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[JANUARY

THOMAS EDWARD BUCKLEY.

IN MEMORIAM.

By J. A. HARVIE-BROWN.

IT is with feelings of unusual poignancy of sorrow that we record a great blank in our happinesses, friendships, and associations in the death of our friend Mr. T. E. Buckley, at Rossal, Inverness, after prolonged illness and suffering, on the 4th of November 1902. Mr. Buckley never appeared to have regained his previous good health since he was first seized by a virulent attack of influenza in March 1900, nor did he ever really rally after he received the culminating attack on the 4th of June 1902.

Mr. Buckley was born on the 3rd of April 1846, and was the son of the Rev. Thomas Buckley, rector of St. Thomas, Old Trafford, known later as "The Church of the Two Asylums," and Elizabeth Akroyd, his wife. He was educated at Rugby and by private tuition, and, spending his youth and part of his early manhood at his native place—Old Trafford, near Manchester, and at Beverley, Yorkshire—till 1869, he afterwards passed a full curriculum at the University of Cambridge, where he took his degree of Bachelor of Arts about 1867 or 1868. He visited Scotland for the first time in 1869 as the guest of Mr. Donald Charles Cameron, of Glenbrittle, Skye.

In 1866 he went to Lapland and Sweden, and returned to Sweden in the two following years.

In 1869 he visited Turkey and Greece, along with Mr. H. J. Elwes, on a collecting trip, the results of which are detailed, under joint authorship with his friend and companion, in the "Ibis" for the year 1871—one of these delightful accounts of good field work which graced the earlier volumes of that magazine.

He made four different expeditions into Africa for sporting purposes—to the Gold Coast in 1872, accompanied by Captain Shelley; to Matabeleland, in pursuit of birds, in 1873, with Frank and William Oates; to Amaswaziland in 1876; and lastly to Kilimanjaro in 1888-89, with his greatest friend, Guy Dawnay (M.P. for the North Riding of Yorkshire from 1882 to 1885), whom he had met first in South Africa in 1873.

In 1882 he paid a first visit to New Brunswick, in company with his cousin, Mr. Charles Akroyd, and went there again in 1884. In 1893 he went on a sporting expedition with Akroyd to the Rockies. A grand series of his trophies of all these several expeditions have ever since adorned the hall and staircase of the lovely house in Inverness.

He became the lessee of the shootings of Gordonbush, Brora, in Sutherland, and occupied these from 1870 till 1873.

In 1874 he married Miss Reed, only child of Ellerington Reed, of Gordonbush; and since he returned from his last African expedition he may be said to have resided principally in Scotland.

In 1885 he purchased the small Highland estate of Rossal, on the River Cassley, in Sutherland, but he resold it two years later, because he did not find the sporting or the residential amenities of the place up to his expectations. He then built the handsome house in Inverness, in which he had resided as his home till his death, and which was named Rossal after his previous possession.

On the River Helmsdale Buckley broke the record of salmon killed by rod single-handed in the North of Scotland, the previous record having been twenty-one fish to one rod on the Thurso. His record on the Helmsdale was twenty-

two fish, all killed with fly on a 12-foot trout-rod, and unaided by an attendant. A very full account of this "grand bit of sport" he wrote, at Mr. Grimble's request, for that gentleman's handsome volume on the "Salmon Rivers of Scotland."

Perhaps the greatest personal sorrow Buckley ever had during his life was the loss of his friend, the late Guy Dawnay, who accompanied Buckley on his last African expedition in 1888-89, as above referred to, and who met with his death from the treacherous charge of a wounded buffalo.

The last two shooting seasons of his life were spent at Castlehill, Castleton, near Thurso, whence finally he was removed to his own home at Rossal, Inverness.

The writer first met Buckley in 1871, in the house of Mr. H. J. Elwes, Portman Square, London, and since then has been intimately associated with him in work connected with a survey of the vertebrate fauna of Scotland. On these many pleasant associations and friendship I do not enlarge, except to say that during the long period in which we worked together there has been not only complete *entente cordiale*, but also, better still, the most unflinching friendship. In conclusion, I desire to add that I am indebted and grateful to Miss Buckley, assisted by Mr. Akroyd, for some of the more exact dates of the salient periods in his life's work.

The following I believe to be a fairly complete list of his published contributions to science, but I would be glad to be informed if I have omitted any:—

- 1870. 'A List of the Birds of Turkey,' by H. J. Elwes and T. E. Buckley ("Ibis," 1870, three parts).
- 1872. 'Two Months' Collecting on the Gold Coast,' by Captain G. E. Shelley and T. E. B. ("Ibis," July 1872).
- 1873. 'List of Birds collected or observed during a Journey into the Matabele Country in 1873' ("Ibis," p. 355).
- 1876. 'On the Past and Present Distribution of the Large Mammals of South Africa' ("P.Z.S." 7th March 1876, *op. cit.*).
- 1877. The same continued, p. 277. These contain the united experiences of his two South African expeditions.
- 1881. 'On the Birds of East Sutherland' (1869 to 1880, "Proc. Glasgow Nat. Hist. Soc." April 1881).

1882. 'On the Variability of the Plumage exhibited by the Red Grouse' ("P.Z.S." 7th Jan. 1882).
 1888. 'A few Notes on the Migratory Habits of the Red Grouse' (Inverness Field Club, 22nd May 1892).
 1892. 'Contribution to the Vertebrate Fauna of Sutherland and Caithness' ("Annals of Scot. Nat. Hist." July 1892).

And many minor notes and contributions to the "Proc. Glasg. Nat. Hist. Soc." and "Annals Scot. Nat. Hist." etc.

THE RED DEER OF NORTH UIST.

By ANDREW M'ELFRISH.

THERE are about three hundred deer in North Uist. The North Uist deer are particularly good. I believe they compare favourably with, if they do not surpass, the deer of most Scotch forests. They are all big, heavy animals, and the stags carry very fine heads. The proportion of "Royals" and fine heads is, I believe, worthy of note. A few years ago I counted five "Royals" in one day. Within the last fifteen years two endeavours were made to introduce fresh blood by the deceased proprietor, the late Sir John Campbell Orde, Bart., first by the introduction of a very large stag from one of the south country parks—but this animal, which was very tame and grazed among the cattle on the west side of the island, was wantonly shot by one of the natives—and afterwards by the introduction of a number of calves from forests in the north. These calves were brought across, reared on cows' milk, and when sufficiently grown, having been lug-marked, were turned out into the forest. Afterwards I repeatedly saw them trotting about by themselves. They appeared to keep pretty much by themselves. I have not heard of any of them being killed.

Our present proprietor, Sir Arthur Campbell Orde, has adopted means for the regular infusion of fresh blood, and it is to be hoped he will succeed. He has purchased an Irish stag and several hinds. These he is keeping in a park within the policies at Kilmory, his seat in Argyllshire, and I

understand his intention is to import the young to North Uist, and after a time to transfer the stag there also, and replace him at Kilmory by another. I had recently the pleasure of seeing these animals, and to my eye the Uist animals are certainly not inferior to them.

A very fine stag was shot in North Uist on 2nd September 1897. He was a real wild Highlandman, carried a grand head of 14 points, and weighed 22 stone 7 lbs. I knew him for several years before he was killed. He occupied a small island in a loch at Braenish, on the east side of the public road, where I often went to look at him. He was a great favourite of the then keeper, who was very proud of him and called him "the big fellow." I was quite sorry when he was killed, and followed up his head until I overtook it and got photos. At the same time there was another magnificent stag which occupied the island of "Mossam" in Loch Fada. The "Mossam" stag was of great size, quite as large and heavy as the other, and carried a very fine "Royal" head of jet black antlers with perfect cups and tips which in the sun shone almost like silver. This animal, which was also a great favourite of the keeper, when I saw him last was easily distinguishable from the others by the intense blackness of his antlers. The North Uist deer get no hand-feeding. Since the stag above alluded to was shot, another 14-pointer was got in 1898. A 16-pointer was got in 1900. During the years 1897-1901, over and above these animals, five Royals and three 13-pointers were got.

A few years ago a number of deer left the island of Pabbay, swam across to North Uist, and took up their quarters on the farm of Newton and the golf course at Trumisgarry. I do not know whether they eventually succeeded in taking up with the North Uist deer, but the keeper of the time said the stags were afraid to venture among the North Uist deer, that the latter would have none of them, that so soon as one of the Pabbay stags ventured to cross a certain line he was set upon by the North Uist stags and driven back. This may have been a romance, but at all events Sir John did not desire that these stags should pay attention to his hinds. He did not admire their heads. One of them which I several times saw on the golf course

had a peculiar head. The horns immediately above the brow antler shot out almost at right angles to the head, and then went straight up and finished off with two upright points at the top.

A few years ago, possibly four or five, a stag, but whether from Pabbay or North Uist is not known, wandered down to South Uist, across both fords and through the island of Benbecula, and took up his quarters on the farm of Ashemish. For some time he was occasionally seen at different spots, but I believe not for some time back. Possibly grown tired of celibacy, he returned north to gather a harem about him.

There is a story that, in years gone by, the deer frequently crossed the Sound of Harris between Harris and North Uist, and that the hinds were caught by the inhabitants of the island of Bernera, "put on tethers," and regularly milked by the ladies. I think the story a bit too tall. I very much doubt any Bernera ladies having the courage to attempt to milk a hind, even supposing the hind would stand for her to do so.

Subjoined is a note of the particulars of deer killed in North Uist during the years 1897-1901:—

1897			
STAGS		5. 9 stone 7 lbs.	7 points.
1. 22 stone 7 lbs.	14 points.	HINDS	
2. 15 " 7 "	13 "	1. 9 stone 7 lbs.	
3. 13 "	10 "	2. 9 "	
4. 15 "	12 "		

1898			
STAGS		3. 17 stone 3 lbs.	9 points.
HINDS		4. 17 "	14 "
1. 13 stone 8 lbs.	13 points.	5. 17 " 12 "	9 "
2. 20 "	10 "	6. 16 " 5 "	11 "

1899			
STAGS		5. 20 stone	11 points.
HINDS		6. 12 "	8 "
1. 15 stone	8 points.	1. 7 stone 7 lbs.	
2. 12 "	6 "	2. 8 "	
3. 17 "	11 "		
4. 18 "	13 "		

1900

STAGS				
1.	18 stone	16 points.	3.	18 stone 12 points.
2.	15 "	10 "	4.	14 " 9 "
			5.	14 " 12 "
			6.	14 " 7 "

1901

STAGS					
1.	17 stone	12 points.	5.	15 stone 7 lbs.	12 points.
2.	17 "	10 "	6.	12 " 7 "	8 "
3.	12 " 7 lbs.	9 "	HINDS		
4.	12 "	11 "	1.	8 stone	
			2.	8 " 7 lbs.	

ON THE AVIFAUNA OF THE OUTER HEBRIDES, 1888-1902.

By J. A. HARVIE-BROWN.

(Continued from p. 217, No. 44.)

CORNCRAKE (*Crex pratensis*), p. 122.—There are certainly some curious statistics in connection with the arrivals, residence, and departures of this species in the Outer Hebrides (see our previous accounts). Mr. C. V. A. Peel holds that some remain all winter; and records having shot one upon December 15, 1898, and another on January 19, 1899. And he adds: "I have frequently seen Land-rails in winter on the island of Vallay, North Uist." Mr. Peel quotes from his game-book, in reply to my inquiry: "I always examined Water-rails and Land-rails carefully, but never shot a Carolina Rail." I asked the question, having reference to the record of the Carolina Rail recorded as obtained in Tiree by Mr. Lort Phillips in the winter of 1901-1902 ("Ann. Scot. Nat. Hist." 1902, p. 9). It is interesting in this connection to record that Corncrakes were also found wintering in the island of Tiree during the season of 1901-1902, which we have record of at date of March 3, 1902.

COOT (*Fulica atra*), p. 123.—Previously rather rare in Benbecula, it is reported as "now very common there" by Mr. M'Elfrish, who adds: "at all events, hundreds are bred on the west sides of North Uist and Benbecula every year on the fresh-water lochs."

There does not appear to be much difference known in the distribution of this bird in the Outer Hebrides north of the Sound of Harris. Mr. Radclyffe Waters can only speak of it as frequenting

one loch on the Galston Shootings in Lewis ("Zoologist" 1896, p. 142).

GOLDEN PLOVER (*Charadrius pluvialis*), p. 124.—Correspondents agree, as a rule, that this species has greatly increased, and are most abundant in the southern isles of the group, especially in Benbecula and South Uist, in winter, but it appears still to be a somewhat rare breeding species anywhere south of the Sound of Harris. A variety of the Golden Plover is recorded by Dr. M'Rury—wings and tail partly white ("Ann. Scot. Nat. Hist." 1893, p. 116).

Golden Plovers are recorded as having been seen in St. Kilda by Mr. Norman Heathcote in his "St. Kilda," p. 193.

Mr. M'Elfrish, after speaking of "a very few pairs breeding in North Uist, and of one pair which bred regularly within two miles of Lochmaddy, some years ago," gives a good account of their arrivals there and in Benbecula. He says: "In August a few small lots arrive, and later on more come in. By October and November they may be seen in countless numbers in some years, and, of the islands of our district, Benbecula is by far the most frequented." Mr. Abel Chapman describes the arrival of the Golden Plover in North Uist as "streaming in from the north over Ben Maravall on October 1.

GREY PLOVER (*Charadrius helvetica*), p. 124.—The Grey Plover appears to be a rare species in the Outer Hebrides. It is recorded as occurring in mid-winter, January 1892, in Barra, by Dr. M'Rury, and has been shot by Mr. W. L. MacGillivray of Eoligary. Dr. M'Rury also mentions that he had only once met with it on the Vallay Strand in North Uist "some nine or ten years ago" ("Ann. Scot. Nat. Hist." 1893, p. 116). And Mr. C. V. A. Peel marks it as "seen only twice by him in North Uist" during the last five years. One is also recorded from Island Ghlais in Harris on May 10 ("Ann. Scot. Nat. Hist." 1893, p. 160).

Mr. M'Elfrish says of it: "By no manner of means common. I never saw one in North Uist, but have shot a few in Benbecula during Sir Wm. Smythe's tenancy of the shooting. Five or six at a time were the most that were seen."

GREEN PLOVER (*Vanellus cristatus*), p. 125.—Now, although MacGillivray speaks of the Lapwing as "being of very rare occurrence in the extreme north of Scotland and in the Hebrides," C. Gordon, in his annotation, says: "Thousands of these birds breed in South Uist every year to my certain knowledge, having both seen the young and taken the eggs"; and in this remark he is supported by the authority of the late Mr. John MacGillivray.

There is every reason to believe in the increase of the Lapwing, especially to the south of the Sound of Harris. Mr. Peel, who has shot for some seasons in islands on both sides of the Sound, considers them commonest and in larger flocks in North and South Uist and Benbecula than to the north of the Sound of Harris.

One nest of Lapwings' eggs was found on Pabay More, an island off the west side of Lewis, in June 1901; and one nest with four eggs was taken in Bernera in May 1902.

RED-NECKED PHALAROPE (*P. hyperboreus*), p. 129.—Of birds formerly comparatively rare as breeding species, the same correspondent mentioned under Swan, Terns, etc., instances the Red-necked Phalarope as having greatly increased. He says: "When I came here seventeen years ago it was a very rare thing to see more than two pairs in a season. Now, *i.e.* in the summer of 1900, I counted about thirty pairs round their favourite haunt; but, *besides*, they are fairly well distributed over the islands in the nesting season." I may, however, say that his remarks cannot be held to refer to any of the islands or any parts of the mainshores or lochs north of the Sound of Harris. Similar evidence is borne out by the excellent notes I have received from Mr. M'Elfrish, who mentions seeing a flock of about fifty at one locality. He adds, however, that he had never seen a flock before. More data are required to establish the fact of an increase.

GREY PHALAROPE (*P. fulicarius*), p. 130.—The first record of the species in the Outer Hebrides bears date of about October 20, 1900, as given by Buckley, and was shot at Lochmaddy. In 1901 Mr. Eagle Clarke received the wing and leg of one obtained at Eilean Ghlais Lighthouse on November 3, and Dr. John M'Rury records one found in Barra in September ("Ann. Scot. Nat. Hist." 1892, p. 139; 1894, p. 207).

WOODCOCK (*Scolopax rusticola*), p. 130.—We have recorded in the first number of the "Ann. Scot. Nat. Hist." the nesting of the Woodcock in the Outer Hebrides. This record may, I consider, be looked upon as the first positive information we possessed of the fact, and of the extension from the mainland or Inner Hebrides.

According to Prof. Duns, the Woodcock has never been known to nest in The Lews up to the date of 1865 ("Fauna of the Outer Hebrides," p. 130). Then we were told that it bred at Stornoway in 1879 by Mr. Greenwood (*loc. cit.*). There are earlier general statements, however, which ought not to be lost sight of, *viz.* those given in the sporting accounts of "Sixty-One,"¹ and Mr. Newall, who, in a very casual way, describes it as follows: "Woodcock do not breed there"—*i.e.* in The Lews—"except so occasionally as to prove the rule."

Very likely he had good reason for making this remark, but the next statement is not quite so worthy of repetition, and rather points to the possibility that the first is also imperfect, *viz.*—he goes on to say: "as is the case on the mainland coast opposite" (*i.e.* exceptional). Woodcocks were, however, known to breed in many other

¹ Hely-Hutchison.

parts of Scotland long before the date of Mr. Newall's experiences (*i.e.* "Scottish Moors and Indian Journals," 1887, p. 54). And in support of the first statement I have Mr. D. Mackenzie's communication that "I hear no account of the Woodcock nesting in this island—*i.e.* Lewis—and I don't think they do. If there were any about the Castle grounds they would be seen, no doubt." Of course we have the undoubted occurrence of it breeding farther south, *viz.* in North Uist.

Mr. C. V. A. Peel considers that Barra is the best cock-ground in the Isles in his experience.

At the present time, correspondents seem to agree that Woodcocks are not so abundant as formerly, *i.e.* in the winter and shooting season, and some correspondents hold that they have never recovered from the effects of a severe winter in the isles in 1894-95. In 1901, Woodcock are again reported as not plentiful.

On migration, I have accounts of it passing as far *south and west* as Monach and Flannan Isles (October 1893; "Ann. Scot. Nat. Hist." October 1894), but none, so far as I can find, farther south in the Outer Hebrides.

The time of their arrival in autumn is given as about the third week in October. The first observed of the season 1893 was on October 29.

Mr. Peel gives some interesting data as to the regular arrivals of Woodcocks in the Isles, which I think worth reproduction.

Mr. Peel says: "The Woodcock makes its appearance in the Outer Hebrides in mid-October, almost to a day. In 1895, on October 14; in 1896, on October 15; in 1897, on October 18; in 1898, on October 17." Mr. M'Elfrish follows Mr. Peel's account with the information that they "come to North Uist every year. The first of them arrive regularly from October 20 to October 25. Several years the first were found in Benbecula on October 23. Earliest, October 14, and latest, October 27. By November the bulk may be said to have arrived. The numbers vary in different years. I have known of 60 being shot in two days."

These accounts of Mr. Peel and Mr. M'Elfrish are followed up by the dates of their occurrences in the northern portions of the Long Island, and can scarcely fail to interest the student of migration, as well as be useful to the sportsman. Mr. Radclyffe Waters writes as follows: "Woodcock are far less abundant at Gress than at Galston, but on both shootings it has been much scarcer since the great frost of 1894-95. In that year I received 176 Woodcock from Galston, and after that they had become too thin to be worth shooting, and the keeper was picking up many dead ones along the shore, along with Gulls, Golden Plover, etc. That was the best year for Woodcock of my tenancy; the numbers in the previous years being 126, 127, 99, 37, and in 1895-96 falling to 30." Mr. Radclyffe

Waters also gives me the following interesting dates of arrival at Galston in the west, and Gress in the east. "I have the following dates of the first appearances of the Woodcock in Lewis. At Galston, September 11, 1891 (possibly a bird that had remained all the summer), October 19, 1892, October 20, 1893, October 25, 1895. At Gress, October 18, 1899, October 20, 1901."

Amongst many most excellent notes Mr. M'Elfrish of Lochmaddy says: "Personally, I have never seen but one Woodcock which had passed the summer in North Uist, and I fear he did so *volens volens*. A brother of Lady Campbell Orde and I were shooting just outside the Balelone march, on a day in September some years ago, when my dog set. After a search we found a cock squatting in the heather. I picked him up in my hand, and found he had only one wing, having lost the other cut off close to his body. The stump was quite healed, and he was as fat as a ball of butter.

"He had evidently lost the wing against the march fence, and had been left behind when his friends took their departure the previous season."

COMMON SNIFE (*Scolopax gallinago*), p. 131.—Mr. M'Elfrish tells me he has never seen Snipes sitting upon the sands as described in our "Fauna of the Outer Hebrides," p. 131, where we quoted Professor MacGillivray and Gray, but he has seen them arriving in large flocks during their migration. He writes as follows: "On October 20, 1899, I saw a most interesting sight when driving between Howmore in South Uist and Lochboisdale. I had just got a short distance south from Howmore, when happening to look behind, I saw a great flock of birds flying towards me from the north. They were a considerable distance off when I saw them first, and I could not make sure what they were, so I had the trap stopped, and watched. They came right on until they were almost over my head, and then began to fly round in circles, sometimes dropping down till near the ground, and then ascending again, but still sweeping round in circles. They were Snipes, and hundreds of them. After they had behaved as above for, perhaps, twenty minutes or half an hour, detachments broke off from the main body and went away, some detachments in one direction, and others in other directions, until the whole had disappeared." Then Mr. M'Elfrish adds, criticising MacGillivray's and Gray's statement, "They are never to be seen in flocks, 'like dunlins,' on the ooze or fords. Occasionally in severe weather they may be seen about the shores, but never in flocks." The nearest approach to what Professor MacGillivray describes, that I have seen, are the "wisps" of Snipe which are familiar to most sportsmen, and these, I think, will be found to take place either immediately after their arrival or before a sharp climatic change.

It is always interesting, I consider, to record dates of the arrivals of migrants at different localities during a series of years. Though this has been done ever since the days of the earlier recorders, like White of Selborne, less interest has attached to these details till lately, simply owing to the fact that no means had been arrived at in order to record such parallel observations as have been given us by such men as Gätke in Heligoland, and observations made at lighthouses in Britain and in Denmark and elsewhere. To the sportsman, apart from the naturalist, the dates given as follows ought to be of interest, both as regards Common Snipe and Jack Snipe.

Mr. Radclyffe Waters writes me: "Snipe are most undoubtedly much reduced in numbers by the hard winter of 1894-95. The keeper at Galston reported that he did not find many dead, as in the case of Woodcock, Golden Plover, Gulls, etc.; but they seemed to leave the country and never came back. In that season the total bag was 236, the four previous years yielding 362 to 248. In the following year and season it dropped to 73!"

It appears to be a well-recognised fact that Snipe in many parts of the Outer Hebrides are often found in most unexpected places, and none perhaps more strange than the very summits of the hills, where they are frequently shot as they rise from perfectly dry ground. The same observation has been made in many other localities, but, I think, not so commonly as in these isles. In this respect they seem rather to follow the example of the Woodcock, which, as is well known, prefers a dry bed during the day to rest upon.

JACKSNIPE (*Gallinago gallinula*), p. 131.—Mr. M'Elfrish writes of this bird: "A regular winter visitor every year. The first Jacks arrive in September. This year I saw one on September 29. Some years they come in much greater numbers than others. I have seen them so abundant that it would have been too great labour to have carried enough cartridges to shoot at anything like as many as one might in the day. They get into queer places sometimes. On January 29, 1900, I shot one on the top of Ben Eaval on hard dry ground."

The following are the dates of first arrivals in the north of Lewis: November 6, 1890; September 29, 1891; October 4, 1892; September 27, 1893; September 28, 1894; September 28, 1895; October 2, 1896; September 20, 1897; September 21, 1898; September 30, 1899; September 30, 1900; September 30, 1901. For these I am indebted to Mr. Radclyffe Waters, who further says: "They appear to come in small parties, a few being generally found together. On October 7, 1898, out of 13 snipe killed, there were 9 Jacks. On October 2, 1899, one of the party, when fishing on the 'flats' (or tidal part of the Gress river), caught a Jack Snipe with his landing-net."

PURPLE SANDPIPER (*Tringa maritima*), p. 132.—Though we have nothing new to relate about this species in the west, I wish to draw attention to the statement in the latest edition of "Harting's Handbook" regarding its occurrences in Mingulay, as observed there by Feilden and myself. Harting says: "They were not, however, in full summer plumage." I think I am safe to say, even at this remote period—lapse of time and loss of collections, etc.—that if not in *full* summer plumage, at least they were very far advanced towards that stage; and there could scarcely be any doubt regarding the denuded state of the feathers of the breasts of two of them, and the evident hatching spots displayed. I do not wish to insist that they were breeding, but only to draw attention to our more exact observations as originally given.

By the courtesy of my friend Mr. Thomas Southwell of Norwich, I have received some notes taken in N. Uist and elsewhere by the late Mr. Daniel Catlin Burlingham, of King's Lynn,¹ in which occurs the passage under date of June 12, 1848: "I found nest of the bird supposed to be Purple Sandpiper, and heard its peculiar note . . . no eggs in it." But very slight importance can attach to this note, as it appears from the context that the observations were made at or near the level of Loch Scatavagh, N. Uist. I give it, however, for what it is worth.

KNOT (*Tringa canutus*), p. 133.—Curiously this species, so abundant on our east coasts and on our mainland shores, is decidedly scarce at the present time in the Outer Hebrides. Dr. M'Rury marks his "first seen" on August 31, 1892, when he shot "two out of a few"; and at the same place he again saw about one dozen on January 26, 1893. In July 1899 Mr. W. L. MacGillivray shot one in summer plumage. He adds to the record that he "never saw one in summer since; but a small flock has appeared on a certain sand at Eoligary every winter and spring for some years back."

SANDERLING (*Calidris arenaria*), p. 134.—In addition to our remarks in our previous account, I desire to add that Mr. W. L. MacGillivray records having shot one in May 1897 on the sands of Barra, and he adds: "Regular visitors in winter and spring. I never saw them here later than May."

RUFF (*Machetes pugnax*), p. 254.—One, Benbecula, by Dr. M'Rury, August 18, 1888 ("Fauna of the Outer Hebrides," Appendix D, p. 254); a second in Lewis ("Ann. Scot. Nat. Hist." vol. ii. p. 46); and a third seen by Dr. M'Rury in Benbecula on October 9, 1892.

To the records of Ruffs and Reeves found in our "Appendix to Fauna of the Outer Hebrides," p. 254, Mr. Radclyffe Waters adds as

¹ See Obituary Notice in "Transactions" of Norfolk and Norwich Naturalists' Society for 1891-92.

follows: "One shot on September 6, 1892; a Reeve on September 6, 1893; and a third, a Reeve, on September 8, 1894; and, as far as I know," he continues, "the birds were alone in each instance. Probably few select a route so far to the westward."

GREEN SANDPIPER (*Totanus ochropus*), p. 135.—This is an addition to the fauna of the area. Mr. Macculloch, taxidermist, Glasgow, received one from S. Uist to be preserved, as I am informed by Dr. M'Rury, *in lit.*, October 31, 1901. The specimen was exhibited at a meeting of the Glasgow Nat. Hist. Soc. by Mr. Macculloch.

