identify, were taken at Ballindalloch and Carr Bridge.

Family DOLICHOPODIDÆ.

The members of this family are commonly found in marshy ground, but I found no evidence of their having been eaten by the chicks. The following list, therefore, is of interest only from a faunistic point of view.

Dolichopus atratus, *Mg.*—Seven males and five females, Ballindalloch.

Dolichopus vitripennis, *Mg.*—A few taken at Ballindalloch and Burley-in-Wharfedale.

Dolichopus planitarsis, *Fln.*—Two males of this rare species, Dunachton.

Dolichopus ? punctcornis, *Ztt.*—Two males and one female taken at Ballindalloch seem to fit the description of this species, but I cannot feel quite certain about it.

Rhaphium longicorne, *Fln.*—One male, Dunachton.

Porphyrops, *sp.*—Three males of an undetermined species, with *yellow* spine on the middle coxæ, were taken at Dunachton. These certainly merit further investigation.

Hydrophorus borealis, *Zw.*—One male, Dunachton.

Campsicnemus loripes, *Hal.*—Two males and three females, Dunachton.

Sympycnus cirrhipes, *Wlk.*—One male, Ballindalloch.

*Family SYRPHIDÆ.

The *Syrphidæ* are essentially lovers of the sunshine, and are often seen hovering in the air on bright days, and if disturbed, darting off like lightning to hover again a few feet away. They are difficult to catch in flight, and are most easily taken when feeding or resting on flowers. Their occurrence in the crops of grouse chicks I regard as of little or no importance.

*Platychirus manicatus, *Mg.*—One female, Burley-in-Wharfedale. An example (female) found in a crop from Tulchan.

Platychirus clypeatus, *Mg.*—One female, Burley-in-Wharfedale.

Melanostoma mellinum, *L.*—Three males and four females, Dunachton; one female, Burley-in-Wharfedale; one female, Ballindalloch.

Syrphus torvus, *O.-S.*—One male and three females, Dunachton.

Syrphus vittiger, *Ztt.*—One male and four females, Dunachton.

*Sphærophoria picta, *Mg.*—One male, Burley-in-Wharfedale; one female, Ballindalloch. A male found in a crop from Tulchan and another male in a crop from Dunachton.

Sericomyia lappona, *L.*—One male taken on the moors at Dunachton.

Family TACHINIDÆ.

Macquartia ? tenebricosa, *Mg.*—One example of what I take to be this species was captured at Dunachton.

Cynomyia mortuorum, *L.*—One male and one female of this common, but handsome, "Flesh-fly" were taken at Dunachton.

Onesia cognata, *Mg.*—One female, Burley-in-Wharfedale.

Family MUSCIDÆ.

The "House-Fly" family. Insects of rapid flight, apparently never eaten by the grouse.

Hæmatobia stimulans, *Mg.*—One female, Dunachton.

Pollenia rudis, *F.*—Commonly resting on stones at Ballindalloch. A common fly, of which six males were taken.

Morellia simplex, *Ler.*—One male, Dunachton; one male, Burley-in-Wharfedale.

*Family ANTHOMYIIDÆ.

The remains of flies belonging to this family, but not determined, were found in crops from Glen Eunnich and Dunachton.

Hyetodesia lucorum, *Fln.*—Two males and one female, Dunachton; one female, Ballindalloch.

Hyetodesia obscurata, *Mg.*—One male and one female, Ballindalloch.

Mydæa nigritella, *Ztt.*—One male, Ballindalloch.

Spilogaster duplicata, *Mg.*—Two males, Dunachton.

Limnophora solitaria, *Ztt.*—Two males, Dunachton.

Hydrotæa irritans, *Fln.*—One female, Dunachton.

Trichopticus cunctans, *Mg.*—One female, Dunachton.

Hylemyia variata, *Fln.*—Fifteen males and five females, Dunachton.

*Phorbia ignota, *Rnd.*—Seven males, Dunachton. A specimen probably belonging to this genus, but not specifically determined, was found in a crop from Tulchan.

Azelia zetterstedti, *Rnd.*—One male, Burley-in-Wharfedale.

Caricea tigrina, *Fab.*—One male, Ballindalloch.

Caricea intermedia, *Fln.*—Six males and three females, Ballindalloch.

Cœnosia geniculata, *Fln.*—One male Dunachton; one male, Ballindalloch.

Family CORDYLURIDÆ.

Although the flies of the genus *Scatophaga* are so abundant and conspicuous in the marshy areas where the grouse chicks feed, yet I have not found their remains in any of the crops or gizzards examined.

Cordylura pudica, *Mg.*—One male, Dunachton.

Scatophaga suilla, *Fab.*—Two males, Ballindalloch; one female, Dunachton.

Scatophaga stercoraria, *L.*—A very abundant fly on the moors. Numerous specimens were collected, and have been examined by Mr. Shipley and Mr. Bygrave for possible cysts of tapeworms, but without results.

Scatophaga squalida, *Mg.*—The commonest fly in the marshy places on the moors. A large number of specimens were collected and examined for cysts, but in vain.

Family SCIOMYZIDÆ.

Tetanocera lævifrons, *Lw.*—One male, Ballindalloch.

Tetanocera umbrarum, *L.*—One example of each sex taken at Dunachton.

Family PSILIDÆ.

Psila nigra, *Fln.*—Two specimens, Dunachton.

Loxocera aristata, *Pz.*—One female, Burley-in-Wharfedale.

Family OPOMYZIDÆ.

Opomyza germinationis, *L.*—One female, Ballindalloch.

Family SEPSIDÆ.

Sepsis violacea, *Mg.*—One female, Ballindalloch.

Sepsis cynipsea, *L.* — Three males and one female, Burley-in-Wharfedale.

Family PIOPHILIDÆ.

Piophila affinis, *Mg.*—One specimen, Dunachton.

*Family GEOMYZIDÆ.

Diastata unipunctata, *Ztt.*—One specimen, Dunachton.

*Diastata nebulosa, *Fln.*—An example of this species was found in a crop from Dunachton.

Family EPHYDRIDÆ.

Hydrellia griseola, *Fln.*—An abundant species, of which three examples were taken at Dunachton, three at Ballindalloch, and sixteen at Burley-in-Wharfedale.

Scatella stagnalis, *Fln.*—One specimen, Burley-in-Wharfedale.

Family DROSOPHILIDÆ.

Scaptomyza graminum, *Fln.*—One specimen, Burley-in-Wharfedale.

Family CHLOROPIDÆ.

Chlorops, *sp.*—An undetermined example, belonging to this genus, was taken at Ballindalloch.

Oscinis frit, *L.*—One specimen, Dunachton.

Elachyptera cornuta, *Fln.*—One female, Dunachton.

Family AGROMYZIDÆ.

Agromyza, *sp.*—One male, Ballindalloch; one female, Burley-in-Wharfedale.

Ceratomyza denticornis, *Pz.*—One example, Ballindalloch.

Ochthiphila juncorum, *Fln.*—One specimen, Dunachton.

Ochthiphila geniculata, *Hal.*—One specimen, Dunachton.

Family BORBORIDÆ.

Borborus geniculatus, *Meq.*—Two specimens, Ballindalloch.

Borborus, *sp.*—An undetermined species, one example of which was taken at Ballindalloch.

Sphærocera denticulata, *Mg.*—A specimen was found among heather sent me from Colintraive in February 1909.

*Family HIPPOBOSCIDÆ.

*Ornithomyia lagopodis, *Sharp.*—This parasitic fly must be a source of much annoyance to the young grouse, since from six chicks I obtained more than 100 specimens!

*Order COLEOPTERA (Beetles).

Besides the Beetles enumerated below, the fragments of one were found in a crop from Ballindalloch, but were not identified.

Family CARABIDÆ.

Elaphrus uliginosus, *Fab.*—One specimen, Dunachton.

*Family STAPHYLINIDÆ.

Two species of this family, undetermined, occurred on the moors at Dunachton. The group was also represented in the crops of three chicks (two from Dunachton and one from Tulchan).

*Family ELATERIDÆ (Click Beetles).

Sericosomus brunneus, *L.*—One specimen, Dunachton.

*Corymbites cupreus, *Fab.*, *var.* æruginosus, *Fab.* — Five specimens of this common beetle taken at Dunachton. Remains were found in three crops from Dunachton.

Family DASCILLIDÆ.

Helodes marginata, *Fab.*—One, Dunachton; one, Ballindalloch.

Family TELEPHORIDÆ.

Telephorus nigricans, *Mull. var.* discoideus, *Steph.* — One, Dunachton.

Telephorus obscurus, *L.*—Five, Dunachton.

Rhagonycha limbata, *Thoms.*—One, Ballindalloch.

Rhagonycha elongata, *Fln.*—Eight, Dunachton.

Malthodes flavoguttatus, *Kies.*—One, Ballindalloch.

Family CHRYSOMELIDÆ.

Donacia discolor, *Panz.*—Three, Dunachton.

Lochmæa suturalis, *Thoms.*—One female, Dunachton. This is the so-called "Heather Beetle," and although only one specimen was taken during my collecting trip, yet from other evidence (see my special Report on this insect) it is obvious that it is generally distributed in Scotland, and only too abundant on many of the moors.

Haltica ericeti, *All.*—One, Dunachton.

*Family CURCULIONIDÆ (Weevils).

"Remains of an undetermined Weevil occurred in a crop from Dunachton."

*Strophosomus lateralis, *Payk.*—Remains of this species were found in two crops from Tulchan.

*Phyllobius maculicornis, *Germ.*—One, Dunachton.

Limnobaris t-album, *L.*—One, Dunachton.

*Order LEPIDOPTERA (Butterflies and Moths).

The only Lepidopterous remains found in the crops I examined were those of an undetermined Tineid Moth. The occurrence is apparently of no importance.

Family NYMPHALIDÆ.

Argynnis euphrosyne, *L.*—This Fritillary is no doubt often seen flying over the heather in most parts of Scotland. One example was caught at Dunachton and others seen.

Cœnonympha davus, *F.*—Also a common moor-loving species. One specimen taken at Ballindalloch.

Fidonia atomaria, *L.*—The "Heath" Moth, very abundant on the moors, especially at Dunachton, where I obtained twenty-seven specimens.

Eupithecia, *sp.*—Three specimens of a "Pug" taken at Dunachton but too much rubbed for identification.

Pyrausta ostrinalis, *Hb.*—Four, Dunachton.

Cnephasia musculana, *Hb.*—One, Dunachton.

Phoxopteryx unguicella, *L.*—Nine, Dunachton; one, Ballindalloch.

Gelechia ericetella, *Hb.*—Two, Dunachton.

Argyresthia cœdartella, *L.*—One on wall at Ballindalloch.

*Order HEMIPTERA.

Heteroptera.

Family SALDIDÆ.

Salda saltatoria, *L.*—One specimen, Dunachton.

*Homoptera.

Fragments of Homoptera were found in two crops, from Dunachton and Ballindalloch respectively, but they were not determinable.

Family DELPHACIDÆ.

Liburnia, *sp.*—One specimen, species not determined, Dunachton.

Family CERCOPIDÆ.

Philænus spumarius, *L.*—Eight specimens, Burley-in-Wharfedale. This is an abundant insect everywhere, especially in dampish places. It is the well-known species known as the "Cuckoo-Spit."

Philænus lineatus, *L.*—Two, Burley-in-Wharfedale.

*Order HYMENOPTERA.

*Family TENTHREDINIDÆ (Saw-Flies).

*Dineura, *sp.*—One specimen, undetermined, Dunachton. An example, probably of the same species, was found in a crop from the same moor.

Pœcilosoma subMuticum, *Thoms.*—One, Dunachton.

Dolerus palustris, *Klug.*—One, Dunachton.

Dolerus fissus, *Htg.*—One, Dunachton; one, Ballindalloch.

Tenthredo olivacea, *Klug.*—One, Dunachton.

*Family CYNIPIDÆ.

A small hymenopterous insect, apparently a Cynipid, was found in a crop from Ballindalloch—the occurrence was, perhaps, a casual one.

*Family CHALCIDIDÆ.

Undetermined specimens belonging to this large, interesting, but difficult group of insects, were found in two crops from Dunachton and one from Tulchan. A Chalcid was also captured in the net at Dunachton.

Families ICHNEUMONIDÆ and BRACONIDÆ.

A number of undetermined specimens were found in three crops from Dunachton and one from Tulchan.

CRYPTUS TARSOLEUCUS, *Schr.*—One female captured at Dunachton.

Family APIDÆ (Bees).

BOMBUS TERRESTRIS, *L.*—One, Dunachton. A number of *Bombi* were seen flying over the moors, but they are of no special interest in the inquiry regarding Grouse Disease.

ORDER TRICHOPTERA (Caddis-Flies).

Family SERICOSTOMATIDÆ.

SERICOSTOMA PERSONATUM, *Spence.*—One, Ballindalloch.

SILO PALLIPES, *Fab.*—One, Ballindalloch.

Family LEPTOCERIDÆ.

BERÆA MAURUS, *Curt.*—Two, Ballindalloch.

Family HYDROPSYCHIDÆ.

PHILOPOTAMUS MONTANUS, *Don.*—Very abundant along all the streams at Dunachton; 19 examples taken.

ORDER NEUROPTERA.

ODONATA (Dragon-Flies).

PYRRHOSOMA NYMPHULA, *Sulz.*—One of each sex taken at Dunachton.

*Family EPHEMERIDÆ (May-Flies).

A fragment of a May-fly was found in a crop from Tulchan.

LEPTOPHLEBIA SUBMARGINATA, *Steph.*—Two males, Dunachton.

RHITHROGENA SEMICOLORATA, *Curtis.*—Eleven males, Dunachton.

*Family PERLIDÆ (Stone-Flies).

Fragments of undetermined *Perlidæ* were found in two gizzards from Dunachton.

CHLOROPERLA GRAMMATICA, *Poda.*—Three, Dunachton; one, Ballindalloch.

ISOPTERYX TRIPUNCTATA, *Scop.*—One, Ballindalloch.

*Nemoura, *sp.* — Five, Dunachton; one, Burley-in-Wharfedale. Remains of this genus occurred in a crop from Dunachton.

*Leuctra, *sp.*—Two, Dunachton; one, Ballindalloch; one, Burley-in-Wharfedale. Fragments belonging to this genus were found in a crop from Dunachton.

*Family PSOCIDÆ.

Graphopsocus cruciatus, *L.*—One, Ballindalloch.

*Cæcilius, *sp.*—A specimen of this genus, undetermined, occurred in a crop from Tulchan.

Family SIALIDÆ (Alder-Flies).

Sialis lutaria, *L.*—Three specimens, Dunachton.

The Royal Scottish Museum, Edinburgh.

SCOTTISH DRAGONFLY RECORDS.

By W. J. Lucas, B.A., F.E.S.

Since the publication in 1900 of my text-book on the British Dragonflies, a number of records for Scotland have come to hand. Our knowledge of the distribution of this interesting order of insects in the northern part of the United Kingdom is still, however, meagre in the extreme, and it is with the hope that entomologists generally may be good enough to try to add to our knowledge that the following list is submitted. A full account of the distribution of the Odonata in the Forth area was published in this magazine by Mr. W. Evans in 1905. There is, of course, no necessity to include the localities there recorded in the list that appears below. No doubt some published records have escaped my notice; of such I shall be glad to hear.

Leucorrhinia dubia.—*Inverness-shire*: Nethy Bridge, 13th June 1900 (Col. Yerbury). *Aberdeenshire*: scarce at Invercanny Moor (J. Mearns).

Sympetrum striolatum.—*Isle of Lewis*: Stornoway, a striking variety figured in "Entom.," May 1900, p. 139 (H. S. Fremlin).

Argyllshire: Tayrallich (1900), and Taynish Loch (A. M. Stewart). *Bute*: Cumbrae near Millport (A. M. Stewart). *Renfrewshire*: Wass-hill (A. M. Stewart).

S. SCOTICUM.—*Sutherlandshire*: 4th and 8th August, 1900, The Mound, and 14th August, Golspie (Col. Yerbury); 1901, Rogart and Lairg (J. M. Munro). *Aberdeenshire*: abundant on most moors (J. Mearns). *Bute*: Cumbrae near Millport (A. M. Stewart). *Argyllshire*: Tayrallich (1900), and Taynish Loch (A. M. Stewart). *Dumfriesshire*: Common at Ellangowan (B. M'Gowan). *Kirkcudbrightshire*: Colvend (Dr. B. White, "E.M.M.," 1900, p. 109). *Renfrewshire*: Wass-hill (A. M. Stewart).

LIBELLULA QUADRIMACULATA.—*Isle of Lewis*: Stornoway (H. S. Fremlin). *Inverness-shire*: 4th July, 1900, Nethy Bridge (Col. Yerbury). *Aberdeenshire*: Common at Scotston Moor and Banchory (J. Mearns). *Banffshire*: 13th July 1903, Crannoch Loch near Cullen (H. H. Brown, "Entom.," 1903, p. 219). *Argyllshire*: (J. Mackay). *Arran*: July 1901 (Mr. Dunsmore, sent to me by A. M. Stewart). *Renfrewshire*: Dargavel Moss (A. M. Stewart). *Kirkcudbrightshire*: Colvend (Dr. B. White, "E.M.M.," 1900, p. 109). *Dumfriesshire*: Ellangowan, three seen, one of them captured, June 1900 (B. M'Gowan). *Berwick-on-Tweed*: migrants, 1900 (G. Bolam).

ORTHETRUM CÆRULESCENS.—*Kirkcudbrightshire*: Colvend (Dr. B. White, "E.M.M.," 1900, p. 109).

SOMATOCHLORA METALLICA.—*Inverness-shire*: Not uncommon in Strathglass, July 1899, but patience and devotion in the highest degree needed for their capture (C. A. Briggs, *in litt.*, 23rd November 1899).

S. ARCTICA.—*Perthshire*: Mr. K. J. Morton took the species in Black Wood, Rannoch, 19th July 1905; and Mr. J. W. Cardew took it in the same locality, 2nd August 1908.

CORDULEGASTER ANNULATUS.—*Inverness-shire*: Strathglass, July 1899, not uncommon and easy to catch (C. A. Briggs, *in litt.*, 23rd November 1899); Nethy Bridge, 13th June 1900 (Col. Yerbury). *Sutherlandshire*: 6th and 17th July 1900, Invershin (Col. Yerbury). *Aberdeenshire*: Common at Invercanny Moor (J. Mearns). *Argyllshire*: Taynish (A. M. Stewart).

ÆSCHNA CAERULEA.—*Sutherlandshire*: 15th July 1900, Invershin (Col. Yerbury). *Inverness-shire*: Rare and hard to catch in Strathglass, July 1899 (C. A. Briggs, *in litt.*, 23rd November 1899). *Ross-shire*: 8th July 1890, at Loch Rosque near Loch Maree a ♀ (J. J. F. X. King, "E.M.M.," 1900, p. 136). *Perthshire*: Learan, Rannoch, 14th July 1905 (K. J. Morton).

Æ. JUNCEA.—*Isle of Lewis*: Stornoway, 1901, three specimens (C. A. Briggs, collected by H. M'Arthur). *Sutherlandshire*: 5th and 14th August 1900, Golspie; and 10th and 24th August, The Mound (Col. Yerbury). *Inverness-shire*: 4th July 1900, Nethy Bridge (Col. Yerbury). *Banffshire*: A newly emerged ♂ with its nymph-skin from half-way up Cairngorm on 5th July 1900 (Col. Yerbury). *Aberdeenshire*: Common at Scotston Moor, Banchory, and Nigg (J. Mearns). *Selkirkshire*: Galashiels (J. C. Haggart). *Renfrewshire*: Lawmarnock; and in 1901 near Paisley (A. M. Stewart). *Kirkcudbrightshire*: Colvend (Dr. B. White, "E.M.M.," 1900, p. 109).

Æ. GRANDIS.—*Dumfriesshire*: Ellangowan (B. M'Gowan). *Kirkcudbrightshire*: Colvend (Dr. B. White, "E.M.M.," 1900, p. 109).

CALOPTERYX VIRGO.—*Kirkcudbrightshire*: Colvend (Dr. B. White, "E.M.M." 1900, p. 109).

C. SPLENDENS.—Prof. Trail tells Mr. J. Mearns that *C. splendens* has occurred at Fyvie, Aberdeenshire, in abundance (E. N. Bloomfield, "E.M.M.," 1900, p. 263).

LESTES DRYAS.—*Kirkcudbrightshire*: Colvend (Dr. B. White, "E.M.M.," 1900, p. 109; but M'Lachlan considered the record doubtful).

L. SPONSA.—*Aberdeenshire*: "One specimen sent me; others have been taken by Mr. J. Mearns" (E. N. Bloomfield). *Renfrewshire*: near Paisley, 1901 (A. M. Stewart). *Argyllshire*: Taynish Loch and Tayrallich (A. M. Stewart).

PYRRHOSOMA NYMPHULA.—*Isle of Lewis*: Stornoway, 1901, a fine series, evidently common (C. A. Briggs; collected by H. M'Arthur). *Inverness-shire*: Aviemore, 28th June 1900, and Nethy Bridge, 13th and 27th June 1900 (Col. Yerbury). *Banffshire*: Crannoch Loch, near Cullen, 13th July 1903 (H. H. Brown, "Entom.," 1903, p. 219). *Aberdeenshire*: Common at Banchory and Whitestripes (J. Mearns). *Perthshire* (G. W. Kirkaldy). *Renfrewshire*: Wass-hill, and near Paisley 1901 (A. M. Stewart). *Dumfriesshire*: Ellangowan (B. M'Gowan). *Kirkcudbrightshire*: Colvend (Dr. B. White, "E.M.M.," 1900, p. 109.

ISCHNURA ELEGANS.—*Isle of Lewis*: Stornoway, ♂ ♂ ♂ ♀, rather small (C. A. Briggs, collected by H. M'Arthur). *Banffshire*: Crannoch Loch, near Cullen, 13th July 1903 (H. H. Brown, "Entom.," 1903, p. 219). *Aberdeenshire*: Common at Scotston and Invercanny (J. Mearns). *Argyllshire*: Taynish Loch (A. M. Stewart). *Dumfriesshire*: Ellangowan (B. M'Gowan). *Renfrewshire*: near Paisley (A. M. Stewart).

AGRION PULCHELLUM. — In Scotland according to de Selys ("E.M.M.," 1900, p. 109).

A. PUELLA.—Indicated as Scotch, by De Selys ("E.M.M.," 1900, p. 88). *Mid-Lothian*: One taken in June 1896, near Rosslyn (W. Evans, "E.M.M.," 1900, p. 88). *Renfrewshire*: near Paisley, 1901 (A. M. Stewart). *Dumfriesshire*: a single male, June 1902, Ellangowan; probably others were present (B. M'Gowan, *in litt.*, 18th Feb. 1903).

A. HASTULATUM.—Rediscovered,[1] 28th June 1900, by Col. Yerbury, who captured a male at Aviemore (*Inverness-shire*), which happened to be somewhat aberrant and resembled *Enallagma cyathigerum*; Mr. J. J. F. X. King took it again in Aviemore in 1903.

ENALLAGMA CYATHIGERUM. — *Isle of Lewis*: Stornoway, 1901, twenty males and four females; specimens rather large; the spot on segment 2 usually large, in one or two cases somewhat similar to that figured in "E.M.M.," 1900, p. 110 (C. A. Briggs, collected by H. M'Arthur). *Aberdeenshire*: Common at Bishop's Loch (J. Mearns). *Banffshire*: Crannoch Loch, near Cullen, 13th July 1903 (H. H. Brown, "Entom.," 1903, p. 219). *Inverness-shire*: A male from Nethy Bridge, July 1909 (D. Sharp). *Perthshire* (G. W. Kirkaldy). *Argyllshire*: Taynish Loch (A. M. Stewart). *Kirkcudbrightshire*: Colvend (Dr. B. White, "E.M.M.," 1900, p. 109). *Dumfriesshire*: Ellangowan (B. M'Gowan). *Renfrewshire*: near Paisley, 1901 (A. M. Stewart).

28 KNIGHT'S PARK, KINGSTON-ON-THAMES,
June 1910.

CONTRIBUTIONS TO A FLORA OF THE OUTER HEBRIDES. No. 4.

By ARTHUR BENNETT, F.L.S.

THE following records, etc., are partly new records, partly records omitted, notes, etc., that have come to my notice since No. 3 appeared in the "Annals" of July 1905.

I regret to say that my correspondent Mr. W. S. Duncan has since that date been seriously ill, and able to do scarcely

[1] Mr. C. W. Dale had in his collection (now in the Hope Museum in Oxford), specimens taken by R. Weaver in *Sutherlandshire* in 1842 (*see* Notes on the Dale Collection, in "E.M.M.," xix. p. 198; xx. p. 79, where references are also made to other Scottish dragonflies).

any collecting and observing; but the following pages will show that while he could he has done good work.

I shall be extremely glad if any one can add to these records, and will publish the additions, no matter how trivial they may seem. It is only by many units that we can build up a floral record of any county.

Working through Messrs. Balfour and Babington's 1841 List,[1] there is little to comment on, as a first-list notice was of course taken of species rather than of critical forms. The *Cerastium atrovirens*, Bab., is simply a state of *C. tetrandrum*, Curt. *Potentilla Tormentilla* is given as "flourishing at a height of 3000 feet." There is no hill in the Outer Hebrides that attains that altitude, Clisham in North Harris being the nearest to it (2622 feet); but at that date the altitudes were little known. *Taraxacum officinale*—"Upon the upper part of Langa (2102 feet) we found a variety of this plant, approaching *palustre*, but with descending lobes to the leaves, and the outer scales of the involucrum lanceolate-attenuate." Under *Eriophorum* they give both *angustifolium* and *polystachion*; according to "Babington's Manual" (1843) their *angustifolium* represents the type, and the other is "*elatius*, Koch." Their *Carex cæspitosa* is *C. Goodenovii*, Gay. "*Molinia cærulea*, β *alpina*, on the mountains of Lewis and Harris," is not mentioned in the "Manual," but according to Macreight[2] β *alpina* = *M. alpina* (Don) = *M. depauperata*, Lindley; but Don's name for it was "Melica alpina."[3] In the last edition of the "London Catalogue" we have two varieties named under *Molinia*, but not this old one. Upon Langa they gathered "*Thalictrum alpinum*, *Arabis petræa*, *Silene acaulis*, *Saxifraga stellaris*, *Oxyria reniformis*, *Luzula spicata*, amongst rocks on the summit (2102 feet) *Hymenophyllum Wilsoni*, and on moist micaceous rocks on the north-west side *Saussurea alpina*."

The above seems to be the only station yet recorded in the islands for *Arabis petræa*.

THALICTRUM MAJUS, *Crantz*.—Mr. Ewing records this, giving Babington as the authority; but this record in "Top. Botany,"

[1] "Trans. Bot. Soc. Edin." i. (1844), pp. 145-154.
[2] "Man. Brit. Botany," 1837.
[3] "Notes from Roy. Bot. Gard. Edin.," 1904, p. 134, Nos. 12 and 13.

ed. 2, 1883, was a record of an aggregate species; there is no doubt that a second species occurs on the islands in addition to *T. dunense*, Dum., but it is probably *T. collinum*, Wallr.

ANEMONE NEMOROSA, *Linn.*—Mr. Ewing gives this[1] as vouched for by Mr. A. Somerville, but I do not know where it was recorded.

RANUNCULUS TRICHOPHYLLUS, var. DEMERSUS, *N. E. Brown.*—Dr. Williams makes this the *R. aquatilis*, var. *eradicatus*, Laest.[2] With this I cannot agree; I had a specimen of Laestadius' plant, which is a very delicate form, not seen by me from elsewhere. He describes it as "sub-aquaneus, caule bi-l-3-pollicari, filiformi; floribus minutissimis, ante explicationem vix semine cannabis majoribus; foliis non proprie capillaribus, sed abbreviatis; radice filiformi, fibrosa. Hab. in stagnis vadosis, ex. gr. Karavuopis et Saxajerfvi ad Karesuando Lappon. Tornensis." Fries included *eradicatus* in his *Batrachium confervoides*, "Bot. Not.," 1845, p. 141, and "Sum. Veg.," 1846, p. 139; and C. P. Laestadius[3] also quotes L. L. Laestadius' habitats for *B. confervoides*, Fr. Mr. N. E. Brown seems to think[4] that the *eradicatus* (quoted from Hiern) is something different from Fries' plant. No doubt it is not the same, but it is a delicate form or variety of it.

I have a series of the Perth plant, gathered by Mr. A. Sturrock. It does not seem to be mentioned in the "Flora of Perth" (1898). A succulent form of Fries' plant occurs in thirteen of the botanical provinces of Finland. It is *B. admixtum*, W. Nylander.

Hartmann[5] quotes "*R. paucistamineus*, Tausch, var. *borealis*, Beurling ("Bot. Not.," 1852), as a synonym of Fries' plant.

Laestadius at the end of his paper remarks—"*R. aquatilis eradicatus*, *a*, *subaquaneus*. Hujus forma minima, p. exsiccata vix pollicaris ad ripas lacuum exsiccatas post defluxum aquæ florens caule filiformi depresso, foliis filiformibus, peltatis nullis, obvenit. circa Karesuando." Specimens referable to Mr Brown's plant I have from Harris, Duncan, *sp.*

RANUNCULUS HEDERACEUS, *Linn.*—Loch Boisdale in South Uist.

TROLLIUS EUROPÆUS, *Linn.*—In all floras species supposed to be absent are almost as interesting as recorded ones. This is a case in point. Why does *Trollius* grow in West Sutherland,

[1] "Glasgow Cat. of Native Plants" (1899), p. 1.

[2] In "Loca Parall. Plant," written in 1831 and 1832, but not published until 1839.

[3] "Bid. till kan. Torneå Lappmark." 1860, p. 39.

[4] "Eng. Bot." Suppl., 1892, p. 13.

[5] "Hand. Sk. Fl.," ed. 10 (1879), p. 167.

Caithness, West Ross and Skye, yet not in the Outer Hebrides? Another similar case is that of *Corydalis claviculata*.

ARABIS HIRSUTA, *Scop.*, var. PROPINQUA (*Jord.*)—Coast sand-hills, Balranald, North Uist, 16/7/1898, Dr. Shoolbred.

The Rev. E. F. Linton[1] refers these specimens to the above species of Jordan, as does the late Herr Freyn, who observes: "*A. hirsuta*, Scop., var. agrees with var. *propinqua* (Jord.) Rouy; but this is an alpine plant." Certainly very different from the Glamorgan (Newton Nottage) specimens which Rev. E. S. Marshall tells me are referred to *A. Retziana*, Beurling (Pl. Scand., 1859), var. *hispida*, by M. Rouy. In this I concur; it nearly corresponds with the Caithness plants I have referred to *Retziana*, except that they are nearly glabrous. Lönnroth[2] discusses many forms of *hirsuta*.

COCHLEARIA DANICA, *Linn.*—Coast near Scalpig, North Uist, Shoolbred, *sp.*

POLYGALA OXYPTERA, *Reichb.*—West side of South Uist, growing near to or with *P. eu-vulgaris*, A. Somerville, *sp.*

STELLARIA HOLOSTEA, *Linn.*—Wood in the Stornoway Castle grounds, where a few plants come up every year, W. J. Gibson.

MONTIA FONTANA, *L.*, *sp.*, LAMPROSPERMA.—Chamisso.[3] Island of Barra, July 1884, A. Somerville, *sp.* Another specimen from South Uist (A. S.) has no fruit ripe enough to be certain of.

RUBUS PULCHERRIMUS, *Neuman.*—North Uist and Barra. Dr. Shoolbred.

R. INCURVATUS, *Bab.* } Rev. W. Moyle Rogers, "Handbook of
R. CORYLIFOLIUS, *Sm.* } British Rubi," 1900, p. 100.

FRAGARIA VESCA, *Linn.*—Castle grounds at Stornoway, W. J. Gibson, *sp.*, 1908.

ROSA OMISSA, *Desegl.*—Trail, "Ann. Scot. Nat. Hist.," 45, 1908, *ex* Rev. A. Ley, "Journ. Bot.," May 1907.

PEPLIS PORTULA, *L.*—South Uist, A. Somerville. In part ii., 1892, this was listed as "Duncan Cat." Mr. Duncan wrote (3/6/1896) that this was an error; and I omitted to note Mr. Somerville's record in part iii., 1895.

EPILOBIUM TETRAGONUM, *Linn* (seg.).—Scarp, W. S. Gibson, *sp.*

E. ANAGALLIDIFOLIUM, *Lam.*—Clisham (2622 feet), Dr. Shoolbred.

CRITHMUM MARITIMUM,[4] *Linn.*—Mangustra Cliffs, north of the island of Eileen Moloch, west coast of the Lewis. Beyond

[1] "Exch. Club Report for 1898," p. 565.
[2] "Obs. Crit. Pl. Suec. Ill.," 1854, pp. 8-12.
[3] Cf. Beeby in "Ann. Scot. Nat. Hist.," 104, 1909.
[4] See "Ann. Scot. Nat. Hist.," 1909, p. 54.

the distribution given, *l.c.*, it occurs in Malta and on the coast of the Black Sea. But the plant, though succulent in its annual growth, becomes after some years almost woody at the base; and the roots penetrate some distance into the cliffs. At St. Margaret's Bay, East Kent, there was a large plant that I knew for 15 years. It was nearly 2 feet long and quite woody. The sea has since swept it away. The Lewis specimens are almost typical, while the Colonsay ones are more drawn and taller, up to 16 inches high.

SAUSSUREA ALPINA, *DC.*—In No. 3 I gave the height of its occurrence on the Caithness Cliff at "about 40 feet." But 20 feet is about the altitude.

HIERACIUM OREADES, *Fr.*, var. SUBGLABRATUM, *F. J. Hanb.*—Cliffs, south side of Loch Maddy, North Uist, Shoolbred.

H. ARGENTEUM, *Fr.*—Clisham, North Harris. Cliffs near Tarbet, South Harris, Dr. Shoolbred.

H. SCOTICUM, *F. J. Hanb.*—Crogay More, North Uist;] Clisham, North Harris, Dr. Shoolbred.

H. SILVATICUM, *Gouan*, *sub-sp.* CORDIGERUM, *Norrlin.*—Scarp, W. S. Duncan, *sp.* A remarkable plant which I have not seen from elsewhere in Britain. The peculiar form of the leaves and the dense silky covering are very unusual.

H. SAGITTATUM, *Lindeb.*, var. SUBHIRTUM, *F. J. H.*—Linton ("Br. Hier.," 1805, p. 52).

H. STICTOPHYLLUM, *Dahlst.*—Stornoway, Linton ("Journ. Bot.," 1893, p. 198); near Tarbert, South Harris, Shoolbred, *l.c.*

H. STRICTUM, *Fr.*, var. RETICULATUM (*Lindeb.*). Linton's ("Journ. Bot.," 1893, p. 201).

VERONICA CHAMÆDRYS, *Linn.*—Castle Grounds at Stornoway and in the neighbourhood, W. J. Gibson, *sp.*

EUPHRASIA BOREALIS, *Wetts.*—Bernera, Harris, Mrs. MacGillivray, July 1828, Trail ("Ann. Scot. Nat. Hist.," 1901, p. 179).

E. BREVIPILA, *Burnat and Gremli.*—Tarbert, W. A. Shoolbred ("Journ. Bot.," 1899, p. 480).

E. FOULAENSIS, *Towns.*—Baleshare Island and Ben Lee, North Uist, W. A. Shoolbred, *l.c.*

E. SCOTTICA, *Wettst.*—Ben Lee, North Uist, W. A. Shoolbred, *l.c.*

RHINANTHUS PUBESCENS, *Wallr.*—East coast of Benbecula, W. A. Shoolbred ("Journ. Bot.," 1895, p. 245).

MELAMPYRUM SYLVATICUM, *L.*—"110, Macgillivray," "Glas. Cat." (1899, p. 99), much needs confirmation.

Utricularia vulgaris, *Linn.*—110 Hebrides, "Top. Bot." ed. 2, 1883. Recorded by Balfour and Babington in 1841, from N. Uist. As they went from Dunvegan to Loch Maddy in N. Uist, and as Dr. Shoolbred found *U. neglecta* near there, it is possible that they gathered the same plant, as *U. neglecta* was not then differentiated in Britain from *U. vulgaris*.

As yet I have not seen specimens of *U. vulgaris* from the islands, and by the kindness of Messrs. Goode and Moss, I have ascertained there are no specimens of *Utricularia* from the Outer Hebrides in the late Prof. Babington's herbarium. Dr. Bayley Balfour kindly allowed Mr. Jeffrey, the Curator of the Edinburgh Herbarium, to look if there were any specimens from the Outer Hebrides in it, and he reports "there are none," so that we cannot prove whether it was *vulgaris* that was seen.

(*To be continued.*)

NOTES ON CAREX.

By Rev. Edward S. Marshall, M.A., F.L.S.

Perhaps I may be allowed to supplement my friend Mr. Druce's general review of Pfarrer G. Kükenthal's monograph (pp. 46-52) by some more detailed remarks. In the revised list which I drew up for the tenth edition of the "London Catalogue" there are some errors and inadvertent omissions of varieties, the latter mainly due to my having taken over the work in an advanced stage, and too hastily assumed that most, if not all, recent additions had already been included in the rough draft.

C. chætophylla, Steudel.—Specimens from Seaford, 14, East Sussex, were so named for Mr. H. S. Thompson in 1905 by Mr. C. B. Clarke. They look fairly distinct from our ordinary British *C. divisa*, having very slender filiform leaves and a smaller inflorescence.

C. diandra, Schrank, var. *Ehrhartiana* (Hoppe).—I cannot distinguish the English specimens so named from type; it is accordingly ignored in "Lond. Cat."

C. contigua, Hoppe (*muricata*, Koch, et auct. angl.).—This name is definite, and preferable to the earlier *C. spicata*, Huds.; the synonyms quoted by Hudson are very vague, and the habitat

assigned (in aquosis et ad margines fossarum) is quite unusual for this normally dry-soil species.

C. muricata, Linn. Herb. ! (*Pairæi*, F. Schultz).—The description in "Spec. Plant." (capsulis acutis divergentibus spinosis) confirms the evidence of the specimen ; its patent fruit being one of the obvious characters which mark off *Pairæi* from *contigua*. Mr. W. A. Shoolbred and I found what we thought was a new British sedge on sandy hedge-banks near Pyle, 41, Glamorgan, so far back as 1902 ; Kükenthal at first named it *Leersii*, but subsequently identified it in herb. C. E. Salmon as *Pairæi*. Last year Rev. E. F. Linton collected this species in fine condition at Edmondsham, 9, Dorset.

C. Leersii, F. Schultz.—Clearly very near the last, though authentic specimens at Brit. Mus. are considerably more robust, and have larger fruit, in addition to the longer and more interrupted spikes. Our British plants are usually weaker, but cannot be separated by any definite character. If treated as a mere variety, it should apparently be called *C. muricata*, L., var. *pseudo-divulsa*, Syme. Mr. Druce's *C. muricata* × *remota* has, I believe, *contigua* as one parent ; I have hitherto seen no other British examples, though Focke calls it "perhaps the most frequent *Carex*-hybrid."

C. canescens, L.—Mr. Druce has shown good grounds for retaining this name, instead of *C. curta*, Good.

C. cespitosa, L.—Mr. Beeby some years ago informed me that he had given up the Shetland plant so determined by Dr. Lange (I saw his herbarium specimen at a Linnean Society Meeting, and could not make out how it differed from *C. Goodenowii*) ; but Mr. Bennett is satisfied that the Wensleydale *cespitosa* is correct.

C. gracilis, Curt., var. *sphærocarpa*, Kük.—My Bignor, 13, West Sussex, plant (No. 2610) has brown, roundish fruit. I have not seen a description of this variety.

C. aquatilis, Wahl., forma *angustata*, Kük.— Speyside below Kingussie, 96, East Inverness (Nos. 2102-3). In 1898 Kükenthal wrote that my specimens were analogous to *C. gracilis*, var. *personata*, Fr. Spikelets slender ; foliage narrow. I have the same thing, in a reduced form, from 2800 feet in Corrie Kander, 92, South Aberdeen (No. 2983).

Var. *sphagnophila*, Fr.—Is an earlier name for the var. *minor*, Boott, so common on the Clova Mountains.

Var. *epigeios*.—Kükenthal in 1898 named my specimens from the tableland above Glen Callater, coming from Canlochan, at over 3000 feet, as var. *epigeios*, Anders. ; whether that is the

same as of Læstadius I am unable to say. They are about 18 inches high. Male spikelet solitary; female 2 or 3, appressed to the stem, short, fairly stout, with very dark, blunt glumes. Dr. Buchanan White's alleged var. *epigeios* from Methven was placed under *Goodenowii* (*C. vulgaris* γ *elatior*, Lang, forma *angustifolia*) by Kükenthal, and certainly cannot stand under *aquatilis*.

C. elytroides, Fr.—Kükenthal does not accept the Anglesey plant which has been so called. He remarked on my two sheets—which, by the way, are fertile—"Carex elytroides, Fr., ex orig. longe aliena, nempe hybrida Carex gracilis × vulgaris. Haec est nil nisi forma elatior C. vulgaris."

C. Goodenowii, Gray, var. *strictiformis*, Kük.—I was glad to see this fine plant (Nos. 1936, 2378) at length decisively named. Mr. Shoolbred and I discovered it in a peaty ditch within fifty yards of *C. chordorhiza*, which we met with a few minutes later in its first British station. When growing it has quite the appearance of a distinct species, being considerably more robust, and having stouter spikelets than any other of our numerous *Goodenowii* forms known to me. Kükenthal at first confidently named it *Goodenowii* × *gracilis*; but it is quite fertile, and *gracilis* is unknown in the north of Scotland. In 1901 he wrote that it came nearest to *C. Gaudichaudiana*, Kunth, from Australia and New Zealand. Rev. E. F. Linton's unpublished *C. Goodenowii*, var. *subacuta*, from Co. Westmeath, seems to be closely allied. Probably a subspecies, rather than an ordinary variety.

Var. *subcæspitosa*, Kük.—Peaty marsh-dyke near Rosslare, Co. Wexford, June 1897 (No. 1969); forming dense hassocks up to 18 inches high, both cæspitose and stoloniferous. Kükenthal remarked that it had much the aspect of a *cespitosa* × *vulgaris*. The spikelets are crowded in a head one to two inches long, subtended by a bract often twice its length. Var. *juncella* is sometimes densely tufted, but has its leaves more or less involute-filiform; whereas in var. *subcæspitosa* they are flat, and occasionally 15 inches long.

C. panicea, L., var. *intermedia* (Miégeville).—Still known as British only from a wet heath about a mile east of Fort William (No. 431), where I found it on June 23, 1888. It remained constant under cultivation, and exactly matches Bordère's specimens at Kew, thus named, from the Pyrenees. Kükenthal's comment in 1898 was as follows:—"Carex intermedia, Miég., est mihi ignota (K. Richter ad C. vulgarem ducit!). Haec forma pulchra reducta Caricis paniceæ." The station, only 100 feet above sea-level, cannot account for its divergence

from type, which seems to me quite varietal. I have always, however, regarded the so-called var. *borealis*, And., of *C. vaginata*, which is frequent on the Cairngorms above 3000 feet, as merely an alpine *state*.

C. binervis, Sm., var. *Sadleri* (Linton).—Both this and var. *nigrescens*, Druce, remain constant under cultivation; but the former, whether identical with var. *alpina*, Drejer, or not, is at least a good subspecies, whereas var. *nigrescens*, from Corrie Kander, differs from type only by its darker glumes, the fruit-character being normal.

C. distans, L.—My inland gatherings from the neighbourhood of Trowbridge and Devizes, North Wilts (No. 2718, etc.), where it is locally plentiful, have the beak of the fruit rather longer and more gradually narrowed from the base than in the coast-form referred by C. B. Clarke to *C. neglecta*, Degland; the utricles also appear to be less conspicuously punctate.

C. flava, L.—The typical plant of Linn. Herb. seems to be most rare in Britain; I believe that I have observed it only once, near Fulbourne, Cambridgeshire, but alpine forms occur in the Breadalbanes which belong here, one of which (from about 2000 feet on Ben More, 88, Mid-Perth), with very inflated, subglobose fruit, and stems 3 to 6 inches high, was named var. *pygmæa*, And., by Kükenthal. *C. lepidocarpa*, Tausch, perhaps distinct enough to rank as a species, is most frequent in north Scotland, but occurs as far south as Dorset, and in Ireland.

C. Œderi, Retz., var. *œdocarpa*, And. (*flava*, var. *minor*, Towns.).—By far our most common and generally distributed representative of the *flava*-group in the three kingdoms. Much can be said in favour of keeping it under restricted *C. flava*, L.; but it varies greatly (this is well shown on the plate in *Flora Danica*), being sometimes nearly two feet high, and sometimes only two or three inches, as at Fleet Pond, 12, North Hants, where it shades off almost imperceptibly into typical *Œderi*. I think that Andersson's name should be retained, both as being older, and as more in accordance with the features of the plant taken as a whole. Though the beak is usually (not always) much longer than in type-*Œderi* and the other varieties, it is straight, never in my experience abruptly deflexed, as in *flava* and *lepidocarpa*; and occasionally the fruit itself is small.

C. inflata, Huds., *Fl. Angl.*, ed. 2, p. 412 (1778).—Mr. Beeby, the most accurate and careful botanist of my acquaintance, whose untimely death is an almost irreparable loss, demurred to the identification of this with *C. rostrata*, Stokes (*ampullacea*, Good.), on the ground of Hudson's species being described as having a solitary male spikelet; but I cannot see that the expression,

"mascula erecta lanceolata" need imply this, and the objection would be equally valid against *C. vesicaria*, L., the only possible alternative, which also has two to four male spikelets.

Var. *utriculata*, Kük.—Plants from near Cong, West Galway (No. 1478), and Lough Drin, Westmeath (No. 1426), which seem hardly separable from Mr. Lloyd-Praeger's supposed *C. rhynchophysa*, were named by Kükenthal *C. rostrata*, var. *latifolia*, Aschers (1864). An even stronger form, found by Mr. Shoolbred and myself in Glen Clova (No. 2764), was identified by Mr. Bennett with *C. ampullacea*, var. *robusta*, Sonder (1851), an earlier synonym of var. *elatior*, Blytt (1861). I suspect that all the above-mentioned gatherings should rank as one variety, which in *Lond. Cat.* I have called *C. inflata*, var. *robusta*.

C. Grahami, Boott.—A careful study of wild specimens from Clova, as well as of living plants from that *locus classicus*, cultivated at Kew and Bournemouth, has quite convinced me that this is a variety or subspecies of *C. vesicaria*, L. The var. *alpigena*, Fr., as named for me by Kükenthal, has short, roundish female spikelets and a shorter beak, and agrees well with some specimens issued in *Herb. Normale*, Fr., though not quite with all. This tends towards *C. saxatilis*, L. (*pulla*, Good.); the transitions from which to *Grahami*, *e.g.* in the bog below the neck separating Ben More from Stobinian (also called Am Binnein and Ben Ein), are numerous, and may be due in part to hybridity. When growing by itself, *C. saxatilis* is very characteristic and quite constant; I regard it as being more distinct from *vesicaria* than is *C. lepidocarpa* from type-*flava*.

West Monkton Rectory, Taunton,
February 21, 1910.

ON SOME SCOTTISH ALPINE FORMS OF CAREX.

By P. Ewing, F.L.S.

I have been asked to put on record, through the medium of the "Annals," my opinions regarding some of the critical forms of our alpine Carices, and now that Georg Kükenthal's able monograph of the genus has been published in the "Pflanzenreich" the work is much simplified. His arrangement, however much it may differ from the arrangement of former authors, is the one I prefer to follow in whatever

remarks I make, as it is more in accordance with my ideas concerning the relative position of the forms. The descriptions of these forms may not be comprehensive enough, but on the whole, so far as I have tested them, they seem to fit our British plants fairly well.

The species I intend to discuss are well known, therefore I do not think it necessary to enter into their synonymy, which may be found in the above-mentioned work, and in various other sources at the command of most students. I may just be permitted to say in passing that this monograph from an authority of such generally recognised ability, has not come too soon, as the great discrepancies to be found in the descriptions of different authors must have been a source of great inconvenience to all students of the genus, and the want of a good standard book, more up-to-date than any we have, for reference on critical points, must have long been a felt want.

The hill-forms of Carex are, in my opinion, more interesting than the low-country forms as they are much more varied, and taking note of these variations as one is quietly ascending a mountain-side adds much to one's knowledge, relieves the muscular exertion, and thereby makes toil a pleasure. Also by observing the effects on the same plant, growing in a wet bog or dry soil, or on rock ledges, at different altitudes, helps the student very materially to decide which form of the plant the author had before him when he was drawing out his description.

Let me begin with :—

Carex rostrata, Stokes. If we go to the muddy shores of Loch Dochart we find this plant with a stem longer than the leaves, and the leaves themselves comparatively flat ; but if we follow the streams and examine the marshes right up to the highest bog-land and note the changes in the proportion of stems to leaves ; we see the stems getting shorter, and the leaves becoming longer, narrower, and more involute, till we find it with leaves twice as long as the stems, and as a rule we find all the other organs proportionately changed in shape and colour.

Under the type Kükenthal describes five forms, of which I think we can lay claim to the following :—

Forma 3. *pendulina*, Blytt. With us the peduncle is often over 6 cm. long, and the lower spikelet often has a small spikelet at its base. It is found at the same elevations as the var. *brunnescens*, but in deeper and more sheltered glens. There is a fine patch of this at the base of Beinn Chaluim.

Forma 5. *longipalea*, Neuman. This is the only other form, so far as I am aware, we have; it is found pretty well up on the hills in such places as the marsh on the saddle-back between Ben Lawers and Meall Garbh? I have never seen it with the fruit so well developed as to cause the spikelet to droop.

Of the varieties described by this author, var. *brunnescens*, Anderss., is our common hill form, from about 250-750 meters, easily distinguished by its narrow leaves which are much longer than the stem, and the brownish appearance of its spikelets, although the glumes are often for the most part white and membranous.

Var. *borealis*, Hartm., is not a rare variety with us, but it is very rare in fruit. It may have one or two spikelets, but they are always closely sessile. Although found at higher altitudes than the var. *brunnescens*, the perigynia when present are always better developed than in that variety at a lower altitude. It is easily known, even when barren, by its long involute leaves, and is a plant of the saddle-backs from 750 meters upwards, if water is constant.

C. vesicaria, L. The so-called varieties of this plant have always been a mystery, and no two authors seem to agree about them. This is due, of course, to the want of field-experience of the variations. Begin at the shores of Loch Dochart and follow this plant up the mountains and you will see the following changes taking place. The type occurs on the exposed shore, the form *elatior* in the muddy bays, the dwarf form 30 cm. high, and smaller in all its parts, in the meadows; then as we ascend the mountain we lose sight of it altogether, and not till we reach 750 meters do we come across it again from 30-60 cm. high, with very short erect spikelets, when it is known as *C. Grahami*, Boott; and associated with it we find another form 20-30 cm. high, with its lower spikelet hanging on a long hair-like peduncle. Now let us take these two last forms in their order.

Var. *Grahami* (Boott) Kükenth. This plant has always been a difficulty to botanists, and the reason is easily explained when one knows the plant. I have gathered it at all the stations recorded for it and a few others, and have long known that a correct description of the plant did not exist, from that of Dr. Boott to that in the last edition of Babington's "English Flora." Kükenthal puts it in its right place, and is the first, so far as I am aware, to place it, as a plant having three stigmas, under *C. vesicaria*. Had Boott done this, and described it as a plant of cæspitose habit, it would have saved much confusion. Generally the female glumes are light brown, often with a green midrib; the perigynia are generally light green, often shaded with brown; and both these organs are darker if there has been much sun in July.

I have this from Sweden as *C. vesicaria*, var. *alpigena*, Fr.; and I saw it this year in the Herbarium at the University of Christiania among *C. saxatilis*, L., collected by O. A. Hoffstad at Kirkebyfjeld, Meraker, N. Trondhjem Amt.

Forma *intermedia*, mihi. This form seems intermediate between var. *Grahami* and *C. saxatilis*, differing from the former in being 15-30 cm. high, not cæspitose, and with flatter leaves; from the latter it differs in having the female spikelets 1-3, the lower one at least hanging on a long hair-like peduncle when mature; glumes as long as the perigynia, subulate, blackish-brown, with a light-coloured midrib and a white tip; perigynia as in *Grahami*, but always darker in colour, in fact large plants of this in the young state may easily be confused with *Grahami*, as may be seen in the Royal Herbarium at Edinburgh, where they are mixed together.

This is certainly not the form that Fries describes in Mant. iii. (1842), p. 142, as *alpigena*, under *C. vesicaria*, as it sometimes has three male spikelets and always a rudimentary second spikelet; female spikelets are never sessile, and the leaves are always flat. Then, if Kükenthal is right (as I believe he is), in stating that *C. vesicaria*, var. *dichroa*, Anderss., is the same as *C. Grahami* (Boott), Kükenth., this plant is not that form, as may be easily seen by a reference to the figure in Andersson's "Cyper. Scand." (1849, t. n. VIII. f. 107b.

There is a fair quantity of this on our hills; and it is no doubt often taken for the form *alpigena*. On Beinn Laoigh it grows in the same marsh with *Grahami*; on Beinn Heasgarnich, where I have not seen *Grahami*, it grows mixed with *C. saxatilis*. I have no doubt var. *Grahami* would soon become *C. vesicaria* if it were grown at a low elevation; but I am not so sure about this form; it looks so different when growing on the hill beside var. *Grahami*. Yet I would not be surprised if, after a few years' growth at a lowland lakeside the forms proved to be identical.

Var. *alpigena*, Fries. This is another very doubtful form. My having got the vars. *Grahami* and *intermedia*, and fairly typical *C. saxatilis*, sent me from the Continent as this form, shows we are not much worse than our northern friends; and I do not think we are much helped by the description given by Kükenthal in this case. That a Carex may be found so commonly with both "3 and 2 stigmas" as to warrant this being entered as part of the description, rather upsets my ideas of specific differences. For my own part, I am inclined to so name a form which agrees very closely with that described by Kükenthal in all but the three stigmas. This form is found at higher altitudes even than *C. saxatilis*, and as a rule on rock ledges, where, if growing fairly dry, the spikelets take on a very dark blackish shining appearance, the perigynia always remaining lighter at the base, not so abruptly tapering to the comparatively long neck as in *C. saxatilis*, but with a very evident bifid beak, very like the beak of *C. rostrata*. I have never seen this form with more than two stigmas.

I have always looked on this as the *alpigena* of Fries; and if it is not, then I am very doubtful if we have got such a plant on our hills; and as may be seen from what I have said above, it is very questionable if the form is at all well known on the Continent. I must, therefore, differ from Kükenthal, and say that if he intends to recognise var. *alpigena*, Fries, as a good variety he must place it under *C. saxatilis*, it having two stigmas; otherwise there is no difference so far as I can see between his admitted vars. *Grahami* and *alpigena*.

C. saxatilis, L. I note that Kükenthal reduces this to a

subsp. under *C. vesicaria*, L.; and quite possibly with his wide knowledge of the species, he has good reason for so doing. Speaking from my own knowledge of the British forms, I think it would be a pity if the authors of our floras were to do this. It is well worthy of specific rank. Quite independently of what the floras say, it is no more a plant of three stigmas than *C. Goodenowii* is; and I may say that this remark is borne out by the investigation of hundreds of spikelets which I have examined in various districts in Norway. No doubt it is rather a difficult plant to describe definitely. It seems to me what De Vries would call an ever-sporting species; yet the most essential features vary little, what variation there is being probably due to crossing and intercrossing, so that some of its forms when dried are hard to separate from some of the forms of *C. rigida* and *C. Goodenowii*. It has very little in common with *C. vesicaria* until crossed with it, when the light-tipped glumes, lengthened, stout, tapering neck of the perigynia, and the deeply bifid beak shows this at once. It should be classified as a species having two stigmas, light to blackish-brown, seldom without a white tip, perigynia nerveless unless at the sides, light to blackish-brown, beak emarginate or erose. In the type the perigynium is suddenly contracted into a very short neck, the mouth in the flowering stage is so shallow in the fissure as scarcely to warrant the term bifid; and it can best be separated from the var. *alpigena* by the perigynia of that form tapering to a much longer constricted neck, and always having a distinctly bifid beak.

Forma 1. *dichroa*, Blytt. Through the kindness of Prof. Wille I had a few hours among the Carices in the University Herbarium in Christiania this year, and turned up this form. In going carefully over all the sheets I found Blytt's own description, "med naesten straagule Frukter," to fit them exactly. They are neither more nor less than the ordinary form of the type with almost straw-yellow perigynia. The almost is advisable here, for like our own there were some with a considerable part green, and some with a light brown tinge among them.

This form is quite common on our hills. As a rule it is greenish when collected in July, but dries yellow, while in the

end of August the yellow is quite apparent on the growing plant. Here and there on our hills there is a form with curved stems, single male spikelets, and single sessile small ovate female spikelets, which always remains green when dried. I sent this to Kükenthal; and he determined it as var. *dichroa*, Blytt, although Dr. B. White and I always looked on it as *C. saxatilis* × *C. flava*.