GREENSHANK (*Totanus canescens*), p. 135.—All subsequent observations carry out our previous remarks. Mr. M'Elfrish, for instance, writes that: "I do not suppose I have seen a score in the past 15 years. I have, however, seen a few at different times both in N. Uist and Benbecula. I never saw two together, and only remember having seen one during the breeding season. That was in Benbecula." Mr. C. V. A. Peel has seen small family parties of from 3 to 6 together occasionally (*in lit.*), but nobody has seen "flocks," as have been often described.¹

BLACK-TAILED GODWIT (*Limosa algocephala*), p. 136.—This is an addition to the fauna of the Outer Hebrides.

Dr. M'Rury writes me that he "believes" that a good specimen of the Black-tailed Godwit was shot in South Uist a year or two ago, but this may well be the same specimen which, as reported to me by Mr. C. V. A. Peel, that gentleman shot in Benbecula—"the first I have noticed in the Outer Hebrides."

Subsequent information, however, tells me that the above are different specimens. The one shot in South Uist is in the collection of Sir Reginald Cathcart at Grogary, as I am informed by Mr. M'Elfrish.

BAR-TAILED GODWIT (*L. lapponica*), p. 136.—Mr. MacGillivray writes: "I shot one out of a flock of about fifteen in July 1896. They were not in summer plumage, and must have been young birds, as they remained here all through the summer. I saw a small flock remain last year also"; and these facts are verified by Mr. M'Elfrish's notes.

¹ There is an error—indeed, a double blunder—in "The Vertebrate Fauna of the Outer Hebrides," at p. 136, under Greenshank. We say—misquoting Professor MacGillivray—that he speaks of "astonishing numbers of Greenshanks." But we had misread and misquoted. What he *did* say was that "Many individuals remain during the summer, when they are found by the lakes in the interior, of which the number in Uist, Harris, and Lewis is astonishing."

And we also gave the date of his first writing as 1852, which is the correct date of his vol. iv. of his "British Birds" (*loc. cit.* p. 322). But the first printing of the passage was an original contribution to Audubon's "American Ornithological Bibliography," vol. iii. p. 483, which gives the earlier date of 1835. I have to thank Mr. Wm. Evans for the above corrections.

WHIMBREL (*Numenius phaeopus*), p. 136.—A single bird of this species stayed right on from the summer of 1889, continuously through the seasons to 1893 (Dr. M'Rury, "Ann. Scot. Nat. Hist." vol. ii. p. 116). This must surely have been a wounded bird, although Dr. M'Rury seemed to be of the opinion that it was not.

We have seen that the Whimbrel migrates to the west of the Outer Hebrides; also passes Rockall on migration north in June; and so it is not extraordinary to have it added to the list of birds seen on St. Kilda by Mr. Norman Heathcote ("St. Kilda," by Norman Heathcote, 1900).

Speaking again of their general routes of migration along the coasts of Scotland, I wish to say that there are several crossing-places from east to west in both spring and autumn, such as by the Spey valley, to a modified extent; and regular and distinct from Forth to Clyde in autumn by more than one route. Thus on the west side of Loch Lomond they are often seen and shot during grouse-driving in the early season (August 12 to 20, etc.), and many are seen on Clyde passing west at or near the point of Strone, which is a direct continuation of their flight across, between Loch Lomond and the Clyde at Helensburgh. There is little doubt also that a few Whimbrels pass in spring up the west valley of the Pattock, and so to Spey, as well as use that depression in autumn.

COMMON TERN (*Sterna fluviatilis*), p. 141.—While this bird has not been absolutely discarded from the "Fauna of Outer Hebrides," and indeed was fully admitted in the Appendix D, p. 225, even then we were very chary of adding it to the species found breeding, notwithstanding Dr. M'Rury's evidence.

Since then there is the announced fact of this species nesting in the island rock of Hysgeir, off Canna, by Mr. Howard Saunders. Hysgeir is not one of the Outer Hebrides, but is so approximate to them that it is reasonable to suppose that an extension might take place at any time; and so in 1901 we find a note from Dr. M'Rury to the effect that the Common Tern was identified by him at last during the spring and summer of 1900 ("Ann. Scot. Nat. Hist." 1900, p. 143). We have before said that we believe the Common Tern to be an advancing species, and there has occurred some evidence to prove that it is so.¹

ARCTIC TERN (*Sterna arctica*), p. 139.—I do not find much to add to the history of this species in the Outer Hebrides, unless to make the remark that it would almost appear to be becoming a dwindling quantity, though the process may not seem to be a rapid one. The Common Tern, on the other hand, appears to afford evidence that it is the "coming race" in the struggle for existence.

¹ It seems of sufficient interest to note the first authentic record of the nesting of the Common Tern (in 1901) on one of the islands on the west coast of Shetland ("Ann. Scot. Nat. Hist." for April 1902).

At all events, it may well be worthy of attention on the part of future observers to note carefully the actual facts which year after year present themselves in connection with the respective distribution of these two closely-allied species. Even their present actual comparative distributions are not thoroughly wrought out.

LESSER TERN (*Sterna minuta*), p. 143.—The Lesser Tern is now known to have bred certainly in the Outer Hebrides since 1885 or 1886, or for the last 16 or 17 years, and it is now far from uncommon. My informant (who wisely desires that his name be not given, for obvious reasons, and gives no encouragement to collectors, of whom he says “there are already far too many”) tells me that “it is a positive fact that the Lesser Terns breed here in two colonies, their numbers having greatly increased during the last few years, and especially in 1899 and 1900. They arrive about the end of May.” In 1900 I obtained two eggs from this Outer Hebridean locality in order to put the record beyond cavil. Furthermore, I have to add that in the “Ann. Scot. Nat. Hist.” for October 1902 it is recorded that the species nested in Barra for the first time on record. “From 5 to 6 pairs nested.”

IVORY GULL (*Pagophila eburnea*), p. 144.—This is added to the “Fauna of the Outer Hebrides” by Buckley, who sent me notice of one—a male—sent to Mr. M’Leay of Inverness by Duncan Mackenzie of the Royal Hotel, Stornoway, in January 1890, and seen by Buckley in M’Leay’s shop.

ICELAND GULL (*Larus leucopterus*), p. 148.—This species may almost be considered a regular winter visitor to the Outer Hebrides, though not in great numbers. Mr. Mackenzie continues to find them frequently about Stornoway (“Ann. Scot. Nat. Hist.” 1892, p. 140; April, 1890, etc.).

They are seen also at Barra, but not perhaps so frequently as at Stornoway (*loc. cit.* 1894, p. 113).

Thus one was shot at Stornoway by Mr. Mackenzie, and was sent to Mr. M’Leay, Inverness, which was procured about the end of August 1897. There are several other records in the Migration Reports. Mr. Mackenzie also killed one in adult plumage about two years ago—say 1899—which had remained all the winter and spring and the following summer. It was shot in September.

Mr. W. L. MacGillivray also meets with it in Barra. He shot one immature bird in February 1897; he found one—an adult—in a rabbit trap on January 18, 1902. He writes me “that it is the first he has ever met with in adult plumage in Barra,” and adds: “and more’s the pity that it was not found fresh and in good stuffing condition.” Another was sent me by Mr. D. Mackenzie from Stornoway in 1902; while I also have the general statements that Iceland (and Glaucous) Gulls have appeared more abundantly

throughout the group during the past winter than was known before, *i.e.* 1901-02.

GLAUCOUS GULL (*Larus glaucus*), p. 148.—Mr. Mackenzie of Stornoway tells me that “a very good specimen of the Glaucous Gull was shot by the keeper on the Gress shootings, and is now in his (Mr. Mackenzie’s) possession. It was got on the shore of Broadbay three years ago—*i.e.*, say, 1897 or 1898.

Mr. W. L. MacGillivray shot one in mature plumage in March 1898, and another in immature dress in March 1900. A few young birds are seen in the Barra seas every winter and spring, and this is verified by Mr. M’Elfrish’s notes for North Uist.

POMATORHINE SKUA (*Lestris pomatorhinus*), p. 151.—One is recorded by MacGillivray as shot by him in Barra in October 1895.¹

BUFFON’S SKUA (*Lestris parasiticus*).—There is one specimen of the Long-tailed Skua in the possession of Dr. Mackenzie, North Uist, which was caught alive at Scolpig, in that island, as I am informed by Mr. W. L. MacGillivray. And Dr. M’Rury records the first instance known to him of one on Barra on May 12, 1896 (“Ann. Scot. Nat. Hist.” 1897, p. 150).

GREAT SKUA (*Lestris catarractes*), p. 151.—Added to Birds of Outer Hebrides. Buckley records one seen by him in M’Leay’s in Inverness on January 8, 1894, which had been shot at Abhuinnsuidh (or Fin Castle) in North Harris. This is a first recorded occurrence in the Outer Hebrides. The line of migration towards their breeding grounds in Shetland and Faroe is probably further to the westward and over sea, as, on the occasion of a visit to Rockall in 1896, some evidence of this was found.

Another is recorded by Dr. M’Rury on the authority of Miss Edgar, daughter of the lightkeeper at Barra Head, in the summer of 1893.

FORK-TAILED PETREL (*P. leucorrhœa*), p. 154.—Barrington tells me (*in lit.* December 4, 1893) that the Fork-tailed Petrels on Borrera, St. Kilda, nest in the “cleets” or little turf houses of the natives, among the sods of dry turf.

Mr. Mackenzie told Mr. J. Young, on the occasion of the latter gentleman’s visit to Dunvegan, Skye, that hundreds (*sic*) of Fork-tailed Petrels’ eggs were sold every year at St. Kilda.

¹ In “Harting’s Handbook” (ed. 2, p. 308) Buckley and I are quoted as stating that this species “has been noticed in some numbers every summer in the Hebrides” (“Fauna of Sutherland and Caithness,” p. 235), but the *correct* quotation is as follows: “These birds appear to frequent the *ocean* and *seas* of the Outer Hebrides in some numbers every summer of late years.” The line of their migration towards the north appears to be further west than the shores of the Outer Hebrides. The misquotation would almost make it appear that the species was recorded by Buckley and myself as a bird *nesting every summer in the Outer Hebrides*.

Mr. Mackenzie writes me, with regard to the number of eggs taken : " It is difficult to arrive at anything like an exact figure. I am the very last person to whom the natives would give the information, as they are aware of my strong objections to their touching the eggs of any of the birds that do not form an article of food. There are fourteen men on the island, and I think a fair average per man would be one dozen each."

Mr. C. V. A. Peel appears to have the impression that Fork-tailed Petrels breed somewhere among the islands of the southern group of the Outer Hebrides, but I have never been able to establish the fact. Mr. Peel's notes may have been from his own observation, or what appears probable, quoting old records, since found inaccurate (see " Fauna of Outer Hebrides," p. 154).

I have not been able to ascertain either that the Outer Hebrides participate to any appreciable extent in the " storm-driven rushes," so to speak, of this bird, which occurred from Tiree and Skye eastward in the end of September 1891, as recorded by Mr. Evans (" Ann. Scot. Nat. Hist." 1891, pp. 74-75). Indeed, I have very few instances to give of occurrences at all anywhere in the Outer Hebrides, except on the few places known to provide them with breeding haunts.

One, however, is recorded from Barra, which was found dead on September 28, 1897 (" Ann. Scot. Nat. Hist." 1897, p. 151), and Mr. Peel speaks of " seeing them often flying between Barra and an island just to the north of it." On the other hand, Mr. W. MacGillivray writes me that he has only seen the one above stated in the flesh, " and it was found dead by our cattle-herd, quite fresh, but without its head, and as if killed by a hawk "; and he adds : " I have never known them to breed in the southern isles of Barra."

FULMAR PETREL (*Fulmarus glacialis*).—I do not know upon whose authority Gray speaks of the Fulmar as having once bred upon any of the South Isles of Barra, and that previous to 1844, and I observe that we took no note of the remark in the " Fauna of the Outer Hebrides." This was not a lapsus on our part, but simply, I think, at that time we could not find a scrap of confirmation. What we should have done was to have quoted Gray's statement, and placed it in square brackets—a system we have always advocated in order to save later compilers useless trouble. But this question is again taken up, and Gray is again quoted by Dr. M'Rury (" Ann. Scot. Nat. Hist." 1898, p. 77). Therefore we must now notice it.

We know nothing more about it now than we did then, and cannot allow it to stand without more perfect statistics than perhaps can now be obtained. I shall be very glad, however, if any one having access to the correspondence and literary remains of the late Mr. R. Gray can throw any light upon the statement. In all the

many letters I have from my old friend I can find no reference to the fact.

It is, however, undoubted that the Fulmar has increased greatly in numbers in St. Kilda, and has spread out to other localities. Mr. Mackenzie tells me: "My observations lead me to the conclusion that the numbers of nesting birds round the whole group are considerably on the increase, and so also are the Gannets; and the Puffins simply swarm and overrun the place, especially on Soay and Borreray."

We now have it reported as occurring in the Flannan Isles, by Mr. Herbert Langton, who found two eggs.

MANX SHEARWATER (*Puffinus anglorum*), p. 155.—I have now to somewhat modify the remarks made regarding the appearances of this species west of the Outer Hebrides. Whereas in our vol. we spoke of them as being seen west of The Lews, etc., "always single birds, or at most in pairs," Mr. Henry Evans—whose knowledge of the St. Kilda group of islands is *facile princeps*—writes me that on one occasion, when in his yacht in the neighbourhood of St. Kilda, he witnessed at least 1500 "sunning themselves on the calm sea" (*in lit.* August 25, 1899).

Of the vast numbers to be seen around the oceanic rock some 157 miles west of St. Kilda, named Rockall, see the Report to the Royal Irish Academy.

There is excellent evidence afforded us of at least one additional colony in the Outer Hebrides, besides those previously mentioned. It is *not the first time* we heard of it; but, for those "obvious reasons," and from the small number of the birds breeding there—some twenty pairs only—I prefer to retain the details concerning this colony.

RAZORBILL (*Alca torda*), p. 157.—A pied example has been recorded from St. Kilda by the late Rev. H. A. Macpherson ("Scotish Naturalist," 1887-88, p. 238, and "Zoologist," May 1887).

PUFFIN (*Fratercula arctica*), p. 165.—A pied example has been recorded from St. Kilda by the late Rev. H. A. Macpherson in the "Zoologist," May 1887. I may mention that pied or albino or brown-plumaged Puffins and Razorbills and Guillemots are not commonly met with. Perhaps more of these varieties are obtained in the Faroe Isles than elsewhere.

Puffins travelled south in countless numbers, and this was witnessed at Eilean Ghlais during three days—from August 1, 1894, from 8 P.M. on 1st ("Ann. Scot. Nat. Hist." 1894, p. 224).

GREAT SHEARWATER (*Puffinus gravis*), p. 156.—Since our short paragraph on this bird, which appeared in the "Fauna of the Outer Hebrides," much knowledge has accrued of its distribution within the

areas of our seas, but the locality or localities of its breeding haunts remain as great a mystery as heretofore. I scarcely think it necessary to epitomise the later items of information, as the details are so recent in the memory of ornithologists.

Since the "Fauna of the Outer Hebrides" was issued, in which at most half a dozen instances—and some doubtful—were given, little more was known of interest till June 1890. And this was the case, although Mr. Henry Evans had had almost annual opportunities to have met with and recognised them in the many cruises he had in his yacht among the islands. In 1894, however, many were seen, first off the Butt of Lewis. On this occasion all were in pairs. Prof. Newton and Mr. Henry Evans witnessed the facts. "Some thirty or forty pairs" was the estimate of the numbers seen. These observations continued until the ship approached North Rona, "after which we saw no more of them," says Prof. Newton ("Annals Scot. Nat. Hist." 1900, p. 143), *i.e.* to the northward or anywhere else during that trip. But, as will be seen, Mr. Hugh Popham saw more farther to the northward that same year. Again, in June 1895, Prof. Newton met with many Great Shearwaters between Barra Head and St. Kilda. Again they were in pairs, and behaved "exactly as they did on the former occasion." At the same time the men of St. Kilda were not at all familiar with the bird, although some of them knew it as a rare visitor previous to this season—or those seasons of 1894-95; but succeeded in obtaining several specimens for Mr. Evans in 1897. When in Mr. Evans' yacht again in July, off Lewis and North Rona, and that on the anniversary of the day when so many were seen there in 1894, "not a Great Shearwater showed itself."

I now refer to a visit paid in 1896 to that extraordinary rock out in the Atlantic, *viz.* Rockall, which was visited by the expedition supported by the Royal Irish Academy, and of which a full account will be found in the Transactions of that Society (vol. xxxi. part iii. pp. 66-78, and plates ix. x. and xi.). In the Ornithological Report a very full account of this singular bird is given, bringing up to the date a fair amount of our knowledge regarding its distribution in the North Atlantic. On that occasion Great Shearwaters were found in great numbers, and *in large flocks* all around and about the Rock on both occasions on which it was visited in June 1896.

A Great Shearwater was found dead on the west shore of Eoligary, Barra, in July 1899, and it is preserved in Mr. MacGillivray's collection. He had never seen one there before.

BLACK GUILLEMOT (*Uria grylle*), p. 164.—For an account of an individual of this species in breeding plumage in winter in Barra, see "Ann. Scot. Nat. Hist," 1893, p. 118. The question is not yet settled, I think, about the old birds retaining the summer plumage all winter, and only the young birds being grey in their

first winter. Elsewhere Buckley and I have mentioned that birds were found breeding in a mottled stage of plumage ("Fauna of Sutherland," etc.). It seems most likely that these phases of plumage have more to do with the ages of individuals than with the seasons.

LITTLE AUK (*Mergulus alle*), p. 164.—This species seems to be rare in the Outer Hebrides, especially on the west side, so occurrences are worth giving. For an account of one in mid-summer—June 24, 1893—captured at Monach Island, in plumage like that of winter, and with abnormal growth upon the skull, see "Ann. Scot. Nat. Hist." 1894, p. 55. One was found dead on the west shore of Eoligary, Barra, in March 1894, and another caught alive in a turnip-field in December 1897. Mr. MacGillivray has not seen any since then.

BLACK-THROATED DIVER (*Colymbus arcticus*), p. 167.—Of this species Mr. M'Elfrish writes: "It has increased somewhat in N. Uist in the past few years, probably since the objectionable practice of lifting and selling the eggs has been stopped."

LITTLE GREBE (*Podiceps fluviatilis*), p. 168.—Although MacGillivray ("Brit. Birds," vol. v. p. 279, *q.v.*) doubted its occurrence in the Outer Hebrides in winter, Dr. C. Gordon has a note: "I have seen several of these birds on a small loch in S. Uist during winter"; but on the other hand he has no remarks about the Slavonian Grebe.

SLAVONIAN GREBE (*P. auritus*), p. 168.—There remained considerable uncertainty as to the nesting of this bird anywhere in Scotland at the time of the issue of our volume on "Fauna of the Outer Hebrides." Nor indeed can it be said that much more evidence is forthcoming yet. But the following notes from Dr. M'Rury may be worth insertion here. Under date of September 30, 1893, he says: "When recently on a visit to Benbecula, I noticed on a little loch a large grebe with a half-grown young one following it. I was at once struck by its size and also with the colour of its head and neck, which were dead chestnut. I had no glasses with me, but it was within twenty yards of me, and I could not bring myself to believe it was the little grebe which is very abundant in the island. But if it was the Slavonian—a specimen of which I once shot in Benbecula—I could not see any appearance of long feathers on the head; but I think it was quite as large as the Slavonian. The date was September 3, and I thought it rather late for the young to be so small. In a day or two after that I saw another on another loch in Benbecula, and this one had three or four young ones accompanying it, apparently not more than a week old. Had I been acquainted with the shooting-tenant, I would have called upon

him, or written to him about them, but as I only had a few days in the island, I didn't. I give the above for what it is worth." Dr. M'Rury evidently did not regard it as at all a certainty; but when his usual accuracy and care are taken into consideration, as well as his great experience of his subject, I feel that I may be permitted to chronicle the account, though the actual proof of its having nested is still wanting. MacGillivray supplements the above with the record of one shot in Barra in April 1898, in full summer plumage, "and another I shot the same day is in the Edinburgh Museum."

ON THE OCCURRENCE OF *PHYLLOSCOPUS VIRIDANUS*, BLYTH, AND OTHER INTERESTING BIRDS AT SCOTTISH LIGHT-STATIONS.

By WM. EAGLE CLARKE.

IN connection with the inquiry into the annual migratory movements of birds in Scotland, which is being carried out by Mr. Harvie-Brown, Mr. Laidlaw, and myself, I have received for identification during the year just passed some interesting specimens which are, perhaps, deserving of special record.

GREENISH WILLOW WARBLER (*Phylloscopus viridanus*).—A fine adult male example was killed at the lantern of the Sule Skerry Lighthouse on the night of the 5th September, and was forwarded to me in the flesh by Mr. James Tomison, the keeper. A Garden Warbler (*Sylvia hortensis*) was captured at the same time. Sule Skerry is a rocky islet lying some forty miles west of Hoy, Orkney, and nearly the same distance N.E. of Cape Wrath.

This eastern species has only once previously been known to occur in the British Isles, a female specimen having been obtained on the 5th September 1896 by Mr. Caton Haigh on the N.E. coast of Lincolnshire. It is also the fifth recorded occurrence of the bird in Western Europe, it having been captured on three occasions in Heligoland—once in the autumn and twice in the spring migration.

The Scottish specimen is an unusually fine example, the

wing measuring 2·6 inches, and is in brilliant plumage, having just completed the moult. In it the third primary is the longest, the fourth being next, while the second is intermediate between the sixth and seventh—a feature described as rare in the “Catalogue of Birds” (British Museum), vol. v. p. 45, where that quill is said to be usually intermediate between the seventh and eighth. The figure of this species in Lord Lilford’s “Coloured Illustrations” is not satisfactory: the tarsus as there represented is much too short, the bill is neither long enough nor sufficiently robust, and in colour the under surface is too yellow and lacks the greyish tint which is somewhat conspicuous on the flanks. The figure in the Supplement to Mr. Dresser’s “Birds of Europe” (Plate 651, Fig. 1) is a little better in these respects, but the lower parts are too much washed with green. As compared with other British members of the genus, *viridanus* may be described as being stout-billed, long-legged, and short-toed. In other respects it is a decidedly green Willow Warbler, with a pale bar across the wing, a conspicuous superciliary stripe, and the under surface greyish white delicately washed with sulphur-yellow.

This species has only been recognised as a regular member of the European avifauna during recent years, having formerly been recorded under the name of *P. plumbeitarsus*, an allied species now proved to be Asiatic and not European. The Greenish Willow Warbler is a summer visitor to Russia, where it occurs as far to the north-west as the Government of Olonetz, and eastwards to the Urals and the northern shores of the Caspian. In Asia it is found during the nesting season in the Altai, Turkestan, Kashmir, and probably throughout the higher Himalayas; and in winter it is widely distributed in India and is found in Ceylon. Its eggs are, I believe, unknown.

It is perhaps not quite so rare a bird in the spring and autumn in Western Europe as it is at present supposed to be. It is much liable to be overlooked from its general resemblance to the Common Willow Warbler, and it says much for Mr. Tomison’s perspicacity that he recognised his capture as something new to him. The fact that it has twice occurred in spring in Heligoland indicates a return

movement on the lines of the autumn emigration, and would also seem to imply that the bird is of more frequent occurrence.

The whole of the circumstances surrounding the occurrence of this little bird on that remote Orcadian rock brings prominently to our notice how little we really know of what is passing along our shores during the periods of migration; how much may, and does, yearly escape our attention; and also the extent to which the little knowledge we possess comes to us by the merest chance.

The specimen is now in the British Collection in the Edinburgh Museum of Science and Art.

LESSER WHITETHROAT (*Sylvia curruca*).—A fine adult male was killed at the lantern of the Sule Skerry Lighthouse on the night of the 17th of September last, and was forwarded to me in the flesh. This species undoubtedly occurs annually on the Scottish coasts as a transient migrant, especially on the eastern seaboard, when proceeding to and fro between its Scandinavian summer haunts and its African winter retreats. It seems, however, to escape detection in quite a remarkable manner during these migrations, and Mr. Tomison's capture is a welcome as well as an interesting addition to our scanty knowledge on the subject. Although, there can be little doubt, it is a bird of double passage, yet all our information refers to its occurrence on the autumn journey, during which it has been recorded for Shetland on four occasions (Saxby), North Ronaldshay twice (Allan Briggs), once Barra (MacGillivray), once for Aberdeenshire (Sim), and twice at Berwick (Bolam); while one seen by Dr. Hamilton in West Inverness-shire, on the 10th of August 1880, was either a transient visitor or an emigrant summer bird. It is a local summer visitor to the Solway area, and there are one or two reliable records of its having nested elsewhere in Scotland.

BLACK-TAILED GODWIT (*Limosa belgica*).—A wing and leg of an adult male of this somewhat rare bird of passage on the east coast of Scotland was forwarded to me from the Isle of May, where it had been obtained on or about the 30th of May last.

Regarding the occurrence of this migrant in the Forth area, my friend Mr. Wm. Evans has kindly furnished me with the following interesting information:—

“There is good reason for supposing that the Black-tailed Godwit is a fairly regular visitant, on migration, to the east coast of Scotland; but the number passing at any time must be very small, which no doubt accounts in great measure for its visits being so seldom detected, especially in spring when the birds naturally tarry little on their way north.

“The following are the only records of the capture of the species in the ‘Forth’ area of which I have any note. They are all, it will be seen, connected with the autumn migration, with the possible exception of the Berwickshire specimen. The occurrence of an example at the Isle of May in May last is, therefore, of special interest:—

One obtained in Tyne Estuary, East Lothian, ‘some winters ago.’—John Nelson, in MS. list, dated 1851.

One shot at Dowlaw, near Fast Castle, about 1864.—Muirhead’s ‘Birds of Berwickshire,’ ii. 257.

One procured on the shore near Leith, early in November 1867, and exhibited at a meeting of the Royal Physical Society on 27th November 1867 (per Minutes).

Two shot at the Black Rocks, Leith, were taken to Small & Son, George Street, Edinburgh, to be stuffed, on 7th November 1869 (per entry in Small’s books).

[Two or three seen on coast near Grangemouth, in autumn of 1870, by Mr. Harvie-Brown (per his MS. notes on the Birds of Stirlingshire).]

“A few specimens of more recent date, shot—both in spring and autumn—in other parts of the east coast of Scotland, have come under my notice.”

SOOTY SHEARWATER (*Puffinus griseus*).—A female specimen was captured in Stromness harbour on the 16th of October and forwarded to me by Mr. James Tomison, who had correctly identified it.

This Shearwater appears to be of extremely rare occurrence in the Scottish seas; and there are very few

records indeed of its visits, all of which, so far as we know of them, appear to have been confined to the south-eastern section of the coast. It is a new bird to the fauna of the Orkneys; and though it has not been detected in the Shetlands, has occurred in the Færoes.

THE SOOTY SHEARWATER, *PUFFINUS GRISEUS*
(GMEL.), IN THE FIRTH OF FORTH.

By WILLIAM EVANS, F.R.S.E.

THE following notes on *Puffinus griseus* in the "Forth" area, drawn up three or four years ago, may be of interest to readers of the "Annals" at the present time, when attention is being directed to the bird by Mr. Eagle Clarke's record (*ante*, p. 25) of a specimen recently received from the Orkney Islands. I have added a paragraph bringing the information down to date.

Status in the Area.—A fairly regular, though usually far from common autumn visitant to the seaward portion of the Firth of Forth.