Var. *compacta* (R. Br.), Dew. This description suits a form growing in the eastern ravine of Ben Lawers, and on Carn nan Sac, Glenshee. Its perigynium is very broadly ovate and inflated, so much so that when the specimens are taken from the drying-press you find that the perigynia on either side have all been crushed in, the female spikelet being so compact that there is not room for them to flatten out with pressure. This form is always found in wet but well-drained situations, and has much darker and more shining perigynia than is usual with the type.

Var. *glomerata*, mihi. I wish to mention another much more distinct form than any of the above, a form which it seems to me has been passed over as small plants of *C. atrata*, to which in facies it closely approaches, as may be seen from the following description:—Rootstock shortly creeping, with light brown and bright purple-coloured leafless sheaths at the base, the barren shoot and that of the following year's curved upwards from the base, leaves narrow and shorter than the stem, strict, slightly keeled, margins revolute with angular points, edges rough, stems stout 15-25 cm. high, bluntly triangular, scarcely rough at the top (thus far it is practically *C. saxatilis*). Spikelets 3-4 bluntly ovate-oblong, upper spikelet very shortly stalked, next sessile near its base, next shortly stalked, lowest on a long stalk, so that they are all crowded; terminal spikelet may be all male, or all female, or partly both, and stamens are often seen on the other spikelets; lower bract leaf-like, not sheathing; glumes lanceolate, acuminate, dark purple with a lighter tip and slender midrib, visible only on some of the glumes; perigynia yellowish at the base, purple above, broadly ovate, slightly inflated, veinless except at sides; neck and bifid beak distinct; stigmas two.

I have seen this form on Ben Lawers, Creag Mhor,

Glen Lochay, and Beinn Heasgarnich; and Mr. Young of Kirkcaldy has got the same form on Beinn Laoigh, where I must have overlooked it myself.

ZOOLOGICAL NOTES.

The Common Dolphin in Moray Firth.—About the first week of May a female Dolphin (*Delphinus delphis*) was stranded on the coast three miles east of Nairn Harbour. It lay on the shore for more than two weeks before I heard of the occurrence, and was somewhat damaged when I went to see it. I took the following measurements:—Total length (in straight line), 5½ feet; snout to blow-hole, 12 inches; snout to dorsal fin, 28½ inches; height of dorsal fin, 6 inches; length of flippers (anterior border), 9 inches; breadth of tail flukes, 10 inches. It was black above, and whitish grey along sides and belly. The line of demarcation was quite distinct. There were no separate stripes or lines through the light coloured parts. I secured the damaged skull. It measured 16½ inches in total length, and the upper and lower jaws were of equal length. Teeth only about 45 or 46 on each side of each jaw, which is fewer than usual, but I think it only shows that the example was not full-grown. I am not sure if the number of teeth differs in the two sexes. The skull of this species is easily distinguished from that of every other British Dolphin by the deep groove on each side of the bony palate. This species has rarely occurred in the Moray Firth; and the late Mr. Sim never found it on the Aberdeenshire coast, the example, 8 feet long, which he recorded was really a White-beaked Dolphin, as he afterwards told me.—Wm. Taylor, Lhanbryde.

Crossbills in Perthshire.—Though I believe there are always Crossbills in the neighbourhood of Meikleour in the winter, and possibly a few breeding there, it is of interest to note, in view of the recent invasion of Great Britain by Crossbills, that there was a very marked increase in the number of them when I visited Meikleour in March and April. Small flocks were frequently seen, and their work amongst the fir cones was very much in evidence. Bramblings, Redpolls, and Goldfinches were also feeding on the seeds of the larch and Scotch fir, and threw down the cones in the same way as the Crossbills.—M. Bedford, Woburn Abbey, Woburn.

A Peeblesshire specimen of the Chough (*Pyrrhocorax graculus*).—I ought, perhaps, to put on record a specimen of the Chough from Peeblesshire which has been in my possession for the past twenty years. Mr. R. S. Anderson, Peebles, on seeing the specimen in a house in West Linton in 1889, and being assured that it had been

got in the neighbourhood, kindly procured it for me. The account given of the bird was, that it was shot by a man named James Culloch on Leadlaw Hill, near Stoneypath Farm, a little to the north of West Linton, about the year 1872, and given to Mr. Porteous, late landlord of the Townhead Hotel there, who got it stuffed in Penicuik. These particulars Mr. Anderson had from Mr. Porteous and his sister. In the "Proceedings" of the Berwickshire Naturalists' Club for 1881 (vol. ix., p. 488), there is a record of a specimen of the Chough procured in the vicinity of The Glen, near Innerleithen.—WILLIAM EVANS, Edinburgh.

Crossbills on the North-East Coast of Scotland.—In connection with Mr. A. G. Gavin's remarks, *re* Crossbills at Fraserburgh, I may state that I saw a party of seven in the Sinclair Hills, on Philorth estate, on 15th December 1909. I have shot this wood for many years, but have never seen Crossbills there before. I also saw a Great Spotted Woodpecker on the same day.—W. STEWART-MENZIES, Craig Ellachie.

Golden Oriole in Fife.—On 16th May a fine adult male Golden Oriole (*Oriolus galbula*) was found dead, but in a perfectly fresh condition, in an old wooded quarry in the policies of Dhuloch House, Inverkeithing. The bird was sent to Dr. Hew Morrison, Edinburgh, who very appropriately presented the bird to the Royal Scottish Museum in the name of Miss Lauder, of Dhuloch, who had forwarded the specimen to him. It has made a beautiful mounted example.—WM. EAGLE CLARKE.

Greater Wheatear in the Solway Area.—On the 18th of May I saw, during the greater part of the day, three individuals of *Saxicola lucorrhœa* in some fields close to Southerness on the Solway coast of Kirkcudbrightshire. I have seen this peculiar and quite distinguishable form of Wheatear in other springs, and also in autumn, and have always been greatly interested in its visits.—ROBERT SERVICE, Maxwelltown.

Arctic Bluethroat in the Clyde Area.—On 14th May I had the great good fortune to come across an Arctic Blue-throated Warbler (*Cyanecula suecica*), while walking up the Clyde Valley with my friend, Mr. H. Duncan. It was skulking in fairly thick foliage in the close vicinity of the river, and when disturbed was very restless. Its identity was, however, established beyond any doubt, and as it flew off, we particularly noted the tail with its slight amount of red and conspicuously dark terminal band. It is a bird with which I am quite familiar, having seen quite a number of them during my residence on Fair Isle. It is, I believe, an addition to the birds of the Clyde area, and the second record for the Scottish Mainland in spring. This particular locality, near Carmyle, seems to have an attraction for birds on passage, for on the same day we noted

the Garden Warbler, Common White-throat, Sand Martin, and Swift as new arrivals. It may also be worthy of mention that we saw a single Lesser Whitethroat on the early morning of the 20th, near Rouken Glen.—G. Stout, Glasgow.

Dipper in the Island of Barra.—A Dipper (*Cinclus aquaticus*), was seen at the Borve on the west side of the Barra, Outer Hebrides, on the 2nd February. Single birds have also been seen in previous years, but not for some time past.—Wm. L. Macgillivray, Barra.

Great Spotted Woodpecker in Perthshire.—On 25th June, while bird-watching in a pine wood in the Dunkeld district, I had the pleasure of seeing an adult male Great Spotted Woodpecker (*Dendrocopus major*). As this handsome bird is fortunately spreading as a nesting species in Scotland, I venture to think your readers may be interested to know of its presence in this part of Perthshire in the summer season.—Gladys Graham Murray, Stenton.

Great Spotted Woodpecker in Sutherland.—It may be of interest to record the fact that a Great Spotted Woodpecker (*Dendrocopus major*), has been seen here for nearly two months, namely, from the middle of March to well on into May, but not later. I only observed one bird, which I think was a male.—Francis G. Gunnis, Gordonbush, Brora.

An Argyllshire Heronry.—In the lists of Scottish Heronries which have been published recently in the "Annals," I find no mention of one in the woods adjacent to Ardgour House, Argyllshire. This was certainly in existence as a going concern in 1887 or 1888, and may be used still for all I know. As far as I remember it was only a small colony. I may have an opportunity during the ensuing summer of examining the place, and will make a point of doing so if possible.—W. I. Beaumont, Plymouth.

Eider Ducks in Clyde Area.—From Loch Sweyn on the west side of Kintyre (Argyll) Eiders have, during the past few months, appeared for the first time across the peninsula and within "the Clyde Area." Although known for some time to have frequented Loch Sweyn, by Col. Campbell of Inverneil, Ardrishaig, they have never been seen by him on the east side anywhere on Loch Fyne. But R. F. Graham, Esq., of Skipness, tells me he had seen them for the first time off Skipness shore, Loch Fyne, in November, when there were five—2 males and 3 females. Since then he has seen them on three occasions, the last being on 10th April 1910, when he saw seven — 3 males and 4 females, one male being immature. On the other two occasions, dates of which he cannot recall, once there was a pair, and the other time four or five birds; the immature male seen on the 10th April is the only one not in mature plumage. These birds have always been in exactly the same spot,

over the submerged rocks off Skipness Point. The above notes are of special interest to students who have watched the progress and processes of expansion and especially dispersal of a species whose movements in several directions have been already carefully recorded for many years.

The accompanying fact that Eiders are now known to frequent the islands of Cara and Gigha is also of importance in tracing the advance of the species southwards along the confines of "Clyde," or on the west side of the watershed between "Argyll" and "Clyde." Apparently they have broken through the divide at its lowest "neck," "pass," or "depression" between Loch Sweyn and the Skipness shore of Loch Fyne, about the closing months of the year 1909. Whether they have nested inside of Clyde area yet or not, these notes cannot fail to be of interest to ornithologists, and we may hope that Mr. R. F. Graham may carefully note down and record such an event and as soon as he can put the occurrence beyond doubt—perhaps in this summer of 1910.—J. A Harvie-Brown.

American Yellow-billed Cuckoo (*Coccyzus americanus*) **in Argyllshire.**—I do not know if the following record of the occurrence of this bird in Colonsay in 1904 has appeared in any ornithological magazine, but I can find no mention of it in the "Annals of Scottish Natural History."

Mr. Murdoch M'Neill (author of "Colonsay, one of the Hebrides," Edin. 1910) writes to me that an "unknown bird was found near the centre of the island, on 6th November 1904, by Lady Edith Adean and her son, and was sent for identification to the Natural History Museum, in South Kensington, and was there named the American Yellow-billed Cuckoo." I am informed by my friend Mr. Pycraft that this interesting specimen is now in the Natural History Museum, Cromwell Road, London, S.W.—Hugh S. Gladstone, Capenoch, Thornhill, Dumfriesshire.

Notes on Siphonaptera.—When examining a Black Water-vole (*Arvicola amphibius*, var. *ater*) from Fearnan, Loch Tay, last August, I observed a number of small yellow fleas running about in its fur. A few were secured; and they proved on examination to be *Ctenophthalmus agyrtes* (Heller). Many specimens of the same species, mistaken at the time for *Ct. gracilis*, were also found in a mole's nest at Dirleton, East Lothian, on 14th March, 1908.

The accidental occurrence of Siphonaptera on other than their natural "host" is not uncommon. Thus, in October 1905, I got a *Pulex* (*Ctenocephalus*) *felis*, ♀—determined by Mr. N. C. Rothschild—on a Tawny Owl from near Edinburgh; and in April 1908 Mr. Macvicar sent me a number of *P. cuniculi*, Dale, taken off the ears of a cat at Invermoidart, Argyllshire, after it had been in a rabbit's burrow. Occasionally, too, one finds them away from any host. In November 1900, for instance, I beat a *P. irritans* off a

hedge at Comiston, near Edinburgh; and in October 1896 a *P. erinacei* was shaken from moss and leaves at Mortonhall.

Perhaps the following observations on the Squirrel flea (*Ceratophyllus sciurorum*) are worth mentioning. In the beginning of June 1909 I had a squirrel's nest, from near Dunbar, securely tied up in a stout paper bag. On opening the bag from time to time living fleas have always been encountered; to-day, 18th March, *i.e.* after the lapse of 9½ months, five or six were seen on a hasty glance. From a hole in the bottom of the bag a number of dead ones have on several occasions been shaken out. The bag, I may say, has lain all along in a dry place, and the nest has never been moistened. None of the imagos that were in the nest when it was obtained are likely, I should think, to have survived all this time, those latterly met with being, it may be presumed, a subsequent brood which have passed through their various stages in the interval. I have already recorded in the "Annals" (1906, p. 163) the finding of *C. styx* in plenty in Sand-Martins' burrows, near Elie, on 13th April (not May as erroneously printed in the note) awaiting the return of the birds from their winter quarters in the south. How long Siphonaptera are able to live without access to a host, and whether such access is necessary for the repetition of the life-cycle, are questions of considerable interest.—William Evans, Edinburgh.

British Orthoptera (Earwigs, Cockroaches, Grasshoppers, and Crickets).—Mr. W. J. Lucas (28 Knights' Park, Kingston-on-Thames) would be glad to hear of records or captures of Scottish examples, especially of the commoner species, so that a better knowledge may be obtained of the distribution of the members of this Natural Order in Britain, for a monograph which he has in hand.

BOTANICAL NOTES AND NEWS.

Andreæa petrophila, *Ehrh.*, var. *gracilis*, *B. and S.*—J. A. Whaldon, in the "Journal of Botany" (1910, p. 102), in a paper on 'Marrat's Collection of British Mosses,' has a note to the following effect:—"I refer to this a slender reddish plant, labelled by Marrat, '*A. alpina*, Hed., a curiosity found on Ben-na-Boord, Forfar. July, 1844.' It is new to V.C. 90." As this note may lead to the moss being erroneously recorded for Forfarshire, V.C. 90, it seems well to state that "Ben-na-Boord" is not in Forfarshire, but on the border of South Aberdeenshire, V.C. 92, and Banffshire, V.C. 94, being chiefly in 92.

Lycopodium Selago, *L.*, **in a strange habitat.**—This Clubmoss has become scarce within some miles of Aberdeen, the peaty soils preferred by it having been much reduced by the exhaustion of many of the peat-mosses and the drainage and cultivation of moors.

I rarely see the species near the city, hence I was the more surprised when, during a walk in May through the parish of Maryculter, a few miles up the valley of the Dee, I found a very healthy plant growing on the thatch of a cottage which had been left to decay. Both sporangia and separable buds were present in plenty, so the peculiar habitat seemed likely to be colonised by the Clubmoss.—James W. H. Trail.

Sarcoscypha protracta (*Fr.*) *Sacc.*—In "Grevillea" (1890, p. 83) this fungus was recorded as British, under the name *Lachnea mirabilis*, Borscz., a clump of the elegant small cups having been found by me in April 1890 on the bank of the Dee, near Ballater, in short turf, and reported as *Anthopeziza Winteri*, Wettst., under which name it was described and excellently figured in the "Verhandl. Zool. Bot. Gesellsch.," Wien, 1886, p. 383, pl. 16, enabling me to identify it as new to Britain. I reported it in the "Scottish Naturalist" (Oct. 1890, p. 384) as *Lachnea mirabilis*, having been informed by Mr. Phillips of the identity of *A. Winteri* with this; but in the "Scottish Naturalist" of Jan. 1891, pp. 34-35, I corrected this to the earlier specific name *protracta* given by Fries. In Saccardo's "Sylloge Fungorum" it is placed in the genus *Sarcoscypha*.

My specimens are preserved in the botanical museum in the University of Aberdeen. I am not aware of its having been found again in the British Islands until April 1910, when Miss J. L. Legge, a student of advanced botany, after graduating B.Sc., picked up, during a short holiday at Ballater last winter, various plants, which were shown to me for assistance in their identification. Among them were two or three of the very characteristic cups of *S. protracta*, rediscovered after twenty years near the place where it was previously found.—James W. H. Trail.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—April-June 1910.

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

ZOOLOGY.

Notes on the Mammals of Islay. J. A. Harvie-Brown, *Zoologist*, April 1910, p. 157.—Refers to the occurrence of the Common Shrew and the Lesser Shrew in Islay, and a White Otter in Jura.

Summer Notes on the Birds of Garelochhead. W. R. Baxter, *Glas. Nat.*, May 1910, pp. 69-78.—Notes on seventy-eight species.

Additions to the List of Clyde Coleoptera. Anderson Fergusson, *Glas. Nat.*, May 1910, pp. 83-92.—First paper.

List of Aquatic Coleoptera from the Monklands (Lanarkshire). Mr. J. M'Leod, *Glas. Nat.*, May 1910, pp. 78-80.

Biston hirtaria in Inverness-shire. Robert Lawson, *Entomologist*, May 1910, p. 145.—Met with in April 1910.

Enarmonia ericetana, H.-S., a Species of Tortricina new to the British List, in Scotland. Eustace P. Bankes, M.A., F.E.S., *Ent. Mo. Mag.*, May 1910, pp. 110-114.—Specimens recorded from Aviemore.

Lesteva sicula, Erichs., and Lesteva punctata, Erichs. T. Hudson Beare, *Ent. Mo. Mag.*, May 1910, pp. 117-118. L. sicula is recorded from Nethy Bridge, Aviemore, and Edinburgh.

Diagnoses of some new Species of Gabrius. David Sharp, M.A., F.R.S., *Ent. Mo. Mag.*, June 1910, pp. 129-131.—G. pennatus, appendiculatus, and bishopi, spp. nn., are recorded from Scotland.

Notes on Corticaria, with Descriptions of two new Species. D. Sharp, M.D., M.A., F.R.S., *Ent. Mo. Mag.*, May 1910, pp. 105-108.—C. fowleriana, sp. n. described from specimens found at Braemar in June 1871.

Additions and Corrections to the British List of Muscidæ Acalyptratæ. J. E. Collin, F.E.S., *Ent. Mo. Mag.*, May 1910, p. 124, and June 1910, pp. 125-129.—Numerous Scottish records are included in this paper.

BOTANY.

Notes on British Elms. By Rev. Augustin Ley (*Journ. Bot.*, 1910, pp. 65-72, pl. 503).

The British Roses (continued). By Major A. H. Wolley-Dod (*Journ. Bot.*, 1910, Suppl. pp. 33-64).—A few entries for Scotland.

Notes on British Carices. By G. Claridge Druce, F.L.S. (*Journ. Bot.*, 1910, pp. 98-101).—Chiefly based on Kükenthal's *Cyperaceæ-Caricoideæ*, but containing some new records for Scotland.

Callitriche intermedia, Hoffm., var. tenuifolia. By Edward S. Marshall (*Journ. Bot.*, 1910, p. 111).—Refers to record of this variety in Exch. Cl. Rep. for 1908, p. 187, by Mr. A. Bennett, as from Inchnadamph (V.C. 108).

Inverness and Banff Cryptogams. By J. A. Wheldon, F.L.S., and Albert Wilson, F.L.S. (*Journ. Bot.*, 1910, pp. 123-129).—Enumerates mosses, liverworts, and lichens found, in July 1909, during four days spent among the higher Cairngorms and on Craig Ellachie; and contains numerous additions to county lists to records of altitudes.

Ross-shire Plants, 1909. By Rev. E. S. Marshall, F.L.S., and W. A. Shoolbred, F.L.S. (*Journ. Bot.*, 1910, pp. 132-140).—Chiefly from E. Ross (106), with a few from W. Ross (105)—vascular plants, a good many being additions to county lists.

Notes on Lastræa remota (Moore). By W. B. Boyd (*Trans. Edinb. F. Nat. and Micr. Soc.*, 1909, vi., pp. 85-92).—Discusses its origin, as a hybrid between *L. dilatata* and *L. Filix mas* probably, and records its occurrence between Ardlui and Tarbet (V.C. 99).

Microfungi observed at Traquair and Roslin. By D. A. Boyd (*Tr. E. F. N. and M. S.*, 1909, vi., pp. 149-152).—A list of species, of which *Marssonia Daphnes*, Sacc., on *Daphne Mezereon*, is a new record for Britain.

An Account of the Excursions during 1908, of the Edinburgh Field Naturalists' and Microscopical Society. (*Tr. E. F. N. and M. S.*, 1909, vi., pp. 172-178, and pl. 14-15).—A number of flowering and flowerless plants are named as observed, several being new records for counties.

BOOK NOTICES.

Darwinism and Human Life. By J. Arthur Thomson, M.A. Pp. xii and 245. (Andrew Melrose, London, 1909.) Price 5s. net.

The volume contains a graceful and enthusiastic appreciation of Darwin, the ideal seeker after knowledge, "one of the great Immortals among men," whose persistent, lifelong aim was the discovery of truth; and of Darwin's work, the effect of which has been so far-reaching that "without exaggeration . . . it may be said that no other man of science has influenced the framework of human thought as Darwin has done." But it is much more than a mere eulogium of Darwin and his work, for while our debts to the great scientist are fully acknowledged, his contributions to the philosophy of natural science, and especially to the doctrine of organic descent, are examined in the light of the recent researches to which his work was the direct incentive. Thus there are chapters discussing the Web of Life, the Struggle for Existence, the Raw Materials of Progress, the Facts of Inheritance, and Selection; and

in all these Professor Thomson places in our hands the results of the most apposite experiments, and inquires into their significance from the Darwinian standpoint. He insists on Darwin's breadth of view, for example, as regards the "struggle for existence," maintaining that the phrase, as originally used, had a wider application than some recent exponents of Darwinism are willing to allow. It connotes more than the "assumed competition for survival between individuals of the same species," and occurs "wherever living creatures press up against limiting conditions." Of great interest are the author's efforts to show the importance of a full understanding of the principles of organic evolution to the well-being of mankind, and in especial to show how necessary it is that some mode of rational selection should be adopted in human society now that humanitarianism and the complex of inter-dependent labour have nullified the winnowing effects of natural selection.

It is unnecessary to add that a work from Professor Thomson's hand is delightfully written, and contains much stimulating suggestion. The type is clear, and the text is free from misprints, the only error detected occurring in Professor Cossar Ewart's name on p. 147. A bibliography containing representative books on Darwinism is appended, but, while there is an extended list of contents, it is regrettable that an index, which would have facilitated reference to the numerous and frequently striking results of researches brought together in this volume, has not also been added. J. R.

The Vertebrate Fauna of Cheshire and Liverpool Bay. Edited by T. A. Coward, F.Z.S. With illustrations by Thomas Baddeley. In two volumes. London: Witherby & Co., 1910. 26s. net.

From its comprehensiveness and the excellent manner in which its varied subjects are treated this book is entitled to a place in the foremost rank of works of its kind. That such works devoted to the western counties of England are so remarkably few adds to its value and acceptability, as does also the fact that the volumes are results of the labours of well-known naturalists. Messrs. Coward and Oldham contribute an exhaustive and interesting account of the Mammals and Birds, which runs to 459 pages, and forms the bulk of Vol. I.; the remaining pages, xxxii in number, are devoted to introductory matter, and include an account of the physical features of the area viewed from the zoological standpoint. That Cheshire is rich in members of the great and attractive classes of animals named is manifest from the fact that no less than 46 species of mammals and 231 of birds, excluding doubtful records, are members of its fauna.

Volume II. treats of the Reptiles, Amphibians, and Fishes, and includes sections giving much information relating to the sea-area and its vertebrate life. Concerning the Reptiles Messrs. Coward

and Oldham inform us that Cheshire is remarkable for its poverty, and that no single species is common. This poverty, however, is not without interest to the student of geographical and ecological distribution. The amphibians are at full strength, and include the locally dispersed Natterjack. The section on the fishes is contributed by Mr. James Johnstone. The number of forms treated of amounts to 107, regarding which much information of a varied and useful nature is given. An extensive bibliography forms the concluding portion of this volume.

The volumes, which are admirably got up and abundantly illustrated by half-tone plates from photos devoted to depicting the topography of the area, form a welcome and authoritative contribution to the zoological survey of the British Islands.

A History of Birds. By W. P. Pycraft. With an Introduction by Sir Ray Lankester, K.C.B., F.R.S. London: Methuen & Co. 10s. 6d. net.

In this volume, which forms the second of a series of an evolutionary history of animal life, we find Mr. Pycraft at his best as a writer of popular books. The aim of the series, we are told, is to provide, free from technicalities, a graphic history of all that pertains to animal life in relation to the external world, and we congratulate the author on having successfully accomplished his share of so difficult a task. He has brought together, and treated in a lucid and pleasant fashion, a number of factors having an important bearing on bird life which the student of that fascinating subject will not find elsewhere in a single volume. These deal with, among others, the relation of birds to other animals, distribution, seasonal life, migration, relation to environment, inter-relations, social life, nidification, nestlings, plumage, variation, acquired characters, natural and sexual selection, structural adaptations, etc. The volume is excellently and abundantly illustrated, and forms an admirable introduction to the study of bird life.

Life-History and Habits of the Salmon, Sea-Trout, Trout, and other Freshwater Fish. By P. D. Malloch. London: Adam and Charles Black, 1910. 10s. 6d. net.

Salmon problems, to the consideration of which much of this volume is devoted, are numerous and difficult, and anything which contributes to their elucidation is a most welcome addition to Ichthyological literature. Mr. Malloch has enjoyed exceptional opportunities of studying a number of these problems during many years, and in many waters, and it is probable that his experiences are quite unique. A book written by an author such as this is worthy of the perusal of all who are interested in a series of very complicated and vexed questions. On many of these Mr. Malloch throws much light, while on others his suggestive remarks will be of

great use for future investigators. To those who are interested in the faunal aspect of such a work, the author's account of the numerous forms of Salmonidæ found in the various Scottish rivers and lochs is of exceptional interest, and, as far as trout are concerned, incomparably of greater value than anything that has been hitherto made known. The illustrations devoted to this aspect of Mr. Malloch's work are particularly acceptable. Many other subjects are dealt with, such as the age of salmon as indicated by their scales, salmon disease, migration, and histories of a number of "coarse fish" (especially as Scottish species) are treated of. The book is remarkable for the number and beauty of its illustrations, of which there are 239.

A Natural History of the British Lepidoptera. Vol. X. By J. W. Tutt, F.E.S. London: Swan Sonnenschein & Co., 1908-1909. Price £1 net.

With indomitable perseverance Mr. Tutt has completed another volume, the eighth in order of publication, of his exhaustive and masterly treatise on British Lepidoptera. Since only five species are dealt with in this volume, whose history and that of the tribes to which they belong occupies some 358 closely printed pages, it may readily be imagined that little remains to be done in the elucidation of the life-history, variation, and distribution of these attractive insects. Yet in the preface the author modestly states that, hard as he has striven to reach his ideal, he has "in many ways failed signally to do so." Upon examining the result of the author's labours we feel constrained to remark that the ideal aimed at must have been an exceptionally high one, for we are not acquainted with any single entomological work in any language which surpasses that now lying before us in thoroughness of detail and in the amount of conscientious labour which has been bestowed upon it. Planned as it is on the same lines as the previous volumes noticed it is unnecessary for us to describe the form of the book in detail. Part I. contains three chapters which complete the exhaustive account of the "Family Habits in Butterfly Larvæ" commenced in a previous volume. The number of plates continues to increase, and we are here presented with no fewer than 53, which are beautifully executed, and which deal mainly with the eggs and larval skin (in the various instars) of the species treated of in the text. These are, *Everes argiades*, *Cupido minimus*, *Plebeius argus* (*ægon*), *Cyaniris semiargus*, and *Agriades thetis* (*bellargus*). At one time they were all grouped under one generic name (*Lycæna*), but times have changed, and so have most of the names of British Butterflies! The scientific study of structure, apart from mere superficial resemblance, and based upon the Butterflies of the whole world, has revealed characters which amply justify the separation of these forms into distinct genera, unfamiliar as these may be to the

amateur collector. The 38 pages dealing with the variation of the puzzling *Plebeius argus* are a revelation to us, showing what can be done by carefully studying a large series of specimens taken in different localities and under different conditions. It will astonish not a few, indeed, to read that "the impress of these conditions is such as to lead us to recognise almost at sight the origin of individuals coming from lowland, highland, heath, and moorland districts." Mr. Tutt's volumes are verily a treasure-house of information, of which it is impossible to speak too highly. We can only wish him strength and length of days to continue, if not to complete, the herculean task, so much of which he has already admirably accomplished. P. H. G.

Colonsay, one of the Hebrides, its Plants, their Local Names and Uses—Legends, Ruins, and Place-Names—Gaelic Names of Birds, Fishes, etc.—Climate, Geological Formation, etc. By Murdoch M'Neill. Edinburgh: David Douglas, 1910. Sm. 8vo. Pp. x and 216.