Although only two instances are on record of the capture of the Sooty Shearwater within the limits of this area, I am, nevertheless, strongly disposed, as the result of personal observation and inquiry, to consider it a regular, or all but regular autumn visitant, in small numbers, to the outer portion of the Firth of Forth and the adjacent sea. Five-and-twenty years ago it was observed more than once by the late Robert Gray in the vicinity of the Bass; and since then I have myself, on several occasions, when sailing in the outer waters of the Firth, had the satisfaction of seeing a few unmistakable examples skimming over the waves or temporarily resting on their surface. Further, the Kellys and other fishermen at North Berwick, who know the bird well, tell me that scarcely a year passes without some of these big dark-coloured, or "King" Shearwaters, as they are locally called, making their appearance about the fishing-grounds between the coasts of East Lothian and Fife.

They are stated to be shyer than their smaller and much commoner white-breasted relatives, the Manx Shearwaters, in whose company, however, they sometimes approach the boats when the men are baiting the lines. The period within which they may be looked for ranges from the latter part of August to the end of October. As a rule they are seen singly or in pairs, but occasionally as many as half a dozen or more have been observed together.

The first recorded specimen—a male—was shot off North Berwick by Mr. Robert Chambers on 27th August 1878: when first seen, the bird “was resting upon a piece of wreckage, and appeared to be comparatively tame, allowing the boat to make a near approach” (*cf.* “Zoologist,” 1878, p. 436; “Proc. R. Phys. Soc.” v. p. 34; “Proc. Berw. Nat. Cl.” viii. p. 502; and Yarrell’s “Brit. Birds,” ed. 4, iv. p. 18). The second—a female—was shot in the same locality by R. Kelly, fisherman, on 25th October 1879, and was acquired by the Edinburgh Museum of Science and Art, where it is still preserved (*cf.* “Proc. R. Phys. Soc.” v. p. 376, and “Zoologist,” 1880, p. 69). These two specimens, both of which I have seen, were at the time they were obtained regarded as young Great Shearwaters, and were recorded as such, the specific distinctness of the two forms not having then become generally known. But previous to these occurrences—namely, in September 1875 and again in September 1876—Robert Gray had observed several in the Firth between North Berwick and the Bass Rock: they “were at once recognised”—so he subsequently wrote, under *P. griseus*, in one of his note-books—“by their uniform sooty plumage.” It was evidently to these observations that he referred in his note on the “Greater Shearwater,” printed in the “Proceedings” of the Berwickshire Naturalists’ Field Club for 1878 (vol. viii. p. 502).

In August 1887, Sooty Shearwaters seem to have visited our shores in greater numbers than usual. On the 27th of that month I was fortunate enough to see, at close quarters, first four and then two of these ocean birds, from the deck of the steamer *Tantallon Castle*, when about midway between North Berwick and Elie. The last pair, when first noticed, were sitting on the water directly ahead of us, and

did not take wing till we were close upon them. A few days later I examined a specimen in Durham which had been killed off the coast of Northumberland on the 22nd of August. During the same autumn several were shot by North Berwick fishermen at the mouth of the Firth of Forth, but unfortunately they were not preserved; their wings were cut off and sent, along with those of several hundred Kittiwakes, etc., to a man in Bristol to be prepared as "feathers" for ladies' hats.

In 1897 one was observed just inside the Bass on 25th August, and another was reported to have been seen about the same date on the "Kingston bank," some two miles N.N.W. of Fidra Island.

In 1901 only a very few, I am told, were seen. As regards the present year (1902), however, the North Berwick fishermen say they never noticed more. From about the end of August till far on in October they were seldom off at the fishing without seeing one or two, and once about a dozen, I am assured, were in sight at the same time. Manx Shearwaters were also present in more than their usual numbers — "as thick as Marrots" (Guillemots), were the expressive words of one of my informants.

Where do these Sooty Shearwaters come from? is one of the most interesting of the many ornithological problems yet to be solved. The only known breeding-places of the species are, it would seem, in the New Zealand group of islands; but it can hardly be supposed that the birds which annually visit the British seas come from a home quite so distant as that. Their nursery is much more likely to be somewhere within the Atlantic area; but as to whether it is on this side of the equator or to the south of it, as may well be the case, we are at present entirely in the dark.

NOTES ON THE ANTHOPHILOUS INSECT FAUNA OF THE CLOVA MOUNTAINS.

By J. C. WILLIS, M.A., and I. H. BURKILL, M.A.

NOTE I.—ON THE ABSOLUTE NUMBER OF INSECTS VISITING.

DATES OF OBSERVATION.

1894. July 5-9 (J.C.W. and I.H.B.).—Weather unsettled.
 1895. April 1-17 (J.C.W.).—Snow at first covering all down to 1000 feet,
 gradually retreating up the hills; nights frosty.
 June 14-July 8 (I.H.B.).—Fine to unsettled.
 July 5-23 (J.C.W.).—Wet weather.
 September 13-24 (I.H.B.).—Fine weather.
 1896. May 21-23 (J.C.W.).—Unsettled; season early.
 June 16-July 11 (I.H.B.); July 4-11 (J.C.W.).—Fine to unsettled.
 1897. May 18-27 (I.H.B.).—Very fine; season late.
 1898. May 7-16 (I.H.B.).—Cold with frequent snow showers; season late.
 1899. June 10-19 (I.H.B.).—Fine and warm.
 July 24-26 (J.C.W.).—Dull.

On all but the first two of the visits to Clova¹ which we made in order to study flower fertilisation, we kept record of the exact number of individual insects seen to visit; and from our records we here give statistics regarding their seasonal and altitudinal distribution. It must be clearly understood at the outset that insects which are not attracted to flowers for some purpose or other did not come under observation in any way.

The total number of individual visitors recorded by us is 17,306; they were distributed among the classes of insects in the way given in the following table, wherein also their usefulness to the flowers is denoted by the conspicuousness of the type used:—

HYMENOPTERA.

APIS	430
BOMBUS and PSITHYRUS	937
ANDRENA (66), HALICTUS (1), and NOMADA (1)	68
ODYNERUS (5) and CHRYSIS (1)	6
Vespa	45
<i>Formicidæ</i> and <i>Myrmicidæ</i> (<i>Ants</i>)	202
<i>Tenthredinidæ</i> (<i>Sawflies</i>)	201
<i>Entomophaga</i> with <i>Cynipidæ</i> (<i>Petiolata parasitica</i>)	461

LEPIDOPTERA.

RHOPALOCERA	192
NOCTUIDÆ and GEOMETRIDÆ	204
BOMBYCES and MICROLEPIDOPTERA generally	64
Eriocephala	101

¹ Cf. "Trans. Edinb. Bot. Soc." xxii. 1901, p. 109.

DIPTERA.

SYRPHIDÆ	712
EMPIS (411) and PACHYMERIA (16)	427
Other Empidæ	129
Muscidæ, Tachinidæ, and Sarcophagidæ	1,083
Other Diptera	10,321
 Coleoptera	 1,314
Other Insects	409
 Total	 17,306

They were distributed in season as follows:—

TABLE II.

	Spring (23 days).	Summer (88 days).	Autumn (12 days).	Total.
Apis	160	266	4	430
Bombus and Psithyrus	272	362	303	937
Andrena and Nomada	2	65	1	68
Chrysis and Odynerus	0	6	0	6
Tenthredinidæ (Sawflies)	5	196	0	201
Entomophaga (Ichneumons)	13	297	151	461
Ants	3	173	26	202
Wasps	2	41	2	45
Lepidoptera, long-tongued	23	304	69	396
Lepidoptera, mid-tongued	1	54	9	64
Lepidoptera, short-tongued	0	101	0	101
Syrphidæ and Empis	158	732	249	1,139
Other Flies	3,514	6,062	1,957	11,533
Coleoptera	33	835	446	1,314
Other Insects	13	287	109	409

and they were distributed in elevation as shown in Table III.

TABLE III.

	High Moor.	Crag Belt.	Third Belt.	Second Belt.	Strath.
Apis . . . . .	...	...	...	36	394
Bombus and Psithyrus	4	149	67	125	592
Andrena and Nomada . . . . .	...	...	1	10	57
Chrysis and Odynerus . . . . .	...	1	0	0	5
Tenthredinidæ	1	8	1	4	187
Entomophaga	17	58	53	43	290
Ants . . . . .	...	58	30	36	78
Wasps . . . . .	...	1	...	12	32
Lepidoptera, long-tongued	4	32	19	18	323
Lepidoptera, mid-tongued . . . . .	...	22	5	3	34
Lepidoptera, short-tongued . . . . .	...	4	1	28	68
Syrphidæ and Empis	32	51	31	112	913
Other Flies	227	848	647	848	8,963
Coleoptera	10	180	66	85	973
Other Insects	11	183	33	14	168

Further, they were distributed by altitude and season as in the next table:—

TABLE IV.

HIGH-MOORS.	Spring.	Summer.	Autumn.
Apis . . . . .	...	...	...
Bombus and Psithyrus . . . . .	...	2	2
Andrena and Nomada . . . . .	...	...	...
Chrysis and Odynerus . . . . .	...	...	...
Tenthredinidae	1	...	...
Entomophaga	2	1	14
Ants . . . . .	...	...	...
Wasps . . . . .	...	...	...
Lepidoptera, long-tongued . . . . .	...	4	...
Lepidoptera, mid-tongued . . . . .	...	...	...
Lepidoptera, short-tongued . . . . .	...	...	...
Diptera, long-tongued . . . . .	...	32	...
Diptera, short-tongued	10	209	8
Coleoptera . . . . .	...	10	...
Other Insects . . . . .	...	11	...
CRAG-BELT.			
Apis . . . . .	...	...	...
Bombus and Psithyrus	35	105	9
Andrena and Nomada . . . . .	...	...	...
Chrysis and Odynerus . . . . .	...	1	...
Tenthredinidae . . . . .	...	8	...
Entomophaga . . . . .	...	32	26
Ants . . . . .	...	58	...
Wasps . . . . .	...	1	...
Lepidoptera, long-tongued . . . . .	...	32	...
Lepidoptera, mid-tongued . . . . .	...	22	...
Lepidoptera, short-tongued . . . . .	...	4	...
Diptera, long-tongued	1	47	3
Diptera, short-tongued	150	619	79
Coleoptera . . . . .	...	179	1
Other Insects . . . . .	...	178	5
THIRD BELT.			
Apis . . . . .	...	...	...
Bombus and Psithyrus	29	34	4
Andrena and Nomada . . . . .	...	1	...
Chrysis and Odynerus . . . . .	...	...	...
Tenthredinidae . . . . .	...	1	...
Entomophaga . . . . .	...	10	43
Ants	1	26	3
Wasps . . . . .	...	...	...
Lepidoptera, long-tongued . . . . .	...	18	1
Lepidoptera, mid-tongued . . . . .	...	5	...
Lepidoptera, short-tongued . . . . .	...	1	...
Diptera, long-tongued	2	29	...
Diptera, short-tongued	56	422	169
Coleoptera . . . . .	...	64	2
Other Insects . . . . .	...	18	15
SECOND BELT.			
Apis . . . . .	...	36	...
Bombus and Psithyrus	13	44	68
Andrena and Nomada . . . . .	...	10	...
Chrysis and Odynerus . . . . .	...	...	...
Tenthredinidae . . . . .	...	4	...
Entomophaga	3	15	25
Ants . . . . .	...	28	8

TABLE IV.—SECOND BELT—*continued*.

	Spring.	Summer.	Autumn.
Wasps . . . . .	...	12	...
Lepidoptera, long-tongued	1	14	3
Lepidoptera, mid-tongued	1	3	...
Lepidoptera, short-tongued . . . . .	...	28	...
Diptera, long-tongued	34	57	21
Diptera, short-tongued	86	481	281
Coleoptera	2	29	54
Other Insects . . . . .	...	2	12

STRATHS.

Apis	160	230	4
Bombus and Psithyrus	195	177	220
Andrena and Nomada	2	54	1
Chrysis and Odynerus . . . . .	...	5	...
Tenthredinidæ	4	183	...
Entomophaga	8	239	43
Ants	2	61	15
Wasps	2	28	2
Lepidoptera, long-tongued	22	236	65
Lepidoptera, mid-tongued . . . . .	...	25	9
Lepidoptera, short-tongued . . . . .	...	68	...
Diptera, long-tongued	121	567	225
Diptera, short-tongued	3212	4331	1420
Coleoptera	31	553	389
Other Insects	13	78	77

We propose here to discuss the changes which season and altitude seem to make in the anthophilous insect fauna.

First of all it is to be remarked that we have not been able to spread our days of observation equally over the seasons. We spent 23 days in spring, 88 in summer, and only 12 in autumn. Therefore, to equalise our seasonal figures, we have calculated from our data what the observations would be for seasons of 61 days. Spring at Clova is April and May, summer is June and July, autumn is August and September, and winter begins in October.

Of the spring days 9 were overcast, 4 showery, and 1 wet; of the summer days 11 were overcast, 12 showery, 13 wet, and 4 very wet; and of the autumn days 3 were overcast, and 1 wet. This is about normal for these hills, where July is apt to be a wet month and June not settled. Table V. is derived from Table II. by equalising our periods of observations.

TABLE V.—THE VISITORS IN THE THREE SEASONS—A SEASON BEING CALCULATED AS OF 61 DAYS' DURATION.

	Spring.	Summer.	Autumn.
Apis	427	184	20
Bombus and Psithyrus	721	251	1540
Andrena and Nomada	5	45	5
Chrysis and Odynerus . . . . .	...	4	...
Tenthredinidæ	13	136	...
Entomophaga	34	206	767
Ants	8	120	132
Wasps	5	28	10

TABLE V.—continued.

	Spring.	Summer.	Autumn.
Lepidoptera, long-tongued	61	211	351
Lepidoptera, mid-tongued	3	37	46
Lepidoptera, short-tongued . . . . .	...	70	...
Diptera, long-tongued	419	507	1266
Diptera, short-tongued	9320	4203	9948
Coleoptera	88	579	2267
Other Insects	34	199	554

There are many remarks to make on it. We notice first of all the increase of Parasitic Hymenoptera, Ants, long and mid-tongued Lepidoptera, long-tongued flies, Coleoptera and miscellaneous insects (chiefly Thrips) to autumn. We notice that mid-tongued Hymenoptera (*Andrena*, *Halictus*, *Nomada*, *Chrysis*, and *Odynerus*) are summer insects, as also are the Tenthredinidæ, the Wasps, and the short-tongued Lepidoptera (*Eriocephala* only). The short-tongued flies and the *Bombi* decrease from spring to summer to increase again in autumn; while *Apis* seemed almost to disappear towards autumn.

Hymenoptera.—*Apis*, a stranger introduced and kept by man in the glens, may be henceforward disregarded. We will turn to the *Bombi*. The vernal abundance of *Bombi* is due to *B. lapponicus*, F., the autumnal to *B. terrestris*, L., and *B. agrorum*, F., especially the former. *B. agrorum* is the longest tongued of the three, and *B. terrestris* the shortest; seasonally they were distributed as follows (the seasons being calculated as of 61 days):—

TABLE VI.—SEASONAL DISTRIBUTION OF THE THREE COMMONEST BEES.

	Spring.	Summer.	Autumn.
<i>B. agrorum</i>	13	34	224
<i>B. lapponicus</i> (with <i>B. pratorum</i> , <i>B. ionellus</i> , and <i>B. Scrimshirauus</i>) }	483	113	56
<i>B. terrestris</i>	205	53	1220

Short-tongued Flies.—Like the *Bombi*, the short-tongued flies showed a summer decrease. This—our largest group in Table V.—deserves some subdivision, and on separating the orders we get the following:—

TABLE VII.—SEASONAL DISTRIBUTION OF THE SHORT-TONGUED FLIES.

	Spring.	Summer.	Autumn.
Short-tongued Empidæ	63	69	30
Muscidæ	186	159	2984
Tachinidæ	85	70	244
Sarcophagidæ . . . . .	...	9	10
Anthomyidæ	8641	3398	4819
Tabanidæ, Tipulidæ, Limnophilidæ	3	10	10
Bibionidæ	11	72	158
Scatophagidæ	106	60	539
Small Flies of other Orders	225	354	1154

The table shows that Anthomyids are very prevalent in spring,

Muscids in autumn, Bibionids in autumn, Scatophagids in autumn, and in autumn also the orders of small flies such as Cecidomyidæ, Ephydriidæ, Chloropidæ.

We have observed of the *Bombi* that their autumnal and vernal maxima were determined by the great abundance of one or two species; the same is true of the short-tongued Diptera. The autumnal maximum of Bibionidæ is almost entirely due to *Biblio pomona*, F., of Muscidæ to *Pollenia rudis*, F., and of Tachinidæ to *Siphona geniculata*, Deg., which increases in number from May onwards; while the vernal abundance of Anthomyidæ is due to one or two species of *Anthomyia* and *Trichophthicus*.

Long-tongued Flies.—The long-tongued Diptera, like the short-tongued, increase numerically from summer to autumn, but in our observations they did not show a vernal maximum. Their numbers in autumn were very largely due to two insects—*Eristalis pertinax*, Scop., and *Empis tessellata*, L.—the first a Syrphid, the second an Empid. When we study the seasonal distribution of the Syrphidæ we see that the larger bodied have an autumnal maximum, but not so the smaller species, the commonest genus of which is represented throughout the three seasons by a succession of representatives, thus:—*Platychirus discimanus*, Loew (spring), *P. manicatus*, Mg. (summer), and *P. albimanus*, F. (autumn).

TABLE VIII.—SEASONAL DISTRIBUTION OF LONG-TONGUED FLIES.

	Spring.	Summer.	Autumn.
Larger Syrphids ¹	24	120	473
Small Syrphids ²	236	218	234
Larger Empids	159	169	559

The greatest variety of Syrphids is to be seen in summer, and indeed the greatest variety of every group of anthophilous insects, whether with a vernal or an æstival or an autumnal maximum. Of Syrphids summer has 34, autumn 12, and spring 10; of Empids summer has 22, autumn 10, and spring 9. *Rhingia campestris*, Mg., is among the summer Syrphids; it seems to have a very short period of flight just at mid-summer. *Volucella* is a summer insect; the commonest *Chilosia-C. fraterna*, Mg., is also a summer insect; *Sericomyia borealis*, Fln., is an autumn insect. *Empis tessellata*, F., which is autumnal chiefly, is the largest and longest-tongued of the Empidæ at Clova, and it associates with *Pachymeria palparis*, Egg., an insect not much smaller. The smaller Empids, like the smaller Syrphids, are not autumnal.

Autumn has the longest-tongued of the short-tongued Flies.—It has

¹ Genera here included are: *Rhingia*, *Volucella*, *Sericomyia*, *Eristalis*, *Helophilus*, *Chilosia*, *Leucozonia* and *Chrysogaster*.

² Genera here included are: *Syrphus*, *Syrpita*, *Platychirus*, *Melanostoma* with *Melangyna*, *Ascia* and *Sphcerophoria*.

been remarked that the Tachinidæ owe their autumnal maximum to *Siphona geniculata*, an insect deserving of notice, for its tongue is remarkably long. Among our Anthomyidæ the largest and longest-tongued, *Drymia hamata*, Fln., is autumnal (119 individuals in summer and 668 in autumn), and *Hyetodesia incana*, W., which is the largest and longest-tongued of its genus, is æstival-autumnal (558 and 442 being the proportions of individuals for the two seasons).

Lepidoptera.—The Lepidoptera next require comment. We have seen that *Eriocephala calthella*, L., is entirely æstival. The autumnal moths are chiefly *Hydræcia nictitans* and *Celena Haworthii*, Curts., and a somewhat autumnal butterfly is *Polyommatus phlæas*, L. The vernal long-tongued Lepidoptera are chiefly the butterflies *Vanessa urticæ*, L. and *Pieris napi*, L. In summer *Lycæna Icarus*, L., is the commonest insect of the class; it is joined, as the Ericas burst into flower, by two species of *Aglaia*, by *Cænonympha Pamphilus*, L., by several species of *Plusia*, and by many other butterflies and moths. In the Lepidoptera, again, the autumnal maximum is due to a few species present in large numbers, while summer has the greater variety.

Coleoptera.—Coleoptera showed an increase to autumn. In spring they are rare; in summer there are many species about: *Epuræa æstiva*, L., being next commonest to the two common *Meligethes*, and *Anthophagus alpinus*, Payk., being by no means rare. In autumn the abundance is due to *Meligethes viridescens*, F., and *Meligethes æneus*, F. There is no heightening of the type through the seasons.

Parasitic Hymenoptera.—Parasitic Hymenoptera become very abundant in autumn, especially the larger Ichneumonidæ, such as *Alomyia* and *Ichneumon*.

DECIDEDLY DESIRABLE VISITORS.

	Spring.	Summer.	Autumn.
1. Bombus and Psithyrus	Average type high	Longest-tongued Bombi not uncommon	Average type low; the shortest-tongued Bombi very abundant.
2. ...	...	...	...
3. Long-tongued Lepidoptera	Type high; species few	Longest-tongued moth on the wing; species varied	Type rather lower than spring; species not many.

DESIRABLE VISITORS.

4. Andrena, etc.	Absent . . .	Present . . .	Absent.
5. Chrysis and Odynerus	„ . . .	„ . . .	„

DESIRABLE VISITORS—*continued.*

	Spring.	Summer.	Autumn.
6. Larger Syrphidæ	Few . . .	Longest-tongued on the wing; species varied	Abundant; average type fairly high; species few.
7. Smaller Syrphidæ	Abundant; species few	Abundant; longest-tongued on the wing; species varied	Abundant; species few.
8. Larger Empidæ	Fairly abundant	Fairly abundant; longest-tongued becomes abundant	Longest-tongued very abundant; species few.
9. Mid-tongued Lepidoptera	Very few . . .	Fairly abundant; species varied; largest types present	Not abundant.

INDIFFERENT VISITORS.

10. Vespidæ . . .	Few . . .	More plentiful . . .	Few.
11. Tachinidæ . . .	Fairly plentiful . . .	Fairly plentiful; largest types on the wing	Abundant; especially in one of the longest-tongued.
12. Muscidæ . . .	Plentiful . . .	Plentiful; largest types on the wing	Very abundant; especially in larger forms.
13. Sarcophagidæ . . .	Absent . . .	Few . . .	Few.
14. Anthomyidæ . . .	Extremely abundant	Much less abundant, but type heightened	Abundant; type high.
15. Short-tongued Empidæ	Fairly plentiful . . .	Fairly plentiful . . .	Less plentiful.
16. Tabanidæ, etc.	Very few . . .	Few . . .	Few.
17. Bibionidæ . . .	Few . . .	Fairly plentiful . . .	Plentiful; type heightened.
18. Scatophagidæ . . .	Fairly plentiful . . .	Less plentiful . . .	Abundant.
19. Coleoptera . . .	Plentiful . . .	Abundant and varied	Very abundant, but not varied.
20. Short-tongued Lepidoptera	Absent . . .	Plentiful . . .	Absent.
21. Small flies . . .	Plentiful . . .	„ . . .	Very abundant.

INJURIOUS VISITORS.

22. Parasitic Hymenoptera	Few . . .	Plentiful . . .	Very plentiful; type higher.
23. Tenthredinidæ	Few . . .	„ . . .	Absent.
24. Ants . . .	Few . . .	„ . . .	Plentiful.
25. Other insects . . .	Few . . .	„ . . .	Abundant.

TABLE IX.—THE NUMBERS AND PERCENTAGES OF DECIDEDLY DESIRABLE, DESIRABLE, AND INDIFFERENT INSECTS ABROAD IN THE SEASONS. (*AFIS* OMITTED).

	Decidedly Desirable.		Desirable.		Indifferent.	
	No.	%	No.	%	No.	%
Spring . . .	295	7.37	161	4.02	3549	88.61
Summer . . .	666	7.78	856	10.00	7039	82.22
Autumn . . .	372	12.25	259	8.53	2405	79.21

In summary we may remark that spring and summer are rather alike as to the decidedly desirable insects; autumn and summer as to the others. *The average of the lower types is higher in autumn than in spring, but the average of the higher types is lower in autumn than in spring; at the same time, the autumn increases the number where the type is lower, and decreases them where the type has heightened.* Summer holds the highest types in each group, but rarely in anything beyond small numbers: *Macroglossa*, *Bombus hortorum*, L., *Andrena*, *Odynerus*, *Rhingia campestris*, Mg., *Empis tessellata*, *Mesembrina meridiana*, L., and *Siphona geniculata*, *Drymia hamata* and *Hyetodesia incana*.

The following table gives the percentages of the whole anthophilous fauna seen in the different seasons:—

TABLE X.

	Spring.	Summer.	Autumn.	Total.
<i>Apis</i>	3·81	2·72	0·14	2·47
<i>Bombus</i> and <i>Psithyrus</i>	6·48	3·70	9·11	5·41
<i>Andrena</i> and <i>Nomada</i>	0·05	0·66	0·03	0·39
<i>Chrysis</i> and <i>Odynerus</i>	0·00	0·06	0·00	0·03
<i>Tenthredinidæ</i>	0·12	2·00	0·00	1·16
<i>Entomophaga</i>	0·31	0·03	4·54	2·66
<i>Ants</i>	0·07	1·77	0·78	1·16
<i>Wasps</i>	0·05	0·42	0·06	0·29
Lepidoptera, long-tongued	0·56	3·11	2·07	2·29
Lepidoptera, mid-tongued	0·02	0·55	0·27	0·37
Lepidoptera, short-tongued	0·00	1·03	0·00	0·58
Diptera, mid-tongued	3·76	7·48	7·48	6·58
Diptera, short-tongued	83·69	62·19	58·83	66·76
Coleoptera	0·78	8·32	3·41	7·47
Other Insects	0·31	2·93	3·27	2·36

(*To be continued.*)

NOTES ON THE FLORA OF EAST SUTHERLANDSHIRE.

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

IN August 1902 I spent a couple of days at Golspie, and explored the sand dunes, shingle, and pretty glen, as well as the fir woods, the home of *Moneses*, which are situated on low sandy ground, doubtless at one time covered by the sea.

Thalictrum dunense, *Dum.*, was rather frequent but very dwarfed on the links.

Ranunculus bulbosus, L., occurred as a very branching plant on the links.

- Fumaria Boræi*, *Jord.*—Golspie, cultivated ground.
- Arabis hirsuta*, *Br.*—In the glen, Dunrobin.
- Cardamine flexuosa*, *With.*—Dunrobin Glen.
- Draba incana*, *L.*—A very dwarf form on the sand dunes.
- **Erophila vulgaris*, *DC.*—Golspie.
- Cochlearia grœnlandica*, *L.*—Golspie.
- Sisymbrium Sophia*, *L.*—On the shingle, Golspie. Not in Professor Trail's list.
- **Brassica alba*, *Boiss.*—Golspie, on cultivated ground.
- Thlaspi arvense*, *L.*—In cornfields rather common, Golspie.
- Crambe maritima*, *L.*—Several large plants grew on the shingle on the foreshore in front of Dunrobin Castle, quite naturalised if not native; but the situation is one where it is possible rubbish from the gardens may have been deposited, although no introduced plant was near. Nearer Golspie †*Campanula Trachelium* and †*Geranium pratense*, evidently from the gardens, occurred on the sandy ground.
- Cakile maritima*, *Scop.*—Golspie. Not in Professor Trail's "Top. Botany" for East Sutherland, but recorded by Marshall and Shoolbred in 1897 from the vice-county.
- Viola tricolor*, *L.*—Golspie.
- V. arvensis*, *Murray.*—Cultivated fields, Golspie.
- Polygala oxyptera*, *Reichb.*—A red-flowered form approaching the Tain plant in the turf of the links, but rare.
- Silene maritima*, *Sm.*—Golspie.
- Lychnis alba*, *Mill.*—Golspie.
- L. alba* × *dioica*.—Near the Mound, undoubtedly the hybrid plant. Noticed by the Rev. E. S. Marshall at Tongue, and brought by him to me. New to Britain in name, but specimens from Berkshire were distributed through the Exchange Club by me in 1892.
- Cerastium tetrandrum*, *Curt.*—Golspie.
- C. semidecandrum*, *L.*—Golspie.
- Arenaria peploides*, *L.*—Golspie.
- Sagina nodosa*, *Fenzl.*—Near the Mound.
- Buda rubra*, *Dum.*—Golspie.
- Spergularia sativa*, *Bonn.*—Common in crops.
- Montia fontana*, *L.*, *var.* **major*.—By the railway, north of Golspie.
- Malva sylvestris*, *L.*, and **M. rotundifolia*, *L.*—Golspie, on the foreshore.