This little volume is a valuable contribution to the history, natural and civil, of the island of Colonsay. Unpretentious in form and in style, it is full of most interesting information of the nature detailed in the title-page. Introductory chapters, extending to 85 pages, deal with the past history and traditions of the island and its people, the Gaelic names of animals, the geological structure, and the more general matters relating to the habitats and characters of the flora, both native and introduced; but the greater part of the book (pp. 86-204) is devoted to a systematic account of the flowering plants and fern allies of the island. All the species and their varieties are named, and information is given as to frequency, the localities being added for most. The Gaelic names and local uses of all that could be determined are also given, as well as numerous notes from other works, the local being clearly distinguished from the more general information. The interest of many of the notes, gathered in the island, of folklore that is fast dying out, causes regret that so much has been already lost, and that so few attempts have been and are being made to preserve such records of the past. There are several additions to the species and varieties previously recorded from vice-county 102, of which Colonsay forms a part.

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REPORT ON SCOTTISH ORNITHOLOGY IN 1909.

By Evelyn V. Baxter and Leonora Jeffrey Rintoul.

(*Continued from p.* 148.)

We are indebted to the "Annals of Scottish Natural History," the "Glasgow Naturalist," and "British Birds" for several of the following records :—

Turdus viscivorus (Missel-Thrush).—Three arrived in Mull on 2nd February, single birds occurred on the Isle of May on 20th March, and Fair Isle on 21st April. The first migratory band going south passed Mull on 17th August; it consisted of about forty birds. One at the Isle of May, 21st September.

Turdus musicus (Song-Thrush).—A few all night at the lantern on the Isle of May, 19th March, and there and at Fair Isle on the 22nd. Many on the Isle of May on 17th October, and on Fair Isle next day. One was seen near Largo on 10th September, "with a curious oblique light band across the tail, not far from the tip."

Turdus iliacus (Redwing).—The last records of the spring departures are from the Butt of Lewis, 7th April; Kirkliston, 8th; East Ross, 13th; and Fair Isle, 21st. The first autumn record is at Fair Isle on 25th September, and several at the Isle of May next day; the first mainland record is at Tyningham on 30th September. A great immigration at the Isle of

May on 10th October, and in numbers at the lantern on Fair Isle from 7 p.m. on the 10th to 3 a.m. on the 11th. A great rush, 367 being killed, at Tarbatness lantern between 12 and 4 a.m. on the 18th; on the same day enormous numbers on the Isle of May, and at Fair Isle at the lantern and numerous on the island, and in hundreds all night at the lantern on the Flannans. At the Skerryvore lantern on the 23rd, on which day they arrived in Mull. In thousands at Inverbroom (West Ross), from the 1st to the 6th November (sleet and snow). Reports come of scarcity of this species in the winter of 1909-10.

Turdus pilaris (Fieldfare).—Last seen in Mull, 5th April; very numerous on the Isle of May, 22nd and 23rd; and about 150 seen at Newhall, near Yester, on 3rd May. Last noted at Fair Isle on 28th May. In autumn two or three are recorded at the lantern on the Isle of May in the early hours of 17th October, one was killed at Tarbatness early on the 18th, while next night numbers are reported on the lanterns of the Flannans, Sule Skerry, and Fair Isle. At Mull "a large flock seen, 30th October (N.N.E. light, snow), flying low over the crofts to the south, when they turned to E.S.E. and starting from sea-level ascended in a zig-zag until they disappeared at about 2000 ft., still rising, and would eventually over-top the Ardgour and South Lochaber Hills." In thousands, Inverbroom (W. Ross), from the 1st to the 6th November, and a very large flock at the Butt of Lewis on 18th November. In East Ross on 19th April, a Fieldfare was seen "with an almost pure white head and nape, throat and breast white, flecked with grey."

Turdus merula (Blackbird).—Not much movement is recorded in spring; a lot at Lerwick on 25th February, a few at the lanterns on the Isle of May and Fair Isle on 22nd March, and several at Sule Skerry on the 26th. A pair were found near Paisley laying in the same nest as a Thrush; last nest at Kirkliston, 26th July. A considerable influx of Blackbirds took place at Loch Awe on 8th October, numbers are reported from Dunrossness (Shetland) on the 13th, and Fair Isle on the 14th, while a rush to the lantern is recorded on the 18th from Sule Skerry, Tarbatness, and Fair Isle.

Turdus torquatus (Ring Ouzel).—First noted on the West in Mull (1 ♂) on 7th April, Shutterflat Moor (Ayr) on the 11th, and not till the 17th on the East, when one was seen in the Ochils. Arrived at Fair Isle on the 16th, and a few still on passage at the Isle of May on 2nd May. The return journey is noted at the Isle of May on 26th September, at the Flannans on

4th October, three were killed at the Butt of Lewis on the 17th, and the same number at Tarbatness next night. On the same date several were seen at Fair Isle and Isle of May. Single birds at the Pentland Skerries on 4th November and Fair Isle on 18th December.

Saxicola œnanthe (Wheatear).—First recorded from the West at Lendalfoot (Clyde) on 18th March, the first East Coast record not being till the 31st at the Isle of May. A male at Tiree on 1st April, and males are recorded on the 5th as reaching Mull and Fair Isle, the first female arriving at the latter place on the 11th. Very numerous on Tiree and Fair Isle on the 10th. The first return migration is noted at the Isle of May on 28th July, at the Flannans (1) on 10th August, and at Sule Skerry (6) on the 19th. Last seen on the Isle of May, 7th October; at Kirkliston, 8th; Fair Isle, 12th; Butt of Lewis, 17th; and Flannans, 31st. A semi-albino seen on Dumbarnie Links on 20th July was dense white on the nape and sides of the neck, white shading off to brown on the back and crown, elsewhere the ordinary sandy-brown plumage. The larger race of this species, *S. œnanthe leucorrhoa* (the Greater-Wheatear), is recorded in spring from Fair Isle, a number being present on 3rd May. Single birds were killed at Dunnethead on August 30th (♀), the Mull of Galloway on 12th September, and at the Isle of May on 20th and 26th September and 22nd October. Observed on Fair Isle on thirteen dates between 28th September and 16th October. The wing measurements recorded range from 102 to 109 millimetres.

Saxicola pleschanka (The Eastern Pied Chat).—One ♀ procured on the Isle of May on 19th October, the first record for Britain ("A.S.N.H.," 1910, p. 2).

Pratincola rubetra (Whinchat).—First recorded from the East Coast at Balcomie (East Fife) a ♂ on 22nd April and at Possil (Clyde) next day. Five males arrived in Mull on the 24th, and two females and a male are recorded on passage from Fair Isle on 6th May. On return migration in East Fife 18th August, and several at Fair Isle on the 25th. Last seen East Ross on 17th September, Kirkliston and Isle of May 18th, and Fair Isle 25th.

Ruticilla phœnicurus (Redstart).—Very early records of this species come from the Shetlands, single birds being seen at Fair Isle on 22nd March and at Lerwick on 28th March. The first mainland record is from Carmichael on 19th April, and a pair at the Bass on the night of the 26th; first seen East Ross on the 28th. The first note of the return movement comes from Largo on 25th August, several at the Isle of May

on the 28th. Last records are a male at the Flannans on 23rd September; Isle of May, 1st October; and a female at Fair Isle next day.

R. TITYS (Black Redstart).—One ♀ at Fair Isle on 14th October.

CYANECULA SUECICA (Red-spotted Blue-throat).—Is recorded from Fair Isle both in spring and autumn, and single birds from the Isle of May on 14th and 17th September.

CYANECULA CYANECULA (White-spotted Bluethroat).—An adult male was procured on Fair Isle in spring, the first record for Scotland ("A.S.N.H.," 1910, p. 68).

SYLVIA CINEREA (Whitethroat).—First noted on the East Coast at the lanterns of the Bass and Isle of May on the night of the 26th-27th April. The first West Coast records are at Mull and Beith (Clyde) on 2nd May, Fair Isle, 4th. On autumn passage at the Isle of May on 15th August. Lots on the Isle of May, 24th, last seen there 27th September. Last at Fair Isle, 1st October.

SYLVIA CURRUCA (Lesser Whitethroat).—Single birds at Fair Isle on 23rd April and 4th May. In autumn one seen near Cathcart Cemetery (Clyde) in August ("Glas. Nat." vol. ii. p. 46). Small numbers are recorded from Fair Isle from 25th August to 2nd October, and from the Isle of May from the 16th to the 30th September; a good many on the 24th.

SYLVIA ATRICAPILLA (Blackcap).—The only spring record of this species comes from Kirkliston on 29th April. In autumn a few are noted at Fair Isle between 24th August and 4th October, and at the Isle of May between 13th September and 19th October.

SYLVIA HORTENSIS (Garden Warbler).—Arrived on the West at Rouken (Clyde) on 10th May, and on the East at Kirkliston next day. In autumn the first record of movement is at the Isle of May on 5th August; several there and at Fair Isle, 29th September. Last seen Fair Isle, 11th October; and Isle of May, 17th October.

SYLVIA NISORIA (Barred Warbler).—A female was procured on Fair Isle in autumn and a male on the Isle of May on 13th September.

REGULUS CRISTATUS (Golden-crested Wren).—No large or widespread immigration is reported in 1909, though Goldcrests were numerous on Fair Isle on 28th September, and at Loch Awe on 30th November, extraordinarily tame at the latter place.

PHYLLOSCOPUS SUPERCILIOSUS (Yellow-browed Warbler).—A bird of this species was seen at Lockerbie (Dumfriesshire) on the 11th

April, the first record for Britain in spring and first mainland record for Scotland ("A.S.N.H.," 1909, p. 182). In autumn on eight dates on the Isle of May between 16th September and 24th October, one to three at a time; at least ten birds were seen ("A.S.N H.," 1910, pp. 4-9). Two are recorded from East Ross, a ♂ on 23rd September, and a ♀ on the 27th. This is the first autumn record for the mainland of Scotland and first record for Moray ("A.S.N.H.," 1910, p. 55). Four are reported from Fair Isle between 28th September and 4th October.

PHYLLOSCOPUS RUFUS (Chiff-chaff). — First recorded, at Dalry (Clyde) on 3rd April. A male was killed on 8th April at the Mull of Galloway Lighthouse; the first record for Fair Isle is 7th May. A pair nested in Mull ("A.S.N.H.," 1909, p. 247). Autumn records come from East Fife and the Isle of May of small numbers between 21st July and 28th September.

P. TRISTIS (Siberian Chiff-chaff).—One was procured on Fair Isle in autumn.

P. TROCHILUS (Willow-Warbler).—Is first reported from the West at Beith and Loch Awe on 6th April, but the species was not common till a fortnight later. The first records for the East Coast are at Dreghorn and Kirkliston, both on 19th April; next day it is noted at Fair Isle. In Mull during the first fortnight in August the local birds were withdrawing and migrants passing, some in song, for short periods. One was killed at the lantern on the Bass on 20th August and more seen there next day. Last seen at Kirkliston, 13th September; Fair Isle, 2nd October; Isle of May, 18th October.

P. SIBILATRIX (Wood-Warbler).—First recorded from Saltoun (E. Lothian) on 3rd May, from Mull next day, and Fair Isle on the 5th; one killed at the Mull of Galloway Lighthouse, 17th May.

ACROCEPHALUS STREPERUS (Reed-Warbler).—One bird of this species was procured on Fair Isle in autumn.

ACROCEPHALUS PHRAGMITIS (Sedge-Warbler).—The first record comes from the West at Possil (Clyde) on 29th April. E. Ross, 8th May; Fair Isle, 19th. The only autumn records are one on passage (E. Fife) on 8th August, and one at the lantern on the Isle of May on 15th August.

LOCUSTELLA NÆVIA (Grasshopper Warbler).—There are but few reports of this species in 1909. A male was killed at the Mull of Galloway Lighthouse on 24th April, and this species is recorded at Dalry (Clyde) on 8th May.

Motacilla alba (White Wagtail).—Arrived at Lamlash (Arran) on 21st March. Small parties are recorded from Tiree travelling north from 15th April to 7th May; two at Fair Isle on the 20th April. A pair bred on Fair Isle, the second breeding record for Scotland. On autumn migration flock after flock flew over Fair Isle about 5 p.m. on 18th August, at least 200 birds being seen. On passage, East Fife, on 21st August; at Lerwick on the 29th; Tiree, 3rd September; and Flannans on the 5th. Last seen on the Isle of May on the 28th September; last recorded at Whitberry Point, near Tyninghame (3), on 30th September.

M. melanope (Grey Wagtail).—Three were seen on passage at the Isle of May on 25th March, three at the Flannans on 7th August, one at the Isle of May on 21st September, and one at Lerwick on 8th December.

M. borealis (Grey-headed Wagtail).—Is reported from Fair Isle on both spring and autumn migration.

M. raii (Yellow Wagtail).—First recorded from the West at Beith (Clyde) on 14th April. One at Fair Isle on the 23rd.

Anthus trivialis (Tree Pipit).—Is first noted at Fair Isle on 6th April, several at Cadder (Clyde) on 19th April. Last seen at Kirkliston on 15th September; a few on the Isle of May on various dates between 24th September and 18th October; and on Fair Isle from 25th September to 16th October—numerous on 28th September.

A. pratensis (Meadow Pipit).—Arrives in Mull on 21st March, at Carmichael on the 28th, at Glenorchard (Stirling) on 1st April, and Fair Isle on the 3rd. The autumnal passage began at Kirkliston on 26th August, in Mull large numbers were passing on 5th September, while at the Butt of Lewis on the 19th and at the Flannans on the 20th there was a rush all day. Large numbers are recorded from the Butt of Lewis on 26th September and 18th October, many at the Fair Isle on 16th October, and several at the Butt of Lewis on 2nd November.

A. richardi (Richard's Pipit).—One was observed in autumn on Fair Isle.

A. obscurus (Rock Pipit).—Many on the Monachs in September with a very dark variety, quite distinct in shade from the normal birds.

Oriolus galbula (Golden Oriole).—An adult male at Penton Lynns (Dumfries) on 30th April, a young male flying about a garden in Renfrewshire the first half of May, another was found dead at Port-Glasgow on 10th May, and a fourth was seen on Fair Isle on 26th May.

Lanius excubitor (Great Grey Shrike).—One is recorded from Fair Isle on 18th October.

L. collurio (Red-backed Shrike).—A bird of the year was found dead on the Flannans on 14th September, the first record for the Outer Hebrides.

Muscicapa atricapilla (Pied Flycatcher).—The only spring record is a male at Fair Isle on 7th May. A young bird was obtained at Dunrobin (Sutherland) on 20th June, one at the Fair Isle lantern on 10th September, and a few on the Isle of May from the 14th to the 25th September.

M. grisola (Spotted Flycatcher).—The first arrival recorded is from the West, at Dalry (Clyde), on 5th May; on the East it is reported simultaneously from Kirkliston and East Ross on the 14th. Obtained at the lantern, Isle of May, on 14th August. Last seen in Mull on 5th September, at the Flannans on the 23rd, Isle of May, 26th, and Fair Isle, 4th October.

M. parva (Red-breasted Flycatcher).—One young male was procured on the Isle of May on 25th September, the first record for Forth.

Hirundo rustica (Swallow).—Is first recorded from the West in three localities in Clyde on 8th April, the first noted on the East being on the 13th at Edinburgh and Kirkliston. Is reported from Fair Isle on 17th April and Sule Skerry on 9th May. Many (*ad. et juv.*) on the Isle of May on 18th September, last seen at Kirkliston, 12th October, and St. Andrews, 2nd November.

Chelidon urbica (House-Martin).—First noted on the West at Cardross (Clyde) on 9th April, and on the East at Kirkliston on the 18th. "The local nesting birds" in Mull "did not begin to build till 21st May, a few pairs arriving as late as the first week in June, which is abnormal." Many at the Isle of May on 18th September, last recorded at Kirkliston on the 27th. An albino was seen at Cupar (Fife) on 24th July.

Cotile riparia (Sand-Martin).—Is first recorded on the East, near Dirleton, on 9th April, the first record from the West being on the 16th at Loch Loskin (Clyde). Last seen at Kirkliston on 8th September.

Coccothraustes vulgaris (Hawfinch).—One seen at Tayfield (Fife) on 21st April, and one at Fair Isle on 8th May. A nest and five eggs was found in East Lothian on 9th May, the eggs being destroyed by some animal; another nest was found 60 yards away on 23rd May, but these eggs also were destroyed ("A.S.N.H.," 1909, p. 181). The first nest and eggs found in Forth.

Carduelis elegans (Goldfinch).—A bird of this species was seen near Largo (Fife) on 27th January and 2nd February, and two immature birds were seen in East Ross on 25th September.

Chrysomitris spinus (Siskin).—Three are recorded from the Isle of May on 25th March, and two on Fair Isle on 23rd April. Remarkable numbers on Fair Isle between 22nd September and 18th October, and more than usual on the Isle of May from 22nd September to 2nd October. A few are reported from Loch Awe with a very large flock of Lesser Redpolls on 25th November—they were feeding on alders. There appears to be only one previous record of this species in Argyll.

Zonotrichia albicollis (White-throated Sparrow).—One shot on Eilean Mor, Flannans, on 18th May ("A.S.N.H.," 1909, p. 246).

Fringilla cœlebs (Chaffinch).—A few are reported from Fair Isle on 22nd March, and from the Isle of May on the 25th. Many are recorded from Fair Isle on 28th September and 18th October, and huge flocks arrived in Mull on 23rd and 27th October. In Tiree a small flock with Greenfinches on 14th November (both species uncommon there). An albinistic variety is noted in East Fife on 28th February, and a partially melanic specimen was procured on Fair Isle on 6th May.

F. montifringilla (Brambling).—On 1st March a flock of 800 or 900 is recorded from Solway, on the 23rd April about 12 at the Isle of May, while the last noted was at Fair Isle on 20th May. In autumn this species appeared on the Isle of May on 17th September, on Fair Isle on the 25th. On 10th October there was a great immigration to the Isle of May, and to the lantern at Fair Isle, and on that island next day huge numbers were seen. A small flock arrived at the Pentland Skerries on the 12th and stayed several days.

Carpodacus erythinus (Scarlet Grosbeak).—One female procured on the Isle of May on 13th September ("A.S.N.H.," 1910, p. 4).

Loxia curvirostra (Crossbill).—1909 was characterised by a great immigration of these birds. The first is recorded from Fair Isle on 23rd June; they kept on arriving till 10th July, when as many as 300 were seen. After this date the birds diminished slowly; last seen in numbers on Fair Isle on 26th August, and the last is recorded from there on 2nd October (♂ imm.); many were found lying dead, starved ("A.S.N.H.," 1909, p. 215, and 1910, p. 54). On 27th June, an adult male is recorded from Unst (Shetland), and next day Crossbills arrived at Lerwick,—where they are reported up to 21st August in small parties not more than a dozen strong,—at Sule Skerry,

where they remained about three weeks, the largest number seen being 42, and at the Butt of Lewis, whence 7 are reported, one being an adult male. They are also recorded from many other localities in Shetland ("A.S.N.H.," 1909, pp. 215 and 216). Late in June many appeared on the Flannans and remained some time, the last being seen there on 22nd September ("A.S.N.H.," 1909, p. 216, and 1910, p. 54). Three immature birds were seen at Græmeshall, S.E. Mainland, from 29th June to 1st July ("Brit. Birds," vol. iii. p. 82), and 2 are recorded from Lochmaddy, N. Uist ("A.S.N.H.," 1909, p. 216). On 9th July, a flock of about 20 alighted on a steamer off Bervie, Kincardineshire, and remained on board for several hours ("A.S.N.H.," 1909, p. 216), while on the 12th one came on board the 'Goldseeker' when 95 miles E. by S.$\frac{3}{4}$S. of Auskerry Light (Orkney); it was dead tired and allowed itself to be caught ("A.S.N.H.," 1909, p. 217), and hundreds are reported by the fishermen as drowned in the North Sea ("A.S.N.H.," 1910, p. 118). Ten or twelve were seen at Creetown (Kirkcudbright) from 29th July to 3rd August ("Brit. Birds," vol. iii. p. 124). A male at Scrabster (Caithness) on 31st July, and many at Gordonbush (E. Sutherland), a lot being caught in the strawberry nets ("A.S.N.H.," 1910, p. 55). Eight visited a garden in Wick and stayed a fortnight, while others are recorded from Kirkwall and Sanday in Orkney, and from Hawick and Fraserburgh ("A.S.N.H.," 1909, p. 216). Many were seen near Sumburgh Head, and numbers were taken on fishing-boats to the east of Shetland ("A.S.N.H.," 1909, p. 216). One at Gifford (Haddingtonshire) in August ("Brit. Birds," vol. iii. p. 227). Young birds and females predominated, but some old males were observed where the birds occurred in any numbers ("A.S.N.H.," 1909, p. 216). All obtained belonged to a slender-billed continental race ("A.S.N.H.," 1910, pp. 66, 67).

Loxia bifasciata (Two-barred Crossbill).—Adult males were procured on Fair Isle and the Flannans, among the flocks of the common Crossbill ("A.S.N.H.," 1909, p. 217).

Emberiza miliaria (Corn Bunting).—A small flock is noted at Lerwick on 9th May, and this species is recorded as fairly common in Mull, specially near Tobermory, where it nested this year for the first time ("A.S.N.H.," 1909, p. 247). A flock at Lathones (E. Fife) and one at the Flannans, both on 18th December.

E. citrinella (Yellow-hammer).—Four at Fair Isle on 24th March, and a female at the Isle of May on 1st April. One at Tiree (where it is a rare straggler) on 13th November.

E. HORTULANA (Ortolan Bunting).—This species is recorded at Fair Isle on both spring and autumn passage.

E. RUSTICA (Rustic Bunting).—One male was procured in autumn on Fair Isle.

E. PUSILLA (Little Bunting).—A bird of this species is recorded from Fair Isle in autumn, and single birds from the Isle of May on 25th and 26th September, this being the first record for Forth ("A.S.N.H.," 1910, p. 6).

E. SCHŒNICLUS (Reed Bunting).—Laying in Banffshire on 1st May. An albino was procured in Solway (see "A.S.N.H.," 1910, p. 118).

PLECTROPHANES NIVALIS (Snow-Bunting).—Flocks at Sule Skerry on 26th March, and two at the Isle of May on the 31st. A small flock in Tiree travelling north on 17th April, one at the Butt of Lewis on the 25th, and last seen at Fair Isle on 19th May. In autumn several were seen at Sule Skerry on 6th September, two at the Flannans on the 8th, first seen East Ross, 27th; many at Fair Isle on the 29th. Flocks are recorded from Tiree on 23rd October and Aberdeen on the 25th, about 100 arrived on the Flannans on the 31st, and a large flock on Fair Isle on 1st November, many more arriving at the two last-named places on the 2nd.

CALCARIUS LAPPONICUS (Lapland Bunting).—A single bird is recorded from Fair Isle in spring and another in autumn, and one was procured on the Flannans on 3rd September.

STURNUS VULGARIS (Starling).—A flock of arrivals is noted on Fair Isle on 18th March, and a few at the lantern on the Isle of May next night. Some numbers on these two places, and at both lanterns on the 22nd and 23rd. Laying at Kirkliston on 21st April, in an open nest in the head of a Scots fir at that place on 15th May, while from Beith we have the note "nest with four eggs built in a tree, and other starlings carrying building materials to similar places. There seems to be a scarcity of nesting holes for the birds, and they have taken to building in trees." Nesting in the cliffs at the Butt of Lewis, and among rubble on the sea-shore. At the Fair Isle lantern on 11th October, and numerous at the light there, and at the Flannans on the 18th. Numbers passed south in a snow-storm at Aberdeen on 15th November.

CORVUS FRUGILEGUS (Rook).—A good deal of movement is recorded in March. Large numbers at Lerwick on 20th March, 500 to 600 at Fair Isle, and "swarming" on the Isle of May on the 22nd, and at the lanterns of both places that night, while 200 or more are noted at Lerwick on the 23rd and 27th.

Alauda arvensis (Skylark).—A small rush to the lantern of the Isle of May is recorded on the nights of the 15th to the 17th February, and very large flocks are noted at Fair Isle on 2nd March; on the 22nd a great many of these birds were on the Isle of May, and at the lantern there and at Fair Isle that night. In autumn large numbers at the Butt of Lewis on 26th September, numerous on Fair Isle on 18th October and killed at the lantern there that night. Numbers moving south in a snow-storm at Aberdeen on 14th and 15th November.

A. arborea (Wood-Lark).—Four reports of this species come from Fair Isle in January.

Otocorys alpestris (Shore-Lark).—Two on the Isle of May on 13th October and single birds there on the 14th and 16th.

Cypselus apus (Swift).—Is first recorded at Beith (Clyde) on 25th April, three were seen at Kirkliston next day. One was killed at the Mull of Galloway Lighthouse on 11th August. Last seen Kirkliston, 26th August; Flannans, single birds on 23rd and 28th September, and one at Fair Isle on 4th October.

Iynx torquilla (Wryneck).—Single birds on Fair Isle on 8th and 12th May.

Dendrocopus major (Great Spotted Woodpecker).—A single bird at Dunipace on 12th March. Bred in West Fife ("A.S.N.H.," 1910, p. 56) and several pairs nested in the Crieff district. One in Carron Glen on 18th July. As autumn immigrants, a bird of the year on the Isle of May on the 16th September, one at the Butt of Lewis on 23rd September, and single birds at four places in Shetland between the 24th and 28th September. On seven occasions on Fair Isle one to three birds at a time between 22nd September and 3rd October; one dead at Lerwick on 1st October, and a ♀ near Dingwall that month. Two seen at Inverbroom (W. Ross) on 6th November, single birds at Ferse House and Langwell (Caithness) on the 22nd, and a ♀ at Colinsburgh (E. Fife) about the middle of the month. One near Penpont (Dumfries) on 23rd December.

Upupa epops (Hoopoe).—One at Waternish (Skye) on 27th April, second record for Skye, and another was picked up dead at Leadhills on 1st June.

Cuculus canorus (Cuckoo).—The first two records are from the West, viz., at Dalry on 21st April ("Glas. Nat." vol. i. p. 72), and at Loch Awe on the 23rd. By the 24th it is recorded from Crosswood Reservoir (Midlothian). At Beith a Cuckoo's egg was found in a Hedge Accentor's nest, darker than most Meadow-pipit's and smaller than most Cuckoo's eggs

found in the locality. On 31st May an egg of this species was found in a Willow-warbler's nest in East Ross. On 1st July a Meadow-pipit's nest was found near Beith containing only one egg, and that a Cuckoo's; this egg hatched about the 12th, and the young bird was ready to leave the nest when about twenty-one days old. At Beith two young Cuckoos, one and two days old respectively, were put into a Meadow-pipit's nest: the larger threw out the smaller, three eggs and three young Meadow-pipits, the last-named twice over, making ten in all. In the same locality a Reed Bunting's nest was found with a Cuckoo's egg in it, about the same size as a Skylark's, but lighter brown. Return movements are noted on the Isle of May on 14th and 16th August, at Lahill (E. Fife) two adults were observed in the gooseberry nets on 22nd August, a young bird at Syre (Sutherland) on the 25th, and the last record for the year is a young bird near Largo (Fife) on 9th September.

Asio otus (Long-eared Owl).—Three are reported near Lerwick on 25th February, this being an unusual date for their appearance in Shetland. On 28th February a nest and two eggs of this species was found at Kirkliston, the other birds not laying till the end of March; incubation 28-31 days.

A. accipitrinus (Short-eared Owl).—A male was killed at the Mull of Galloway Light on 3rd March. Single birds on the Isle of May on 10th August, several on Fair Isle on various dates between 5th August and 18th October, one at Sule Skerry on 2nd November and one on the Pentland Skerries next day, while several are reported from Tiree on 20th November.

Buteo lagopus (Rough-legged Buzzard).—A mature female was shot at Borrolol, Sutherland, on 30th March, and one was seen at Moorfoot (Forth) in November.

Falco candicans (Greenland Falcon).—Single birds are reported from the Flannans on 1st, 2nd, and 14th December, from the Butt of Lewis on 4th December, Barra on 15th and 25th December ("A.S.N.H.," 1910, p. 119), and Inverbroom (W. Ross) on 28th December ("A.S.N.H.," 1910, p. 119).

Ardetta minuta (Little Bittern).—An adult male was caught alive at the opening of the Loch of Stennis into the sea on 14th May, the second record for Orkney ("A.S.N.H." 1909, p. 183).

Anser albifrons (White-fronted Goose).—One is recorded at Wick on 26th January and on 26th April—this species was travelling from Tiree towards Barra. One shot at Lerwick on 26th October, and large flocks in Tiree on 9th November.

A. brachyrhynchus (Pink-footed Goose).—A female was shot in the Moray Firth on 26th April. A number are recorded from Fair Isle during wild weather from the 7th to the 18th

October, one being shot. This is the first record of this species for Shetland ("A.S.N.H.," 1910, p. 67).