Erodium cicutarium, *L'Her.*, *var. micranthum* (*Rouy and Fouc.*).—
Golspie.

Ononis repens, *L.*—Near the railway. Golspie.

Astragalus danicus, *Retz.*—On the grassy turf of the links, in fruit.

Prunus Padus, *L.*—Golspie Glen.

**Vicia lathyroides*, *L.*—Golspie, very rare.

V. gemella, *Crantz.*—Near Golspie, in a grass field, with *V.*
hirsuta.

V. angustifolia, *Roth.*—Golspie.

**Rubus pulcherrimus*, *Lindcb.*—Golspie.

R. Rogersii, *Linton.*—Golspie.

**R. dasphyllus*, *Rogers.*—Golspie.

R. corylifolius, *Sm.*—Golspie Glen.

R. saxatilis, *L.*—In the glen, near the waterfall.

Alchemilla vulgaris, *L.*, **var. glabra* (*W. and G.*).—Golspie Glen.

**Rosa spinosissima*, *L.*—On the Golspie Links, near Dunrobin.

R. tomentosa, *Sm.* (*R. mollissima*, *Willd.*)—Golspie.

R. eglanteria, *L.* (*R. rubiginosa*, *L.*).—Golspie. Perhaps an escape.

R. glauca, *Vill.*—Golspie.

R. coriifolia, *Fries.*—Golspie.

†*Pyrus Aria*, *Ehrh.*—Certainly planted at Golspie with *P. intermedia*,
Ehrh.

Chrysosplenium oppositifolium, *L.*—In Golspie Glen.

†*Ribes Grossularia*, *L.*—Golspie.

†*Egopodium Podagraria*, *L.*—Golspie.

Linnaea borealis, *L.*—In the firwood near Golspie, but rare, and not
flowering this year; not more than 30 feet above the sea-level.

Galium verum, *L.*, **var. littorale*, *Breb.*—Golspie.

**G. erectum*, *Huds.*—On the railway bank, Inverstair.

Filago minima, *L.*—Heathy ground near Golspie.

Matricaria maritima, *L.*—Golspie.

Senecio viscosus, *L.*—Plentiful on the foreshore at Golspie, and
extending for some distance.

Leontodon autumnalis, *L.*, **var. sordida*, *Bab.*—Golspie.

**Taraxacum palustre*, *DC.*—Golspie.

Sonchus asper, *Hill.*, **var. glandulosus*, and *S. oleraceus*, **var. glandulosus*.—Golspie.

- Fraxinus rotundifolia*, *L.*—Golspie.
Trientalis europæa, *L.*—Golspie.
Gentiana amarella, *L.*, var. *multicaulis* (Lange).—Golspie.
 **G. baltica*, *Murb.*—Golspie.
 *†*Symphytum asperrimum*, *Bieb.*—Golspie.
 **Pneumaria maritima*, *Hill* (*Mertensia maritima*).—On shingle, Golspie; very rare.
 **Veronica didyma*, *Ten.*—Golspie.
 *†*V. Tournefortii*, *Gmel.*—Golspie, garden ground.
Myosotis repens, *Don.*—Golspie Glen.
M. versicolor, *Reichb.*—Golspie, near the railway.
 †*Mimulus Langsdorffii*, *Donn.*—In the glen at Dunrobin, quite naturalised.
 **Thymus Chamædrys*, *Fries.*—Growing with *T. Serpyllum*, *L.*, on the links, but more sparingly, and keeping quite distinct.
Galeopsis Tetrahit, *L.* *var. *bifida* (Boenn.).—Cultivated fields, Golspie.
Plantago major, *L.*, *var. *intermedia* (Gilib.).—Golspie.
P. maritima, *L.*, var.
Salicornia herbacea, *L.*—Near Golspie.
Suaeda maritima, *Dum.* (= *Dondia maritima*, Druce).—Golspie.
 **Atriplex patula*, *L.*—On the foreshore at Golspie. *Var. *angustifolia*, *Sm.*—Waste ground.
A. Babingtonii, *Woods*, *var. *virescens* (Lange).—Golspie.
 **Rumex acutus*, *L.*—Bordering the road near Golspie in some quantity.
R. crispus, *L.*, var. *unicallosus*.—Golspie.
Ulmus montana, *Stokes* (= *U. campestris*, *L.*).—Golspie Glen.
 **Betula verrucosa*, *Ehrh.*—Golspie.
 †*Fagus sylvatica*, *L.*—Undoubtedly planted.
 *†*Quercus sessiliflora*, *Salisb.*—Dunrobin; (?) planted.
 **Salix Caprea*, *L.*—Dunrobin Glen.
 †**S. alba*, *L.*—Golspie.
Listera cordata, *Br.*—Golspie wood, with *L. ovata*, *Br.*
Goodyera repens, *Br.*—Plentiful in the wood with *Linnaea*.
Orchis maculata, *L.* (Dunrobin), and *var. *ericetorum* (Linton).—Golspie; type at Dunrobin.
Habenaria viridis, *Br.*, var. **bracteata* (Asa Gray).—Near Golspie.

- Juncus Gerardi*, *Lois*.—Marsh near Golspie.
Carex arenaria, *L.*—Golspie Links.
Milium effusum, *L.*—Golspie Glen.
Phleum pratense, *L.*, var. *nodosum*, *L.*—Golspie Links.
Agrostis alba, *L.*, *var. *coarctata* (Hoffm.).—Golspie.
A. vulgaris, *With.*, var. *pumila*, *L.*—In heathy ground near Golspie.
Phragmites communis, *Trin.*—Not in “Top. Bot.”
Koeleria cristata, *Pers.*, *var. *gracilis* (Bor.).—Golspie Links.
Melica nutans, *L.*—Golspie Glen.
 **Poa nemoralis*, *L.*—On a wall in Golspie.
P. trivialis, *L.*—Golspie.
Festuca ovina, *L.*, *var. *paludosa* (Gaud).—Golspie Links.
 **Bromus commutatus*, *Schreb.*—Golspie.
Agropyron repens, *Beauv.*, *var. *Leersianum* (S. F. Gray).—Golspie.
 Also *var. *glaucum*.
A. junceum, *Beauv.*—Golspie.
Elymus arenarius, *L.*—Golspie; no personal authority in “Top. Bot.”
Botrychium Lunaria, *Sw.*—Golspie Links; common.
Equisetum arvense, *L.*, *var. *nemorosum* (Braun.).—Golspie.
E. sylvaticum, *L.*, var. *capillare* (Hoffm.).—Abundant in Golspie Glen.
Lastrea dilatata, *Presl.*—Golspie Glen.

SCOTTISH RUBI.

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

(Continued from p. 244.)

99. DUMBARTON.

- R. idæus*.—R.
R. fissus. “Hailstone,” “Top. Bot.”—[R].
R. Rogersii. Between Arrochar and Tarbet, Marshall, 1901.—R.
R. plicatus. Balloch, 1897, *W. M. Rogers*.—R.
R. nitidus. Near Tarbet, 1901, *Marshall*.—R.
R. Lindleianus. “Top. Bot.”; Ardlui, 1896, *Marshall* and *Shoolbred*.—R.

- R. Scheutzii. Balloch, 1896, *W. M. R.*—R.
 R. pulcherrimus. Ardlui, 1896, *M. and Sh.*—R.
 R. villicaulis, *subsp.* Selmeri. 1897, *W. M. R.*—R.
 R. gratus. Near Ardlui, 1896, *M. and Sh.*—R.
 R. mucronatus. Ardlui, 1896, *M. and Sh.*—R.
 R. radula (*s. strict.*). Balloch, 1896, *W. M. R.*—R.
 subsp. anglicanus. Ardlui, 1896, *M. and Sh.*—R.
 subsp. sertiflorus. Near Tarbet, 1901, *Marshall.*
 R. echinatus. 1900.—R.
 R. rosaceus, *subsp.* infecundus. Balloch, in quantity, 1896, *W. M. R.*
 —R.
 R. saxatilis. "N.B. Guide," 1837; "Hooker, sp." "Top. Bot."—R.
 [R. Chamæmorus. "Boué's Inaug. Dissert." "N.B. Guide."]

100. CLYDE ISLANDS.

- R. idæus. Lamlash, *Lightfoot*, 1778.—R.
 R. Rogersii. Near Loch Fad, Bute, 1901, *Marshall.*—R.
 R. plicatus. "Top. Bot."—[R].
 R. affinis. *Balfour*, "Top. Bot."
 R. carpinifolius, Bute, *Balfour*, "Top. Bot."
 R. Lindleianus. "Top. Bot."; plentiful about Rothesay. *Marshall*,
 1901.—R.
 R. rhamnifolius. Bute, 1901, *W. M. R.*—R.
 R. dumnoniensis. Rothesay, scarce, *Marshall*, 1901.—R.
 R. pulcherrimus. Rothesay, plentiful, *Marshall*, 1901.—R.
 R. villicaulis (*s. strict.*). *J. King*, "Add. Rec. 1892."—R.
 subsp. Selmeri. About Rothesay, 1901, *Marshall.*—R.
 R. rusticanus (as *discolor*). "Top. Bot."—R.
 R. macrophyllus. 1900. R.
 subsp. Schlechtendalii, *var.* amplificatus, "Top. Bot."—(R).
 R. pyramidalis. Bute, 1901, *W. M. R.*—R.
 R. mucronatus (as *mucronulatus*). "Arran," "Top. Bot."—(R).
 R. infestus. Bute, 1901, *W. M. R.*—R.
 R. Koehleri, *subsp.* dasyphyllus, (as *var.* *pallidus*). "Top. Bot.";
 Bute, 1901, *W. M. R.*—R.
 R. dumetorum, *var.* fasciculatus (as *corylifolius*, *var.* *purpureus*).
 Arran, *Balfour*, "Top. Bot."—(R).
 R. corylifolius. *King* (Glasg. Cat.)—R.
 var. cyclophyllus (as *var.* *conjungens*), "Arran, *Balfour*,"
 "Top. Bot."—[R].
 R. saxatilis. "Hennedy, Catalogue," "Top. Bot."—R.

101. CANTIRE.

- R. idæus.—R.
 R. suberectus. Near Inverneil, 1897, *C. E. Salmon.*—R.

- R. sulcatus. *C. E. S.* "Add. Rec. 1898."
 R. Lindleianus. By Crinan Canal, Ardrishaig, 1897, *C. E. S.*—R.
 R. rhamnifolius. Cairnbaan, 1897, *C. E. S.*
subsp. Bakeri. 1900.—R.
 R. dumnoniensis. Inverneil, 1897, *C. E. S.*—R.
 R. pulcherrimus. Auchindarroch, by Crinan Canal, 1897,
C. E. S.—R.
 R. villicaulis, *subsp.* Selmeri. By Crinan Canal, 1897, *C. E. S.*—R.
 R. radula, *subsp.* anglicanus, *C. E. S.* "Add. Rec. 1898"; near
 Inverneil, 1901, *C. E. S.*
subsp. sertiflorus. Near Inverneil, 1901, *C. E. S.*—R.
 R. corylifolius.—R.
var. cyclophyllus. By Loch Killisport, 1897, *C. E. S.*—(R).
 R. saxatilis. "Balfour, Catalogue," "Top. Bot."—R.

102. S. EBUDES.

- R. idæus.—R.
 R. plicatus. A. Ley.—(R).
 R. affinis. *Ewing*, "Add. Rec. 1889."
 R. pulcherrimus (as *R. polyanthemus*). *Ewing*, "Add. Rec. 1889."
 [R. hirtifolius, *var.* danicus. Doubtfully recorded for S. Ebudes.]
 R. mucronatus (as *mucronulatus*). "Top. Bot."—(R).
 R. saxatilis. "Balfour, sp." "Top. Bot."—R.

103. M. EBUDES.

- R. idæus.—R.
 R. plicatus. *Macvicar*, "Add. Rec. 1894"; Coll, 1896,
Macvicar.—R.
 [R. affinis. "Add. Rec. 1887," in error.]
 R. carpinifolius. *Macvicar*, "Add. Rec. 1894."—R.
 R. dumnoniensis. *Macvicar*, "Add. Rec. 1894"; Coll, 1896,
Macvicar—R.
 R. pulcherrimus.—R.
 R. villicaulis. *Macvicar*, "Add. Rec. 1894."
subsp. Selmeri. Coll, locally common, 1896, *Macvicar*.—R.
 R. hirtifolius, *var.* danicus. Coll, 1896, *Macvicar*.—R.
 [R. pyramidalis, included with doubt (from Mull) in *M. W. R.*'s list
 of 1895; is omitted from 103 in the "Handbook" as incorrectly
 named.]
 R. mucronatus. *Macvicar*, "Add. Rec. 1894."—R.
 R. radula. *Macvicar*, "Add. Rec. 1894."—R.
 [R. corylifolius. Recorded in error, the specimen proving to be *R.*
hirtifolius, *var.* *danicus*, "Add. Rec. 1896."] *]*
 R. saxatilis. "Ross, Catalogue," "Top. Bot."—R.
 [R. arcticus. "Mull, Dr. Walker," "Eng. Bot." t. 1585.]

104. N. EBUDES.

- R. idæus.—R.
 R. plicatus. *Macvicar*, "Add. Rec. 1895."—R.
 R. pulcherrimus. *Macvicar*, "Add. Rec. 1895."—R.
 R. villicaulis. *Macvicar*, "Add. Rec. 1895."—R.
 subsp. Selmeri. *Macvicar*, "Add. Rec. 1895."
 R. gratus. *Macvicar*, "Add. Rec. 1895."—R.
 R. mucronatus. 1900.—R.
 R. radula (*s. strict.*). *Macvicar*, "Add. Rec. 1895."—R.
 R. thyriger. Dried specimen recorded as seen by *W. M. R.*,¹ 1897.
 —[R].
 R. corylifolius. Uig, Skye, *Lintons*.—R.
 var. sublustris.—R.
 R. saxatilis. "Lawson, Catalogue," "Top. Bot."—R.

105. W. ROSS.

- R. idæus. White-fruited in various localities, *G. C. Druce*,
 1889.—R.
 R. fissus. "Add. Rec. 1894"; near Ullapool, *G. C. D.*, 1896.
 —R.
 R. suberectus. Inverlael, 1893, *G. C. D.*—R.
 R. Rogersii. Kinlochewe, 1896, *E. and C. Salmon* ("J. B." 1897,
 348).—R.
 R. plicatus. Near Dundonnell, 1893, *G. C. D.*—R.
 R. affinis. Kinlochewe, *G. C. D.*, 1890.
 R. carpinifolius.—R.
 R. incurvatus. Ullapool and Inverlael, 1893, *G. C. D.*—R.
 R. rhamnifolius. Strome Ferry, *G. C. D.*, 1894.
 R. pulcherrimus. Jeantown, *G. C. D.*, 1893.—R.
 R. villicaulis (*s. strict.*). "Add. Rec. 1894"; Kinlochewe, *G. C. D.*,
 1896; *E. and C. Salmon*, 1896 ("J. B." 1897, 348).—R.
 subsp. Selmeri. Strathcarron, etc., 1893, *G. C. D.*—R.
 var. calvatus. Recorded from Kinlochewe in 1890 by
 G. C. Druce, but Mr. Rogers says, in "Handbook,"
 "not yet observed in Scotland."
 R. macrophyllus. Inverlael, 1893, *G. C. D.*
 R. pyramidalis. Ullapool and Dundonnell, 1893, *G. C. D.*; Kin-
 lochewe, 1896, *E. and C. S. (l.c.)*.—R.
 R. leucostachys. Ullapool, rare, 1893, *G. C. D.*
 R. mucronatus. "Not rare," 1880, *G. C. D.*; "Add. Rec. 1894."
 —R.
 R. radula. *Druce*. "Add. Rec. 1894."—R.
 R. corylifolius. Glen Shiel, *A. Davidson*, 1884; Ullapool, 1893,
 G. C. D.

- R. saxatilis. Ben Slioch, *G. C. D.*, 1890.—R.
 R. Chamæmorus. "Ch. Babington, MS.," "Top. Bot.;" Ben Slioch, etc., 1889, *G. C. D.*—R.

106. EAST ROSS.

- R. idæus.—R.
 R. fissus. *Marshall*, "Add. Rec. 1891."—R.
 R. Rogersii. Bonar Bridge, 1893, *Marshall*.—R.
 R. plicatus. *Bailey*, "Add. Rec. 1891"; near Dingwall, 1893, *Marshall*.—(R).
 var. hemistemon.—R.
 R. dumnoniensis.—R.
 R. villicaulis (*s. strict.*). Between Loch Eye and Tain, *M.* and *Hanb.*, 1891.—R.
 subsp. Selmeri. Between Meikle Ferry and Tain, *M.* and *Shoolb.*, 1897.—[R].
 R. macrophyllus, *subsp. Schlechtendalii*. *Bailey*, "Add. Rec. 1891."—R.
 R. mucronatus. *M.* and *Hanb.*, "Add. Rec. 1891"; Rossmarkie, 1899, *M.* and *Sh.*—R.
 R. Gelertii. Between Fowlis and Dingwall in quantity, 1893, *Marshall*.—R.
 R. radula. *Marshall*, "Add. Rec. 1892," Rossmarkie, *M.* and *Sh.*, 1899.—R.
 R. dumetorum, *var. diversifolius*. *Marshall*, "Add. Rec. 1892."—(R).
 R. corylifolius. *Marshall*, "Add. Rec. 1891."—R.
 R. saxatilis. "Gordon, Catalogue," "N.B. Guide," 1837, "Top. Bot."—R.
 R. Chamæmorus. "Gordon, MS." "N.B. Guide," 1837, "Top. Bot."—R.

107. EAST SUTHERLAND.

- R. idæus.—R.
 R. Rogersii. Near Invershin, 1890; *Marshall*, "Add. Rec. 1895."—R.
 T. plicatus. Between Rosehall and Invershin, 1899, *Marshall* and *Hanbury*.—R.
 R. opacus.—[R].
 R. villicaulis (*s. strict.*). About Golspie, 1896, *M.* and *Shoolbred.*—R.
 R. micans (*as R. adsitus.*). "Oliver," "Top. Bot.," but no authentic example seen by Mr. Rogers.—[R].
 R. leucostachys. Between Rosehall and Invershin, *M.* and *Hanb.*, 1890.—R.

- R. mucronatus. Between Rosehall and Invershin, *M.* and *Hanb.*, 1890.—R.
 R. radula (*s. strict.*). Frequent at Golspie, 1897, *M.* and *Shoolb.*—R.
 R. corylifolius. Near Invershin, 1890, *M.* and *Hanb.*—R.
 R. Balfourianus. 1897, *M.* and *Shoolb.*
 R. saxatilis.—R.
 R. Chamæmorus. “Grant,” “Top. Bot.”—R.

108. WEST SUTHERLAND.

- R. idæus.—R.
 R. villicaulis (*s. strict.*). Lochinver, *M.* and *Hanb.*, 1891.—R.
 R. hirtifolius, *var. danicus.* 1900.—R.
var. mollissimus. Was recorded as found by Mr. Hanbury at Tongue, but is omitted from the “Handbook” list, the specimen having belonged to *var. danicus.*—R.
 R. Balfourianus. *Marshall* and *Shoolbred*, 1898.
 R. saxatilis. “N.B. Guide,” 1837; “Top. Bot.”—R.
 R. Chamæmorus. “N.B. Guide,” 1837; “Top. Bot.”—R.

109. CAITHNESS.

- R. idæus.—R.
 R. plicatus, *var. hemistemon.* Dunbeath, 1889, *Lintons.*—R.
 R. corylifolius. *Davidson*, “Add. Rec. 1886.”—R.
 R. cæsius.—R.
 R. saxatilis. “R. Brown, Catalogue,” “Top. Bot.”—R.
 R. Chamæmorus. (“Ar. Bennett”), “Top. Bot.”—R.

110. HEBRIDES.

- R. idæus. *Somerville*, “Add. Rec. 1888.”—R.
 [R. carpinifolius. ? “Add. Rec. 1894.”]
 R. incurvatus. “Add. Rec. 1891.”—(R).
 R. pulcherrimus (as *polyanthemus*). *Somerville*, 1888, “Add. Rec.”; North Uist and Barra, 1894, *Shoolbred.*—R.
 R. villicaulis (*s. strict.*) (as *insularis*). *Shoolbred*, “Add. Rec. 1895.”—R.
subsp. rhombifolius.—[R].
 R. gratus. “Plentiful near Obe, Harris,” 1894, *Shoolbred.*—R.
 R. rusticanus. “Near Castle Bay, Barra,” 1894, *Shoolbred.*—R.
 R. mucronatus. “North Uist and Benbecula,” *Shoolbred*; “Add. Rec. 1894.”—R.
 R. radula (*s. strict.*). Near Castle Bay, Barra, 1894, *Shoolbred*, “Add. Rec. 1894.”—R.
 R. rosaceus. “*Shoolbred?*” “Add. Rec. 1894.”

R. corylifolius.—R.

R. cæsius. “*Somerville?*” (Glasg. Cat.).

R. saxatilis. “*Top. Bot.*”—R.

III. ORKNEY.

R. idæus.—R.

R. fissus. “*Top. Bot.*”—R.

R. saxatilis. “*Gillieshb.*” “*Top. Bot.*”—R.

(*To be continued.*)

EQUISETUM HYEMALE, L., IN WESTERNESS.

By ARTHUR BENNETT, F.L.S.

SO far as I know, the only records for this species in West Scotland are Ayrshire (where it is named from five or six parishes, of which Tarbolton is the most westward), and West Sutherland (A. Gray, “*Trans. Bot. Soc.*” Edinburgh). It was recorded by Mr. Croall (“*Record Club Rep. for 1876,*” (1877), p. 174), from Easternness; and though this vice-county is mainly eastern, yet at one point it almost runs out to the western seaboard. Kirkcudbright and Lanark, in which it also occurs, can only be called Central Scotland, though each are partly west of the median line.

Last August my friend Mr. C. E. Salmon gathered it on Culvain (3224 feet), in the parish of Kilmalie, at an altitude of 1750 feet; this exceeds by 850 feet any record known to me. In the “*Comp. Cybele Brit.*” the highest record is 600 feet, “*Baker in Humber.*” But in Baker’s “*Lake Flora,*” p. 247 (1885), he gives it for 900 feet, “*between Shap and Anna Well, I. Lawson.*”

In the “*Flora of Perth,*” p. 374 (1898), it is given for “*low levels*” only; in Dickie’s “*Bot. Guide to Aberdeen, Banff, and Kincardine,*” p. 236 (1860), the altitude noted is 150 to 400 feet. In “*Top. Bot.,*” ed. 2 (1883), the record for S. Aberdeen is marked doubtful.¹

In Scotland this species extends north to about N. lat. 58° 30'. In Finland it grows in two of the north-west provinces (Lapponia inarensis and L. tulomensis) to about 69°

¹ The localities named in the “*Bot. Guide*” are all either in Kincardine or in N. Aberdeen. I have not myself seen it in S. Aberdeen.—J. W. H. TRAIL.

N. lat. In Norway at $70^{\circ} 8'$, E. Finmark and W. Finmark at $70^{\circ} 19'$ (Norman "Notationes summatis conceptæ," p. 516, 1881). In Iceland, Greenland ("Islands Flora," p. 138, 1881). Landt reported it from the Faroes, but I am not sure whether it has been confirmed from them since; it is not admitted by Rostrup ("Færoernes Flora," p. 72, 1870); nor is it given for the Færoes in Ostenfeld's "Flora Arctica," 1902. As the var. *Doellii*, Milde, it occurs in West Greenland at $60^{\circ} 35'$ (Ostenfeld, "Flora Arctica," p. 9). In Canada it is "quite common throughout the northern forests, and westward through the mountains to the Pacific" (Macoun, "Cat. Canad. Pl.," pt. 4, p. 252, 1888), but it does not seem to reach the extreme north.

From this distribution there seems no reason why it should not be found in the extreme north of Scotland, the Orkneys, and the Shetland Isles. In England it extends south to E. Kent and Surrey, but is not recorded further south, and only from N. Somerset, in the S.W. of England.

ZOOLOGICAL NOTES.

Polecat in Ross-shire.—I received in December a remarkably fine male specimen of the Polecat (*Mustela putorius*). The animal was in fine fur, and was 22 inches in length and weighed $2\frac{3}{4}$ lbs. It was taken in a trap set for rabbits in a rocky hill face at Leckmelm, Ross-shire. Fifty years ago the Polecat was found in every county from the Solway to Sutherlandshire, and at that time was tolerably numerous in the Oban district. The Pine Marten (*Mustela martes*) is also fast becoming extinct. A very few specimens have been obtained in late years, and these have also principally been taken in traps set for rabbits. A very fine specimen of the Pine Marten was thus captured in the Melfort district a short time ago. This latter specimen, together with the Polecat, has been added to my collection of Highland mammals. It would be interesting to know the date of the last capture of the Polecat in Argyllshire.—CECIL H. BISHOPP, Oban.

[Two specimens of the Polecat captured during the past year in the Assynt district of Sutherland came under our notice, and were examined by us.—EDS.]

Crested Tit in Lower Strathspey.—In Messrs. Harvie-Brown's and Buckley's "Moray" the Glen of Rothes is mentioned as the

lowest locality on the Spey from which the Crested Tit (*P. cristatus*) has been recorded. During the autumn of 1901 and spring of 1902 I found the bird fairly numerous in the neighbourhood of Fochabers, which is several miles north of the Glen of Rothes. The first time the Crested Tit was seen near Fochabers was in the winter of either 1868 or 1869, when a single bird was noticed by Mr. John Webster, brother of the present head gardener at Gordon Castle. In June 1899 Mr. George Muirhead, jun., found two Crested Tits' nests in a large fir-wood about a mile from Fochabers; one nest contained young birds, and the other hard-set eggs. As I have seen Crested Tits within five miles of Elgin, perhaps they may now be extending their range beyond the valley of the Spey.—NORMAN B. KINNEAR, Achnacarry.

Nesting of Great Spotted Woodpecker in East Lothian.—On 5th May 1902 I visited a nest of *Dendrocopus major* in a wood not very far from here. The exact spot, at the request of the proprietor, I do not name. The nest was in an upright half-dead branch of a beech-tree some 25 feet from the ground. The extraordinary litter of chips which bestrewed the ground at the foot of the tree first attracted attention to it. The entrance hole measured $2 \times 2\frac{1}{4}$ inches, and the depth of the hollow from the lower lip of the aperture to the surface of the chips and wood-dust which formed the nest was 10 inches. The circumference of the branch outside the aperture was 19 inches. As I was away from home during part of May, I did not manage to visit the nest till 10th June, when I saw many signs of the presence of the birds; but several people in the neighbourhood saw the parent birds repeatedly going in and out of the nest, and described to me most accurately their colours and markings. The young were hatched and got safely away, I am glad to record.—H. N. BONAR, Salton.

Honey Buzzard in Argyllshire.—On the 9th of October an immature female Honey Buzzard (*Pernis apivorus*) was shot at Killfinnan, Loch Fyne.—CHARLES KIRK, Glasgow.

Honey Buzzard in Forfarshire.—I am informed on the most reliable authority that a bird of this species was observed being pursued by a lot of Jackdaws at Teinavon. The bird passed within 20 yards of my informant, whose attention was called to the bird by its cries while being hustled by its pursuers.—J. A. HARVIE-BROWN.

Glossy Ibis in Roxburghshire.—On the 17th of November last an immature specimen of the Glossy Ibis (*Plegadis falcinellus*) was shot at a place called the "Brick House," which is situated on the Tweed about four miles below Kelso, and where there is a small pond and marshy places, to which numerous ducks resort. This example has been acquired by the Edinburgh Museum of Science and Art.—ARCHIBALD STEEL, Kelso.

Glossy Ibis in Islay.—An immature female Glossy Ibis (*Plegadis falcinellus*) was shot at Kildalton, Islay, on 30th October, and is now in the collection of Mr. Jain Ramsay, Kildalton.—CHARLES KIRK, Glasgow.

Note on Migrating Wild Ducks.—I occasionally see birds pass the disc of the sun, or the moon, when I happen to be looking at these bodies at certain times of the year. On the evening of 12th September (time being eleven minutes past nine) I noted the most satisfactory observation of this kind that I have ever made. I was looking at the sunrise upon the mountains extending out into the small unilluminated portion of the moon's eastern hemisphere, when a flock of birds passed across the moon in an instant. They were wild ducks, and nine, perhaps ten, were upon the disc at once. The direction of flight was S.S.W. by S. The instrument I was using is an 8½-inch reflector, and the power I had on was 60. I had about two-thirds of the moon's image in view, and it filled the whole field. A calculation of the distance and height of the birds was in the circumstances rather difficult, depending almost entirely upon estimation. Upon the whole, I think they would be nearly five miles distant, and about 3000 feet high.—R. SERVICE, Maxwelltown.

Velvet Scoter Inland.—On 29th October last I received a fine old male Velvet Scoter (*Edemia fusca*) that had been shot the same morning by the side of the Nith below Dumfries, and some five or six miles from the open firth. That it had not long left the sea was shown by the fact that its stomach was crammed with shells of *Tellina*. I have known the Common Scoter to occasionally visit the large inland lochs of Galloway just about the time of the spring migration, but this is the first local occurrence inland of the Velvet Scoter that I have met with.—R. SERVICE, Maxwelltown.

Little Stint in the Island of Coll.—On making further inquiry regarding the occurrence of *Tringa minuta* in Coll, alluded to in the last number of the "Annals" (1901, p. 251), I find that they were observed, and specimens obtained late in February, not in March as previously stated. The keeper says he only saw them at one place—the sandy beach of Crossapol.—L. H. IRBY, London.

Black-tailed Godwits in Tiree.—One shot in Tiree by Mr. Peter Anderson was sent in the flesh in August. Mr. Anderson writes me as follows:—"Black-tailed Godwits are not at all *very* rare in Tiree on migration. I see some of them nearly every year either in spring or autumn, but I never see more than four together. There were three in that party (two of them rusty on breast, the other not rusty), out of which I shot the bird sent. It is one thing to see Black-tailed Godwits, and quite another thing to get near enough

to shoot them. They are extraordinarily shy and wary. They are always on bare marshy ground, and they keep from 150 to 200 yards away from one, walking away feeding and watching all the time that one does not get nearer them. They keep calling 'Nape, nape' to one another whilst feeding. I saw another lot of four, two or three days after I shot the one sent. I watched them for over two hours. They have a wild, eerie whistle when on the wing."

In another letter Mr. Anderson speaks of the Bar-tailed Godwit as very common on the sea-shore in flocks of ten to twenty birds or more, but it *never leaves the sea-shore*, and I have never seen a Bar-tailed Godwit "inland, or on a marsh, or even on grass land; whereas the Black-tailed species never goes near the sea-shore. While in Tiree the habits of the two species are entirely different. The Bar-tailed Godwits are very confiding, while the Black-tailed species is quite the reverse."

"I spent some time watching a Black-tailed Godwit to-day (5th September 1902)—a single bird, at the Faoil. It was rusty red on neck, breast, and belly, except the vent, which was whitish. If I had had my gun I could have shot it, as it passed, while feeding, within 20 yards of where I was hiding."—JOHN A. HARVIE-BROWN.

Herring Gull capturing a Bat.—Between the Perth Museum and the bridge over the river Tay is a favourite resort of Gulls of various species. On 19th September, at noon, a foolish bat was disporting himself near the bridge. A number of Herring Gulls were present, and one of them flew at the Bat, but did not make a capture, for the Bat dropped; a second Gull, however, swooped and took it from the river, and made off with it.—ALEX. M. RODGER, Perth.

Pomatorhine Skua on the Nith.—On the morning of 29th October last a fine young immature bird of this species was shot as it passed Glencaple Quay, going up the Nith on the flood tide. It was sitting on a carcase of the Herring Gull, which it was busy devouring. I found its stomach gorged with Gull's flesh and feathers.—R. SERVICE, Maxwelltown.

Pomatorhine Skua at Loch Lomond.—On 5th October an immature female Pomatorhine Skua (*Stercorarius pomatorhinus*) was found on the shore at Midrass, Luss, Loch Lomond, by Mr. Colquhoun, which had been choked while endeavouring to swallow a Powan (*Coregonus clupeioides*) weighing 4 ounces.—CHARLES KIRK, Glasgow.

Note on a Young Adder.—I have been interested in the correspondence in the "Annals" regarding the Adder (*Vipera berus*) in Scotland, in response to Dr. Leighton's paper. And as, so far, no information with regard to actual specimens appears to be forthcoming of vipers measuring less than 15 inches, perhaps it is worth while recording that I have a specimen, taken at Aberfoyle about the

end of May 1899, which is in perfect condition, being preserved in diluted alcohol.

It measures just $9\frac{1}{2}$ inches long. The colour, which has not undergone any change, may be roughly described as a warm brown. It could not by any stretch of imagination be called red, although I daresay it is redder than the common adult forms.—ALBERT F. ROSA, Edinburgh.

Mollusca observed at Stromness, Orkney.—The following is a list of some land and fresh-water shells collected in the neighbourhood of Stromness, Mainland, Orkney, during the first week of September 1902. All except two, namely, *N. fluviatilis* and *V. pellucida*, are new to the list for Orkney; and they have in all cases been identified by Mr. J. W. Taylor, to whom the discovery of *H. radiatula* among specimens forwarded is also due.

Neretina fluviatilis.—Stennis Loch. Still abundant in this old habitat and in comparatively salt water. All my specimens were taken from stones among seaweed between Bridge of Waith and Deepdale. The round, opaque, whitish egg capsules were attached to the shells in many cases; also seen crowding the cracks in rows.

Limnæa peregra.—Small field-drain entering sea about $\frac{1}{2}$ mile south-west of town. A few found.

L. truncatula.—Common. In several burns and drains into Stennis and Bay of Ireland.

Ancylus fluviatilis.—One. Small burn south side Bay of Ireland.

Succinea putris.—One. Roadside-drain, where road from Stromness meets loch at Deepdale.

Vitrina pellucida.—Common south-west of town near shore. In company with *P. cylindracea*.

Hyalinia cellaria, var. *albina*.—Found in company with the foregoing. Also at loch, end of old road to Stennis.

H. alliaria.—A few under stones near Bridge of Waith.

H. radiatula.—One. Near town.

H. crystallina.—Several south-west of town near shore.

P. cylindracea.—By far the most abundant land shell met with. Occurred in all directions, but on stones near the shore was in colonies, twenty to forty individuals. Three distinct types occur: (1) *P. cyl. normal*, (2) var. *edentula*, (3) var. *curta*. There are other slight variations in size of denticle, but the edentulous are far the most numerous.

Vertigo pygmaea.—Where road skirts south end of Stennis. Apparently common. Twenty-one taken.

Cochlicopa lubrica, var. *lubricoides*.—A few near shore, south-west of town.

Besides these were seen, but not taken, *Arion ater* and *Helix rotundata*.—JAMES WATERSTON, Edinburgh.

Pupa anglica (*Fér.*) in Linlithgowshire.—Referring to my note in the last number of this Magazine (1902, p. 254), recording this little mollusc from Mid-Lothian, I have now to state that on 27th October 1902 I found a colony of it in a damp spot adjoining the shore within Dalmeny grounds, West Lothian. Most of the dozen or so specimens gathered were got about the bases of dead leaves and stems of the spotted hemlock.—WILLIAM EVANS, Edinburgh.

Spilodes sticticalis (*L.*) in Haddingtonshire.—On 27th July 1901 I caught four good specimens of this very local moth, and saw several others on Luffness Links, East Lothian. Mr. C. G. Barrett has seen one of them, and confirms my identification. The species has been recorded by Prof. Trail from Old Aberdeen (“Trans. Nat. Hist. Soc. Aberd. 1878”); and in Leech’s “British Pyralides,” published in 1886, “Fifeshire, Perthshire, and Aberdeen” are given as localities for it.—WILLIAM EVANS, Edinburgh.

Rare Moths in Fifeshire.—In July 1901 I captured several specimens of the *Spilodes sticticalis* (*L.*) and *Botys terrealis* (*Tr.*) in a locality in Fifeshire, which perhaps should not be more particularly indicated at present. As I understand that both species are rare, it may be of interest to place these captures on record.—J. Ross, Kirkcaldy.

BOTANICAL NOTES AND NEWS.

Memorial to George Don.—At the last meeting of the British Pharmaceutical Conference at Dundee, when I had the honour of being president, I took for my address the subject of the “History of Scottish Botany,” and incidentally drew attention to the botanical work of George Don, of Forfar, who made so many and important discoveries of British plants.

Some years ago Mr. John Knox, of Forfar, gave a sympathetic sketch of Don in the pages of the “Scottish Naturalist,” to which I afterwards contributed a paper on the same subject. Don, as we know, lived a hard life, and died in abject poverty; but, unlike those Scottish worthies Robert Dick and Thomas Edward, he has had no due public acknowledgment, but instead has met with, I think, unmerited criticism and blame at the hands of a few botanists.

Recently an important article on the subject of the life of George Don has appeared in the *Scotsman*; and I have been asked to start a movement towards erecting some simple monument to him in his native town. The local committee of our

conference at Dundee has kindly voted five pounds, and I am informed that the New Club of Forfarshire will probably give a similar amount; and I now venture to ask your readers to contribute to this project, even by any small sum, so that a recognition, even if tardy, may be offered to the unwearied and unselfish investigator into the natural history of Scotland. Subscriptions may be sent to me at 118 High Street, Oxford.—G. CLARIDGE DRUCE.

[The proposal to commemorate George Don is one that must commend itself to all that know how much he did to extend what was known of the flora of Scotland, and under what conditions he did that work. We trust that such a response will be given to Mr. Druce's appeal as to ensure the provision of a suitable memorial.—EDS. "Ann. Scot. Nat. Hist."]

Scottish Hieracia.—Among my *Hieracia*, all named by Mr. Hanbury or Mr. Linton, are the following. Additions to the vice-county records enumerated in the last issue of this journal (October) are marked, as usual, with an asterisk :—*H. melanocephalum*, *Tausch*, *97, Aonach Mor; *H. eximium*, *Backh.*, 98, Ben Dothaid; *H. curvatum*, *Elfst.*, *90; *H. lingulatum*, *Backh.*, *98, Ben Laoigh; *H. callistophyllum*, *F.J.H.*, *92, Glen Callater; *H. cerinthiforme*, *Backh.*, *90, Glen Dole,* 92, Glen Callater, *96; *H. anglicum*, *Fr.*, var. *longibracteatum*, *F.J.H.*, 104, Skye; *H. flocculosum*, *Backh.*, 92, Cairntoul; *H. clovense*, *Lintons*, *92, Glen Callater, 1878; *H. Schmidtii*, *Tausch*, 109; *H. lasiophyllum*, *Koch*, *92; *H. euprepes*, *F.J.H.*, *109, 72; *H. rubiginosum*, *F.J.H.*, *90, *92, *105; *H. farrense*, *F.J.H.*, *109; *H. Oreades*, *Fr.*, var. *subglabratum*, *F.J.H.*, *110; *H. Sommerfeltii*, *Lindeb.*, *96, *98; *H. hypochaeroides*, 98, Ben Houran; *H. rivale*, *F.J.H.*, *96; *H. rigidum*, *Hartm.*, var. *Friesii* *Hartm.*, *96, Spey, and var. *tridentatum* (*Fr.*), *96; *H. dovense*, *Fr.*, var. *spectabile*, *E. S. Marshall*, *90; *H. strictum*, *Fr.*, var. *angustum* (*Lindeb.*), *96; *H. auratum*, *Fr.*, 104 Skye; *H. crocatum*, *Fr.*, *96; *H. boreale*, *Fr.*, *97.—G. C. DRUCE.

The Deadnettlles (*Lamium*) in Scotland.—Mr. S. T. Dunn, in his paper on the "Origin of the Deadnettlles in Britain" ("Journ. Bot." 1902, October), comes to the conclusion that only *Lamium Galeobdolon* can be regarded as indigenous; that *L. album*, *L. purpureum*, *L. incisum*, *L. amplexicaule*, and *L. intermedium* are unknown in Britain, "except in places prepared for them unintentionally by man"; and that *L. maculatum* and *L. bifidum* "seem to have only an insecure footing in our flora, being found only where they have escaped from gardens, or been introduced with agricultural seed, and never spreading of their own accord." Criticising this paper, the Rev. E. S. Marshall ("Journ. Bot." 1902, pp. 390-391) expresses the view that, as regards *L. purpureum*, "there is fairly strong evidence in favour of its being aboriginal," and that "*L. incisum*

is also a characteristic inhabitant of sandy heath-borders and rough banks in light soil"; and he adds: "I have little doubt that in such situations it is native, and has spread thence into fields, etc." As far as my acquaintance with the distribution of the genus *Lamium* in Scotland extends, it supports Mr. Dunn's conclusions, except that even *L. Galeobdolon* cannot be regarded as native in Scotland, where it is rare even as an escape. *L. album* occurs not uncommonly in the vice-counties (except 93, 97, 98, 100) as far north as Inverness, though very rarely north of the Caledonian Canal; but it is restricted to waysides and hedges, near houses, and where rubbish is thrown out. *L. maculatum* is an evident escape, outcast, or relic of cultivation. *L. purpureum* occurs in every vice-county; *L. amplexicaule* in all except 97, 99, 102, 104, 112; *L. intermedium* in all except 79, 81, 84, 86, 88, 97, 99, 104, 106, 107; and *L. incisum* (the least frequent of the four) in all except 72, 73, 74, 75, 79, 82, 96, 97, 101, 103, 104, 105, 106, 107, 108, 109. All the four grow chiefly as weeds of cereal or root field-crops, or in gardens, but they also grow on waste ground where rubbish is thrown out, or on similar soil on the borders of fields, especially in light soil. But though found in such uncultivated ground, it is only, so far as I have seen, as extending to it from cultivated ground, and not as natives of the uncultivated soil invading the fields. There are good grounds, therefore, for regarding all the species of the genus as either casuals, colonists, or aliens within Scotland.—JAMES W. H. TRAIL.

Scottish Algæ.—In the "Catalogue of the British Marine Algæ," by Mr. Batters, now being published as a supplement to the "Journal of Botany," localities on the coast of Scotland are given for the following species:—*Ectocarpus ovatus*, Kjellm.; *E. Hincksia*, Harv.; *E. distortus*, Carm.; *E. Landsburghii*, Harv.; *E. granulatus*, Ag.; *E. secundus*, Kütz.; *Sorocarpus uvæformis*, Pringsh.; *Pylaiella litoralis*, Kjellm., *f. longifructus*, Batt., and vars. *firma*, Kjellm., and *varia*, Kuckuck; *Isthmoplaea sphaerophora*, Kjellm.; *Myriotrichia claviformis*, Harv.; *M. filiformis*, Harv.; *M. densa*, Batt.; *M. repens*, Hauck; *Arthrocladia villosa*, Duby; *Myriactis pulvinata*, Kütz.; *M. Areschongii*, Batt.; *M. stellulata*, Batt.; *Elachistea stellaris*, Aresch., var. *Chordæ*, Aresch.; *E. fucicola*, Fries; *E. Grevillei*, Arnott; *E. flaccida*, Aresch.; *E. scutulata*, Duby; *Leptonema fasciculatum*, Rke., vars. *sub-cylindrica*, Rosenv., and *uncinatum*, Rke.; *Halothrix lumbricalis*, Rke.; *Sphacelaria radicans*, Harv.; *S. olivacea*, Pringsh.; *S. racemosa*, Grev.; *S. tribuloides*, Menegh; *S. cirrhosa*, Ag., with vars. *pennata*, Hauck, *patentissima*, Grev., and *ægagropila*, Griff.; *S. plumula*, Zan.; *S. plumigera*, Holmes; *Chælopteris plumosa*, Kütz.; *Cladostephus spongiosus*, Ag.; *C. verticellatus*, Ag.; *Halopteris filicina*, Kütz.; *Stypocaulon scoparium*, Kütz.; *Myrionema strangulans*, Grev., and var. *punctiforme*, Holm.

and Batt. ; *M. Corunnæ*, Sauv. ; *M. æcidioides*, Sauv. ; *Hecatonema globosum*, Batt. ; *H. reptans*, Sauv. ; *Ascocyclus orbicularis*, Magn. ; *Ralfsia clavata*, Farlow ; *R. pusilla*, Batt. ; *R. verrucosa*, Aresch. ; *Lithoderma fatiscens*, Aresch. ; *Spermatocnusus paradoxus*, Kütz. ; *S. Lejolisii*, Rke. ; *Stilophora rhizodes*, J. Ag. ; *S. tuberculosa*, Rke. ; *Chordaria divaricata*, Ag. ; *C. flagelliformis*, Ag., and var. *minor*, J. Ag. ; *Mesogloia vermiculata*, Le Jolis ; *M. Leveillei*, Menegh. ; *M. lanosa*, Crouan ; *M. Griffithsiana*, Grev. ; *Castagnea virescens*, Thur., and var. *gracilis* ; *C. Zosteræ*, Thur. ; *C. contorta*, Thur. ; *Leathesia difformis*, Aresch. ; *L. crispa*, Harv. ; *Sporocnusus pedunculatus*, Ag. ; *Chorda filum*, Stackh. ; *C. tomentosa*, Lyngb., and var. *subfulva*, Foslie ; *Laminaria saccharina*, Lamour, and vars. *caperata*, Farl., *latissima* (Turn.), and *phyllitis*, Le Jol. ; *L. hieroglyphica*, J. Ag. ; *L. digitata*, Lamour, and vars. *stenophylla*, Harv., and *ensifolia*, J. Ag. ; *L. Cloustoni*, Edin. ; *Saccorhiza polyschides*, Batt. ; *Alaria esculenta*, Grev. ; *Cutleria multifida*, Grev. ; *Aglaozonia reptans*, Crouan ; *Fucus distichus*, L. ; *F. ceranoides*, L., and var. *linearis*, Batt. ; *F. spiralis*, L., and var. *platycarpus* (Thur.) ; *F. vesiculosus*, L., and vars. *balticus*, J. Ag., and *laterifructus*, Grev. ; *F. serratus*, L., and vars. *latifolius*, Turn., and *laciniatus*, Grev. ; *Ascophyllum nodosum*, Le Jolis ; *A. Mackaii*, Holm. and Batt., var. *Robertsoni*, Batt. ; *Pelvetia canaliculata*, Dene and Thur. ; (? *Bifurcaria tuberculata*, Stackh.) ; *Himanthalia lorea*, Lyngb. ; *Halidrys siliquosa*, Lyngb., and var. *siliculosus* (Stackh.) ; *Cystoseira ericoides*, Ag. ; *C. granulata*, Ag. ; *Tilopteris Mertensii*, Kütz. ; *Haplospora globosa*, Kjellm. ; *Achinotopora pusilla*, Born., and var. *crinita*, Batt. ; *Dictyota dichotoma*, Lamour, and vars. *implexa*, J. Ag., and *latifrons*, Holm. and Batt. ; *Taonia atomaria*, J. Ag.

FLORIDEÆ.—*Conchocelis rosea*, Batt. ; *Goniotrichum elegans*, Le Jol. ; *Erythrotrichia carnea*, J. Ag. ; *E. ciliaris*, Batt. ; *E. investiens*, Born. ; *Bangia fuscopurpurea*, Lyngb. ; *Porphyra coccinea*, J. Ag. ; *P. leucosticta*, Thur. ; *P. linearis*, Grev. ; *P. umbilicalis*, Kütz., var. *laciniata*, J. Ag., and var. *umbilicalis*, J. Ag. ; *P. amethystea*, Kütz., *P. miniata*, Ag., and vars. *amplissima*, Rosenv., *tenuissima*, Rosenv., and *abyssicola*, Rosenv. ; *Acrochaetium Chylocladiæ*, Batt., f. *pulchra*, Batt. ; *A. sparsum*, Batt. ; *A. virgatulum*, J. Ag. ; *A. secundatum*, Näg. ; *A. Daviesii*, Näg. ; *Nemalion elminthoides*, Batt. ; *N. multifidum*, J. Ag. ; *Helminthora divaricata*, J. Ag. ; *Scinaia furcellata*, Biv. ; *Choreocolax Polysiphoniæ*, Reinsch ; *C. tumidus*, Reinsch ; *Harveyella mirabilis*, Schm. and Rke. ; *Naccaria Wigghii*, Endl. ; *Pterocladia capillacea*, Born. ; *Gelidium crinale*, J. Ag., and vars. *spathulatum*, Hauck, and *polycladum*, Hauck ; *G. pusillum*, Le Jol. ; *G. aculeatum*, Grev., and var. *abnorme*, Batt. ; *G. pulchellum*, Kütz., and var. *setaceum*, Batt. ; *G. attenuatum*, Thur., var. *confertum*, Batt. ; *G. corneum*, Lamour. ; *G. latifolium*, Born. ; *Chondrus crispus*, Stackh., and vars. *stellatus* (Turn.), *æqualis* (Turn.), *lacerus* (Turn.), and

planus (Turn.); *Gigartina stellata*, Batt.; *Phyllophora epiphylla*, Batt.; *P. Brodiaei*, J. Ag., and var. *angustissima*, Ag.; *P. Traillii*, Holm. and Batt.; *P. membranifolia*, J. Ag.; *Gymnogongrus Griffithsiae*, Mart.; *G. norvegicus*, J. Ag.; *Ahnfeltia plicata*, Fries; *Actinococcus subcutaneus*, Rosenv.; *Colacolepis incrustans*, Schm.; *Sterrocolax decipiens*, Schm.; *Calophyllis laciniata*, Kütz.; *Calocolax neglectus*, Schm.; *Callymenia reniformis*, J. Ag., and vars. *cuneata*, J. Ag., and *Ferrarii*, J. Ag.; *Cystoclonium purpureum*, Batt.; *Catenella repens*, Batt.; *Euthora cristata*, J. Ag.; *Rhodophyllis bifida*, Kütz., *R. appendiculatus*, J. Ag.; *Sphaerococcus coronopifolius*, Grev.; *Gracilaria confervoides*, Grev., and var. *procerrima* (Turn.); *Calliblepharis ciliata*, Kütz.; *C. lanceolata*, Batt.; *Rhodymenia Palmetta*, Grev., *R. palmata*, Grev., and vars. *marginifera*, Harv., *sarniencsis*, Grev., *sobolifera*, J. Ag., and *laciniata*, Holm. and Batt.; *Cordylecladia erecta*, J. Ag.; *Lomentaria articulata*, Lyngb.; *L. clavellosa*, Gaill., and var. *sedifolia*, Harv.; *L. rosea*, Thur.; *Champia parvula*, Harv.; *Chylocladia kaliformis*, Hook., and var. *patens*, Harv.; *C. ovata*, Batt.; *Plocamium coccineum*, Lyngb., with vars. *angustifrons*, Le Jol., *latifrons*, Le Jol., and *uncinatum*, Ag.; *Nitophyllum punctatum*, Grev., and vars. *ocellatum*, J. Ag., *crispatum*, Harv., *Pollexfenii*, Harv., *fimbriatum*, Harv., and *reniforme*, J. Ag.; *N. Bonnemaisonii*, Grev., and var. *crassinerve*, Batt.; *N. uncinatum*, J. Ag.; *N. Gmelini*, Grev.; *N. ramosum*, Batt., and vars. *ciliiferum* (Kütz.), *uncinatum* (Grev.), and *Smithii* (Kütz.); *N. reptans*, Crouan; *N. Hilliae*, Grev.; *Phycodryis rubens*, Batt., and vars. *quercifolia* (Turn.), and *lingulata* (J. Ag.); *Delesseria sanguinea*, Lamour.; *D. alata*, Lamour.; *D. angustissima*, Griff.; *D. ruscifolia*, Lamour.; *D. hypoglossum*, Lamour., with vars. *Woodwardii*, Hauck, *ovalifolia*, J. Ag., *glomerata*, Chauv., *arborescens*, J. Ag., and *angustifolia*, Kütz.; *Bonnemaisonia asparagoides*, Ag.; *Bostrychia scorpioides*, Mont.; *Rhomomela subfusca*, Ag., and vars. *gracilior*, J. Ag., and *firmior*, J. Ag.; *R. lycopodioides*, Ag., and var. *laxa*, Kjellm.; *Odonthalia dentata*, Lyngb.; *Laurencia obtusa*, Lamour.; *L. caespitosa*, Lamour.; *L. pinnatifida*, Lamour., and vars. *osmunda*, Harv., and *litoralis*, Harv.; *Chondria tenuissima*, Ag.; *C. dasyphylla*, Ag.; *Polysiphonia macrocarpa*, Harv.; *P. fibrata*, Harv., *P. urceolata*, Grev., and vars. *patens*, J. Ag., and *formosa*, J. Ag.; *P. divaricata*, Kütz.; *P. Richardsoni*, Hook.; *P. spinulosa*, Grev., and var. *major*, J. Ag.; *P. elongella*, Harv.; *P. elongata*, Grev., and vars. *rosea*, J. Ag., and *denudata*, Grev.; *P. violacea*, Grev.; *P. fibrillosa*, Grev.; *P. fastigiata*, Grev.

Many of the above are old friends under new names, due to more accurate determination of the forms described by the earlier algologists, and to the views now prevailing with regard to the limits of genera. Critical remarks accompany many of the records. Reference should be made to the "Catalogue" for information on these matters, and on the distribution round the British coasts of the

species named above, and of numerous additional species that may be expected to be found on the coasts of Scotland, though not yet recorded therefrom.