Bernicla leucopsis (Barnacle Goose).—Several single birds were seen at Fair Isle during the first three months of the year, two being procured: this species is new to Fair Isle. In autumn, the first is recorded at Dunrossness (Shetland) on 23rd October, hundreds at the Flannans on several dates between 26th October and 29th November, and a flock at Tiree on 21st November.

Bernicla brenta (Brent Goose).—A flock of about 500 is recorded in the Cromarty Firth on 31st March, about 100 there on 9th April and 60 on 3rd May. Five returned to the Dornoch Firth on 21st September, one at Dunrossness (Shetland) on the 29th, and at Fair Isle on 16th October an injured Brent was captured—this was an addition to the Fair Isle fauna. A great many in the Dornoch Firth on 6th November.

Cygnus musicus (Whooper Swan).—One was found dead at Morton Loch (N.E. Fife) on 18th January. Eight at Dunrossness (Shetland) on 19th October, and unusual numbers in Tiree on 8th November.

C. bewicki (Bewick's Swan).—A few on Tiree on 3rd November; very plentiful there later, throughout the winter.

Tadorna casarca (Ruddy Sheldrake).—An adult female was obtained at Sule Skerry on 18th June, the first record for the Northern Isles ("A.S.N.H.," 1909, p. 247).

Anas strepera (Gadwall).—A pair are reported from Morton Loch (Fife) on 25th January, and on the 29th a flock of 20-30 at the same place. A pair were seen on Bishop Loch near Glasgow on 25th April, and in June two nests containing five and seven eggs were found near a loch in S.E. Scotland ("A.S.N.H.," 1909, p. 184). A male was shot in Elginshire on 2nd November, and this duck is recorded from Tiree on the 10th.

Dafila acuta (Pintail).—Rather plentiful in Solway waters in the winter of 1908-9, and a male shot at the Edenmouth on 12th January. Last seen in Solway at Southerness on 28th February.

Mareca penelope (Wigeon).—The main body left Mull on 12th April, three were seen there on the 24th, and on the 28th the last flock is recorded from the Cromarty Firth. Two nests in E. Scotland on 22nd May with six and nine eggs respectively. A bird marked when young at Loch Brora (E. Sutherland) on 19th June, was captured in the province of

Groningen (N.E. Holland) on 3rd September ("Brit. Birds," vol. iii. p. 220). Reappeared on Linlithgow Loch on 26th August, and first seen on the Cromarty Firth two days later; about a hundred there by 4th September.

Fuligula ferina (Pochard).—Last seen at Kirkliston on 26th April. Returned to Kirkliston on 26th August.

Harelda glacialis (Long-tailed Duck).—A good many at Balcomie (E. Fife) on 22nd April, two at Fair Isle on 1st May. In autumn one is reported as seen in East Ross on 26th September, six off Fair Isle on 14th October; when diving they remained under water sixty-six and sixty-seven seconds. An adult male at the Isle of May on the 15th, and an adult male was shot inland near Gretna (Dumfriesshire) on 2nd November ("A.S.N.H.," 1910, p. 119).

Columba œnas (Stock-Dove).—Laying at Kirkliston on 15th April, hatched about the 23rd in East Fife. About 30 pairs were nesting in ivy-covered cliffs at Shiskin (Arran). Unusual numbers in Largo Bay on 9th August; and, 21st, "parties everywhere."

Turtur communis (Turtle-Dove).—A good many are reported, single birds being recorded from Kelso on 15th May, Fair Isle on 20th and 27th May, Syre (Sutherland) on 1st July, Fair Isle on the 7th, Dunrossness (Shetland) and the Flannans on 10th September.

Tetrao tetrix (Black Grouse).—A ♂ hybrid between a Blackcock and a Capercaillie hen was shot in Kincardineshire on 15th December ("A.S.N.H.," 1910, p. 120).

Coturnix communis (Quail).—Heard in E. Fife at five places near Crail from 2nd to 4th July. Several pairs bred in East Lothian; heard calling there in June and 10th July to 23rd August.

Crex pratensis (Corn-Crake).—Is first recorded from Beith in the West of Scotland on 18th April, and not till the 27th from the East Coast, when one was observed on the Isle of May; at Fair Isle on the 4th May. On the return journey one was killed at the Mull of Galloway Lighthouse on 31st August, and the last record for the year comes from Fair Isle on 18th October.

Porzana parva (Little Crake).—One was caught in a fishing-boat in Girvan Harbour on 29th March, the first record for Clyde ("A.S.N.H.," 1909, p. 185).

Rallus aquaticus (Water-Rail).—Single birds are recorded from Fair Isle, 6th February, and as killed at the lantern, Tarbatness, on 22nd March, and at the Mull of Galloway that night and the next. By a small loch near the Butt of Lewis on 18th April,

and Sule Skerry 20th June. In autumn several are noted at Fair Isle, one was killed at the lantern of the Isle of May on 16th October, and a single bird is noted from Tiree on the 24th.

Gallinula chloropus (Moorhen).—One was killed at the lantern of Davaar Lighthouse (Argyll) on 23rd February, and one is reported from the Isle of May just a month later.

Eudromias morinellus (Dotterel).—One was found dead at Bellshill (Lanarkshire) on 20th April ("Glas. Nat." vol. i. p. 135).

Charadrius pluvialis (Golden Plover).—On the hills at Beattock on 4th February. Small numbers at the Isle of May and Fair Isle on 22nd March, and 30 at the Butt of Lewis on 29th April. The return movement is first noted at Largo (Fife) on 8th July, a great many at the Cromarty Firth on 7th August, flocks arriving at Tiree on 17th September, and a number at Fair Isle on the 20th.

Squatarola helvetica (Grey Plover).—One in winter dress on the Dornoch Firth, 3rd June; fourteen at the Edenmouth on 31st August, seven being in summer plumage.

Vanellus vulgaris (Lapwing).—A considerable movement of this species took place in March, when it was numerous at the Isle of May on the 21st, and in uncountable numbers there and at Fair Isle next day; a rush to the lantern at these places being recorded the following night. At Lerwick and Isle of May great flocks on the 23rd, and several at Sule Skerry on the 25th. About one hundred on Fair Isle on 6th October, and this species participated in the movement at Aberdeen during a snowstorm on 14th and 15th November. A Lapwing ringed at Glenorchard (Stirling) on 17th June was shot 20 miles west of Pau, Basses Pyrenees, France, on 17th November ("Brit. Birds," vol. iii. p. 251).

Strepsilas interpres (Turnstone).—Present in East Fife throughout the summer.

Hæmatopus ostralegus (Oystercatcher).—Arrived at Sule Skerry on the 12th February, very numerous at Fair Isle on 8th March, and a small flock at the Butt of Lewis ont he 30th; by 3rd April it was on Loch Awe. On 5th June there were large flocks at the Edenmouth, and many hundreds there on 31st August.

Phalaropus fulicarius (Grey Phalarope).—Is twice recorded from Fair Isle in January and once in October, two being procured. This species is new to Fair Isle. Phalaropes, probably this species, are recorded from Sule Skerry in January and September.

Scolopax rusticola (Woodcock).—Notes of birds on spring migration come from Fair Isle on 23rd March, Sule Skerry on the

28th, and the Isle of May on the 31st. Several nests in Morayshire, last hatched 7th August ("Brit. Birds," vol. iii. p. 129). In autumn one is recorded from Dunrossness (Shetland) on 18th October, many there on 10th November.

GALLINAGO MAJOR (Great Snipe).—One was procured on Fair Isle in September.

G. CŒLESTIS (Snipe).—Is recorded as very numerous on Fair Isle on 19th and 27th January, 1st February, and 10th March. Scarce at Lerwick early in September, but plentiful by the 25th, on which day we have a note of arrivals at Fair Isle "flying round for quarters." Numerous in Tiree on 30th October, large numbers at the Butt of Lewis on 14th November, and next day at the Pentland Skerries (frost and snow). Again numerous in Tiree on 23rd November, and on 21st December in Mull; severe weather drove numbers within the burgh of Tobermory.

TRINGA MINUTA (Little Stint).—Two in Aberlady Bay on 4th September, and one at Fair Isle on the 30th.

T. SUBARQUATA (Curlew Sandpiper).—Two at the Edenmouth on 31st August, and five or six in Aberlady Bay on 4th September.

T. CANUTUS (Knot).—Small numbers remained throughout the summer at the Cromarty Firth. Four at Balcomie (E. Fife) on 14th August.

CALIDRIS ARENARIA (Sanderling).—Last seen in Largo Bay on 16th May, returned there 17th July.

MACHETES PUGNAX (Ruff).—One seen at Waukmill Glen Dam (E. Renfrew) on 29th August and 12th September, and two at Balgray Dam on the latter date.

TOTANUS HYPOLEUCUS (Common Sandpiper).—First seen on the West Coast at Dalry (Clyde) on 14th April, and two days later on the East beside the Tyne (E. Lothian), and Fair Isle 24th. First reported on autumn migration on 17th July in East Fife.

T. OCHROPUS (Green Sandpiper).—One was shot on the banks of the Ae in Dumfriesshire on 20th January, and one was seen on Fair Isle late in July.

T. FUSCUS (Spotted Redshank).—One seen at Waukmill Glen Dam (E. Renfrew) on 29th August and 12th September ("Glas. Nat." vol. i. p. 146).

T. CANESCENS (Greenshank).—A pair is reported from Tiree on 11th June, one at Largo (E. Fife) on 22nd July, two beside the Spey on 5th August, and two or three at the Edenmouth on 31st August. Two in East Renfrew on 12th September. Records come from the Cromarty and Dornoch Firths in April

and June, and from August to the end of the year mostly single birds.

LIMOSA LAPPONICA (Bar-tailed Godwit).—One was killed at the lantern at Tarbatness on 23rd March. A flock of about fifty at the Edenmouth on 5th June, and three in summer plumage in Largo Bay on 20th July. Small numbers stayed by the Cromarty Firth throughout the summer; on 28th September one was seen there "with creamy upper parts."

L. BELGICA (Black-tailed Godwit).—Single birds are reported from the Cromarty Firth on six dates between 23rd April and 16th September, July being the only month without a record. One at Luce Bay, Wigtownshire, on 13th August, and one shot at Morton Loch (Fife) on 20th August in interesting transition plumage, two at Tiree on the 27th, and one at Waukmill Glen Dam (E. Renfrew) on the 29th, and 12th September ("Glas. Nat." vol. i. p. 146).

NUMENIUS PHÆOPUS (Whimbrel).—A few in Tiree on 22nd April, becoming more numerous till the middle of May, several at the Butt of Lewis on 2nd May, and three at Fair Isle next day. In autumn about twelve at Balcomie (E. Fife) on 28th July. Last seen Isle of May on 25th September, several records from Fair Isle between 23rd July and 17th October, and four records from East Ross between 23rd September (3), and 16th November (1).

STERNA CANTIACA (Sandwich Tern).—First seen near Crail (Fife) on 22nd April. Quantities in Largo Bay on 24th August, and very many at the Edenmouth on the 31st. Last seen Isle of May on 9th October.

S. FLUVIATILIS (Common Tern).—First reported from Balcomie (E. Fife) on 22nd April, and next day from Largo Bay and the Cromarty Firth. In numbers in Aberdeenshire on the 29th. Numerous at the Isle of May on 18th July, young on the shore in Aberdeenshire, still being fed by their parents on 8th September, last seen there two days later.

S. MACRURA (Arctic Tern).—First reported on 3rd May from the Cromarty Firth, arriving at Tiree from the 12th till the end of the month, at Lerwick on the 23rd. Last seen at the Cromarty Firth on 4th September, the breeding Terns last seen at the Butt of Lewis on the 5th. Great numbers of migrating Terns, probably this species, are recorded as passing Lerwick on the night of 11th September and again on the nights of the 22nd to 24th; a number were round the lantern on the Isle of May early on 22nd September and at Fair Isle next night.

S. MINUTA (Little Tern).—First seen at St. Andrews (3) on 5th May, arriving at Tiree from the 12th to the end of the month.

Xema sabinii (Sabine's Gull).—An adult was seen at Lerwick on 25th July and again a few days later ("A.S.N.H.," 1909, p. 248).

Larus ridibundus (Black-headed Gull).—On northern passage at Mull on 5th March and many passing over Aberdeen on the night of the 21st. Arrived in Mull on the return journey on 7th July and next day hundreds appeared in Largo Bay, nearly all adults in full summer plumage. Thousands are recorded from the Bass Rock in December during frost, the first seen on the Rock by Mr. Campbell. One with roseate plumage shot at Inverbroom (W. Ross) on 9th December and many more roseate birds seen there later.

L. canus (Common Gull).—A number on Loch Awe on 19th March. Many arrived at Fair Isle on 5th October, while on the 14th (before a gale) there were an unusual number on this island, several hundreds being recorded.

L. fuscus (Lesser Black-backed Gull).—One in Glasgow Harbour on 13th March. Several still at Fair Isle on 5th October, and one at the Isle of May on the 23rd and 27th.

L. glaucus (Glaucous Gull).—Occurred in small numbers, mostly immature birds on Fair Isle during the first and last quarters of the year. One immature bird at the Isle of May on 24th October.

Megalestris catarrhactes (Great Skua).—Seen at Foula on 12th April. One at Fair Isle on 4th May, last seen there 8th October. A young bird was killed at Borrolol (Sutherland) on 19th October.

Mergulus alle (Little Auk).—Very numerous in the sea off Fair Isle on 20th January and 1st February, the numbers having decreased by the 5th, and single birds are recorded from Largo Bay on the 26th February and at St. Andrews on 10th March. Again noted off Fair Isle on 18th November becoming more numerous, till at the close of the year a great many were present.

Fratercula arctica (Puffin).—A white Puffin was seen at Sule Skerry on 18th June.

Colymbus arcticus (Black-throated Diver).—One young bird of this species was shot at Morton Loch (Fife) on 21st January, and one was seen off Gullane Ness on 27th December.

C. septentrionalis (Red-throated Diver).—Great numbers in Largo Bay on 15th February. St. Andrews Bay full of them on 30th September and a great many in Largo Bay on 27th December.

PODICIPES CRISTATUS (Great Crested Grebe).—Three or four at St. Andrews on the 25th January, one on Duddingston Loch on 14th March, the first seen there in six years. Single birds in the sea at St. Andrews on 2nd November and at Craignish (Argyll) on the 8th.

P. AURITUS (Sclavonian Grebe).—In 1908 a pair tried to breed on an Inverness-shire loch, but one parent was shot; in 1909 one or two pairs appeared on the same loch, but their nests were robbed by a private collector ("Brit. Birds," vol. iii. p. 380). One at Fair Isle on 9th September and 6th October; it stayed below water about half a minute when diving.

P. NIGRICOLLIS (Eared Grebe).—One is reported as having been seen on Bishop's Loch near Glasgow in 1909 ("Glas. Nat." vol. ii. p. 58).

P. FLUVIATILIS (Little Grebe).—Single birds were killed at the lantern at Tarbatness and the Isle of May on 22nd March.

PROCELLARIA PELAGICA (Storm Petrel).—Several at Sule Skerry on 18th June in holes and under stones. One at the Bass Rock found at 2 A.M. on 11th December lying exhausted on the pathway round the lantern.

OCEANODROMA LEUCORRHOA (Fork-tailed Petrel).—Two were killed at the lantern at Sule Skerry on 26th August and one was driven ashore by the rollers in a dying condition at Mull on 9th November.

PUFFINUS ANGLORUM (Manx Shearwater).—Two seen in the Firth of Forth on 10th June and about twenty on 5th August. Single birds were killed at the lantern on the Isle of May on 15th and 17th August.

FULMARUS GLACIALIS (Fulmar).—Arrived in the geos on Fair Isle on 23rd January. One was killed at the lantern at Sule Skerry on 2nd February. One found dead on shore at Kingsbarns, Fife, on 4th July ("Glas. Nat." i. p. 145).

[The Editors desire to express to Mr. John Paterson their indebtedness for, and high appreciation of, the series of excellent Reports on Scottish Ornithology which he was good enough to prepare for the "Annals." The Editors know from experience the labour involved in their preparation, which is infinitely greater than would be supposed by those who have not been engaged on such work.—EDS.]

ON VISITS PAID TO THE ISLAND OF N. RONA.

By Her Grace the Duchess of Bedford.

During the present summer I have on two occasions visited the Island of North Rona, viz. on 19th July and on 25th August. As on a previous visit in 1907, I landed without difficulty.

A cave running almost half-way across the narrow isthmus at the north-west end of the island affords an excellent landing-place on the western side. There is no anchorage on this side for a large vessel, and, as the sailing instructions vaguely inform one that "a low water rock lies two cables off the southern side of the island and others more than half a mile off," North Rona is more interesting to me than my Captain. The yacht therefore has to stand some distance out at sea.

The author of "The Fauna of the Outer Hebrides," describing his visit to the island in 1887, says: "The sea-pink, which grows in continuous profusion over the whole surface, filled the air with delicious fragrance, faint but sweet." The sea-pink was in bloom at the time of my visit, but by no stretch of the imagination could I have detected its fragrance amidst the all-pervading stench of the nesting-place of hundreds of Fulmars, Great and Lesser Black-backed Gulls and Herring Gulls, and his remark probably bears eloquent testimony to the great increase in these birds since that time, an increase which may possibly be due to the island being now entirely uninhabited. The Fulmars occupy not only the cliffs, but all the old ruins and even the sloping ledges of rock. The low peninsulas both at the south-west and northern ends of the island are thickly covered with the nests of the Lesser Black-backed Gull, and in smaller numbers the Greater Black-backed and Herring Gulls. The cliffs are tenanted by thousands of Puffins, Guillemots, Razorbills, Kittiwakes, and Shags. At the extreme south-western end is a large colony of Arctic Terns. Great numbers of Gannets were seen flying round the island, probably members of the colony nesting on Sulisgeir.

I found several Petrel haunts, but those I pulled out were all Storm Petrels. As they nest in the same places as the Fulmars it is somewhat difficult to detect them, and as I am still less able to discriminate between the odours of a Fork-tailed Petrel and the Storm Petrel I had to abandon the search for the former.

Numbers of Eider Ducks frequented the bays, and Rock Pipits were numerous, as also Oystercatchers.

The Fulmars are unpleasant people to deal with at close quarters. The adults allow one to approach within 4 or 5 feet before leaving the nest, and the young are able to squirt the oil a distance of 2 to 3 feet out of their mouths. When the supply of oil is exhausted they disgorge the contents of their stomachs, after which they may be handled with impunity, but after the last operation one ceases to desire to interfere with them. They seem loath to leave the nest long after the condition of their plumage would lead one to suppose that they could fly, and I confess that having seen the capture of the young Fulmars on St. Kilda by the cliff climbers, I feel less sympathy for them than I did when I had only read about it. They are so intensely stupid, sitting still to have their necks wrung, that I feel sure that Providence must have designed them to be caught in order to limit the surplus population of a bird which can have few other enemies. The manner of their death is rapid and merciful, and if the young Fulmar has cause for complaint it can only be that of thousands of other young creatures in the world, "Since I am so quickly done for, I wonder what I was begun for?"

I set my mouse-traps for several hours, but caught nothing. It is strange that it pays any one to keep sheep on the island. I saw a great deal of fresh mutton lying about, as also carcases in every stage of decay, and there can be but few months in the year when the grass affords them a diet to grow fat on. The few that are there are extremely wild.

At the time of my second visit in August, owing to there being rather more swell than on the previous occasion, an easier landing was effected by rowing to the extreme end of the cave. From here there is a curious gap sloping up from the sea to the grass-covered surface above. The

opening being very narrow, daylight cannot be seen from below, and, bending almost double, one has to feel one's way in comparative darkness for the first few yards. It is moreover extremely slippery, but the actual landing is less risky in a swell than jumping on to wet sea-weed at the mouth of the cave.

A great change had taken place amongst the birds since my visit in July. The Guillemots, Razorbills, Eider Ducks, and Terns had all gone. A few Puffins remained and a good many Kittiwakes and Fulmars. Some of the young Fulmars had not yet left the nest. Great and Lesser Black-backed Gulls were still very numerous, Herring Gulls had increased, and a few pairs of Oystercatchers were still about. In place of the departed breeding birds there had been a great immigration of Wheatears, Meadow Pipits, White Wagtails, and Waders. I think that the Rock Pipits had also increased. There must have been hundreds of Meadow Pipits and Wheatears on the island, and as I suspected the latter of belonging to the larger race I shot one. The wing measured 99 mm. White Wagtails, though not so abundant, were there in great numbers. A large flock of Curlews (upwards of 50) arrived whilst I was on the island, and I also saw a flock of Starlings. Many of the little spray pools were tenanted by Ringed Plovers, Dunlin, Redshanks, and Turnstones, and a solitary Heron flapped slowly away as I landed. I also put up a Snipe.

The Great Grey Seal was very much in evidence in the bays. Some of them appeared to be huge animals. It is a splendid place for watching them, as, when the boat has gone back to the yacht and all is quiet, they show up at the mouth of the cave only some forty feet directly below one in perfectly clear water.

The horrible modern tombstone erected to the memory of the last two inhabitants who died there in 1887, and placed in the little chapel-yard amongst the old locally carved stone crosses, had been re-whitewashed. If ever I commit sacrilege it will be here.

I had hoped to return to Rona the following day, but "the best laid schemes o' mice and men gang aft agley," and an easterly gale compelled me to go southwards instead.

NYSSIA ZONARIA, SCHIFF., IN THE OUTER HEBRIDES.

By Percy H. Grimshaw, F.R.S.E., F.E.S.
Natural History Department, the Royal Scottish Museum, Edinburgh.

This interesting and very local Moth, the so-called "Belted Beauty," has been known as a British species since the year 1834, but until recent years it was only recorded from the sand-hills on that part of the English and Welsh coast which stretches from New Brighton to Conway, a distance of less than 40 miles. Within the last few years, however, the insect has been observed, either in the caterpillar or imago state, in a few isolated localities in other parts of the British Isles, but always in the West, on coasts exposed to either the Atlantic Ocean or Irish Sea.

During an official collecting expedition in the month of June last I was fortunate in discovering what I believe to be an entirely new locality for the Moth, and one which considerably extends its distribution. I refer to the extensive range of sand-hills on the western shore of the island of South Uist, in the Outer Hebrides. For a distance of at least a mile and a half of the coast due west of Daliburgh, that is to say, on the Atlantic coast of the southern part of the island, the conspicuous and unmistakable caterpillar of *Nyssia zonaria* was seen in myriads crawling over rushes, *Lotus corniculatus*, and other low-growing plants which carpeted these interesting dunes. So numerous were they, indeed, that I found it necessary, before sitting down to rest, to look carefully lest I should crush numerous examples of this local, but here predominant, species.

In this connection it is interesting to find that my experience confirms an old record which was published by Mr. J. B. Hodgkinson in the "Zoologist" for 1844 and 1845 —and one that has for many years been received with suspicion and distrust. In the two notes referred to the Moth is recorded for Skye, while the island of "Bernarah" is also mentioned as a locality for the species. As these were the first (and until 1899 the only) records for Scotland it

may be interesting to quote what is actually said. In the "Zoologist" for 1844, p. 686, Hodgkinson writes: "A friend of mine who lately visited the Isle of Skye observed a great number of the larvæ of a Geometra, very similar to those of *Abraxas grossulariata*: they were feeding on the burdock, on the summit of Ben Beckley, where he shot a rock dove (*Columba livia*), the crop of which was completely gorged with them. A few of these larvæ have since changed into pupæ." The following year (1845, p. 1006) the same naturalist communicated the following note: "Caterpillar of *Nyssia zonaria* in Skye. I formerly made a communication respecting some larvæ which were found in the Isle of Skye, by my friend Mr. Cooper, of Preston ('Zool.' 686). I saw him last week, and learned that a female *Nyssia zonaria* had come out this spring, from one of the chrysalides that was uninjured. I hinted to Mr. Henry Doubleday what I thought they were. Now it is a question whether *Nyssia zonaria* is indigenous to the Hebrides or not; and those which have been found at New Brighton, Cheshire, have been originally imported thither among wool, etc., or rushes that have been used to pack up fish with. My friend informs me that the larvæ were in swarms upon the sand-hills of Bernarah, and several other islands which he visited."

It will be seen that some doubt is here thrown upon the question of the insect being a true native, especially in the Hebrides. In view of the fact that it has since been recorded from Tiree by Mr. William Evans ("Ann. Scot. Nat. Hist.," 1899, p. 239) and from several places in Ireland, I think there can be no doubt but that it is a truly British moth. When referring to the Tiree record in his "Lepidoptera of the British Islands" (vol. vii. p. 152), Barrett makes the pertinent remark that "it seems possible that the creature belongs naturally to this more northern latitude, and that this may help to explain the failure of the species to establish itself more extensively upon the English coast, where suitable sand-hills are by no means wanting." This opinion receives ample support from my experience of the caterpillar in such vast numbers on the extreme west of the Outer Hebrides, to which remote place its importation seems inconceivable.

A concise summary of the British distribution of *Nyssia zonaria* as now known may be useful:

England and Wales.—CHESHIRE AND NORTH WALES: Coast from New Brighton to Conway.
LANCASHIRE: Coast from Liverpool to Blackpool.

Scotland.—INNER HEBRIDES: Skye and Tiree.
OUTER HEBRIDES: South Uist and (?) Bernerah.

Ireland.—ANTRIM: Ballycastle.
MAYO: Achill Island and Bingham Castle.
GALWAY: Slyne Head and Roundstone.

ON THE SCOTTISH SPECIES OF *OXYURA* (*PROCTOTRYPIDÆ*)—PART V.[1]

By PETER CAMERON.

IN this part of the Catalogue of the Scottish Oxyura I have dealt with the *Diapriinæ*, and have recorded 47 species known to me from Scotland, namely, 14 of the tribe *Spilomicrini* and 33 of the tribe *Diapriini*. Of these 35 have been described by Dr. Kieffer as new species. I give also, within square brackets, the localities of 6 new species from England and 2 from Spain. *Spilomicrus compressus*, Thoms., is also an addition to the British Fauna. Marshall, in his Catalogue published by the Entomological Society of London, records 13 genera and 52 British species of *Diapriinæ*. Most of the species recorded in this Catalogue not taken by me, have been described by C. G. Thomson from Scandinavia and by Marshall himself from England. Not much appears to be known regarding the early stages of the *Diapriinæ*. Some have been bred from gall-making Diptera.

SPILOMICRINI.

SPILOMICRUS, West.

[*annulicornis*, K., Mickleham (C. G. Champion)].
1. *minor*, K., Dalry; Bishopton; Boxhill (C. G. Champion.)

[1] Continued from p. 95.

*2. *abnormis*, Marshall, Ballantrae.
3. *crassiclavis*, K., Bishopton.
4. *compressus*, Thoms., Kenmuir Bank, near Glasgow.
*5. *basalyformis*, Marshall, Bonar Bridge; Kingussie; Claddich; Loch Awe; Clober; Aviemore (C. G. Champion); Dunham Park, Cheshire; London District (C. G. Champion).
6. *integer*, K., var. *varicornis*, K., Cambuslang.
*7. *S. hemipterus*, Marsh., has been taken at Boxhill by Mr. C. G. Champion.

Idiotypa, Foer.

1. *nigriceps*, K., Mugdock.
2. *rufiventris*, K., Eccles, Dumfriesshire.

Paramesius, West.

1. *Cameroni*, K., Possil Marsh, near Glasgow.
2. *dentatus*, K., Mugdock.
3. *nigricornis*, K., New Galloway.

Aneurynchus, West.

1. *oviventris*, Thoms., Dumfries; Cheshire.
2. *ruficornis*, Thoms., Clyde at Newton; Loch Awe; Boxhill (C. G. Champion).
3. *obliquus*, K., Cadder.

DIAPRIINI.

Platymischus, West.

1. *dilatatus*, West. Frith of Clyde, near Cloch Lighthouse.

Basalys, West.

[*collaris*, K., York (F. G. Binnie).]
1. *rufiscapus*, K., Mull.

Loxotropa, Foer.

1. *macroptera*, K., Loch Awe.
2. *convexa*, K., Cadder.
3. *ciliata*, K., Dumfries; Clober; Lee (C. G. Champion).
4. *scotica*, K., Claddich; Cambuslang; Dumfries.
5. *sulcata*, K., Claddich.
6. *atricrus*, K., Clyde at Newton.
7. *cursitans*, K., Rannoch; Claddich; Lade at Cadder.

8. *longipennis*, K., Mull; Manuel; London District (C. G. Champion); Peak of Derbyshire in house.
9. *bifoveata*, K., Cambuslang.
10. *luctuosa*, K., Dumfries.
11. *unifoveata*, K., Bonar Bridge.
*12. *dispar*, Nees, Rannoch; Lade at Cadder.