Orehis maculata, *L.*, *subsp. ericetorum*, E. F. Linton.—In this Journal (1901, p. 245) the description of this form was quoted from Mr. Linton's "Flora of Bournemouth" (1900, p. 208). In the issue of "The Essex Naturalist," of date July 1902, Mr. C. G. Britton states his views on this, the prevalent if not the only form of *O. maculata* in Epping Forest. Discussing the value of the characters as given by Mr. Linton, he points out that "some are of questionable value. Thus some of the Epping Forest plants possess a pleasant odour; the bracts and stems are more frequently green than purplish, and though some plants show the lip with the outer line of purple markings complete, these are in the minority." The most useful characters are said to be "the narrow leaves, small spike of pale flowers, mid-lobe of lip smaller than the lateral, general slender habit, and heathland habitat."—GEORGE DON ("Gardener's Chronicle," 30th August and 6th September 1902).

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—October-December 1902.

[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.

FAUNA OF BEN NEVIS. *Scottish Mountaineering Club Journal*, vol. vii. (39) pp. 172-173 (September 1902).—Records eleven mammals and fifteen birds (species).

THE SEALS, WHALES, AND DOLPHINS OF THE CLYDE SEA AREA. By Hugh Boyd Watt. *Trans. Nat. Hist. Soc. Glasgow*, vol. vi. (N.S.) part ii. (June 1902) pp. 191-198.—Notes on twelve species, with a Bibliography including twenty-two titles.

OBITUARY NOTICE.—D. C. BURLINGHAM OF KING'S LYNN. By C. B. Plowright, M.D. *Trans. Norf. and Norw. Nat. Soc.*, vol. vii. part iii. (1901-02) pp. 416-418 and 421.—Brief account of visits to Hebrides—Lewis, etc.—and Highlands in 1844 and 1848; mostly bird observations. Widgeon breeding in Glen Garry, 1844. Snow Bunting in breeding plumage on hill above Loch Garry, 4th July 1848, etc. etc.

THE BIRDS OF BALLINLUIG, BLAIR ATHOL, AND FOSSOWAY. By Bruce Campbell. *Trans. Edin. Field Nat. and Micro. Soc.*, vol. iv. part iv. (1902) pp. 277-282, pls. xxviii. and xxix.

EXTRACTS FROM AN UNPUBLISHED ORNITHOLOGY OF GLASGOW. By the late Dr. John Grieve, with Notes by John Paterson. *Trans. Nat. Hist. Soc. Glasgow*, vol. vi. (N.S.) part ii. (June 1902) pp. 181-190.—Refers to a manuscript account of the birds of Glasgow, entitled "Ornithologia Millburnensis," bearing the date 1847, and based on a journal kept during the years 1843, 1844, and 1845.

THE MOUNTAIN EAGLE. By A. I. McConnochie. *The Country*, vol. i. (8) (October 1902) pp. 221-222.—Contains one or two personal observations of Golden Eagles on the Cairngorm mountains.

WOOD-SANDPIPER IN THE ORKNEY ISLANDS. C. S. Buxton. *Zoologist* (4) vol. vi. p. 391 (October 1902).—One shot on the island of Eday on 1st September.

OBSERVATIONS ON THE FOOD OF FISHES. By Thomas Scott, F.L.S. *20th Ann. Rep. Fishery Board for Scotland*, part iii. pp. 486-538 (October 1902).—Based upon Scottish material, the number of fishes examined being over two thousand, including representatives of fifty-six species and thirty-seven genera.

COLEOPTERA IN SCOTLAND. T. Hudson Beare, F.E.S. *Ent. Record*, vol. xiv. pp. 265-266 (October 1902).—Notes on species taken at Cramond, Hawthornden, and Musselburgh.

COLEOPTERA IN SCOTLAND. T. Hudson Beare, F.E.S. *Ent. Record*, vol. xiv. p. 297 (November 1902).—Notes on species obtained chiefly in the Edinburgh district.

ADDITIONS TO THE LIST OF SCOTTISH COLEOPTERA. By Anderson Fergusson. *Trans. Nat. Hist. Soc. Glasgow*, vol. vi. (N.S.) part ii. (June 1902) pp. 214-216.—Notes on eleven species occurring in the Clyde area.

COLEOPTERA IN A BERWICKSHIRE MOSS. T. Hudson Beare, F.E.S. *Ent. Mo. Mag.* (October 1902) p. 242.

NOTES ON COLEOPTERA COLLECTED NEAR NEWTONMORE, INVERNESS-SHIRE, FROM 29TH AUGUST TO 15TH SEPTEMBER 1902. James E. Black. *Ent. Record*, vol. xiv. pp. 296-297 (November 1902).—Seventy species recorded.

MALACHIUS MARGINELLUS, OL., IN SCOTLAND. James E. Black. *Ent. Record*, vol. xiv. p. 267 (October 1902).—A single specimen, taken at Peebles on 26th July 1902.

THE BRITISH SPECIES OF LEUCTRA. By Kenneth J. Morton, F.E.S. *Ent. Mo. Mag.* (November 1902) pp. 255-256.—Scottish localities referred to.

PANCHLORA EXOLETA, KLUG. (BLATTIDÆ), IMPORTED INTO SCOTLAND. W. L. Distant. *Ent. Mo. Mag.* (October 1902) p. 247.—Specimen obtained by Mr. Robert Service at Maxwelltown, Dumfries.

LIST OF SPECIES, VARIETIES, AND ABERRATIONS OF LEPIDOPTERA SO FAR ONLY RECORDED FROM THE BRITISH ISLANDS. By J. W. Tutt. *Ent. Record*, vol. xiv. pp. 259-262 (October 1902).—Includes several Scottish forms.

LATE SEASON FOR LEPIDOPTERA IN PERTHSHIRE. E. Rogers Bush. *Ent. Record*, vol. xiv. p. 271 (October 1902).—Eight species are referred to, with dates.

AUGUST LEPIDOPTERA IN SUTHERLANDSHIRE. Neville Chamberlain, F.E.S. *Ent. Record*, vol. xiv. p. 302 (November 1902).

AGRIUS CONVULVULI AT WICK. David Rosie. *Ent. Record*, vol. xiv. p. 276 (October 1902).—Female specimen found lying on a path on 3rd September 1902.

LOPHOPTERYX CARMELITA IN SUTHERLAND. Neville Chamberlain, F.E.S. *Ent. Record*, vol. xiv. p. 274 (October 1902).—Larva taken in August 1902.

NOTES ON GATHERINGS OF CRUSTACEA COLLECTED BY THE FISHERY STEAMER "GARLAND," AND THE STEAM TRAWLERS "STAR OF PEACE" AND "STAR OF HOPE," OF ABERDEEN, DURING THE YEAR 1901. By Thomas Scott, F.L.S. *20th Ann. Rep. Fishery Board for Scotland*, part iii. pp. 447-485, pls. xxii.-xxv. (October 1902).—Includes descriptions of four genera and ten species new to science.

NOTES ON THE ENTOMOSTRACA OF MID-LOTHIAN. By Dr. T. B. Sprague and Miss B. Sprague. *Trans. Edin. Field Nat. and Micro. Soc.*, vol. iv. part iv. (1902) pp. 305-321, pls. xxxi. and xxxia.—An interesting paper, containing notes on sixty species.

NOTES ON SOME PARASITES OF FISHES. By Thomas Scott, F.L.S. *20th Ann. Rep. Fishery Board for Scotland*, part iii. pp. 288-303, pls. xii. and xiii. (October 1902).—Several species noticed (chiefly Copepoda) which have not been previously recorded from the coast of Scotland, including also six new to science.

NOTES ON THE MARINE DEPOSITS OF THE FIRTH OF FORTH, AND THEIR RELATION TO ITS ANIMAL LIFE. By F. G. Pearcey. *Trans. Nat. Hist. Soc. Glasgow*, vol. vi. (N. S.) part ii. (June 1902) pp. 217-251 and chart.—Includes a long list of animals obtained by trawl, dredge, and tow-net in the areas of the Firth of Forth stations.

BOTANY.

REPORTS ON EXCURSIONS OF NAT. HIST. SOC. GLASGOW IN 1900-1901 (*Trans. Nat. Hist. Soc. Glasg.* vi. N.S. ii. pp. 251-264), to Camis Eskan, Douglas Support, Buchanan Castle, Cadzow, Culzean Castle, and Crossraguel Abbey, Aikenhead, Corehouse and Corra Linn, Creag-na-Caillich, and Cathcart Nurseries.

PROCEEDINGS OF THE NAT. HIST. SOC. GLASGOW, 1900-1901 (*l.c.* pp. 265-283). In the *Reports* and *Proceedings* are notices of dimensions of trees, records of fungi (including a number found in Rothiemurchus in September 1900), and of other plants.

METEOROLOGICAL NOTES, AND REMARKS UPON THE WEATHER DURING THE YEAR 1900, WITH ITS GENERAL EFFECTS UPON VEGETATION. By James Whitton (*Trans. Nat. Hist. Soc. Glasg.*, *l.c.* pp. 198-213).

SALIENT CHARACTERS IN HIERACIUM. By Frederick N. Williams, F.L.S. (*Journ. Bot.* 1902, pp. 313-316).—A useful discussion of the value of these marks.

ORIGIN OF THE DEADNETTLES IN BRITAIN. By S. T. Dunn, B.A. (*Journ. Bot.* 1902, pp. 356-360).—Reprinted from the *South-Eastern Naturalist*, 1901.

EUPHRASIA CURTA, *f.* PICCOLA, AND ERICA STUARTI (*Journ. Bot.* 1902, pp. 362-364).—Quoted from *Ann. Scot. Nat. Hist.* 1902.

NEW VARIETIES OF BRITISH MOSSES. By H. N. Dixon, M.A., F.L.S. (*Journ. Bot.* 1902, pp. 374-380).—*Campylopus atrovireus*, De Not, var. *gracilis*, found at Broadford and Loch Coruisk, Skye, and in Glen Phee; *Weisia curvirostris*, C.M., var. *insignis*, from Ben Laoigh; Meall-nan-Tarmachan; Acharn Falls; Cam Creagh; Lochay Bridge; Tyndrum; Glencoe and Ballachulish, and Inchnadamph; *Ditrichum zonatum*, Limpr. var. *scabrifolium*, from near top of Ben Laoigh, Perthshire side; Ben Lomond; Ben Chalum; *Eurhynchium myosuroides*, Schp., var. *brachythecioides*, Quiraing Hill, Skye, and Ben Clibreck, Sutherland.

A CATALOGUE OF THE BRITISH MARINE ALGÆ—*continued*. By E. A. L. Batters (*Journ. Bot.* Supplement, September-November, 1902, pp. 49-80).—Includes from *Cutleriaceæ* to *Dictyotaceæ*, and *Florideæ* to *Polysiphonia*.

BOOK NOTICES.

OOTHECA WOLLEVANA: AN ILLUSTRATED CATALOGUE OF THE COLLECTION OF BIRDS' EGGS FORMED BY THE LATE JOHN WOLLEY, JUN., M.A., F.Z.S. Edited from the original notes by Alfred Newton, Part ii., Picariæ-Passeres. (London: R. H. Porter, 1902.)

It is quite needless to remark that the appearance of the Second Part of this valuable Catalogue will be most heartily welcomed by ornithologists.

Although written long ago, the extensive series of field-notes on the numerous species treated of retain a freshness that will probably never depart from them. Wolley was no ordinary man, as is well known to all who are interested in birds, and, although a pioneer, his methods in field-work and his originality of description have never been equalled, and hence they possess a charm, an interest, and a value which are peculiarly their own.

The part under consideration deals with certain species around whose nesting habits, even to this day, few naturalists have any practical experience, and affords for the first time the *complete details* connected with some of those remarkable discoveries in Oology with which Wolley's name will always be associated, among others those relating to the Waxwing, Siberian Jay, and Red-throated Pipit; while much early, and hence historically valuable, information is given concerning the nidification of the Redwing, Brambling, Pine Grosbeak, etc. Not only, however, have we afforded the results of Wolley's labours, but also the continuation by Prof. Newton of the work commenced by Wolley in Lapland. The result is that the collection now includes specimens which had baffled Wolley's efforts to obtain, and comprises the eggs of every species of bird known to breed in that country. In addition, we have the experiences on the nidification of certain species from the pens of Sir Edward Newton, Mr. Osbert Salvin, and other well-known ornithologists. Nor must we overlook the numerous contributions, chiefly critical observations and historical notes, by the Editor. These, like all Prof. Newton's writings, exhibit an amount of ornithological erudition which is not to be found elsewhere.

An appreciative memoir by the same writer, giving an account of the life and work of Wolley, accompanied by a portrait, forms a welcome preface to the volume.

The illustrations consist of four beautiful coloured plates, giving numerous figures of the eggs of the more interesting species treated of, and three tinted plates of Lapland, Icelandic, and Spitzbergen scenery.

In conclusion, we can only express the pleasure it afforded us to learn from the last words of the preface that the preparation of the remaining portion of this unique Catalogue has been commenced.

MAMMALIA. By Frank Evers Beddard, M.A. (Oxon.) F.R.S., Vice-Secretary and Prosector of the Zoological Society of London. (London: Macmillan and Co., Limited, 1902.)

It is no doubt a general opinion among zoologists that one of the last books among their wants in Natural History literature is a new work on Mammals. This may be so, but a survey of the advance in our knowledge of this Class during the past decade (it is eleven years since the last important work on the subject was published) will make it evident that an up-to-date volume would be distinctly useful. Mr. Beddard's book includes all the latest discoveries, which comprise a number of interesting and important new types, both recent and fossil. In his preface the author tells us that he has treated fully certain orders and species, while the accounts of others, such as the Rodentia and Chiroptera (with their very numerous forms), and such familiar animals as the lion and leopard have been, rightly, we think, curtailed, and the pages thus saved have been devoted to other and more important groups and species. The systematic portion of the volume is preceded by a series of chapters containing much useful information on structure, distribution (past and present), and ancestors. Like the other volumes of the excellent and useful "Cambridge Natural History," of which it forms the tenth, the book is abundantly enriched with numerous illustrations in the text, comprising anatomical diagrams and portraits of species. The book bears evidence of careful preparation, and though it does not supersede other works in which the various families of the Mammalia are treated of in a more comprehensive, and hence more thorough, fashion, yet for the reasons stated it is both distinctly valuable and acceptable.

A NATURAL HISTORY OF THE BRITISH LEPIDOPTERA. By J. W. Tutt, F.E.S. Vol. iii. (London: Swan Sonnenschein and Co., July 1902.)

With remarkable and praiseworthy promptitude the successive volumes of this thoroughly scientific work are appearing to gladden the heart of the earnest worker in the most popular group of British insects, and we hardly know which to admire most, the zeal of the author in so rapidly producing the mass of information which is contained in each volume, or the thoroughness with which his work is done. Before dealing with the work more in detail, we must emphatically assert that, in our opinion, it is far and away the best account of our native Lepidoptera that has ever been published. And as much of the information relates to Scotland, both as regards distribution and variation, we cordially recommend the work to the notice of our northern entomologists. To the really scientific lepidopterist, indeed, Mr. Tutt's volumes are quite indispensable.

The present volume deals with the remainder of the sixth superfamily (Lachneides) of the Sphingo-Micropterygid Stirps, the seventh

and eighth superfamilies (Dimorphides and Attacides), and a portion of the ninth (Sphingides). The exhaustive nature of the work is shown by the fact that in 540 closely-printed pages only fourteen species are disposed of, that is, in addition to the accounts of the various genera and larger groups to which these species belong. The account of *Lasiocampa quercus*, the Oak Eggar, occupies no less than 69 pages! The information there given is printed under the following heads:—Synonymy, original description, description of imago, sexual dimorphism, gynandromorphism, variation (39 pages), egg-laying, egg-parasite, description of ovum, comparison of ova of different varieties, habits of larva, ($4\frac{1}{2}$ pages) description of larva, comparison of larvæ of different varieties, pupation, description of cocoon, description of pupa, comparison of pupa with that of *Cosmotriche potatoaria*, dehiscence of pupa, food-plants, parasites, habits and habitat, time of appearance (3 pages), localities and distribution (3 pages of small type). What more could the most exacting seeker after information desire? The matter, too, is so well arranged that any particular fact under any of the heads just quoted can be found without much difficulty. The present volume is an improvement upon the two previous ones, inasmuch as the table of contents is more extended, but we would suggest a slight additional alteration which would, we think, be acceptable to all who use the work. If in the index the figures indicating the page upon which the *main* account of any particular genus or species *commences* were printed in bolder type, it would save unnecessary page-turning. Lastly, the addition of a *comprehensive* index to this and the preceding volumes would be a boon, and we are glad to read in the preface that the author is willing to print one, if carefully prepared by any one who has the requisite time at his disposal.

P. H. G.



A. & S. Chatterton,
1903

VARIETIES OF SOLWAY MAMMALS

The Annals of Scottish Natural History

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[APRIL

COLOUR VARIATIONS IN SOLWAY MAMMALS.

By ROBERT SERVICE, M.B.O.U.

PLATE I.

THE following notes are drawn almost entirely from my own experience. The subject is a valuable one, and has a very large relation to some high problems in natural evolution.

Of the permanence of some of the described variations there remains no doubt in my mind. For instance, the Black Variety of the Water Vole occurs so persistently in certain localities, and is so comparatively numerous in individuals, that if isolation could be given them, a sufficiently permanent "species" would soon be established.

Similarly, the same remark may be made in relation to the Yellow Moles, and to that particularly interesting variety of the same animals, patched or striped, with orange buff on the middle of the abdomen.

The belief of all mole catchers here, that these two variations "run" in certain mole families is very well founded. Of course, the extraordinary range of colour variation that has resulted from the domestication of the House Mouse and Rabbit is too well known to be more than alluded to.

PIPISTRELLE BAT (*Vesperugo pipistrellus*).—There is a considerable range of colour in the fur of this species. It is generally stated that the dark, or dull black, individuals are the young animals. This is not always the case, for I have often had specimens with dull, or lustreless, black fur, that were fully adult. In such examples the whole of the naked portions of the membrane share in this melanic shade. Although the majority are of deep rufous brown, individuals of this dark colour are by no means rare in Solway. This variation, or phase as it ought more properly to be called, results evidently from the extension of the basal colour of the hairs to their extremities.

COMMON HEDGEHOG (*Erinaceus Europæus*).—Most Hedgehogs are either of a decided brown tint, or a dirty black colour, with a small minority of a pale gray. The light points of the spines are always conspicuous and modify the body, or under, tints. These colours are neither seasonal, nor sexual, although they may have something to do with age. I have not met with an albino, but in several instances that I could depend upon, such cases have been reported to me.

COMMON MOLE (*Talpa Europæa*).—I have never found a true albino of the Mole, although leucotic specimens are comparatively common, and the palest of these are often very white. I have several pretty specimens of a warm orange or bright buff. Others are light creamy. There is a variety of tolerably frequent occurrence which has a more or less narrow streak of bright orange buff along the mesial line of the abdomen. That is the usual form of this aberration, but occasionally the buff broadens out to a large patch. The remainder of the fur is normal with occasionally a considerable tinge of rusty buff round the snout; but in every specimen showing this buff streak, patch, or spot on the abdomen the tip of the tail has been white, and the long hairs fringing the feet have also been mostly pure white. No pied (black and white) moles have ever fallen into my hands, and grayish and brownish ones have only been got at rare intervals. The mole catchers have a firm belief that the leucotic, or yellowish, animals are confined to certain farms, that in fact variations of the sort run in certain mole families. I am strongly inclined to accept this conclusion.

COMMON SHREW (*Sorex araneus*).—While differing shades of gray and brown are not scarce in this little animal, only one striking aberration is in my collection; the specimen figured which is a pale-yellow example. It was taken at Glenlee.

WATER SHREW (*Crossopus fodiens*).—The specimen figured was captured by myself in Colvend on May 25th 1896. I threw my hat at it as it crossed the path in front of me in the gloaming of the summer evening and knocked it over. The patch of black on the lower breast and abdomen is conspicuous. The pubis is also black, and a streak of rusty yellow runs down from the angle of the lower jaw, terminating at the bottom of the throat in a pea-sized spot of black. The black of the back is also far deeper than usual.

WEASEL (*Mustela vulgaris*).—Many years ago I examined in the possession of the late Mr. Hastings, Taxidermist, in Dumfries, a true albino of this species, while it was still in the flesh. It had been shot in Torthorwald.

OTTER (*Lutra vulgaris*).—A white Otter was reported as seen last summer on the Annan by members of the Dumfriesshire Otter Hunt.

WOOD MOUSE (*Mus sylvaticus*).—The depth of colouring, and brightness of the lustre of the pelage, varies much with the seasons. The small yellow spot on the breast is mostly present, but its absence is not at all uncommon. The size of the spot is not a fixed quantity, but as yet I have not met with any specimens of the Wood Mouse that had the "broad yellow band" said to be distinctive of the species, so called, *M. flavicollis*.

COMMON MOUSE (*Mus musculus*).—It would be hardly satisfactory to assume that the white, particoloured, and slate-coloured specimens, sometimes found here and there, are aberrations of wild origin. These are doubtless only the relatives, one remove, of stray escapes of tame breeds to their feral cousins.

BROWN RAT (*Mus decumanus*).—I have occasionally had examples from a locality near Lochmaben of very dark,

though not black, rats. There are two prevailing types of coloration, which may be termed "peppers" and "mustards," that all our rats belong to. These bear a tolerably close resemblance to the colour of the two familiar breeds of Dandie Dinmont dogs. I have skins of yellow rats from Dalbeattie, and although these were taken in a quite wild state, I believe they were escapes, or the immediate relatives of such.

COMMON FIELD VOLE (*Microtus agrestis*).—In the "Annals" for 1893, p. 112, I described a leucotic variation of this species. Although during the plague of the first few years of the '90's I saw these animals in myriads, above was the only variety noticed. The herds reported an occasional pied individual. I believe the hill voles are distinguishable by their dull smoky gray tints from the voles of the low pasture lands and shore districts, which are always brighter and ruddier.

WATER VOLE (*Microtus amphibius*).—The black Water Voles are found in all shades from dark brown to glossy jet black, and one with the shining coal black fur is a very handsome creature indeed. Near Thornhill a number of individuals with regular small white spots were once procured, and I saw these in the collection of the late Dr. Grierson.

Pied Water Voles are found now and then, and this variation is figured on the plate. This specimen was taken near Lochmaben. The shoulders and fore-legs, all the feet and a part of the tail, are white; the remainder of the fur is normal. This species is easily domesticated, or at least can be easily kept in confinement, and it breeds in captivity. I have often wondered why some one with the requisite time and inclination does not take the Water Vole in hand, and evolve another fancy pet.

In a purely wild state its variability is unusually active, and there seems little doubt this tendency might be strengthened in a captive race.

COMMON HARE (*Lepus Europæus*).—I have records of both albino and melanic hares, but these are of old date now. The species has become so scarce, that "white" and "black" hares will soon be a mere tradition.

RABBIT (*Lepus cuniculus*).—In recent years the great majority of the Rabbits hereabouts have shown tufts and spots of white upon the feet, together with a small white spot on the forehead. "Black" rabbits are of course familiar to all; black ones with yellow-grey tips on the fur, are less common, while pure albinos are decidedly rare. Pied individuals are common enough, and probably result from an infusion of hutch blood.

ROEDEER (*Capreolus caprea*).—In the winter of 1879-80 a Roe, the whole of whose hind quarters were pure white, frequented the woods of Mabie. Needless to say it was extremely conspicuous as it bounded along.

EXPLANATION OF PLATE.

- No. 1. Water Shrew (*Crossopus fodiens*) ♂, 25th May, 1896; Knockieknowe, Colvend, Kirkcudbrightshire.
 No. 2. Common Shrew (*Sorex vulgaris*) ♀, 16th July, 1882, Glenlee, Kirkcudbrightshire.
 No. 3. Water Vole (*Microtus amphibius*) ♀, 20th November, 1893, Lochmaben, Dumfriesshire.
 No. 4. Mole (*Talpa Europæa*) ♂, 10th April, 1899, Craigaploch, Kirkcudbrightshire.

ADDITIONAL NOTES ON THE VERTEBRATE FAUNA OF WEST ROSS-SHIRE.

By LIONEL W. HINXMAN, B.A., F.R.S.E., and WM. EAGLE
CLARKE, F.L.S., F.R.S.E.

IN a paper entitled 'A Contribution to the Vertebrate Fauna of West Ross-shire,' read by us before the Royal Physical Society on 18th April 1894, and published in the "Transactions" of that Society, we placed on record in a brief form the results of our personal observations in the districts of Torridon, Applecross, and Strathcarron, together with information obtained from other observers in various parts of the faunal area.

Some additional information is contained in a subsequent paper entitled 'Notes on the Birds of West Ross,' by A. H. Evans, M.A., F.Z.S., that appeared in the "Annals" for April 1896.

The present notes embody further observations made by ourselves and others since the date of the above paper, together with previous records which were not at the time of writing known to us.

Much of this new material has been obtained from MS. notes communicated in 1897 by the late Sir Arthur Fowler, Bart. of Braemore. They refer almost entirely to the Lochbroom area, and are distinguished by being placed within inverted commas.

Other new records have been established by the examination of the collection of specimens obtained on the Braemore estate and preserved at Braemore House, and a few by isolated observations made by different persons in various parts of the area, some of which have already appeared in the pages of the "Annals," but are collected here for convenience of reference.

"New record" signifies additional to our list of 1894, and not previously recorded in any *published* list to which we have had access.

MAMMALIA.

ERINACEUS EUROPEUS, Hedgehog. — "Appeared in 1890 (probably imported in 'baled' hay). Several trapped at Inverbroom in that year, but have not been seen since." Attadale, several specimens in 1894. Only one previous record, at Fasag, Loch Torridon.

SOREX ARANEUS, Common Shrew.—Strathcarron, July 1894. New record.

CROSSOPUS FODIENS, Water Shrew.—Local specimens in Braemore collection. Not previously recorded for the area.

FELIS CATUS, Wild Cat.—A young male of this rare species in West Ross was trapped at Kishorn in December 1894. The specimen is now in the Edinburgh Museum.

MUSTELA MARTES, Pine Marten.—"Female trapped at Braemore, 1896, previous record 1884." A fine female in the Edinburgh Museum was obtained at Kintail in February 1895. Very rare now, if not extinct, in most parts of West Ross.

MUSTELA PUTORIUS, Pole Cat.—"Very rare in Lochbroom." One in Braemore collection. Only previously recorded from Dundonnell.

MELES TAXUS, Badger.—"No occurrence at Braemore since 1880." One at Fannich 1892-93. Appears to be extinct, or nearly so, in all districts.

ARVICOLA GLAREOLUS, Bank Vole.—A good many trapped at Braemore, 1894-95. A specimen received from Braemore in April 1894 was believed to be the most northerly record of this species in Britain.

LEPUS EUROPEUS, Brown Hare.—Braemore; “fairly numerous.” Supposed to be decreasing in most districts.

LEPUS VARIABILIS, Varying Hare.—“Very scarce of late years in Braemore, probably not one per 1000 acres of hill. They are as scarce on sheep ground as on deer forests.”

SCIURUS VULGARIS, Squirrel.—Braemore. “Seen on two occasions only, about 4 years ago” (*i.e.* 1893). New record.

AVES.

TURDUS VISCIVORUS, Missel Thrush.—Rare at Braemore, and apparently only first identified in 1901. Thinly distributed in other wooded districts.

SYLVIA CURRUCA, Lesser Whitethroat.—A clutch of eggs now in Miss Marjorie Fowler’s collection at Inverbroom House, and taken by the late Sir Arthur Fowler at Inverbroom in 1896, were identified by us as those of the Lesser Whitethroat. See “Annals,” October 1901.