Diapria, Latr.

*1. *conica*, Ltr., Cadder; Gloucester.
[*tetratoma*, K., Gloucester.]
*2. *oogastra*, Thoms., Cambuslang.
[*nocticolor*, K., York (F. G. Binnie).]
3. *clavatipes*, K., Bishopton.
4. *apicalis*, K., Bishopton.
5. *melanopa*, K., Mugdock; Ballantrae.
6. *inæqualis*, K., Cadder.
[*conotoma*, K., Alsasua, Spain (D. Sharp).
7. *petiolaris*, K., Bishopton.
*8. *verticillata*, Nees (Ltr. ?), Eccles; Dunham Park, Cheshire; Bexhill (Champion).
9. *ciliaris*, K., Clydesdale.
10. *varipes*, K., Cadder.

Phænopria, Ashmead.

1. *Cameroni*, Clyde at Newton; Mickleham (Champion).
2. *subimpressa*, K. I have no definite locality for this species.
3. *halterata*, K., New Galloway.

Trichopria, Ashmead.

1. *inermis*, K., Thornhill.
2. *atricornis*, K., Glen Lyon, Clyde, near Newton.
3. *fimbriata*, K., Craigton in fungus.

Galesus, Curt.

[*Cameroni*, K., Caterham (C. G. Champion).]
[*bispinosus*, K., Scarborough (D. Sharp).]
1. *parvulus*, K., Clober.
2. *atricornis*, K., Clober.
*3. *cæcutiens*, Marsh., Edinburgh.
[*mayeti*, K., var. *hispanicus*, K., and *rufimanus*, K., Gibraltar (J. J. Walker, R.N.).]

CONTRIBUTION TO OUR KNOWLEDGE OF THE HYDROID FAUNA OF THE WEST OF SCOTLAND.

Being an Account of Collections made by Sir John Murray, K.C.B., on S.Y. "Medusa."

By James Ritchie, M.A., B.Sc.,
The Royal Scottish Museum.

This paper is an almost insignificant attempt to reduce our ignorance of the marine invertebrate fauna of the West Coast of Scotland. Apart from that relating to the Clyde Sea area, to which many skilled and painstaking naturalists have devoted their attention, little information can be gleaned of the natives of our western seas. This is the more to be wondered at since the Atlantic Coast has already shown itself to be worthy of close scrutiny. Not only the recent magnificent researches of the Irish Fishery Board on the west of Ireland, but even casual records from Scottish waters, foretell that the western coast of Scotland will yield to the investigator many kinds of animals at present regarded as members of a more southern fauna, and many kinds also, unknown on our eastern coasts, which will link the fauna of South-Western Europe with that of Norway.

The material to which I had access consisted of collections brought together by Sir John Murray and presented by him to the British Museum (Natural History) between the years 1887 and 1892. But in order to make the account of the work accomplished by the "Medusa" as thorough as possible, I have included the references to Hydroids contained in the yacht's log-books, and in various lists of species representing the content of collections examined by experts at Sir John Murray's request. Such manuscript records are indicated by "(M.)," and although some of them have already been published in the British Association volume, "Fauna, Flora, and Geology of the Clyde Area" (1901), the desire to make this a comprehensive list of the Hydroids collected by Sir John Murray in the West has induced me to repeat them here.

In addition I have included a few species collected by Dr. Oswald Fergus of Glasgow, Dr. J. N. Marshall of Rothesay, and myself, in the Kyles of Bute, off Tighnabruaich and the Burnt Isles, amongst these being the boreal *Thuiaria tenera*, a species hitherto unknown to British lists.

In these records there has been given, even in the case of common forms, every locality at which a species was obtained; but for this seeming triviality there need be no apology in days when the necessity for the closer and more detailed intensive study of the distribution of marine animals has been recognised. In order to simplify reference, however, I have grouped the records; those from the Clyde Sea area being arranged as in the scheme adopted in the British Association handbook mentioned above and shown on the map which accompanies that volume. In recording epizoïc forms the name of the host species has invariably been stated where it was known, in the hope that accumulation of evidence may reveal some constancy of association between epizoon and host; for in discussing the Hydroid fauna of the Mergui Archipelago, I have already shown that all Hydroid species are not equally subject to infestation by extraneous Hydroid growths. Synonyms have been inserted where the recognised name of a species has altered since Hincks wrote his classical "History of the British Hydroid Zoophytes" (1868), but it has been considered necessary to refer the reader only to the name made use of by Hincks.

The collections made from the "Medusa" contained representatives of 75 species: 14 Gymnoblastea, 61 Calyptoblastea. Three of the latter are worthy of special mention as being recent additions to the fauna of Britain. *Parascyphus simplex* (Lmx.), from between Sanda Island and Ailsa Craig, has not hitherto been found in the North Atlantic Ocean, and for this species I have found it expedient, on account of its Campanularian habit associated with its Sertularian hydranth, to institute a new genus. *Thuiaria tenera* (Sars) is not to be found in any British list, though, strange to say, a specimen from "Great Cumbray" exists in the Vienna Natural History Museum, its presence there having been recorded by Marktanner-Turneretscher in 1890. The addition of *Polyplumaria flabellata*, Sars, to the British

fauna by the two records here given, was anticipated by a few months through the discovery of Dr. Jäderholm that the collections of the Swedish National Museum contained some specimens from an indeterminable locality in the Shetland Islands.

In conclusion it gives me pleasure to thank Mr. R. Kirkpatrick of the British Museum, but for the facilities given by whom this collection could not have been examined by me; Sir John Murray, K.C.B., and Mr. J. Chumley of the "Challenger" Expedition Office, the former especially for his generosity in granting me access to his log-books and manuscript lists; and Miss J. J. Elliot for assistance in the classification of localities.

These symbols have been employed: (M.), record extracted from the log-books of the "Medusa," or from manuscript lists in the possession of Sir John Murray. Referring to the frequency of occurrence of specimens: c., common; m.c., moderately common; c.c., very common; r., rare; m.r., moderately rare; r.r., very rare.

GYMNOBLASTEA.

Family CLAVIDÆ.

1. Clava squamata (Müller).

Clyde Sea Area.—Dunoon Basin, 20-40 fms.; W. shore (M.). Kyles of Bute—Burnt Islands, on *Fucus* at low water, c.

Family BOUGAINVILLIDÆ.

2. Perigonimus repens (Wright).

Clyde Sea Area.—Barrier Plateau—between Sanda Is. and Ailsa Craig, 24-28 fms.

Loch Etive, 30-40 fms.

Loch Carron, 60 fms., on outside and inside of shell of *Chrysodomus antiquus*.

3. Dicoryne conferta (Alder).

Clyde Sea Area.—Barrier Plateau—Sanda to Achinhoan, 19 fms., r.r. (M.).

4. Bougainvillia ramosa (van Beneden).

The branching and habit in general, and the structures of the perisarc of the colonies, agree so closely with those of *B. ramosa*,

that, even although hydranths are absent in the specimens from both localities, there can be little doubt of the specific identity.

Mull of Cantyre, 49 fms.
Firth of Lorne, 50-70 fms., 3 fine colonies, 5 cms. high.

5. Hydractinia echinata (Fleming).

Clyde Sea Area.—Gareloch (M.)—head to Shandon, 14-22 fms.; head to Stroul, to 23 fms., c.; W. side, 10-20 fms., c.; centre above Narrows, mud, 20-30 fms., c. Loch Goil (M.)—shore, low water, m.c.; head to Stuckbeg, 25-45 fms., m.c.; E. side below pier, 30-35 fms.; Beach Point to Stuckbeg, 20 fms.; W. side, off Aird Madailh, soft mud, 20 fms.; off Ardminean Farm, 10-12 fms.; outside Barrier, 10-12 fms., m.c. Dunoon Basin (M.)—E. side, 6-20 fms., m.c.; centre, 10-20 fms., m.c.; W. side, 6-8 fms., r. Loch Striven (M.)—E. side, 10-30 fms., c.c.; Berry's Pier, 15-25 fms., r.; centre, 30-40 fms., c.c.; W. side, 15-35 fms., m.c. Upper Loch Fyne (M.)—E. side, 10-30 fms., m.c.; below Strachur Pier, stones, gravel, and sand, 10-15 fms., c.c.; Newton Bay, stones and sand, 10-20 fms., c.c.; W. side, 10-15 fms., m.c.; off Crarae, 3-9 fms.; centre, 34-36 fms., m.c.; Minard Narrows, 12-20 fms., c. Arran Basin (M.)—Kilbrennan Sound—Otterard to Carradale, 18-20 fms., r.; off Davarr Is., 20 fms., r. E. section—off Ardrossan, 10 fms., c.; off Pladda, 30-35 fms., r. Barrier Plateau (M.)—Sanda to Achinhoan, 19 fms., m.c.; between Sanda and Ailsa Craig, 24 fms.
Mull of Cantyre, 50 fms.
Loch Etive, 30-40 fms., on *Trochus*.
Loch Sunart, 45-50 fms., very fine specimens, with long tentaculozooids bordering margin of shell.
Sound of Sleat, Knock Castle, mud, shells, 40 fms. (M.).

Family EUDENDRIDÆ.

6. Eudendrium capillare, Alder.

Clyde Sea Area.—Arran Basin—Kilbrennan Sound, 10-15 fms., on *Thecocarpus myriophyllum*.
Mull of Cantyre, 50 fms.
Firth of Lorne, five records at depths varying from 30-110 fms., on *Abietinaria abietina* and *Tubularia indivisa*.

7. Eudendrium rameum (Pallas).

Clyde Sea Area (M.).—Upper Loch Fyne, centre. Arran Basin—Kilbrennan Sound; off Largs, 20 fms.; Millport

Bay, 6 fms. Barrier Plateau—Sanda to Achinhoan, 22 fms., r.
Sanda Is., 35 fms.

8. Eudendrium ramosum (Linn.).

Clyde Sea Area (M.).—Upper Loch Fyne—off Dunerave Castle, 30 fms.; centre, between Strachur and Inveraray, 70 fms. Arran Basin—Kilbrennan Sound. Barrier Plateau—Achinhoan Head to Davarr Is., sand, 17-20 fms.
Firth of Lorne, two records at depths between 50-70 fms.

Eudendrium, sp. indet.

Clyde Sea Area.—Barrier Plateau—between Sanda Is. and Ailsa Craig, 24 fms.

Family CORYNIDÆ.

9. Coryne pusilla, Gærtner.

Clyde Sea Area.—Kyles of Bute—Burnt Islands, on rocks at low water, c.

10. Syncoryne pulchella, Allman.

Firth of Lorne, 70-80 fms. (M.).

Family PENNARIDÆ.

11. Stauridium productum, Wright.

Only a single immature hydranth, which I imagine belonged to this species, was observed, growing on a specimen of *Lafoëa dumosa*. The hydranth was small, with four short capitate tentacles, and was divided into two portions, the lower stem-like portion being rather longer than the upper. Unfortunately the polyp was lost during an attempt to detach it for closer examination.

Firth of Lorne, 30-50 fms.

Family TUBULARIDÆ.

12. Tubularia coronata, Abildgaard.

Clyde Sea Area (M.).—Gareloch—head and E. side, 7-12 fms.; head to Stroul, r. Dunoon Basin—E. side, 5-42 fms., r. Loch Striven—E. side, off Strome Pt., 10-15 fms., r.r. Arran Basin—centre, off Saddell, 47 fms., r.
Firth of Lorne, 70-80 fms.

13. Tubularia indivisa, Linn.

Clyde Sea Area.—Dunoon Basin (M.), 20-40 fms.; E. side, 35-42 fms., m.r.; centre, 10-40 fms., r. Loch Striven (M.)—head, 10-15 fms., r.; E. side, 15-30 fms., r.; centre, 10-15 fms., r.; W. side, 20-30 fms., r.r. Arran Basin (M.)—Kilbrennan Sound, centre, off Saddell, 47 fms., c.c.; S. end of Bute, off Pladda, 30-35 fms., c. Barrier Plateau (M.)—Sanda to Achinhoan, 19 fms., r.; between Sanda Is. and Ailsa Craig, 24 fms.

Mull of Cantyre, 65 fms.

Firth of Lorne, 30-50 fms., in considerable quantities; 70-80 fms.

Upper Loch Torridon, mud, 30-40 fms. (M.).

14. Tubularia larynx, Ellis and Solander.

Clyde Sea Area (M.)—Gareloch—head to Stroul. Loch Goil—head to Stuckbeg, 20 fms., r.; W. side up from Aird Madailh. Dunoon Basin—centre, 30-40 fms., r.

(*To be continued.*)

CONTRIBUTION TO A FLORA OF CAITHNESS. No. V.

By Arthur Bennett, F.L.S.

Following up the notes in the "Annals," Oct. 1904, the following records, corrections, etc., have accumulated.

1. Mr. J. Greg Nicolson contributed to the "Trans. Edinb. Bot. Society," vol. xxii. (1905), pp. 41-45, 'Some rare Caithness Plants, with Notes.'
2. Rev. D. Lillie, 'Hepatics of Caithness,' "Journ. of Botany," 1905, p. 124.
3. Mr. G. C. Druce, 'Caithness Plants,' "Ann. Scot. Nat. Hist.," 1904, p. 168.
4. Mr. G. C. Druce, 'Plants of Sutherland and Caithness,' *l.c.*, 1908, pp. 39-106.

Mr. J. A. Harvie-Brown of Larbert very kindly sent me a copy of R. Dick's Catalogue, transcribed for him at Thurso, but unfortunately I am not competent to judge of the value of the extracts.

It was marked thus: "Red C."—Caithness plants so marked by Dick. "Black C."—Do. wild plants not marked as such in Dick's Herbarium, though several are virtually so, or referred to in Smiles' "Life of Dick."

† Plants occasionally found wild in Caithness, but probably or evidently introduced.

* Garden escapes, trees in plantations, weeds of cultivation, casuals, aliens, etc.

I have collated this with my own Catalogue and papers on the Flora, and additions are here given. Those marked as "Garden escapes, etc.," I have marked with the star.

ANEMONE NEMOROSA, *L.*—Marked by Mr. Nicolson in his catalogue for Caithness; on record for 108 counties.

Mr. Nicolson (*l.c.*) mentions that specimens of aquatic *Ranunculus* from Staxigeo "vary much, and on comparing them with the descriptions and figures in Sowerby's "Eng. Botany" one seems to have a choice between calling them intermediate forms of *R. Drouetii*, *R. Baudotii vulgaris*, and *R. Baudotii confusus*, or supposing the differences between them are imaginary."

Now there is no better defined species of the aquatic section than *R. Baudotii*, and the differences from *R. Drouetii*, even when dried, and still more when living, are so definite that it suggests that his specimens may be hybrids, as I do not remember, in the thousands of specimens that have passed through my hands, *Baudotii* ever being named *Drouetii* or *vice versa*.

RANUNCULUS FLAMMULA, *L.*, var. RADICANS, *Nolte.*—Wick river, Grant, *sp.*

R. ACRIS, *L.*, var. TOMOPHYLLUS (*Jordan*).—Reay, etc., Grant, *sp.*

R. ACRIS, *L.*, subsp. STEVENI, *Andrz.*—Marshall and Shoolbred, "J. Bot." 1898, p. 167.

CALTHA PALUSTRIS, *L.*, var. GUERANGERII (*Bor.*).—Reay, Dr. Ward. Neither name nor locality given at p. 249, 1892.

*ERANTHIS HYEMALIS, Salisb.

*DELPHINIUM AJACIS, *L.*

ARABIS HIRSUTA, *Scop.*—A small (3″ high) form of this with long transparent hairs on Yarrows hills, R. Bain, *sp.*, 1909.

CARDAMINE HIRSUTA, *L.*—A nearly glabrous form from Yarrows, A. Sutherland, *sp.*

*ALYSSUM MARITIMUM, *L.*

*Brassica Napus, *L.*, *B. Rutabaya, *DC.*, and *B. Rapa, *L.*, sativa

Draba incana, *L.*, var. gracilis (*D. gracilis*, Led. "Fl. Ross." i. (1842), p. 152).—Gelert, in "Bot. Tiddsk.," 1898, p. 310, says: "This is a thin form of *D. incana* with only few leaves on the stem." Such weak plants have often been called *D. hirta*. Some Caithness specimens seem to agree with Ledebour's description.

Cerastium vulgatum, *L.*, var. holosteoides, *Fr.*—Reay Links, W. R. Linton, *sp.*

C. semidecandrum, *L.*—Downreay, Holborn Head, Druce.

Arenaria peploides, *L.*, var. diffusa, *Hornem.*—Downreay, near Murkle Bay, Druce.

Spergularia marginata, *Kittel.* (*S. halophila media*, Marss).—Roadside near Wick, R. Bain, *sp.*

Montia fontana, subsp. lamprosperma, *Chamisso* in Linnæa, 1831; var. major, *Bab.* (= *M. fontana*, var. *rivularis*, Syme, *teste* Beeby).—John O'Groat's, Miss Geldart, 1899; shores of Yarrows lochs, J. Grant.

Hypericum pulchrum, *L.*, var. procumbens, *Rostrup.*—Holborn Head, "Bot. Ex. Club Rep." 1897 (1898).

*Geranium phæum, *L.*

*Ilex Aquifolium, *L.*

Acer campestre, *L.*

Radiola Millegrana, *L.*—Dunnet Hill, Miller, *sp.*

Parnassia palustris, *L.*—Abundant on the banks of the Thurso river, Miller, *sp.*

Lotus corniculatus, *L.*—Near top of Morven, 2300 ft., J. Grant, *sp.*

Lathyrus montanus, *Bernh.*, var. tenuifolius, *Roth.*—Among heath and juniper on river braes near Wick, R. Bain, *sp.*

Rubus idæus, *L.*—Among boulders at summit of Morven, J. Grant, *sp.*

†Pyrus Aria, *L.*, Brown, Campst., in "Tr. Bot. Soc. Edin." 1860.—Planted about Castleton, Druce, *l.c.*

Epilobium palustre, *L.*, var. lavandulæfolium, *Lec. et Lam.*—Probably seen by Rev. E. S. Marshall ("J. Bot." 1889, 146).

Peplis Portula, *L.*—Bower, D. Doull, *sp.*

Callitriche palustris, *L.*, (*vernalis*, Koch).—I have seen no specimen that could be referred to this segregate from Caithness.

C. intermedia, *Hoffm.*, var. tenuifolia (Persoon, *sp.*, 1805).

C. HAMULATA, *Kuetz*, var. TENUIFOLIA, *Lönnr.*, 1854.

C. HAMULATA, *Kuetz*, var. HOMOIOPHYLLA (Gr. et Godr. "Fl. Fr." vol. i. (1848), 591, where they say, "Variété souvent stérile." This form seems to be far more plentiful in the north than in the south, and is often named "C. autumnalis, *L.*").—Halkirk, Dr. Davidson, *sp.*

In Neuman's "Sveriges Flora" (1901), p. 308, he seems to make for the idea of hybridity, and has a species *C. bicuspidata* (*C. hamulata*, auct. *p.p.*), which may be the product of *C. polymorpha*, Lönnr., and "*C. hamulata*, auct." What is here supposed to be "*C. hamulata*, auct." is not given for Sweden, though it is not explained what the author himself means by this *hamulata*. Hoffman's name *intermedia* is certainly older, and more appropriate, as the various states do shade off towards *autumnalis* on the one side, and towards *vernalis* on the other. There is a *C. intermedia*, Hoppe, but Hoffman's name seems to be one year earlier. These plants must be in good fruit to be certain of the naming, except *C. autumnalis*, L., which is generally to be recognised by leafage alone. Fries, has a *C. tenuifolia* ("Nov. fl. Suec." ed. 1, 1814), which Hartmann puts to *C. hamulata*, Kütz, with a ?.

SANICULA EUROPÆA, *L.*—Braes above Wick river, with ivy, juniper, hazel, etc., half a dozen tufts, 1906, R. Bain, *sp.*

GALIUM VERUM, *L.*, var. MARITIMUM, *DC.*, 1805 (= *littorale*, Breb., 1836).—Dunnet Links, Grant, *sp.*

ACHILLEA MILLEFOLIUM, *L.*, var. VILLOSA, *Hartm.*—Coast near Scrabster, E. S. Marshall, *sp.*

MATRICARIA INODORA, *L.*, var. PHÆOCEPHALA, *Rupr.*—East Coast, Grant.

PETASITES FRAGRANS, *Presl.*—River-side at Thurso, J. Grant.

TANACETUM VULGARE, *L.*—On sea-cliffs near Clairdon Head, Druce.

CARDUUS ARVENSIS, *Curt.*, var. HORRIDUS (Wimm. and Grab., sub. *Cirsium*).—Gersa, Watten, A. Sutherland.

CREPIS VIRENS, *L.*, var. AGRESTIS (*Willd*). — Watten, A. Sutherland, *sp.*

C. PALUDOSA, *Moench.*—Brae below Sibster, A. Sutherland, *sp.*

HIERACIUM LEYI, *F. J. Hanb.*—Thurso, Rev. H. J. Riddelsdell.

H. RIGIDUM, *Hartm.*, var. FRIESII, *Dahlst.*—Berriedale cliffs, Linton, 1888.

H. SCHMIDTII, *Tausch.*—Banks of the Isauld Burn, W. F. Miller!.

H. PROXIMUM, *F. J. Hanb.*—Between Thurso and Scrabster, E. S. Marshall, 1897. First found by Mr. J. Grant in 1883!.

H. GRAVESTELLUM, *Dahlst.* (*rhomboides*, Stenstr.).—Thurso, Rev. H. J. Riddelsdell.

H. CERINTHIFORME, *Back.*—Thurso, Druce, *l.c.*

H. RUBICUNDUM, *F. J. Hanb.*, var. *β* BOSWELLII, *F. J. H.* (*H. Boswellii*, Linton).—Strath of Dunbeath, Linton.

H. SOMMERFELTII, *Lindeb.*—Berriedale, form with very hairy leaves, Linton.

H. SILVATICUM, *Gouan*, var. PHÆOTRICHUM, *Dahlst.*—Thurso, Rev. H. J. Riddelsdell.

H. SARCOPHYLLUM, *Stenstr.*, var. EXPALLIDIFORME, *Dahlst.*—Reay, Linton's "Brit. Hieracia," p. 55.

H. SUBANFRACTUM, *E. S. Marsh.*—Thurso, Rev. H. J. Riddelsdell.

H. VULGATUM, *Fr.*, var. SUBFASCICULARE, *W. R. Linton.*—Berriedale and Dunbeath, "Brit. Hieracia," p. 64.

H. STRICTUM, *Fr.*, var. OPSIANTHUM, *Dahlst.*—Thurso river and Wick river, "Brit. Hieracia," p. 86.

(*To be continued.*)

CONTRIBUTIONS TO A FLORA OF THE OUTER HEBRIDES. No. 4.

By ARTHUR BENNETT, F.L.S.

(*Continued from p.* 170.)

U. NEGLECTA, *Lehm.* (= *U. major*, Schmidel, *ex* Keller). The plant referred here, gathered by Dr. Shoolbred in "a small loch near Loch Maddy in North Uist," I believe to be correctly named. This species seems to vary in size more than the others, I have specimens with flowering stems 20 inches long and pedicels 1½ inches long from "Staines, Middlesex, G. Nicholson." These I refer to the *U. neglecta*, Lehm., "*f. gigantea*, Prahl,[1] mit 1.5 m. langem Blütenstand fand Prahl!."

Dr. Williams ("Prod. Fl. Brit." p. 6 (1909), p. 346) makes this the *β major* of *U. vulgaris*; and quotes Herr Meister as saying that he considers *vulgaris* and *neglecta* are extreme states of one species. I cannot agree with this. *U. neglecta* is abundant in one spot in Surrey, and flowers freely, and both grow together under the same conditions.

U. INTERMEDIA, Hayne. Scarp, W. S. Duncan, *sp.* "Small lochs and ditches in N. Uist, Harris, and Taransay," Dr. Shoolbred.

[1] In Prahl's "Krit. Fl. Schl.-Holstein" (1890), p. 173.

U. MINOR and U. INTERMEDIA grow near together in Scarp, so that Dr. Neuman's contention that *U. ochroleuca*, Hartm., is a hybrid between these two species seems reasonable.

U. MINOR, Linn.—Island of Scarp, by Harris, July 1893, *leg.*, W. S. Duncan.

If rightly placed here, a very delicate form with fine filiform leaves, very numerous bladders on pedicels ¼ inch long, without leaves, as well as numerous bladders on the leaves; evidently would have produced flowers, and already bore "winter-buds," the flowering stems from the axils of leaves with bladders. I am inclined to think that where the flower-stems are produced late, if the flowers are not developed "winter buds" take their place? Dr. Williams (*l.c.*) remarks that Zabel has described a land form of *U. minor*. Such I found on Woking Heath, Surrey, growing among moss and without any water at that date (July 17, 1880), with flowering stems 3 to 5 inches high, and flowers expanded. I have a very delicate form of *minor* from Flinders Moss, near Stirling, A. Croall, 1880. Mr. Croall was very successful in showing the flowers, his specimens of *U. neglecta* are beautifully dried.

U. BREMII, Heer.[1]—"Aug.-Sept. *U. pulchella*, C. B. Lehmann in *litt.* Simillima *U. minori*, sed omnibus partibus paullo robustior, sepala subrotunda subreniformia apiculo minuto," etc.

To this I refer "*Utricularia*, Loch-a-na-Suinahe, Broadford, Skye, July 1895, S. M. Macvicar," and "*Utricularia*, East Loch Fad, Isle of Colonsay (V.C. 102), 26/7/1908, M. M'Neill;" and specimens gathered by Messrs. Marshall and Playfair at "Moss of Inshoch near Nairn, and in another station about a mile distant (V.C. 96) on 13/8/1898 (ref. No. 2176)," are I believe *Bremii*. They agree well with the plate (drawn from an authentic specimen) by Mr. N. E. Brown for "Eng. Bot. Supp.," but unfortunately not published. I refer here also a plant from "Loch Urr, Kirkcudbright, July 1888, Mr. Coles." A specimen from "Moidart, 1891, S. M. Macvicar, I cannot place anywhere. It has the habit of *ochroleuca*; but branches given off from the main stem (2 ins. long) are almost leafless, with 25 to 40 bladders (the original specimens of *ochroleuca* have very few bladders), rather larger than those of *minor*, but on branches each bearing three, and wonderfully simulating the drawings of Cladocera or Water-fleas.[2] I can only suggest such a combination as *U. neglecta* × *minor* (*U. major* × *minor*). Focke, in "Pflanzen-Mischlinge," 1881, gives no hybrids of *Utricularia*. *U. ochroleuca* has been recorded also from Germany

[1] "Fl. d. Schweiz," 1840, p. 984.

[2] R. Gurney, "Trans. Norf. and Nor. N. Soc." viii. (1905), 44.

as *U. brevicornis*, Celak,[1] and from the Vosges under the name of *U. intermedia*. I do not know what *U. spectabilis*, Madauss, may be; but it is placed under *neglecta* by Boll,[2] and seems to differ but little from that plant. The history of *U. Bremii* as a Scottish plant is interesting. There is no doubt the Rev. J. B. Brichan was the first to gather it in 1833, in the Moss of Inshoch in Nairn; and there is a specimen in Kew Herbarium from him attached to a sheet of continental examples of *U. intermedia*.[3] In the "Phytologist," i. (1842) 259, he discusses whether the specimens belong to *intermedia* or to *minor*. In June 1836 the plant was gathered by Bremi by the Lake of Katzen near Regensdorf, Canton Zurich. They were described by Heer, *l.c.* in 1839. It was first definitely included in the British Flora, by Mr. F. M. Webb in the "Journal of Botany," in 1876, p. 142. Prof. Babington, in the 3rd edition of his "Manual," 1851, p. 257, remarks "*U. Bremii* (Heer) is probably a native"; but this seems to have arisen from some idea that it was a Fen plant.

UTRICULARIA OCHROLEUCA, *Hartmn.*

U. INTERMEDIA, *Hayne* × MINOR, *L.*, *N. Neuman*.[4]—Two forms are reported, viz. *f. subintermedia* and *f. subminor* (= *U. ochroleuca*, *f. microceras*, J. Strandmark, *in exsic.* from specimens sent by Dr. Neuman). I have also excellent specimens from "Helsingel, Sweden," July 1871, legit R. Hartmann, comm. Dr. Nordstedt, "e loco classico."

Here I would doubtfully place Dr. Shoolbred's plant from "small shallow loch and stream near Tarbert, Harris, July, 21/7/1894," named at that date *U. minor* by myself.

Other specimens that I believe to belong here are—"Harris, July 1889, Mrs. Duncan, comm. Mr. King."

For additional notes on *Utricularia*, see Linton in "Trans. Ed. Bot. Soc." 1894, p. 110, and "Proc. Dorset Nat. Hist. Soc." xv. (1894) p. 81.

AJUGA PYRAMIDALIS, *Linn.*—Scarp, high bank of a stream near the coast, and on slopes near, some twenty specimens, commencing to flower early in May.

South-west side of the hill of Maodal, Harris, at 100 feet. South-west slope of Ben Chaipaval, at about 300 feet, in rough ground among heather and short grass, and moderately dry, Duncan.

North bank of the ravine at the mouth of the River Creed, on a high rocky cliff, now wooded. A limited number of plants come up every year, W. J. Gibson.

[1] "Österr. Bot. Zeit." 1886.
[2] "Fl. Meckl. Suppl." 1864, p. 125.
[3] Dr. Williams, *l.c.* p. 369.
[4] "Bot. Notiser," 1900, p. 65.

PLANTAGO MARITIMA, *Linn.*, var. PYGMÆA, *Lange.*—St. Kilda, plentiful, R. M. Barrington ("Journ. Bot.," 1886).

ATRIPLEX BABINGTONII, *Woods*, var. VIRESCENS, *Lange.*—On the beach near Stornoway, Trail (Ann. Scot. Nat. Hist., 1909, p. 250).

EUPHORBIA DULCIS, *Linn.*—Sent from Lewis as wild, but no doubt a garden escape, Trail ("Ann. Scot. Nat. Hist.," 1906, p. 180).

MERCURIALIS PERENNIS, *Linn.*—Near Stornoway, W. J. Gibson, *sp.*

CORYLUS AVELLANA, *Linn.*—"A number of bushes on the rocky banks overhanging the sea near Lochboisdale in South Uist," Somerville, *sp.* Undoubtedly native on cliffs in North Harris and South Harris, Shoolbred. Mr. Watson remarked, "In the Hebrides the Hazel has perhaps been introduced again, after having become extinct there." This referred to Balfour and Babington's station of "Rhoddal in Lewis,"[1] which was admitted to be a very doubtful one. But Mr. Watson[2] remarks, "the question respecting its nativity in the Hebrides would seem to be satisfactorily answered in the affirmative; Mr. Macphail is said to have found some hazel-nuts in a large moss drain in the Lewis, at a depth of nine feet from the surface."[3]

SALIX HERBACEA, *L.*—In the "Annals," 1905, p. 171, I gave 600 feet in St. Kilda (Barrington, *sp.*), as the lowest known British altitude; since then ("Annals," 1908, p. 107), Mr. Druce records it from "near coast level at Cape Wrath, A. M. Bell," this is of course a very exposed position, but none the less a remarkably low altitude.

It is given in the paper by Babington from the "top of Knockgava[4] at a lower level than before," but he had no instruments for measuring heights.

PINUS SYLVESTRIS, *L.*—Remains of this are found in post-glacial deposits in Lewis (Trail, *in litt.*)

ALNUS-GLUTINOSA, *L.* †?—Stream-side, Rhoddill Glen, South Harris, Dr. Shoolbred.

†BETULA VERRUCOSA.—Rhoddill Glen, South Harris, planted, Dr. Shoolbred.

[1] "Trans. Bot. Soc. Edin.," I (1844), p. 151.
[2] "Cyb. Britt.," iii. (1852) p. 507.
[3] "Bot. Soc. Edin.," *ex* "Phytologist," iv. 523.
[4] "Journ. of Life" (1841), 105.

The following account of the Orchids of the Isle of Scarp by Mr. Duncan, is of interest, as showing the habitats much more fully than usual.

MALAXIS PALUDOSA, *Sw.*

1. Among grasses and sedges in very shallow slowly flowing water beside Loch Steoavat, on the south side of Strone Udemul at 430 feet altitude, but small.

2. Among very short, damp sphagnum, in two other spots on the south side of the same hill, and at the same altitude.

3. In and beside a small pool of stagnant water on a natural terrace on the east side of the same hill, at 800 feet, here it is as large as it grows in North Harris in pure water, and among abundance of green sphagnum.

4. On shallow disintegrated peat which is damp and often rather watery on the south-east, at 360 feet, near the pass called "The Cloup."

5. On ground which has been out of cultivation a good many years, on a narrow ridge covered with a dense coat of grass, with an open drain on either side, on the south-east side of the hill, at about 250 feet. Here it is very small.

LISTERA OVATA, *R. Br.*—On a grassy knoll on the east side of the same hill, at 100 feet alt. This is the rarest orchid of the island.

L. CORDATA, *R. Br.*—Common in the northern part of the island, among or covered by heather, and in open ground in damp soil, at almost all elevations. It flowers as early as April.

ORCHIS MASCULA, *Linn.*—Frequent on ledges of the coast-cliffs in the north, and extending a short way inland; large, but with unspotted leaves. In North Harris, just across the Sound of Scarp, among grass it is poor. Also in South Harris on the heath, but south of Scarista it is as large as the Scarp specimens.

O. LATIFOLIA, *Linn.*—Frequent in the east, occasional elsewhere. In deep, damp soil this and the next often grow together in great luxuriance.

O. INCARNATA, *Linn.*, var. ANGUSTIFOLIA, *Bab.*—Frequent. In parts where the coast is low it grows in the sand close to the stones rolled up by the sea, and a few paces inland among grass it is very large. Farther north the sand is often drifting, and then often the spikes only appear out of the sand, and look very odd. In this state it also occurs on the coast of the Harris mainland.

O. MACULATA, *Linn.*—Almost at all elevations. The flowers are often slightly fragrant.

O. ERICETORUM, *Linton.*

HABENARIA VIRIDIS, *R. Br.*—Very abundant in the east on grassy knolls (upper glacial drift) at 180 feet.

Var. BRACTEATA, *A. Gray.*—Coast sands, Newton, North Uist, Shoolbred, *sp.*

H. BIFOLIA, *R. Br.*—Frequent from Amhuinnsuidh to Beitarsaig in North Harris, also between Lustkentyre and Borve in South Harris.

H. CHLOROLEUCA, *Ridley.*—In South Harris, at the foot of a small heathery knoll, and on the coast of the Sound of Harris opposite. A plant of it growing in a cornfield showed that before the flower is quite expanded the backs of the sepals are of a bright green colour.

JUNCUS GERARDI, *Lois*, var. SALSUGINOSUS, *Regel, ex* Ledebour ("Fl. Ross," iv. 1853, p. 230).—Much smaller than the type, 2 to 7 inches high, long-creeping and rooting, sending up stems about every inch, perianth equalling the capsule. Sandy coast of Kirkibost island, 15/7/98, Dr. Shoolbred.

RUPPIA ROSTELLATA, *Koch.*—Brackish pool at the head of the bay south-west of Harris, W. S. Duncan.

Doubtless abundant in the many brackish waters, but Mr. Shoolbred's specimens were too young to be sure of, and Messrs. Babington, Balfour, and Stirton name only the aggregate species.

SCIRPUS FLUITANS, *L.*—Given by Balfour and Babington without locality. Mr. Shoolbred gives North Uist, Harris, and Taransay, and Mr. Somerville adds South Uist, this latter being the floating form with fine leaves. A species that seems to have few varieties, var. *terrester*, Meyer ("Chl. Hann." 1836, p. 600), being the only one given by Ascherson and Græbner.[1] This I have from Ditton Marsh, Surrey, gathered by Mr. H. C. Watson[2] in 1868, and in W. Gloster by Mr. W. White. I have a curious variety from Surrey in which the plant is elongated to 28 inches, with a reptant stem throwing up fascicles of leaves every $\frac{3}{4}$ inch. I can find no mention of such, and propose to call it *f. reptans*, though this generally means "rooting as well."

CAREX BINERVIS, *Sm.*, var. SADLERI, *Linton.*—North Uist, 1894, Dr. Shoolbred! = *C. binervis*, Sm., var. *alpina*, Drej.

C. OEDERI, *Retz.*—Barra, A. Somerville!.

AGROSTIS CANINA, *Linn.*, var. PALLIDA, *Schk.*—South Uist, A. Somerville, *sp.*

[1] "Syn. Mitteleurop. Flora" (1904), p. 306.
[2] "Rep. Bot. Exch. Club" for 1868 (1869), p. 16.

A. ALBA, *Linn.*, var. COMPACTA, *Breb.*—Baleshare island, North Uist, Dr. Shoolbred, *sp.*

AVENA FATUA, *Linn.* var. PILOSISSIMA, *Gray.*—About potato and cornfields in Scarp, W. S. Duncan, *sp.*

CATABROSA AQUATICA, *Beauv.*—β *uniflora*, Gray, "Nat. Arr. Brit. Pl." 1821, p. 133, = β *subtilis*, Hook, "Brit. Fl." 4th ed., 1838, p. 36; = β *minor*, Bab., "Man. Brit. Bot." 1st ed., 1843, p. 266. These represent the one-flowered form which occurs on the sandy coast at Huskinch in North Harris, W. S. Duncan, *sp.* γ *littoralis*, Parn, "Brit. Grass." t. 102, 1842, γ *littoralis*, Kittel, "Tasch. deut. Fl." ed. iii. (1844) p. 102, *ex* Hackel.

This is 2-3 flowered, and occurs in sandy places by the sea.

TRITICUM REPENS, *Linn.*, β BARBATUM, *Duval-Jouve.* Barra, A. Somerville, *sp.*

ASPLENIUM MARINUM, *L.*—Above Sinclair Loch in West of Barra. T. Scott, "Ann. Scot. Nat. Hist." 1895, p. 64.

LYCOPODIUM CLAVATUM, *L.*—Moors near Stornoway, W. J. Gibson, *sp.*, 1908.

It is remarkable that this species should not have been before recorded for these islands.

ISOETES LACUSTRIS, *Linn.*—Island of Scarp, W. S. Duncan.

CHARA ASPERA, *Willd.*—South Uist, A. Somerville, *sp.*

C. FRAGILIS, *Desv.*, var. CAPILLACEA, *Coss. et Germ.*—Scarp, W. S. Duncan, *sp.*

The following 13 species should occur in the islands. The appended numbers signify in how many vice-counties in Britain they occur, and the letters signify their existence in Caithness or Sutherland respectively.

Stellaria graminea, 109, S.
Lotus pilosus, 100, C.
Medicago lupulina, 105, C. S.
Prunus communis, 108, C. S.
Geum urbanum, 107, C. S.
Conopodium denudatum, 109, C. S.
Senecio sylvaticus, 107, C.
Mentha arvensis, 111, C. S.
Nepeta Glechoma, 103, C.
Lamium album, 102, C.
Briza media, 111, C. S.
Bromus sterilis, 108, C.
Polystichum lobatum, 104, C. S.

Isle of Scarp.—Mr. Duncan enumerates 247 species as occurring in that island, which is 3 miles long by $2\frac{1}{4}$ miles wide, and attains the height of 1011 feet in one hill, Strone Romul.

CAREX AQUATILIS, WAHLB., *VAR. NOV.*

By Arthur Bennett, F.L.S.

Recently, when trying to sort my numerous specimens of the above Carex from Scotland, Ireland, Wales, and England, I found specimens from Southern Scotland that were in many points different from any others. They were altogether stouter, in all parts more rigid, etc., and seemed worth a name. They correspond with nothing described in the Northern Floras by Fries, Almquist, Læstadius, or Norman, etc. They certainly better deserve a name than some others lately named.

I propose to call it var. *rigida*. The stems are about $2\frac{1}{2}$ feet high, leaves broad and thick, with strong nerves; the male spikes 2 to 3, stout, sessile, rigid; and where there are 3 the lower one, with female flowers, for $\frac{1}{3}$. The female spikes generally 4, upper 3, sessile (lower 2 inches long, upper 1 inch), 6 mm. thick, the fruit densely compacted, not interrupted. Fruit subrotund, with a short entire beak, the glumes subequal, greenish, with a bright brown edge all round.

The whole aspect of the plant is more like a *salina* form, or *C. fasciculata*, Link., of Portugal, than *C. aquatilis*.

Habitat. Banks of the Nith, Sanquhar, Dumfries, 1883, *Dr. Davidson*. Kenmore Holms, New Galloway, 1887, *Mr. J. M'Andrew*.

Another form gathered by Dr. Davidson has the glumes almost hidden by the fruit. Another from Kenmore Holms has the spikes slender, the glumes twice the length of the fruit, and cuspidate. This is closely allied to specimens from "The Thurso River, two miles above the town, 1875, G. Horn." The Dumfries and Kirkcudbright specimens, when placed by the side of those from the Upper White Water, Glen Clova, A. Somerville, 1896, and others gathered in 1831 by Wight (with spikes 3 mm. thick), look quite like another species; "Eng. Bot. Suppl." t. 2758, very well represents this Clova form. The variability of the plant

is great, even among examples growing near each other. Among specimens from the bank of the Spey at Aviemore (Co. 96), Messrs. Wilson and Wheldon, some answer very well to the var. *virescens*, Ands., with glumes subrotund and shorter than the fruit, while others have the glumes longer and almost cuspidate. The Welsh and Irish specimens do not vary so much; and Mr. Scully's Kerry specimens are very like in habit, etc., to the White Water specimens.

Wahlenberg in "Fl. Lapponica" (1812), 247, gives, "squamis plerumque longitudine capsulis æquantibus sed multum angustioribus." Those specimens named *rigida* differ from the other forms of the species in the shorter, thicker, and denser-fruited sessile female spikes, with rigid, thick, sessile, and more definitely arranged male spikes, broader leaves more strongly nerved.

Nylander in "Sp. Pl. Fenn." pt. 2 (1844), 23, has a var. *planifolia*, "culmo acutangulo, foliis siccitate planis"; and this *rigida* has the stems much more angular, and leaves flatter than the usual forms; but he could not have overlooked the remarkable difference in spikes, which also suggest in habit *C. acutiformis*, Ehrh. (*paludosa*).

The Boswell Herbarium contains some puzzling specimens from Lochnagar, which are mentioned by Syme in "Eng. Bot." x. 112, and which are probably *C. rigida* × *aquatilis*.

Babington in his "Manual," 1st ed., p. 340, mentions specimens given him by Dr. Greville from "Tableland above Canness, Glen Isla," which seem to be another form of this hybrid. Babington suggests *C. dacica*, Heuffl.; but that is put by Richter, and also by Nyman (though with a query) under *C. cæspitosa*, *L.* Certainly the figure of *dacica* by Wierzbicki[1] is much more like *rigida* than *cæspitosa*, as it shows a creeping rhizome.

Kükenthall has named specimens gathered by Mr. Marshall at "2000 ft. below Corrie of Clova, 1904," as *C. aquatilis* × *rigida*; the gatherer remarks, "growing with the parents."

[1] "Linnæa," xxxi. 1863.

NEW AND RARE MOSSES FROM DIFFERENT AND DISTANT PARTS OF SCOTLAND

By Dr. James Stirton, F.L.S.

From a heterogeneous mass of plants, chiefly lichens, I picked out, the other day, a small parcel of mosses gathered on Ben Lawers in July 1855, on the occasion of my second visit to that famous mountain. Amongst them I detected *Timmia Norvegica* (Zett.). Several years afterwards, this moss formed the subject of a somewhat lengthened correspondence between Mr. W. Wilson, author of the "Bry. Brit." and myself. He maintained throughout, his original opinion that this moss could not be otherwise reckoned than as a form of *T. megapolitana* (Hedw.). Along with this grew another smaller *Timmia* which, at the time, must have escaped observation. My curiosity aroused I renewed my researches amongst my later collections from the same mountain and secured several additional tufts of this smaller *Timmia*. After due comparison with different species of this peculiar genus, and more especially with those sent to me by the late Prof. Schimper of Strasbourg, I am constrained to separate it from the others and to elevate it to the rank of a species.

The peculiarity which mainly characterises species of this genus is the protrusion of the anterior cells of the pagina and nerve. From a little above the basal portion of the leaf to near its apex, these protrusions present themselves in the form of large, nearly semi-globose, hyaline bullæ, much resembling those seen on the posterior surface of the broad nerve in several *Campylopi*. The height of these protrusions above the general surface varies in different species from .005 to .017 mm. All the species that I have examined have such bullæ with the exception of *T. Austriaca*, but even in this, faint indications of their presence may be detected under a high power of the microscope, but for purposes of diagnosis these bullæ may be reckoned awanting in that species.

Timmia scotica.—In small tufts varying in height from half an inch to nearly two. Stems generally simple (rarely dichotomously divided), upright ; leaves rather laxly disposed,

spreading rather widely while wet, incurved when dry, whereas the upper comal leaves remain nearly upright, are very long, slender and narrow, 4 by .15 to .2 mm.; in other words, the breadth of these uppermost leaves is that of the nerve alone in the other species, and length about 24 times their breadth, have a very slender nerve and cells considerably larger, shortly oblong, or .013-.018 mm. in longer dimension. The lower leaves are much shorter and broader, linear-lanceolate, acute but not acuminate, the basal part slightly broader and clasping the stem in part, composed below of long narrow, attached cells, hyaline, ultimately of a deep wine-red colour, rendering the whole of the base opaque, the cells next nerve broader, .04—.065 by .009—.012 mm., narrowing outwards and near margin only half the breadth of the others; upper cells smaller than in any other species, close but distinct, quadrate, granular, .006—.009 mm. across; nerve narrower than in the others, .07—.1 mm. tapering and vanishing just below apex or reaching it in the leaves with highly coloured bases. In this species the anterior surface of the nerve and pagina is covered by the hyaline bullæ varying in height from .005 to .01 mm. up to nearly the apex, subsiding somewhat in the lowest fourth, while the posterior surface of the base does not show any of the papillæ seen in *T. Norvegica*, but the nerve has behind, in the same region, a row of minute pellucid cells which do not show any prominences beyond the general surface such as are seen very manifestly in *T. Norvegica*; margin of leaf plane, serrated nearly throughout, although serratures are less pronounced in lowest part. Barren.

From the same parcel of mosses secured in 1855, was picked out what appeared, at first sight, as a rather stunted form of *Climacium dendroides*, a moss which obtrudes itself here and there amongst other mosses and even flowering plants, so as to be a source of annoyance, and which, accordingly, is apt to be carelessly tossed aside. An examination of the leaves showed very manifest distinctions from the only European species of this genus, as well as characters which allied it much more closely to *Climacium americanum*. Of this I have found only one plant which,

however, may be reckoned complete, inasmuch as it has the usual horizontal rhizome, with its bundles of red radicles, continued upwards at right angles into the single stem so characteristic of the genus, with several short obtuse branches from its upper part, constituting a somewhat fastigiate fascicle, almost tree-like.

Climacium epigæum.—The leaves of the upright stem are nearly appressed, thinner and more translucent than those on the branches, with narrower apices, but still showing here and there the curious broadish apiculi; stems of the branches red, leaves thin, rather closely arranged, imbricated in a dry state, spreading only a little when moistened, very concave throughout, with two to four sulci in the lower half, broadly cordate at base, with the alæ prolonged downwards in a semi-elliptical form, to a lower level than the point of attachment of nerve to stem, composed of broadly rhomboid cells, apart but close, with thickish, opaque walls, .03-.04 by .014-.02 mm., a little narrower outwards; between this wing and the nerve, three to five short perpendicular rows of oblong cells also with thick walls, the lower being red, .045-.06 by .013-.018 mm.; apices of leaves blunt and rounded, almost exactly as in *Hypnum purum*, with a broad, bluntish or rather narrowly triangular acumen, about 1 mm. long, and half this in breadth at its point of attachment to the apex of leaf, composed of narrowly oval, detached cells, .016-.024 by .005-.007 mm., margin of leaf entire, plane but slightly incurved owing to the concavity of leaf, nerve at base, of a vivid red colour, lat. there .075-.1 mm., tapering rapidly, getting fainter in colour upwards to a pale yellow, reaching, in a slender form, almost to the base of the apiculus; upper cells of leaf long, narrow, very generally sharp-pointed, .065-.09 by .004-.005 mm., shorter and blunter in upper fourth, broader near base. Leaves towards the blunt round extremities of the branches rather narrower as well as apices.

This moss has evidently close affinities to *Cl. americanum*, and the question, which has often been pressed on my attention, is rendered of more significance since this discovery. Why should plants found on the higher altitudes

of Ben Lawers, and scarcely anywhere else in Great Britain, have such close relationships to those occurring on or near the eastern shores of the more northern parts of North America? Of such I recall three mosses, *Mollia fragilis* (Drum.), *Hypnum hispidulum* (Brid.), and *Climacium epigæum*, besides several lichens.

I have still no clue to anything in the way of a feasible explanation, but I think it right to ventilate the question for the sake of others who may have a wider range of facts on which *to frame, at least, a consistent theory.*

In July and August of 1908 at Onich, near Fort William, I came across a large congeries of the minuter *Orthotricha* growing, for much the greater part, in cracks of the bark of the older Elder bushes. Along with them grew almost invariably small tufts of the curious *Tortula papillosa* (Wils.), as well as, although less frequently, patches of *Orthotrichum diaphanum* (Schrad.), two rather anomalous species of mosses. All of these forms had several characteristics in common, viz., their minuteness, dark lurid-green colour, blunt and rounded apices to the leaves in varying degree, but generally as blunt as in *O. obtusifolium* (Schrad.). The main character is the revolute margins of the leaves in their lower half or a little more, while they are more commonly merely reflexed upwards almost to the blunt apex. Meanwhile I shall describe one of these where the capsule is long and slender, longer indeed than that of *O. tenellum* (Bruch).

Orthotrichum prasinellum. — In small, rather loosely aggregated tufts or patches; stems upright, about a quarter of an inch long, rarely longer, simple, occasionally emitting a short branch; leaves closely arranged around stem, imbricated and straight when dry, spreading a little when moist, narrowly elliptical with round blunt apices, either entire or slightly erose, or showing at times a broad very short square-topped protrusion about .08 mm. broad and nearly as much in height, margin entire, revolute from a half to a whole round of the spiral but not more; pagina only very feebly papillose, often papillæ scarcely perceptible; nerve narrow and thin, lat. near base, .034-.04 mm., tapering a little and vanishing rather abruptly below apex;

cells at central base oblong, attached, ultimately hyaline, .045-.07 by .009-.013 mm., outwards smaller and from 4 to 6 perpendicular rows next margin quadrate, chlorophyllose, length .015-.022 mm., upper cells large, hexagonal, separate, .012-.018 mm. in longer diameter; capsule on a short seta, emerging partly above leaves, pale then red, 8-ribbed, long and slender, contracting a little below open mouth, then swelling gently and again contracting gradually to seta which thickens upwards to where it joins capsule and is there often slightly grooved; teeth 8, pale, broad, bigeminate, reflected when dry, cilia incurved slender and short, lid shortly rostrate, calyptra greenish yellow, naked, turning darker, smooth at first then closely grooved, regularly and widely campanulate, covering capsule, apex sharply acuminate, brown, occasionally showing one or two hairs.

There is another *Orthotrichum* similar to the preceding as regards colour, areolation, size and place of growth, but differing in several important particulars. The margins of the leaves are strongly and closely revolute nearly throughout, to the extent, a little below the middle, of a complete spiral and a half or even a little more, viz., $1\frac{3}{4}$. The apex is very irregular in outline, bluntish with nerve vanishing below it, or apparently somewhat excurrent as a thickish stump, giving the impression that propagula had formed and fallen off or were about to form. Barren.

This might meanwhile be named *Orthotrichum prænubilum.*

Plagiothecium rufovirescens.—In large rather lax tufts of a yellowish-green colour above, pale below with here and there faint dashes of red, showing occasionally creeping rhizomes in the subsoil whence arise numerous upright stems of an inch or more in length, simple or emitting occasionally short lateral branches, as well as rather numerous stolons from the basal part of these stems, bearing slender, rather longly acuminated leaves; stem leaves arranged regularly, not complanately, much less bifariously, undulating on margin but nearly upright when dry, hollow and almost imbricated when moist, and then presenting a considerable resemblance to *Hypnum purum* (especially as the acumen is then somewhat recurved), broadly ovate, slightly acuminate, or rather,

in most instances, apiculate, length .07-.085 mm, ; margin entire, narrowly recurved from base to near apex, reflexed on an average, .015 mm., more broadly so near base, nerve broad near base, quickly splitting into two diverging branches which extend up a third of the leaf; general cells above, large, elongato-hexagonal or merely fusiform, .08-.11 by .013-.017 mm., a little broader near base and at basal alæ nearly quadrate, marginal cells, in 2 or 3 longitudinal rows, much narrower and even longer ; no primordial utricles seen in cells. Leaves often show, under a Codington lens, minute prominent points on the back ; inflorescence peculiar, seen in the axils of the lower smaller leaves of the stem, as very minute compact buds having bracts so short as often to allow the red archegonia to be seen, some buds showing archegonia mixed with pale antheridia, others only antheridia. According to Dr. Braithwaite the moss is polygamous as in *Plag. succulentum* (Wils.). Barren.

On black soil, generally near or on the old stumps of trees in the original, very probably primeval, forest of Arisaig.

I feel constrained to record here the description of a moss which has close affinities to *Hypnum cupressiforme.* I have waited for several years in expectation of finding it in fruit, but hitherto without success. It presents peculiarities such as I have never seen in any of the species grouped around *H. cupressiforme*, much less in any of the numerous forms assumed by this moss. *H. incurvatum* has perhaps a nearer relationship to it than any of the other allied species.

Hypnum deflectens.—In large broad flat sheets with a beautiful silky sheen—a sheen retained for years in the herbarium—of a dark or bluish-green colour; main stems below, brownish, slender, creeping, irregular, nearly bare, whence originate numerous closely arranged, nearly parallel branches, all pointing in nearly the same direction, all prostrate but arcuate in a downward direction, curved from a third to nearly a half of a circle, each about an inch long and rather more than a millimetre in breadth throughout, with blunt slightly incurved extremities, forming nearly flat, broad bundles, all such closely arranged as well as closely connected to the other bundles, so as to constitute a large

almost continuous flat sheet; leaves closely arranged around the stem, also arcuate in a downward direction, ovate lanceolate, longly and slenderly acuminate, acumen from .3 to .6 mm. in length, concave almost tubular in upper half including lower part of acumen, nerveless, margin plane, slightly serrulate above or nearly entire throughout; alar group of cells of medium size, well defined, composed of large separate oval or roundly oblong cells becoming yellow then red, minutely granular, .013-.02 mm. in longer diameter; general cells, in lower half or nearly so, long with blunt extremities, cylindrical, slightly undulating, .035-.055 by .004-5 mm.; in upper half, cells longer, generally sharp-pointed, .05-.075 by .003-4 mm. No paraphyllia seen. On the bark of several large trees chiefly Ash, near Arisaig, August, 1904, etc.

ZOOLOGICAL NOTES.

Note on a Neck-bone of Balæna biscayensis from the Post-Tertiary Clay of the Moray Firth Area.—Last year while a drain was being dug on a farm near Fort George, a large block of bone was discovered by the workmen. It was under a foot or two of moss and three feet of firm blue clay, about a mile from the present seashore and not more than twenty or thirty feet above sea-level. The bone was washed and cleaned and exhibited in the district for a year before I saw it. Nobody could make out what animal, nor even what part of an animal, the bone could have belonged to. Dr. Lindsay, of Ardersier, wrote to me about it, and said it was probably prehistoric, and in that I think he was right. I went to see it, but owing to its rolled and worn condition I could not, at first, make it out. I took it home with me and soon solved the mystery. I compared it with the united cervical bones of some cetaceans, and proved it to be the united seven cervicals of a whale, with all the neural spines and arches, and the transverse processes entirely worn away. It is the neck-bone of a *Balæna*, showing articulations for the condyles of the skull distinctly, and from prominences on the dorsal side seven vertebræ can be counted. It measures twelve inches across the articulating surface now, but may have been an inch or two more before it was worn. The whole length of the seven united cervicals is only seven inches, and the bodies of the vertebræ show very little trace of their union. It is one compact block of bone. I have seen the neck-bone of *Balæna mysticetus*, which is much broader across the articulating surface than

my bone, and the distance between the depressions for the condyles of the skull is also much greater in that species. I have no doubt now that the Fort George bone belongs to *Balæna biscayensis*, and, as far as I know, is the first record of that whale for the Moray Firth area.—Wm. Taylor, Lhanbryde.

Wild Cat in Argyll.—A true Wild Cat is reported by Mr. Chas. Kirk, taxidermist, of Sauchiehall Street, Glasgow. It was shot one mile N.E. of Loch Garasdaile, Kintyre, and sent to Mr. Kirk in the flesh for preservation (Chas. Kirk *in lit.*) by Mr. Hew Blair, Tayinloan. Measurements, Wild Cat ♂ : weight, 11 lbs.; small intestine measured 1 ft. 2 ins.; large intestine measured 3 ft. 9 ins. Mr. Kirk adds: "The tail was not quite so blunt (truncated) as in some of the more southern specimens I have had, but it was certainly not tapered in any way."—J. A. Harvie-Brown.