This apparently authentic instance of the nesting of *S. curruca* in West Ross is extremely interesting. The Lesser Whitethroat is known as a summer visitant to S.W. Scotland in very limited numbers, but has hitherto only been recorded on migration elsewhere in Northern Britain.

PARUS CAUDATUS, Long-tailed Titmouse.—“Common at Braemore.” Not seen in Torridon or Applecross. Noted as common about Loch Maree by Mr. Evans.

PICUS MAJOR, Greater Spotted Woodpecker.—One killed at Inverlael, Lochbroom. New record.

ALCEDO ISPIDA, Kingfisher.—One seen on 10th September 1898, and for three weeks afterwards, on river Broom. New record.

HIRUNDO RUSTICA, Swallow.—“Nested at Braemore, 1895.” Hitherto only recorded as a transient visitor in various localities.

CHELIDON URBICA, House Martin.—Nesting at Strathcarron Hotel, 1894. Inverlael, 1901.

CARDUELIS SPINUS, Siskin.—“Fairly common at Braemore.” New record.

PLECTROPHANES NIVALIS, Snow Bunting.—“Young birds seen in August and September in Braemore forest.” The nest has not yet been recorded as taken in West Ross, although the birds have been seen in summer on most of the higher mountain tops.

PASTOR ROSEUS, Rose-coloured Pastor.—One specimen shot at Inverbroom, 16th August 1897. The only other record—a male—from the head of Loch Torridon some years previous to 1892.

PICA RUSTICA, Magpie.—Corrie, Loch Torridon, winter of 1893-94. Rare, only two previous records, from Inveran and Strathcarron.

CORVUS FRUGILEGUS, Rook. Rookeries at Ullapool, Inverlael, Braemore, and Kinlochewe.

ASIO OTUS, Long-eared Owl.—In Braemore collection. "The Brown and Tawny Owls left the district during the vole plague in South Scotland." New record.

CIRCUS CYANEUS, Hen Harrier.—Braemore, 1875, "now very rare." Very rare in all districts.

PANDION HALIÆTUS, Osprey.—"Seen hovering over Loch Carron at Attadale" (Prof. Newton *in lit.*); "seldom seen," Lochbroom.

FALCO SUBBUTEO, Hobby.—Braemore 1875. New record.

MERGUS ALBELLUS, Smew.—♀ in Braemore collection. "Occurs occasionally in Lochbroom." One previous record only, from Torridon.

COLUMBA ŒNAS, Stock Dove.—Local specimen in Braemore collection. Only previous record from Dorusduan, Kintail, August-September 1877, by Rev. E. S. Marshall, "Annals," 1894, p. 115.

TURTUR COMMUNIS, Turtle Dove.—"Seen at Braemore, June 1896." Two specimens recorded from Inverewe, Loch Maree, October 1895, June 1896, by Mr. Osgood H. Mackenzie, "Annals."

LAGOPUS SCOTICUS, Red Grouse.—"Very scarce now in Lochbroom," 1897. General consensus of opinion as to the decrease of Grouse in most districts. Reasons given—disease, wet seasons, and destruction of eggs by rooks.

RALLUS AQUATICUS, Water Rail.—Local specimen in Braemore collection. "Have noticed several." New record.

FULICA ATRA, Coot.—In Braemore collection. "Common in Coigach."

GALLINAGO CŒLESTIS, Common Snipe. "Rare except during hard frosts, and for about a week in October on migration."

TRINGA ALPINA, Dunlin.—Breeds in Inverlael Forest, 1901. Rare and very local as a breeding species. Common in autumn and winter on the shores.

NUMENIUS ARQUATA, Common Curlew.—"Common in Lochbroom and breeding in considerable quantities." Very local and not common as a breeding species in other districts.

LARUS GLAUCUS, Glaucous Gull.—Local specimen in Braemore collection. New record.

RISSA TRIDACTYLA, Kittiwake.—“More numerous the last few years.” This gull was not observed in 1890-92, but was said to occur in Loch Torridon.

PODICIPES AURITUS, Slavonian Grebe.—A second specimen of this Grebe shot by D. Matheson at Shieldaig, April 1902. Previous record March 1893.

STERCORARIUS PARASITICUS, Buffon's Skua. A specimen in the Braemore collection was shot by Sir Arthur Fowler on the hill while stalking. New record.

STERCORARIUS CREPIDATUS, Arctic Skua.—Local specimen in Braemore collection. “Not often seen.” New record.

PROCELLARIA PELAGICA, Stormy Petrel.—In the Braemore collection. “Common at mouth of Loch Broom.”

COLYMBUS GLACIALIS, Great Northern Diver. “Rare.”

NOTES ON BIRDS OF SOUTH UIST, OUTER HEBRIDES.

By DONALD GUTHRIE.

CINCLUS AQUATICUS, Dipper, p. 47.¹—Very common in South Uist. I never saw its nest there, but it stays all the year round. I find it most numerous on some of the wildest streams.

PYRRHOCORAX GRACULUS, Chough, p. 69.—I saw one in the summer of 1902.

CORVUS MONEDULA, Jackdaw, p. 69.—Often seen in South Uist, but never stays for any time.

CORVUS CORONE, Carrion Crow, p. 70.—Not altogether uncommon, and is often taken by the majority of people for the Raven. I got the eggs of one which nested in Barra, but it is more as a migratory bird in its appearance in the islands.

CORVUS CORNIX, Hooded Crow, p. 70.—As a breeding bird is not nearly so common, but as a migratory bird its numbers depend considerably upon the amount of carrion cast ashore, and the number of horses, cattle, and sheep dying on the islands, which I am sorry to say are almost always left on the surface, notwithstanding

¹ The numbers refer to the original page in the “Fauna of the Outer Hebrides.”

the strict sanitary laws. Poisoning was the only way by which we could diminish the Hooded Crow as a breeding species.

CORVUS CORAX, Raven, p. 71.—The Raven is not nearly so common as a nesting species; but a few years ago two large whales were cast ashore, and hundreds of these birds gathered, some of them staying to nest. But they are not so destructive to eggs and birds as on the mainland. In the islands the shore is the principal hunting-ground of the Raven, Hooded Crow, and Great Black-backed Gull, the two former only going to the hills to roost. They go to the hills at certain hours every evening, and return to the shore in the morning. Were these vermin as destructive in the islands as on some parts of the mainland, not a single nest of any description could survive in some parts.

CIRCUS CYANÆUS, Hen Harrier.—Is becoming very rare as a nesting bird in South Uist and Benbecula.

AQUILA CHRYSÆTOS, Golden Eagle.—I often see a pair of Golden Eagles about Carradale Hill, South Uist, where rabbits are numerous, but they don't nest.

HALIAETUS ALBICILLA, Sea Eagle, p. 84.—Used to be very numerous, by all accounts. Long before I came here a pair used to breed where the Ushenish Lighthouse stands, and another pair on the north side of the entrance to Loch Eynort.

ACCIPITER NISUS, Sparrow Hawk, p. 87.—Very uncommon in these islands. I shot one last August when coming from the moor with the dogs. It was sitting on the centre of the public road, and allowed me to come within easy shot. It appeared to have been dazed or very tired. (The brackets added in my recent article may now be removed.—J. A. H.-B.)

“GREENLAND FALCON,” p. 88.—One was shot at Aird, Benbecula, in September 1889, and brought to the Lodge here by one of the Nunton farm servants, but it had been kept too long, as it was a mass of maggots. A splendid bird it was, the only one I have seen.

FALCO PEREGRINUS, Peregrine Falcon, p. 88.—Perhaps it is not generally known that the Peregrine will attack a Greylag Goose. I have seen it often in full chase, in most determined fashion. On two occasions I have seen Peregrines eat carrion—one was a decomposed Mallard, the other a Bernacle Goose.

FALCO ÆSALON, Merlin, p. 90.—I saw a Merlin knock down an old cock grouse which had been flushed by a setter in October last. That is the only time I have ever seen the Merlin molest a grouse or bird of that size.

ANSER CINEREUS, Greylag Goose, p. 97.—The Greylag Geese breed in large numbers, getting more numerous every year, and

large numbers of migratory birds appear in October and March. Sir Reginald Cathcart strictly preserves them on the lakes where they breed, hence the increase. Formerly one of the lakes was connected with the Loch Boisdale hotel, but Sir Reginald gave another loch to the hotel and preserved the Goose Lake. Common on Benbecula as a visitor, but few breed there. Uncommon in Barra, but they are seen occasionally. I once saw two nests, about thirty yards apart, right in the face of a rock close to an arm of the sea; one had five eggs, the other four, but never saw nests in that place since.

ANSER ALBIFRONS, White-fronted Goose.—Unknown in Benbecula and even in the north part of South Uist until the last three or four years. A flock of about 50 frequents Loch Bee and the vicinity. The natives did not know the bird on its first appearance.

Very numerous in the south part of South Uist—more this year than ever I saw.

BERNICLA BRENTA, Brent Goose, p. 99.—Very rare in South Uist. Two were shot this last winter—October—being in immature plumage. There is a very good specimen in Sir Reginald Cathcart's collection, which was shot on the Strand at Barra.

BERNICLA LEUCOPSIS, Bernacle Goose, p. 99.—In large numbers, increasing yearly, *i.e.* so far as South Uist is concerned. (Mr. Guthrie agrees with me that the geese migrating, as described by Mr. Peel ("Annals," 1902, p. 205), were not Greylag Geese but Bernacles. J. A. H.-B.).

I have seen an enormous flock, as it might be, one day, and next day not a single Bernacle on the island, unless a pinner, or wounded bird.

It is rather strange, but my experience is that the majority of the Bernacles arrive from the south, especially if north or west winds; but I think they fly down wind out at sea, then when about Barra turn and fly up wind. On the other hand, the White-fronted Geese always arrive from the north-east year after year, coming on the same line.

ANAS BOSCAS, Wild Duck, p. 102.—Wild Duck are on the decrease in these islands. I always think flapper shooting, as is carried on where shootings are let, is very detrimental to this bird. Not because of the number shot so much as that many more are destroyed by the dogs in the marshes. Wild duck shooting ought not to open sooner than 20th August in the islands.

ANAS STREPERA, Gadwall, p. 103.—Regularly frequent some places year after year, but I have never seen any in the breeding season.

SPATULA CLYPEATA, Shoveller.—I see you (*i.e.* J. A. H.-B.) have the wrong years for Mr. Peel shooting Shoveller in Benbecula. It should be 1900-1901 ("Annals," 1902, p. 208). I saw several in winter of 1894-95. But it is not in any way common.

QUERQUEDULA CRECCA, Teal, p. 208.—Very common, and I think on the increase as a nesting species. They have, however, always nested, in my experience, in Benbecula and South Uist.¹

DAFILA ACUTA, Pintail, p. 209.—Very numerous in Benbecula this year. Very few to be seen in South Uist. I shall be very much interested to see if any breed here this year (1903).

MARECA PENELOPE, Wigeon.—Very numerous this season (1902-3). Never heard of nor saw any nesting in these islands.

FULIGULA MARILA, Scaup, p. 105.—I am very pleased that it is beyond doubt that some breed in South Uist. I trust they will continue to do so. I have shot them in Benbecula for years back, but they are not common there. It is very strange they are not to be found in North Uist. Mr. Peel's statement ("Annals," 1902, p. 210) that it is "seen occasionally in South Uist" does not agree with my experience, for it is by no means rare.

FULIGULA FERINA, Pochard, p. 105.—I cannot believe that the "Pochards" shot in Barra by Mr. Peel were bred there, as it is the last place in which birds of that class would breed. There is no place on the loch where they could breed, and the surrounding is so much overrun with people. I saw some in South Uist during the summer months, but seemingly they did not breed. They are fairly numerous this season. The largest flock is close to Grogary. There will be about 150 or so, but on the whole they are decreasing every winter.

FULIGULA CRISTATA, Tufted Duck.—More numerous this winter than for some years back. So far as I can learn, MacGillivray was right when he spoke of them as plentiful in his time, but it got very scarce here for a number of years back. Perhaps it will revive again.

CLANGULA GLAUCION, Golden Eye, p. 106.—Are not nearly so numerous anywhere on this estate as they were some years ago. Certainly they are far from rare. It is quite common in Barra. On every loch in winter there are a few.

SOMATERIA MOLLISSIMA, Eider Duck.—Very much on the increase, as it nests on all the sea lochs connected with the Minch on the east side of South Uist, and formerly none could be seen there. The first year I was here an Eider Duck was a great rarity nearer than the Sound of Barra.

CEDEMIA FUSCA, Velvet Scoter, p. 109.—Fairly numerous on the West Coast of the Islands.

¹ Mr. Guthrie has been keeper on these islands for now nearly twenty years.

MERGUS MERGANSER, Goosander.—Very rare, but I often see a pair or two in very stormy weather, and I shot a very good specimen in 1883, which was preserved.

COLUMBA PALUMBUS, Wood Pigeon.—One seen, very tired, in stormy weather, November 1896.

TURTUR COMMUNIS, Turtle Dove.—One came to the Lodge some years ago, on a very stormy day. It stayed for a day or two.

SYRRHAPTES PARADOXUS, Pallas Sand-grouse.—A flock of about 30 were here in 1888. I shot two which are in Sir Reginald Cathcart's collection.

PERDIX CINEREA, Partridge.—Were introduced twice by Sir Reginald Cathcart, and proved a failure. They seemed to be carried away out of their course by the winter storms, and we saw some in places where one would never expect them.

RALLUS AQUATICUS, Water Rail.—I saw lots of Water Rails, and found them most numerous on the east side of the island when hunting for Woodcock. Certainly they are difficult to observe without a *close*-hunting dog.

CREX PRATENSIS, Corncrake.—I never saw a Corncrake in the winter, nor later than the end of September, and it is very surprising to me that Mr. Peel saw so many.

FULICA ATRA, Coot.—This bird is increasing in South Uist.

CHARADRIUS PLUVIALIS, Golden Plover.—More numerous this year than for a number of years. I have found partially white specimens several times; almost every year there are two or three in the first flocks that appear in September.

VANELLUS VULGARIS, Green Plover.—More numerous than in former years; swarming all over South Uist.

PHALAROPUS HYPERBOREUS, Red-necked Phalarope.—Certainly was on the increase (*v.* "Annals," 1903, p. 9), but egg-collectors coming to the Outer Hebrides hotels in the guise of tourists and anglers are difficult to detect, seeing they are always round the water.

SCOLOPAX RUSTICULA, Woodcock.—Never saw a nest in South Uist or Benbecula. The 5th of October is the earliest date on which I ever saw or shot them—once, a couple. We had a very good show the last two winters, but certainly not so numerous since the severe frost of 1894-95. Hundreds were killed by so-called "sportsmen" in the island, when the poor birds could scarcely rise; and many died, as no feeding was to be had.

GALLINAGO CŒLESTIS, Snipe.—I must differ from Mr. MacElfrish, who says he had never seen Snipe on the sands or ooze. I often saw small lots in favourite haunts, especially if there is a touch of frost, on one of our best snipe-bogs which lies close to the sea. Every bird raised makes for the shore, and so well do we know this, under these conditions, that we always then try to be at that particular place when it is high water.

STERNA FLUVIATILIS, Common Tern.—Becoming very numerous; also the Arctic species fairly so.

STERNA MINUTA, Lesser Tern.—A severe storm destroyed their nests in South Uist in the summer of 1901. It was immediately after this Mr. MacGillivray found them nesting in Barra, *i.e.* in 1902, for the first time on record.

REPORT ON THE MOVEMENTS AND OCCURRENCE OF BIRDS IN SCOTLAND DURING 1902.

By T. G. LAIDLAW, M.B.O.U.

THE schedules returned by the lightkeepers during 1902 show a slight decrease in number as compared with the preceding year, and, at several important Stations, a serious falling off in the individual entries; while other Stations from which we used to receive contributions have failed to supply any returns. This result, we hope, is not due to a failing interest in the subject; but is to be ascribed to the extensive changes in the *personnel* of the staffs which have been made during the year, and this has no doubt affected the continuity of the records.

We express the hope that the new keepers at the Stations will manifest an interest in the matter, and continue the observations begun by their predecessors.

It is satisfactory to observe that our Inland correspondents have furnished us with thirty-three schedules,—the same number as last year,—besides supplying a number of valuable notes. We trust we may rely on their co-operation during the present year.

Our thanks are again accorded to all those who have

assisted in these inquiries, and we hope that they may be able to induce others to lend us their aid and co-operation. Schedules may always be obtained from Mr. W. Eagle Clarke, Museum of Science and Art, Edinburgh.

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

SHETLAND.

<i>Locality.</i>	<i>Name of Observer.</i>
Dunrossness	Thomas Henderson, jun.

ORKNEY.

Noup Head L.H.	Thomas J. Wallace, Lightkeeper.
Sule Skerry L.H.	The Lightkeepers.
Pentland Skerries L.H.	James Tomison, Lightkeeper.
Stromness	H. M. Whittell.

SUTHERLAND AND CAITHNESS.

Cape Wrath L.H.	The Lightkeepers.
Thurso	Lewis Dunbar.

MORAY.

Strathconan, etc.	Lionel W. Hinxman, B.A., H.M. Geol. Survey.
Fochabers	N. B. Kinnear.

DEE.

Buchanness L.H.	John Simpson and D. A. Denoon, Lightkeepers.
Peterhead	Rev. William Serle, M.A.
Aberdeen District	Lewis G. Esson.
Inverurie	Thomas Tait.

TAY.

Fordoun	John Milne.
Rannoch	Rev. Robert Godfrey, M.A.
Blair Atholl	Bruce Campbell.
Bell Rock L.H.	Robert Clyne and mates.

FORTH.

<i>Locality.</i>	<i>Name of Observer.</i>
Isle of May L.H.	T. E. Arthur and Wm. Crowe, Light-keepers.
Lothians	Bruce Campbell.
Do.	Rev. R. Godfrey, M.A.
Do. and Aberfoyle	William Evans, M.B.O.U.
Edinburgh District	Rev. W. Serle, M.A.
Kirkliston	Sydney E. Brock.
Dalmeny Park	Charles Campbell.
Tranent	D. Ritchie, M.D.
Aberlady	H. W. Robinson and F. W. Smatley.
North Berwick	William M. Inglis.

TWEED.

Cramilt	Alexander Sim.
Broughton	A. C. Gairns.
Halmyre	D. G. Laidlaw.
Hawick	W. Renton.

WEST ROSS.

Inverbroom, Garve	Lady Fowler.
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OUTER HEBRIDES.

Flannan Isles L.H.	Messrs. Begg and M'Lachlan, Light-keepers.
Island Glass L.H.	William Ross, Lightkeeper.
Barra	William L. MacGillivray.

ARGYLL AND INNER HEBRIDES.

Scarnish, Tiree	Peter Anderson.
Skerryvore L.H.	John Nicol and David L. Murray, Lightkeepers.
Dhuheartach L.H.	The Lightkeepers.
Loch Lochy	N. B. Kinnear.

CLYDE.

Carmichael	Rev. J. D. W. Gibson, B.A.
Various Localities	John Paterson, John Robertson, Robert Wilson, H. B. Watt, and correspondents.

SOLWAY.

Beattock	James Bartholomew.
Maxwelltown, Dumfries	Robert Service, M.B.O.U.

GENERAL REMARKS.

The leading characteristic of the weather in the spring months of 1902, as in 1901, was its great variability; alternate spells of cold weather being succeeded at short intervals by periods of unusual mildness, while the rainfall in most districts was decidedly under the normal. During May and greater part of June cold, changeable, and showery weather was experienced until towards the close of the latter month, when more genial conditions generally prevailed.

An absence of haze during the time when most of the migrants were seeking their summer haunts seems to have been a conspicuous feature at most of our eastern and northern Light Stations; consequently the records of the spring movements are unimportant. More decided movements are noted by West Coast observers, but as a whole birds seem to have been less abundant than in some previous years.

On the East Coast the first movement noted at the Isle of May took place on March 1, when many Thrushes, Blackbirds, and a few Missel Thrushes were at the lantern; Wagtails and Wheatears on the 31st; and on April 7-12, Goldcrests. At the Bell Rock station an early movement of Skylarks and Starlings, on February 26-27, is noted. The same species in larger numbers, with Thrushes and Blackbirds, were at the lantern on March 2-6. Goldcrests, Robins, Larks, and Greenfinches were flying round light on April 4-9, while on the 13th to 17th Wheatears, Wagtails, Pipits, Blackbirds, and Starlings were the species observed.

A rush of Larks is recorded at Noup Head, Orkney, on January 29, and again on March 5. Wheatears were at the light on April 17, and on the 20th Ring Ousels.

On the West Coast migratory movements were more extensive, or at any rate more in evidence, during the spring than on the east of Scotland. At Dhuheartach, between February 23 and March 7, great numbers of Turdidæ, Starlings, Larks, and Pipits were flying round nearly every night. At Skerryvore rushes of Thrushes, Pipits, etc., on February 17, and Larks, Thrushes, Blackbirds, and Starlings

on March 28-31; Wheatears, Chaffinches, Larks, etc., were passing the same situation on April 10. On the same date a great rush of birds—Redwings, Wheatears, Snow Buntings, etc.—is recorded at the Flannans; and on May 10-14, Whimbrels, Wheaters, Wagtails, Redbreasts, and Starlings were in numbers. At Tiree, White Wagtails were passing between April 28 and May 12; and Whimbrels from April 28 to May 20. Along the Nith valley, Solway, on April 14, very large overhead migration from 8.30 till 12.20 and no doubt the whole night following—Curlew, Golden Plover, and Thrushes, distinguished by calls. Curlew, Plovers, and many Gulls were still flying N.N.W. by N. at 8.30 A.M. on 15th, and many Lesser Black-backed Gulls on same route at 11.15 A.M.

The first southward movement was recorded from Sule Skerry on August 20—a rush of Wheatears and Pied Wagtails. The same species, with Pipits, were noted on the 24th, while on September 30 to October 21 many Larks, Redwings, Fieldfares, Starlings, and a few Woodcocks were at the lantern. Fieldfares, Blackbirds, Redwings, and Starlings were in numbers on November 15-16 and 21. At Noup Head, extensive movements of Wheatears, Fieldfares, etc., on September 26, and rushes of Thrushes, Blackbirds, etc., October 26-28, are noted. The most extensive movements of the autumn occurred on November 4-5, when great numbers of Thrushes, Blackbirds, Fieldfares, Starlings, etc., were flying round and striking, many being killed. This movement is also noted at the Buchanness Light Station, where birds of the same species were in great numbers all night. Wheatears were passing the Bell Rock on September 6; and also on the 26th and 28th, with Larks, Song Thrushes, Starlings, etc. Other movements at this station, and at the Isle of May, are recorded on October 5-6, Robins, Goldcrests, Chaffinches, etc.; and October 15, 19, and 29, Thrushes, Fieldfares, Redwings, Starlings, and Larks. There were also strong movements at the latter station on November 4, 6, and 7.

At the Flannan Isles, on August 17, Wheatears and Stonechats were passing south, and migratory Passerines were more or less numerous from the middle till the end of

September; a strong rush, many being killed at the light, is noted on the 29th and 30th. The first rush of Turdidæ was on October 5 and 6, but the principal movement, as on the East Coast, was at the beginning of November. The observer at this station writes on the 7th: "Never before observed anything like the number of birds on lantern, all kinds killed in great numbers." And further: "An exceptional month for migration, the birds passing and resting have been more numerous than I ever saw in my lighthouse experience—Fieldfares, Redwings, Thrushes, Blackbirds, Larks, also Woodcocks." At Skerryvore a few small birds were striking on August 12, and, as at the Flannans, birds on passage were very numerous from September 9 till the beginning of October. The rush of Turdidæ early in November was also strongly in evidence at this station. At Dhuheartach from August 20 to middle of September numbers of Whinchats, Pipits, Wagtails, and Larks were passing; thousands at light on September 10-11, many killed; dozens on rock on the day following. Solway, September 22, "very big movement this morning, flocks of Thrushes, Tree Pipits, and Skylarks passing south; October 13, migration may be considered over for the season, never saw less of it; weather calm, misty near ground, clear above."

Among the casual visitants to Scotland during 1902 the most interesting is *Phylloscopus viridanus*, obtained at Sule Skerry on September 5 (the first record of the species for Scotland and second for Britain). Other species that may be noticed here include the Lesser Whitethroat (*Sylvia curruca*), also obtained at Sule Skerry on Sept. 17; Great Gray Shrike (*Lanius excubitor*), St. Boswells, April 9, and Halmyre, November 24; Hoopoe (*Upupa epops*), Loch Spynie, April 26, and Dunbar, about April 22; Little Owl (*Athene noctua*), Kincardine, February 1; Rough-legged Buzzard (*Archibuteo lagopus*), Ternavon and Loch Fyne, October 9; Osprey (*Pandion haliaetus*), Lewis, in April; Glossy Ibis (*Plegadis falcinellus*), Kelso, November 17, and Islay, October 30; Turtle Dove (*Turtur communis*) and Quail (*Coturnix communis*), Dunrossness, Shetland, in June; Wood Sandpiper (*Totanus glareola*), Eday, Orkney, September 1; Black-tailed Godwit (*Limosa belgica*), Isle of

May, about end of May ; Black Tern (*Hydrochelidon nigra*), Hawick, June 2 ; and Sooty Shearwater (*Puffinus griseus*), Stromness, Orkney, October 16.

TURDUS MUSICUS (Song Thrush).

Orkney—Noup Head, Oct. 26, at lantern all night, a rush ; Nov. 4, a great number all night, nine killed. *Moray*—Fochabers, Feb. 23 to March 1, many returned during this week. *Dee*—Buchanness, Oct. 25, flying about, 10 P.M. to daylight, two killed ; Nov. 4, great numbers, twenty-four killed, also Blackbirds, Starlings, Pipits, etc. *Tay*—Auchinblae, March 2, returned. Bell Rock, March 6-7, at lantern ; 15th, two at light ; April 24, two ; Sept. 26, one killed. *Forth*—Isle of May, March 1, several, midnight ; May 4, a few ; Sept. 22, all night. *Tweed*—Hawick, Feb. 26, numerous. *Outer Hebrides*—Flannans, Nov. 7, great rush of Turdidæ, lantern covered, great many killed ; Nov. 19, fresh rush with Fieldfares, Redwings, and Larks. *Argyll and Isles*—Tiree, April 1, have left ; Oct. 18, returned ; Nov. 21, very large flocks of Thrushes, Fieldfares, Redwings, and a few Blackbirds. Skerryvore, Feb. 27, at lantern with Pipits ; March 28, rush of Thrushes, Blackbirds, Starlings, and Larks ; March 31, Thrushes and Blackbirds, several killed ; Nov. 3-4, strong rush with Fieldfares, Redwings, Blackbirds, etc. ; Nov. 25, striking, several killed ; Nov. 29, rush of Turdidæ ; Dec. 7-10, Thrushes and Larks. Dhuheartach, Feb. 23-24, numbers all night with Blackbirds, Redwings, Starlings, Larks, and Pipits ; March 1, numbers at light ; March 4, numbers with Redwings.

Principal movements, Feb. 23-27 ; March 7, 28-31 ; Nov. 4, 6-7.

TURDUS ILIACUS (Redwing).