Wild Cat in Caithness.—The first occurrence of the Wild Cat in the county for 30 years is recorded here on the authority of Mr. Lewis Dunbar. It was trapped in the Duke of Portland's deer forest, and Mr. Dunbar has received it for preservation. This is an extension eastward of considerable importance and well worthy of note (Lewis Dunbar *in lit.*, 18th August 1910).—J. A. Harvie-Brown.

Whooper Swans breeding in Shetland.—A pair of Wild Swans (Whoopers) are breeding with us this year, and have hatched out three young ones. They are pinioned, of course. The Swans were wounded birds. One was got in the winter of 1905, and the other in 1907. This is the first year they have nested. The nest was not disturbed. They got the migratory fever twice a year when the Wild Swans were passing, and are very restless for a few weeks, after which they settle down again and seem quite contented.—T. Henderson, Jun., Dunrossness, Shetland.

[The above is a most interesting reintroduction of this species to an area which has been credited with the occupation of Wild Swans many years ago in the nesting season. The Messrs. Henderson of Spiggie ought to receive the thanks of all true naturalists for this record of the circumstance; and they deserve recognition, and support in their future preservation of these kings and queens of wild fowl.—J. A. Harvie-Brown.]

Another arrival of Crossbills in Scotland.—I have received information from various localities which indicates that an arrival of Crossbills (*Loxia curvirostra*) from the Continent occurred on our shores during the past summer. The first of these records relates to an adult male which was observed at Fair Isle on 25th June, where also during the first week of August a party of nine were seen. An adult male and female sent from this island were of the Continental type. For the next note I am indebted to Mr. Oliver G. Pike, who

tells me that soon after landing at St. Kilda on 7th July he saw a small boy playing with a bird, which on examination he found to be a Crossbill. It was in a starved condition, and was too weak to use its wings properly. I have seen the skin of this specimen, and found it to be a female, and also a bird of Continental origin. Writing from the island of Barra, Mr. W. L. MacGillivray informs me that on 3rd August he saw a party of seven in a small plantation. Lastly, a bird in immature plumage was brought to Mr. Williams, Torphins, Deeside, on 9th August, as Mr. Harvie-Brown informs me on the authority of Mr. A. Macdonald. It is probable that other records may follow, and be inserted in this number of the "Annals."—Wm. Eagle Clarke.

Crossbills in Tay.—The gamekeeper on the estate of Kippen and shooting of part of Duncrub, Perthshire, has seen many Crossbills—a large flock the other day, and individuals throughout the whole year; as reported to me from the Estate Office, *in lit.*, 19th September 1910.—J. A. Harvie-Brown.

Albino Wheatear in Shetland.—On the 5th of July I found on this island a Wheatear (*Saxicola œnanthe*) in nearly perfect albino plumage, and sent it to Mr. Eagle Clarke for the collections in the Royal Scottish Museum. The bird was at first sight difficult to name, but the white patch on the lower back was paler than the rest of the dorsal plumage, and helped me to solve the question of its identity.—T. Edmonston Saxby, Halligarth, Unst.

Willow Wren nesting on Ivy-covered Wall.—On 16th July at dusk I flushed a small bird from a nest built among short ivy growing against a brick wall in my garden. It was a domed nest, but as I had never seen a Willow Wren's (*Phylloscopus trochilus*) nest in this situation, I thought it was possibly a Chiff-Chaff's. The eggs were rather darkly spotted, but not so dark as is usual in the Chiff-Chaff. I had no opportunity of identifying the bird till ten days later, when I saw it close to the nest and uttering the familiar note of the Willow Wren. Unfortunately the nest was not secure on its foundation and was partly supported by the twigs of a currant bush growing in front of the wall, so that after a stormy night I found the nest inverted and the eggs broken. What I take to be the same bird is still frequenting the garden, but I do not think she has built again. The nest was 3 ft. 6 in. from the ground.—Charles Kirk, Glasgow.

Greenland Falcons in the Northern Highlands.—A fine male Greenland Falcon (*Falco candicans*) was shot at Rogart, Sutherlandshire, on 8th March 1910. A young female of the same species was caught in a trap on the Ardross moors, Ross-shire, on 9th March. Both birds were sent to Mr. Inglis, Dingwall, for preservation, and to him I am indebted for these particulars and also for a sight of the birds.—Annie C. Jackson, Swordale.

Grey Hen with Two Broods.—A few days previous to 19th August, the shepherd on one of the beats on our hill here told my head keeper that he knew of a Grey Hen (*Tetrao tetrix*) which had had two broods of birds this season and was rearing both. The keeper was not unnaturally sceptical, but accompanied the shepherd to the place where the Grey Hen was. This turned out to be an enclosure of about three or four acres surrounded with a dry-stone dyke with only one gate, which is kept shut in order to keep out sheep. On going to the spot in this enclosure where the shepherd said he knew the bird had nested for a second time, there, sure enough, she was with two sets of chicks; the one set being well grown, and the other lot just two or three days old. The shepherd said he knew the bird well, had been watching her all season, and could vouch for her having nested twice. The incident seemed to me unusual, but apparently so well ascertained that, at the suggestion of Mr. Harvie-Brown, I venture to send it for insertion in the "Annals."—JOHN P. WRIGHT, Cardrona, Traquair, Innerleithen.

Woodcocks nesting abundantly in Kirkcudbrightshire.—Captain G. Hutchison writes me from Balmaghie, Castle-Douglas, that this season his keeper has come across (without purposely looking for them) no less than 27 Woodcocks' nests in the home coverts there. It will be remembered Kirkcudbrightshire is one of the three counties in Scotland where the Woodcock is "protected," under the Wild Birds Protection Act, from 1st February to 1st October.—HUGH S. GLADSTONE, Capenoch, Thornhill, Dumfriesshire.

Black-tailed Godwit in East Ross-shire.—On 30th March I had the pleasure of again seeing the Black-tailed Godwit (*Limosa belgica*) at the Cromarty Firth. The bird was in summer plumage, and was amongst a flock of Bar-tailed Godwits. On 8th April I had another excellent view of the bird, but by 14th April it had departed. Very probably this is the same bird which frequented the Cromarty Firth during the late spring and early summer of last year (1909), and reappeared during the autumn migration, in the end of August, remaining till the middle of September.—ANNIE C. JACKSON, Swordale.

Malformation in a Young Curlew's Bill.—Towards the end of July I captured a young curlew with a malformed bill. The upper mandible was half an inch shorter than the under; it was much thickened towards the base of the bill, and was further remarkable in that both nostrils were completely closed by a horny growth, so that the bird could only breathe through the mouth. Breathing was distinctly a laborious process, and became still more laboured when the upper and under mandible were held closely together, though, it may be remarked, by so doing the breathing was never completely arrested, owing to the misfitting mandibles. The

bird, which was fully feathered, was in quite good condition, despite the fact that its feeding, one would think, must now necessarily be attended with some difficulty.—ANNIE C. JACKSON, Swordale.

An unclaimed Marked Starling.—A starling bearing a foot-ring inscribed "U. S. Edinbg. 102" was got near Viborg, Denmark, about the beginning of April 1910, and was brought to Mr. Chr. C. Mortensen. The details of the marking of this bird are still unknown, although Edinburgh seems to be indicated in the ring's inscription. Letters in "The Scotsman" and numerous private inquiries, first by Mr. Mortensen, and later by myself at his request, have been entirely without result, and it has even been suggested to me that the marking of the bird was in the nature of a hoax!—A. LANDSBOROUGH THOMSON, Aberdeen University Bird-Migration Inquiry.

Nightjar in Argyll.—Mr. J. K. Tasker, solicitor here, has shown me a specimen of the egg of the Nightjar (*Caprimulgus europæus*, Linn.) which he found on 6th August last on the slope of Torrmore near Tayvallich, Knapdale, Argyllshire. The egg is of the beautiful pale marbled variety. The nest contained two eggs, and was placed on a piece of rough ground. The eggs were freshly laid.—HENRY H. BROWN, Cupar-Fife.

Forfeited Eggs of the Golden Eagle.—It may interest some of our readers to learn that six Scottish eggs of the Golden Eagle were found on sale, by an officer of the Royal Society for the Protection of Birds, in the shop of an Inverness gunmaker, and were duly forfeited to the Crown. By the instructions of the Secretary for Scotland, these eggs were sent to me, as Keeper of the Natural History Department of the Royal Scottish Museum, and three of them were retained for the National Collections, the others being returned to the Procurator Fiscal at Inverness for the Museum of that town.—WM. EAGLE CLARKE, Edinburgh.

Capercaillies in Moray.—Capercaillies are stated by Mr. Donald Guthrie, late keeper in S. Uist,[1] to be becoming plentiful at the above locality; but, so far, I have not ascertained when they were first observed, nor do I possess other particulars concerning their advent *so far up* Strathspey, or *so far up* the western slopes of Argyll.—J. A. HARVIE-BROWN.

Wrynecks in Tweed.—Mr. N. Wells-Mabon, of Jedburgh, writing to my friend Mr. J. Pedder, presently staying here—Dunipace House—in reply to inquiry, says: "About the Wryneck I saw our local bird-stuffer. The bird was shot in the gardens behind the High Street by a man who thought he was aiming at 'some sort of hawk,' and it was brought to the bird-stuffer on a Saturday night. It was badly smashed about head and neck. It

[1] *Vide* "Annals S.N.H.," April 1903.

was laid aside, and when taken up on the Monday the dead bird was crawling with 'macks' (*i.e.* maggots). It was cleaned out and preservative applied, and the skin is in fairly good order. I am hopeful," Mr. Wells-Mabon adds, "that I may be able to obtain it and bring it with me to Dunipace when I go."—J. A. HARVIE-BROWN.

Great Sp. Woodpecker in Forth.—This bird continues to visit this part of central Scotland, and this season has been heard several times "tapping" in our woods at Dunipace; though the nesting-place has not been found—not, indeed, fully searched for. As it had not, however, been heard since this time last year, it may only be a migrant.—J. A. HARVIE-BROWN.

Nesting of the Gadwall and the Wigeon in "Forth."—Two years ago I recorded in the "Annals" (1908, p. 254) that I had observed two pairs of Gadwall (*Anas strepera*) evidently breeding at a loch in this district. I have now proved that they do breed there, having this year found the nest of one pair containing ten eggs on 14th June. It was, I understand, at the same loch that the two nests reported in the "Annals" last year, by Misses Rintoul and Baxter, were found. There were also at least half a dozen pairs of Wigeon (*Mareca penelope*) breeding on the loch this year, and I had the pleasure of seeing three of their nests—13th May, nine eggs; 21st May, nine eggs; and 12th June, eight eggs. In May 1904 I observed a pair of Wigeon on a loch in Midlothian, where they were evidently nesting.—WILLIAM EVANS, Edinburgh.

Spotted Redshank in "Dee."—While scanning the tidal mud-banks at Donmouth, near Aberdeen, for "waders," on the 30th August last, my attention was attracted by a peculiar call, a loud "tyui," and a bird like a Redshank flew round and alighted at the mouth of the Tile Burn. Turning the glass on it I found that it was a Spotted Redshank (*Totanus fuscus*). The call-note, which was repeated frequently, the absence of white in the wings during flight, and the lighter grey appearance, distinguished it at a glance from the Common Redshank, while the larger size, very long legs, white lower back, and the white mark on each side of the forehead —very striking in a front view—were also noticeable. From the absence of any brown tinge in the plumage (except in a patch on the sides of the neck), and the orange-red feet, the bird was probably an adult. It seemed restless, and finally rose and disappeared in the distance to the south.

The Spotted Redshank has already occurred once in "Dee," a female having been shot in the Ythan Estuary on 13th September, 1902 (G. Sim).—L. N. G. RAMSAY, Aberdeen.

Sea-Bream in the Solway.—This is a species so seldom met with in the Firth that an exact record may be of use. On 20th June I had a very fine specimen of the Sea-Bream (*Pagellus centrodontus*)

sent me by Mr. Robert M'Call, Carsethorn. It is a symmetrical and beautiful fish. The specimen weighed 1½ lbs.; was in length 16 inches, and greatest girth 13 inches. I have not seen a specimen since a small one was sent me by Mr. M'Call several years since.—Robert Service, Maxwelltown.

Lamna spallanzanii in the Moray Firth—An explanation.—About ten years ago my attention was called to a fresh, but somewhat damaged shark at Nairn. I examined it and secured the head, and came to the conclusion that it was a common Porbeagle, *Lamna cornubica*, and recorded it as such in the "Annals." Many examples of the true *Lamna cornubica* turned up on our coast within the next few years, and I at once saw that the identification of my first record might be wrong, or that there might be a considerable difference in the teeth of the male and female. Dr. Traquair kindly helped me in the matter, and I saw that the teeth in the two sexes did not differ. I noticed recently that the figured *Lamna cornubica* in the Cambridge Natural History and in the Oxford Natural History agreed with my original specimen from Nairn, and were not like the common species. I applied to Dr. Boulenger, F.R.S., of the British Museum, to assist me, as the rarer species was a short shark with long teeth, and the common species a long shark with short teeth. He said that it was clear that two species of *Lamna* had been confounded by some authors; that the long teeth agreed with the *Lamna cornubica* of Day, but should be called *Lamna spallanzanii*. The species with the short teeth is the true *Lamna cornubica*, as Dr. Traquair told me. This is not an affair of variety, but of very distinct species. The distance from snout to pectoral fin in *Lamna spallanzanii* is about one-third the total length of the shark. In *Lamna cornubica* it is only about one-fourth the total length. Is *Lamna spallanzanii* a rare shark on the east coast of Scotland? The late George Sim of Aberdeen, who examined hundreds of sharks, makes no mention in his book of two species of *Lamna*; I think the long teeth and very different proportions of this shark would have caught his experienced eye.—Wm. Taylor, Lhanbryde.

Sea Lamprey in Skye.—A fine example of this fish was forwarded to the Royal Scottish Museum for identification by Mr. Donald Beaton. It had been captured in a loch at or near Swordale, Broadford, Skye, about the middle of July last. As this anadromous fish is not recorded for the west coast of Scotland in Day's "British and Irish Fishes," and is probably uncommon there, this instance of the occurrence of *Petromyzon marinus* may be worthy of record.—Wm. Eagle Clarke.

The Worm Pipe-fish (*Nerophis lumbriciformis*) in "Forth."—An example of this little fish, 4½ inches in length, was captured under a stone between tide-marks at North Berwick on 11th June last, and given to me the same day as the young of one of the larger species.

The only other Forth record seems to be that of Mr. Eagle Clarke, who took a specimen also at North Berwick in August 1894 ("Annals," 1900, p. 15). Three specimens of the Müller's Top-knot (*Rhombus punctatus*, Bl.) taken off North Berwick during the past two years have come under my notice—the last was got in a crab-creel on 11th August 1910.—William Evans, Edinburgh.

Some terrestrial Invertebrates from Fair Isle.—Some time ago Mr. Eagle Clarke handed to me for identification a small miscellaneous collection of terrestrial Invertebrates obtained by him on Fair Isle, chiefly in September 1906. The following is a list of the species contained in it. All are common British animals.

Mollusca.

Vitrina pellucida (Müll.).—One example, May 1909.
Hyalinia alliaria (Mill.).—One, May 1909.
Limnæa truncatula, Müll.—A dozen, September 1906 and May 1909.

Arachnida.

Amaurobius fenestralis, Stroem.—Several.
Tmeticus, sp. ?—♀, not in sufficiently good condition for determination.
Phalangium opilio, L.—Several, September 1906, etc.
Oligolophus agrestis (Meade).—Two specimens.
O. morio (Fabr.).—Half a dozen, some with the spinous front tibiæ of var. *alpinus*.
Nemastoma lugubris (Müll.).—One.
Gamasus, sp. ?—A mite belonging to this genus is immature.

Crustacea.

Porcellio scaber (Latr.).—A good many.
Ligia oceanica (L.).— Do.
Orchestia littorea (Mont.).— Do.
Gammarus pulex (L.).—Several.

Myriapoda.

Lithobius forficatus (L.).—Half a dozen adults.
L. melanops, Newp.—Two or three.
Linotænia maritima (Leach).—Eight or nine.
Iulus luscus, Mein. (= *britannicus*, Verh.).—Two females.

Insecta.

Machilis maritima (Leach).—This Thysanuran is represented by a score of specimens.
Agabus, sp. ?—There is a larva of a Water-beetle belonging to this genus.
Melophagus ovinus, L.—Of this common parasite of the sheep there are a number of specimens.
Microlepidoptera.—A few, but in much too bad condition for determination.—William Evans, Edinburgh.

BOTANICAL NOTES AND NEWS.

Plants of a City Waste.—Behind the Royal Scottish Museum, in the heart of the city of Edinburgh, where the demolition of an old house has left a vacant space of 70 × 20 feet enclosed by walls, Nature for the last two years has been reclaiming this waste with plants. It is now colonised by seventeen species, all of which show luxuriant growth. The relative abundance of each plant now established is a less fascinating point of study than the problem of how it originally came.

Composite plants are the most conspicuous, and are well established in this waste. *Carduus lanceolatus*, *Senecio vulgaris*, *Sonchus asper*, and another, a garden escape, *Taraxacum officinale*, and *Tussilago farfara*, all of whose fruits are furnished with a pappus and well adapted to wind distribution, may easily have come here floating above the house-tops on a light wind. The presence also of *Rumex obtusifolius* with its winged fruit, *Epilobium montanum* with its feathery seeds, and two species of *Salix* (garden escapes), is probably due to the same means.

Stellaria media, *Capsella bursa-pastoris*, and *Sagina procumbens*, which quickly take possession of any piece of rough soil in the heart of a city, are among other plants here which may have been brought by the wind. But as their seeds are not well adapted to dispersal it is doubtful whether wind alone can account for their presence in this colony.

The seeds of grass *Poa pratensis*, *P. annua*, and *Lolium perenne* were most likely introduced here by the direct agency of man or bird. At all events the establishment of *Ribes grossularia* in this enclosure was due to one of these causes.—A. B. Steele, Edinburgh.

Alisma Plantago, *L.*, in Caithness.—In the "Annals," 1907, p. 103, I reported *Butomus umbellatus* for Caithness—the record sent me by a correspondent in that county. No specimen was sent, but last winter a promise was given that one should be forwarded. My astonishment was great, and vexation too, to receive a fine full-grown specimen of the *Alisma* as *Butomus*. Of course I ought not to have accepted the record without a voucher specimen. The only redeeming point is that the *Alisma* is a new record for the county, and that being substituted the remarks as to Continental distribution may stand as nearly the same. It is the form with lanceolate leaves, none being cordate.—A. Bennett.

Insect Visitors of Fumaria officinalis, *L.*.—This plant seems to be only irregularly visited by insects, and few species have been recorded. Müller in his "Fertilisation of Flowers" gives only the honey-bee (*Apis mellifica*, L.). Warnstorf records a *Bombus* (species not mentioned), and Scott-Elliot in his "Flora of Dumfriesshire"

mentions a butterfly (*Pieris brassicæ*, L.). It may therefore be worth while recording that during the past summer (1910) I have on several occasions found the flowers being worked by species of humble-bees in search of nectar. Thus, on July 17—a dull and mild day—when walking up the ending of a potato-field in which *Fumaria* was in full bloom, I counted 16 ♀ ♀ of *Bombus agrorum*, Fab., and two small ♀ ♀ of *B. hortorum*, L. Again, on July 28 (dull and showery) several *B. agrorum*, Fab., were noted. Lastly, on August 16 (sunny and mild) I counted in the same place 8 ♀ ♀ of *B. agrorum*, Fab., and a single *B. terrestris*, L. (♀), the latter biting holes in the base of the corolla.—S. E. Brock, Kirkliston, West Lothian.

Scheuchzeria palustris on Rannoch Moor.—I found *Scheuchzeria* on Rannoch Moor on July 18th of this year. The plant was scattered in fair quantity over a very marshy part of the moor. It was associated with *Carex limosa*, *C. pauciflora*, *Drosera anglica*, *D. rotundifolia*, and the other common plants of a peaty marsh, such as *Scirpus cæspitosus*, *Molinia cærulea*, etc.

This is a new locality for the plant, and is of interest, as *Scheuchzeria* seems to be one of our decreasing species. Its only other recorded station in Scotland is Methven Bog near Perth; but it is almost certainly extinct there, as the site where it grew has been flooded, and it has been sought in vain since 1874. In England it has been recorded from no less than nine localities, but Wybunbury Bog, Cheshire, seems to be the only one of these where it can now be found. In 1904 Mr. A. Bennett wrote: "Unless discovered in other stations *Scheuchzeria* would seem to be a doomed species in Britain." It is gratifying to add one new locality where the plant still holds out in considerable numbers.—G. W. Scarth.

Moneses uniflora, *A. Gray*.—In the case of so local a species it may be of interest to state that I found this in August of this year, in fruit, near Loch Mallachie in the parish of Abernethy, East Inverness-shire. It has been known for a good many years in two or three localities some miles to the south, in Rothiemurchus, but I am not aware of its having been previously observed where I saw it.—James W. H. Trail.

Poppies by Railways near Aberdeen.—For a number of years I have kept watch for the poppies that occur near Aberdeen; but the only species that I have observed as a field weed has been *Papaver dubium*, and even it is almost confined to a few fields, and is rarely frequent. *P. somniferum* appears occasionally as a casual on rubbish heaps or as an escape from gardens. *P. Rhœas* has been very scarce even as a casual, and *P. Argemone* I had not seen near Aberdeen before this year.

But, curiously enough, in 1910 poppies have been frequent on ballast and other materials deposited from and near railways, to the

south of Aberdeen in Nigg, and to the north within the city near Don Street Station, and at Parkhill six miles out. Of *P. somniferum* only a few have appeared. *P. dubium* has been plentiful and very variable in size; *P. Argemone* has occurred in two or three places; and *P. Rhœas* has been rather common, a number of plants showing the red hairs on the flower-stalk distinctive of the variety *Pryorii*, Druce. This character seems to vary, some stems of the same individual having the hairs markedly coloured, while others bore almost colourless hairs only.—James W. H. Trail.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—July-September 1910.

[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 on Scotch Islands. G. E. H. Barrett-Hamilton, *Zoologist*, June 1910, p. 267.—States that this Shrew is common on many of the Inner Hebrides, such as Islay and Jura, but absent from the Outer Hebrides and the Orkneys.

A Variety of the Gannet (Sula bassana). R. Fortune, *Zoologist*, September 1910, p. 340.—Seen at the Bass Rock.

Albino Ringed Plover in Orkney. J. Gwyn Jeffreys, *The Field*, Sept. 17, 1910, p. 551.—Specimen obtained in August near Kirkwall.

Some Interesting British Insects (III.). G. C. Champion and R. W. Lloyd, F.E.S., *Ent. Mo. Mag.*, September 1910, pp, 203-205 and pl. iv.—Salpingus bishopi, Sharp, Eudectus whitei, Sharp, and Carida affinis, Payk., are figured and recorded from Scottish localities.

Coleoptera at Newcastleton, etc., in 1909. Lewis Barton, *Ent. Mo. Mag.*, August 1910, pp. 189-190.—Sixteen species taken in June.

A Revision of the British Species of Ptenidium, Erichson. H. Britten, F.E.S., and E. A. Newbery, *Ent. Mo. Mag.*, August 1910, pp. 178-183.—P. intermedium, Wank., and fuscicorne, Erichs., are recorded as Scottish.

Porphyrops nasuta, Fall., and P. elegantula, Mg., in Perthshire. A. E. J. Carter, *Ent. Mo. Mag.*, August 1910, pp. 193-194.—A single male of P. nasuta and several specimens of P. elegantula taken at Clunin Loch, near Blairgowrie, on 13th June 1910.

Help-Notes towards the Determination of British Tenthredinidæ, etc., Dolerides. Rev. F. D. Morice, M.A., F.E.S., *Ent. Mo. Mag.*, July 1910, pp. 154-159.—Dolerus ferrugatus, Lep., bimaculatus, Geoff., fumosus, Zadd., oblongus, C., and rugosulus, v. d. Torre, are mentioned as Scottish.

Additions and Corrections to the British List of Muscidæ Acalyptratæ (continued). J. E. Collin, F.E.S., *Ent. Mo. Mag.*, July and August 1910, pp. 169-178.—Numerous Scottish records are included in this paper.

On some Habits and Hosts of Bird Ceratophylli taken in Scotland in 1909; with description of a new species (C. rothschildi), and records of various Siphonaptera. James Waterston, B.D., B.Sc., *Proc. Roy. Phys. Soc. Edinb.*, vol. xviii. pp. 73-91 (July 1910), figs. 1-6.

Note on "Leptus phalangii" and "Leptus autumnalis" and their parent Earth-mites. William Evans, F.R.S.E., *Proc. Roy. Phys. Soc. Edinb.*, vol. xviii. pp. 100, 101.—Based on observations made in the Forth area.

The Oligochæta (Earthworms and their Allies) of the Forth Area. William Evans, F.R.S.E., *Proc. Roy. Phys. Soc. Edinb.*, vol. xviii. pp. 109-124.—The number of forms recorded is 47, out of 55 which make up the Scottish list.

A Revision of the British Species of Ostracod Crustacea belonging to the Subfamilies Candoninæ and Herpetocypridinæ. G. Stewardson Brady, M.D., etc., *Proc. Zool. Soc. Lond.*, 1910, pp. 194-220, pls. ix.-xxx. (June 1910).—Scottish records are given or summarized in this paper.

Note on Eunephthya glomerata, Verrill, from the Færoe Channel. Professor J. Arthur Thomson, M.A., *Proc. Roy. Phys. Soc. Edinb.*, vol. xviii. pp. 98-99 (July 1910).—Extension of range of a northern species of Alcyonarian.

BOTANY.

The British Roses, by Major A. H. Wolley-Dod (*Journ. Bot.*, 1910, suppl., pp. 81-112), continues the discussion of the forms included under *villosæ* and *rubiginosæ*; several are enumerated from localities in Scotland.

BOOK NOTICES.

Life of William MacGillivray, M.A., LL.D., F.R.S.E., Ornithologist, Professor of Natural History at Aberdeen University. Written by W. MacGillivray, W.S., with an appreciation by Professor J. Arthur Thomson. With illustrations. London: John Murray, 1910. Price 10s. 6d. net.

William MacGillivray, like many other great men, was not sufficiently appreciated during his lifetime. No biography has yet appeared till the present one, and his tomb long remained uninscribed with his name, whilst his monumental work, "The History of British Birds," received only a mediocre welcome. Seeing all these things, it is very fit that the life of William MacGillivray should now appear, and we have to thank his venerable, highly esteemed namesake for giving us such a delightful and ably written little biography of one of our ablest British ornithologists.

Professor MacGillivray was a naturalist in the truest sense of the word, one who loved to study animal life both in the fields and in the laboratory: he was a field naturalist as well as a master of anatomy, being equally at home in the museum or on the moor. His *magnum opus* was "The History of British Birds," written with such delightful enthusiasm; the work treats of all our native birds, and affords practical lessons in their various structural peculiarities. The reader is taken on many an ornithological ramble, in which all the birds observed are fully discussed, imaginary questions being asked by the pupil and answered by the professor. The work was absolutely original and the work of a master, consequently it is a book which will always live and maintain its pristine freshness, though at the date of publication it received but scanty appreciation.

MacGillivray's life was a strenuous one, and full of incident; consequently the biography is full of interesting matter, whilst it gives a detailed course of his life.

Both the biographer and Professor Thomson have performed their labour of love in a manner worthy of all praise, and we cordially recommend this delightful volume to all naturalists. It contains many illustrations which are reproductions of MacGillivray's drawings of birds, the originals of which are now in the British Museum. A further point to notice is the excellence of the paper and the consequent lightness of the volume in the hand. If one may be allowed to criticise, might one point out that the eminent ornithologist alluded to on p. 137 as having been in the mind of the late Professor Newton was assuredly John Wolley, not H. M. Turner. W. E. C. and G. E. G.-M.

Insect Wonderland. By Constance M. Foot. With illustrations. London: Methuen & Co. Price 3s. 6d. net.

This is a charming little volume, containing ten sketches, in story form and simple language, intended to convey to the youthful reader some elementary facts concerning the structure, habits, and life-history of some of our commoner insects. Some of the stories have been read aloud by us to a child under five years of age, to the undoubted enjoyment of the listener. Told like fairy tales, these little chapters are admirably adapted for the instruction of boys and girls who show a taste for natural history.

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No. 73] 1910 [JANUARY

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No. 74] 1910 [APRIL

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