Shetland—Dunrossness, April 15, a few. *Orkney*—Sule Skerry, March 31, one, first this spring ; Oct. 1, a few, with Fieldfares and Starlings ; Nov. 21, at light, Fieldfares, Starlings, etc. Pentland Skerries, Oct. 21 to Nov. 10, numerous all over the island. Bell Rock, Oct. 15, flying round lantern, 3-5 A.M. *Forth*—Yester, E. Lothian, Oct. 11, a few. *Tweed*—Cromilt, Oct. 14, several. *Outer Hebrides*—Flannans, April 7, several ; 9-10, flying in rays, great many, with Wheatears and Snow Buntings ; April 17, two, one killed by Hawk ; Oct. 3, one ; 6-7, a rush, with Pipits and Wheatears, many at lantern ; Nov. 4, several, Pipits, etc. ; Nov. 7, great rush of Turdidæ ; Nov. 19, first rush, Fieldfares, Thrushes, and Larks ; Dec. 5, rush with Fieldfares ; during December, numbers found on island in very poor condition, too weak to fly. Barra, Oct., last week, arrived. Lochmaddy, April 13, about a score. *Argyll and Isles*—Tiree, April 1, have left ; Nov. 3, 10, and 11, in

flocks, with Fieldfares; Nov. 21, large flocks of Turdidæ. Skerryvore, Nov. 3-4, rush of Turdidæ; Nov. 25, another rush, with Chaffinches. Dhuheartach, Feb. 23-24, all night, with Thrushes, Blackbirds, Larks, etc.; Nov. 27-28, with Pipits and Starlings; March 1, numbers; April 11, three; May 16, one. *Clyde*—Queen's Park, Glasgow, March 28, five. Carmichael, Oct. 13. *Solway*—Kinbinnie, Oct. 23, a small lot.

Principal movements, Oct. 6-7, Nov. 4-7, Nov. 19.

TURDUS PILARIS (Fieldfare).

Shetland—Dunrossness, April 15, many. *Orkney*—Noup Head, Sept. 26, all night, a rush; Nov. 4, at lantern, three killed. Sule Skerry, April 26, five; Oct. 1, a few, with Redwings and Starlings; Nov. 15, at light, with Blackbirds; Nov. 21, with Redwings, Starlings, etc. Pentland Skerries, Oct. 21 to Nov. 10, large flocks on the islands. *Sutherland*—Cape Wrath, Nov. 12, a good many. *Moray*—Elgin, April 14, a flock. Laggan, Strathspey, Oct. 7. *Dee*—Aberdeen, March 29, many; Oct. 5, eight. *Tay*—Auchinblae, May 11, a flock; Oct. 26, a large flock. *Forth*—Kirknewton, March 29, a flock. Doune, Oct. 12, flock of about twenty-five. Isle of May, April 17, flock; Oct. 19, first; Oct. 26, a great number, left the island at 1 P.M. and flew northwards; Nov. 4, all night at lantern, twelve killed; Nov. 7, at lantern, midnight till daylight, Blackbirds, Starlings, and Lapwings. *Tweed*—Cromilt, May 5, large flock. Halmyre, May 12, a flock, last seen. Hawick, May 15, large flock, flying N. *West Ross*—Garve, Oct. 20, arrived. *Outer Hebrides*—Lochmaddy, April 13, about a score for some days. Barra, Nov. 9, a flock of fifty or sixty. Flannans, Nov. 7, great rush of Turdidæ and Starlings, great numbers killed; numerous till the 14th, when all left; Nov. 19, fresh rush, with Thrushes, Redwings, and Larks; Dec. 5, another rush with Redwings, left on 7th. *Argyll and Isles*—Tiree, Nov. 4, 10, and 11, in flocks, with Redwings; Nov. 21, very large flocks; Dec. 25, still numerous. Skerryvore, Nov. 3-4, first rush of Turdidæ; Nov. 25, rush of Turdidæ, Chaffinches, etc.; Nov. 29, numbers. *Clyde*—Carmichael, April 24, large flock. Mearns, May 7, over a hundred. Queen's Park, Glasgow, Oct. 29, one or two. *Solway*—Townhead, Closeburn, April 27, at dusk a large flock suddenly arrived and settled to roost in the tall heather.

Principal movements, Oct. 26, Nov. 4-7, Nov. 19-21.

TURDUS MERULA (Blackbird).

Orkney—Noup Head, Oct. 28, flying round light; Nov. 4, at lantern, four killed. Sule Skerry, March 24, one; Nov. 16, at light, with Fieldfares. Pentland Skerries, Oct. 21 to Nov. 10,

numerous. *Sutherland*—Cape Wrath, Feb. 3, a few; Nov. 12, a good many. *Dee*—Buchanness, Nov. 4, great numbers, with Thrushes, Starlings, and Pipits, eight killed. *Tay*—Bell Rock, March 7, a ♂ killed; April 14, one on rock. *Forth*—Isle of May, March 1, several, midnight, with Thrushes, etc.; Oct. 26, a great number, with Fieldfares; Nov. 7, numbers at lantern, with Fieldfares, Starlings, and Lapwings. *Outer Hebrides*—Flannans, Nov. 5, several; Nov. 7, rush of Turdidæ and Starlings, great numbers killed; Nov. 20, numerous. Island Glass, Jan. 15, four at lantern (leg and wing sent). *Argyll and Isles*—Tiree, April 1, have left; Nov. 7, returned; Nov. 21, a few. Skerryvore, March 28, rush of Blackbirds, Thrushes, Starlings, and Larks; March 31, with Thrushes, several killed; Nov. 3-4, rush of Turdidæ, Starlings, etc.; Nov. 25, with Chaffinches; Nov. 29, rush of Turdidæ. Dhuheartach, Feb. 23-24, numbers at light, with Thrushes and Redwings; Feb. 27-28, with Starlings, Larks, etc., at light.

Principal movements, Oct. 21-26, Nov. 4-7, Nov. 10-16.

TURDUS TORQUATUS (Ring Ousel).

Orkney—Noup Head, April 20, four, first I have seen here. Sule Skerry, April 12, a few. *Tay*—Auchinblae, April 17, have arrived. Rannoch, April 20, a pair, Schiehallion. *Forth*—Torduff, Pentlands, April 8. Strathyre, Sept. 26, a good many still about. Isle of May, April 12, one, first. *Tweed*—West Linton, April 25. *Clyde*—Lamlash, April 17. Lendalfoot, April 21. *Solway*—Townhead, Closeburn, April 4, arrived. Beattock, April 18.

Earliest observed, Solway, April 4, Closeburn.

SAXICOLA GENANTHE (Wheatear).

Shetland—Dunrossness, April 13, one. *Orkney*—Noup Head, April 17, a rush, 1 to 4 A.M., at lantern; Sept. 26, all night, a rush. Sule Skerry, April 20, a few; Aug. 10, several; Aug. 20, a rush, with Wagtails; Sept. 24, a rush, with Meadow Pipits and Pied Wagtails. *Sutherland*—Cape Wrath, April 11, two at lantern. *Moray*—Contin, April 15. *Tay*—Rannoch, April 11. Auchinblae, Aug. 26, last seen. Bell Rock, April 13, a ♂ at lantern; April 15, two ♀'s on tower, one died; Sept. 6, several at lantern; Sept. 26, a ♂ at lantern. *Forth*—Swanston, March 25, a ♂. North Berwick, April 4. Isle of May, March 31. *Tweed*—Broughton, March 27, a ♂. Cramilt, April 3, a pair; 4th, several. *Outer Hebrides*—Flannans, April 10, flying in rays and striking, Redwings, Stonechats, etc.; May 12-13, numbers at lantern; Aug. 11, numerous, principally young birds; Aug. 17, very numerous on island; Sept. 29, many birds striking, Pipits, Stonechats, Petrels, etc. *Argyll and Isles*—Tiree, April 4, a ♂; April 10, numerous. Skerryvore,

April 7, four killed at lantern; 10th, at lantern, with Chaffinches; May 8, two killed; Aug. 16, one on rock; 28th, one; Sept. 9-10, a rush, Pipits, Wheatears, etc.; Nov. 15, one in window, appeared to be injured. Dhuheartach, April 14, two; May 1, three; 12th, four. *Clyde*—Lendalfoot, March 20. Lamlash, March 28. Barrhill, Ayr, March 29. Carmichael, April 8. *Solway*—Dumfries, March 26, two. Beattock, April 11.

Earliest, *Clyde*, Lendalfoot, March 20.

Principal movements, April 10-17, Aug. 17-20, Sept. 24-26.

PRATINCOLA RUBETRA (Whinchat).

Moray—Contin, April 26. *Forth*—Aberfoyle, April 23, a ♂. Kirkliston, Sept. 16, last seen. *Tweed*—Broughton, May 12, a ♂. *Argyll and Isles*—Dhuheartach, Aug. 22 to Sept. 15, numbers passing; Sept. 15-17, passing all day, going S.E. and S. *Clyde*—Carmichael, April 24.

Earliest, *Forth*, Aberfoyle, April 23.

PRATINCOLA RUBICOLA (Stonechat).

Tweed—Cramilt, April 5, a pair. Hawick, Nov. 28, one obtained, first I have noticed in Roxburghshire (W. R.). Tيرة, April 1, have left.

RUTICILLA PHENICURUS (Redstart).

Moray—Contin, April 19. Fochabers, April 23. *Tay*—Rannoch, April 21. *Forth*—Dalmeny, April 19. Aberfoyle, April 22, pair. Balquhiddel, Aug. 27-30, family party. *Argyll and Isles*—Dhuheartach, Sept. 2, one. *Clyde*—Carmichael, April 17. Cadder, April 20.

Earliest, *Clyde*, Carmichael, April 17.

ERITHACUS RUBECULA (Redbreast).

Shetland—Dunrossness, April 14, many all over the district. *Outer Hebrides*—Flannans, May 13, one. *Tay*—Bell Rock, April 9, at lantern; April 15, one on tower; Oct. 5, one on rock. *Forth*—Isle of May, March 7, two; Oct. 5, numbers. *Argyll and Isles*—Tيرة, April 1, have left.

SYLVIA CINEREA (Whitethroat).

Forth—Dalmeny, April 26. Aberfoyle, April 28. Kirkliston, Sept. 22, last seen. *Outer Hebrides*—Flannans, June 3, two; June 5, several, with Warblers of various species; Sept. 23, one. *Clyde*—Kilmaurs, April 26. Millport, April 30.

Earliest, *Forth* and *Clyde*, April 26.

SYLVIA CURRUCA (Lesser Whitethroat).

Orkney—Sule Skerry, Sept. 17, one captured (sent in flesh).

SYLVIA ATRICAPILLA (Blackcap).

Forth—Gosford, April 20, several. *Solway*—Maxwelltown, April 15, a ♂.

SYLVIA HORTENSIS (Garden Warbler).

Orkney—Sule Skerry, Sept. 5, one caught (sent in flesh); Sept. 26, one (ditto). *Forth*—Kirkliston, May 23, in several of the woods in the neighbourhood. Last in song July 15.

REGULUS CRISTATUS (Goldcrest).

Tay—Bell Rock, April 4, one at lantern. *Forth*—Isle of May, April 7, at lantern, midnight; Oct. 6, numerous. *Solway*—Maxwelltown, Sept. 28, many.

PHYLLOSCOPUS RUFUS (Chiffchaff).

Clyde—Kilwinning, April 3. Lendalfoot, April 15.

PHYLLOSCOPUS VIRIDANUS (Greenish Willow Warbler).

Orkney.—Sule Skerry, Sept. 5, one caught at lantern (forwarded in flesh). First record in Scotland ("Annals," 1903, pp. 22-23).

PHYLLOSCOPUS TROCHILUS (Willow Wren).

Moray—Fochabers, April 18, one heard; 20th, abundant. *Dee*—Aberdeen, April 23, two. *Tay*—Auchinblae, April 20, arrived. Rannoch, April 21. Bridge of Earn, Sept. 26. *Forth*—Dalmeny, April 16. Kirkliston and Gorebridge, April 17. Oldhamstocks, E. Lothian, and Craigmillar, April 19. Isle of May, April 27, two at lantern, midnight. Kirkliston, Sept. 19, last seen. *Tweed*—Halmyre, April 21, several. Broughton and Hawick, April 22. *Outer Hebrides*—Barra, Oct. 30, a pair in garden at Eoligary. *Clyde*—Busby, April 13. Carmichael, April 15. Newton and Lendalfoot, April 16. *Solway*—Maxwelltown, April 15, several; Sept. 23, several this morning, left before night.

Earliest, *Clyde*, Busby, April 13.

PHYLLOSCOPUS SIBILATRIX (Wood Wren).

Moray—Contin, April 26. *Forth*—Aberfoyle, April 24, one. Dalmeny, May 7. *Clyde*—Beith, May 5.

ACROCEPHALUS PHRAGMITIS (Sedge Warbler).

Moray—Fochabers, May 16, *Tay*—Auchinblae, April 24.
Forth—East Linton, April 25, several. *Argyll and Isles*—
 Dhuheartach, April 23, one. *Clyde*—Dalry, April 27. Caldwell,
 April 30.

Earliest, *Tay*, Auchinblae, April 24.

LOCUSTELLA NÆVIA (Grasshopper Warbler).

Clyde—Loch Libo, May 24. Kilmours and Bute, May 17.

ACCENTOR MODULARIS (Hedge Sparrow).

Shetland—Dunrossness, April 17, one.

(*To be continued.*)

SOME MORE RECORDS OF COLEOPTERA
 TAKEN IN SCOTLAND, CHIEFLY IN THE
 EDINBURGH (OR "FORTH") DISTRICT.

By WILLIAM EVANS, F.R.S.E.

THREE years ago I published in this magazine (1900, pp. 91-101) a first instalment of my personal records of Coleoptera taken in the "Forth" area and some other parts of Scotland, and in the following year (1901, p. 183) I reported five additional species new to the Scottish list.¹ As previously mentioned, I have been collecting Beetles in the Edinburgh (or Forth) district for a number of years back, my object latterly being the issue of a revised list for the area, which is now in hand. But, as the working out of my own collectings, and the weary task of investigating the scattered literature, of which there is more than is generally supposed, and writing up the voluminous data, will necessarily take some time yet, it seems advisable now to publish a further instalment of my records. These have been selected chiefly with a view to filling up blanks in the ascertained distribution as given in Sharp's Catalogue of

¹ These were *Tachyporus formosus*, Matth., *Pseudopsis sulcata*, Newm., *Bryaxis helferi*, Schm., *Hister merdarius*, Hoff., *Cis fuscatus*, Mell.

Scottish Coleoptera,¹ which explains the inclusion of many common species. Had space allowed many more might have been given.² It is not, however, claimed that those so selected are all first records for the areas in which the localities lie. The majority appear to be, but in some cases there are reliable records published prior to Sharp's Catalogue, while others are mentioned in later lists and notes.

In the present list there are only two species for which I have not been able to find any previous Scottish record; these are, *Euplectus piceus*, Mots., and *Læmophlæus pusillus*, Schön. A *Hydnobius*, which still awaits determination, may be an addition to the British fauna. Attention may also be directed to the records of *Dyschirius æneus*, Dej., *Rhizophagus cribratus*, Gyll., *Strangalia quadrifasciata*, L., *Grammoptera ruficornis*, F., and the rearing of *Cetonia floricola*, Herbst., from the larva.

I have again to express my thanks to Mr. Thornley for all the help he has rendered me in the identification of my captures, and also to Dr. Sharp and Mr. Champion for kindly naming or confirming a number of specimens submitted to them.

Cicindela campestris, L.—Common on railway bank near Thornton, Fife, 25th May 1900, and near Saltoun, East Lothian, 12th August 1902. Although plentiful in the Highland portion of the Forth valley above Callander and Aberfoyle, the Tiger Beetle is seldom met with in Lowland Forth.

Notiophilus substriatus, Wat.—Several along with the common *N. biguttatus* and the next, in flood refuse, Orr Water, near Thornton, Fife, February 1903; Aberlady, May 1890. *N. palustris*, Duft.—Oban (Argyll), April 1894; Leadhills (Clyde), September 1900.

Blethisa multipunctata, L.—Bavelaw, Mid-Lothian, May 1900 and June 1901; pond near Aberdour, Fife, August 1900, common.

Elaphrus uliginosus, F.—Oban, April 1894, one specimen.

¹ The Scottish distribution given in Fowler's "British Coleoptera" is, in the great majority of cases, merely a repetition of that in Sharp's Catalogue.

² For "Tweed," which is poorly represented in the Catalogue, I could give scores of records (mainly from Heriot, Peebles, and West Linton), filling up blanks, for many of which, however, records already exist in the "Transactions" of the Berwickshire Naturalists' Club. My Clyde records were given to Mr. Anderson Fergusson when he was drawing up his list for the recent Handbook on the Natural History of that area.

- Dyschirius æneus*, Dej.—On 27th April 1901, I found this form rather commonly on the sides of a deep ditch at Kincardine-on-Forth (identification confirmed by Mr. Champion). In Sharp's "Coleoptera of Scotland" *D. æneus* is marked "doubtful as Scottish," but Fowler, in his "British Coleoptera," quotes a record from Tain. *D. thoracicus*, Rossi.—Still occurs near Aberlady; have found it there on several occasions recently.
- Chlænium nigricornis*, F.—Oban, one, April 1894; Braendam, near Callander, two, April 1900.
- Harpalus puncticollis*, Payk.—Kennetpans, near Alloa, a dozen, April 1901. *H. tardus*, Panz.—Aberlady, one, May 1890.
- Dichirotrichus pubescens*, Payk.—Aberlady, and above Kincardine-on-Forth, common.
- Anisodactylus binotatus*, F.—♂, Loch Awe, Argyllshire, June 1900 (from R. Godfrey).
- Stomis pumicatus*, Panz.—Aberlady, May 1890; Bucklyvie, April 1896; Heriot (Tweed area), June 1898; North Queensferry, August 1900; Kincardine-on-Forth, April 1901; in flood refuse, Orr Water, Thornton, February 1903; scarce in this district.
- Pterostichus æthiops*, Panz.—♂, Pentland Hills, above Currie, October 1900. The late Andrew Wilson took this species on the Pentlands in 1857 ("Proc. Roy. Phys. Soc." i. 411). *P. vitreus*, Dej.—Caerketton, Pentlands, April 1896, and above Currie, March 1900; near Kirknewton, April 1895, and May 1897; Ravelrig Moss, April 1898. Was recorded from the Pentlands by W. A. Forbes in 1876 ("Scot. Nat." iii. 316); but if it be the *Feronia orinomum* of Wilson and Duncan's "Entomologia Edinensis," it has long been known as an inhabitant of these hills.
- Calathus piceus*, Marsh.—Duchray, near Aberfoyle, May, and Penicuik Woods, October 1896; Brodick, April 1895.
- Taphria nivalis*, Panz.—Comiston, Braid, Tynehead; near Kingussie.
- Anchomenus angusticollis*, F.—Kincaig, near Kingussie, August 1889; Aviemore, May 1893. *A. piceus*, L.—Kincaig. *A. ericeti*, Panz.—Bavelaw Moss, April 1889, and May 1900; Elvanfoot, September 1900. *A. viduus*, Panz.—Brodick, April 1895, one, type; Glencorse, Pentlands, May 1896, v. *mæstus*.
- Bembidium schüppeli*, Dej.—Banks of Esk, above Musselburgh, along with *B. monticola*, Stm., February 1903.
- Æpeus marinus*, Ström.—Common under stones on shore at Dalmeny, March, and near Aberdour, April 1901. *A. robinii*, Lab.—Shore near Aberdour, April 1901, a few.

- Dromius agilis*, F.—Kirknewton, Midlothian, April 1895.
- Laccophilus obscurus*, Panz.—Small pond at Bush, Roslin, May 1895; Longniddry, May 1900.
- Hydroporus pictus*, F.—Tulliallan, April 1901. *H. tristis*, Payk.—Bavelaw Moss, March 1899; Cramond, February 1903. *H. obscurus*, Sturm.—Bavelaw Moss, April 1897, and February 1903. The last two were recorded from "Forth" by Mr. Beaumont in the "Entomologist" for 1888.
- Agabus arcticus*, Payk.—Fauldhouse Moor, Linlithgowshire, March 1903. *A. unguicularis*, Thoms.—Kincaig, Speyside, August 1889.
- Ilybius ænescens*, Thoms.—Bavelaw Moss, May 1895; Brodick, April 1895. Identified by Thornley and confirmed by Champion.
- Acilius sulcatus*, L., dark var.—Small pond, south-east of Arngask, Kinross-shire, September 1899.
- Helochares punctatus*, Sharp.—Bavelaw Moss, one, June 1899.
- Helophorus rugosus*, Ol.—Glencorse, November 1884; Luffness Links. *H. nubilus*, F.—Glencorse, November 1884; Edinburgh, January 1901; Thornton, February 1903. *H. arvensis*, Muls.—Heriot Water, May 1901.
- Astilbus canaliculatus*, F.—Muthill, September 1901.
- Gyrophæna lævipennis*, Kr.—Arniston, many on decaying fungi, July 1897.
- Bolitochara lunulata*, Payk.—Kincaig, Strathspey, August 1889.
- Gymnusa variegata*, Kies.—In wet moss on hillside, Innerleithen, January 1897; Carlops, in wet moss at waterfall, May 1902.
- Conosoma lividum*, Er.—Innerleithen, December 1896; Pentlands, etc., common. I have also *Bolitobius pygmæus* from "Tweed" (Peebles).
- Tachyporus formosus*, Matth.—Elie, one, August 1901.
- Mycetoporus clavicornis*, Steph.—Caerketton, Pentlands, one, April 1902; in flood refuse, Thornton, Fife, common, February 1903.
- Ocytus olens*, Müll.—When Dr. Sharp drew up his catalogue, he seems to have had no definite record of the occurrence of this well-known beetle in the south-east of Scotland till W. A. Forbes called attention to its occurrence on Arthur's Seat ("Scot. Nat." iii. 316). It is given as a common species, however, in Wilson and Duncan's "Ent. Edin." (1834), and is recorded in a list for Dollar, published in the "New Statistical Account" of the parish. Though I cannot say it is common in

the Forth area, I meet with it occasionally, and have specimens from Salisbury Crags, Aberlady, St. David's, Charlestown, and Aberfoyle.

Philonthus umbratilis, Grav.—Braid Hermitage, October 1896.

Note.—This species was inadvertently omitted from Sharp and Fowler's 1893 "Catalogue of British Coleoptera."

Othius myrmecophilus, Kies.—Penicuik Woods, October 1896. *O. melanocephalus*, Grav.—Tushielaw, "Tweed," June 1889.

Stilicis rufipes, Germ.—Kincardine-on-Forth, April 1901; Bo'ness, May 1901 (R. G.); Inveravon, Linlithgowshire, February 1903. Identification confirmed by Champion.

Oxytelus tetracarlinatus, Block.—Comiston, Aberlady, Aberfoyle, etc.; common.

Anthophagus alpinus, Payk.—Tushielaw, Etrick, two, June 1889.

Lesteva pubescens, Mann.—Nether Habbie's Howe, Pentlands, November 1902; *L. punctata*, Er.—Comiston, one, July 1896. *L. sicula*, Er.—Pentlands, October 1899; Polton, February 1903 (confirmed by Champion). *L. longelytrata*, Goeze.—Peebles, July 1890; common on the Pentlands, etc.

Acidota crenata, F.—Ravelrig Moss, one, April 1898; Callander, Aberfoyle.

Olophrum fuscum, Grav.—Mortonhall, June 1896; Inveresk, February 1903.

Micralymma brevipenne, Gyll.—Shore, near Aberdour, Fife, a few, April 1901.

Omalium nigriceps, Kies.—One, on rotting seaweed, near Aberdour, March 1900 (named by Dr. Sharp). *O. pusillum*, Grav.—Near Dollar, April 1897. *O. gracilicorne*, Fairm.—Specimens of an *Omalium* found under bark of dead firs at Morton and Swanston, October and November 1896, are referred by Mr. Thornley to this form.

Anthobium sorbi, Gyll.—Abundant in hawthorn blossom at Arniston, May, and Heriot (Tweed), June 1898.

Pselaphus heisei, Herbst.—Elvanfoot, Lanarkshire, September 1900; Kincardine-on-Forth, two, April 1901.

Euplectus piceus, Mots.—One, Comrie, Perthshire, 30th April 1899; named by Mr. Champion. Seems to be first record for Scotland.

Scydmaenus collaris, Müll.—Muthill (Tay), September 1901.

Agathidium levigatum, Er.—Loch Awe, Argyll, one, June 1900 (from R. Godfrey). *A. nigripenne*, Klug., and *A. atrum*, Payk.—Newpark, Midlothian, May 1901.

- Anisotoma picea*, Ill.—An *Anisotoma* taken by me at Kincaig, near Kingussie, in August 1889, is, Messrs. Thornley and Champion consider, probably of this rare species, which has already been recorded from Moray by A. J. Chitty ("Ent. Mo. Mag." 1893).
A. ovalis, Schmidt.—Near Polton, Midlothian, one, May 1902 (named by Champion).
- Hydnobius*, sp.?—♀, Elvanfoot, Lanarkshire, 1st October 1900. Have shown it to Dr. Sharp, Mr. Thornley, and Mr. Champion, none of whom recognise it. Probably an addition to the British list.
- Necrophorus mortuorum*, F.—Not uncommon in Forth; Bavelaw, June 1895; Penicuik, June 1896; Aberfoyle, May 1897. Included in "Ent. Edin." and the Dollar list, but Sharp had not seen it from Forth.
- Choleva spadicea*, Sturm.—Roslin, October 1896. *C. morio*, F.—Aberlady, September 1889.
- Hister carbonarius*, Ill.—Kirknewton, Midlothian, one, May 1901.
H. succicola, Thoms.—Forest Mill, near Dollar, May 1901, several.
- Saprinus maritimus*, Steph.—Plentiful in sand, Ganovan Bay, Oban, April 1894.
- Trichopteryx lata*, Mots.—Luffness Woods, several, August 1896 (named for me by Dr. Sharp). This species was added to the "Forth" list by Buchan-Hepburn ("Scot. Nat." iv. 248).
- Subcoccinella 24-punctata*, L.—Peaton, Loch Long, one, June 1900.
- Scymnus nigrinus*, Kug.—Kincaig, near Kingussie, common on young firs, August 1889. Is given in A. J. Chitty's Morayshire records ("Ent. Mo. Mag." 1893).
- Brachypterus pubescens*, Er.—Luffness Links, August 1896; Lothianburn, near Edinburgh, April 1897; Heriot (Tweed), June 1898. This and some other species mentioned in this paper have quite recently been recorded from "Forth" by Prof. Hudson Beare ("Ent. Rec." 1902). *B. urticae*, F.—Braidburn, common, June 1889, 1895, etc.; near Roslin, July 1893; Luffness, August 1896; etc.
- Meligethes æneus*, F., and *M. viridescens*, F.—Are quite common in "Forth" and "Tweed," for which they are only indicated as probably present in Sharp's catalogue. Both are given in "Ent. Edin."
- Cychramus fungicola*, Heer.—One, Castle Campbell, Dollar, July 1902 (*teste* Champion).
- Rhizophagus parallelocollis*, Er.—Under old board in my garden, Morningside, Edinburgh, April 1901 (*teste* Champion). *R.*

- depressus*, F.—Mortonhall, May 1895; Broxburn, April 1899.
R. cribratus, Gyll.—One, Braid Hermitage, Edinburgh, 24th March 1902.
- Læmophloeus pusillus*, Schön.—Two examples of this small beetle have been brought to me by Mr. R. Godfrey, both got in bread, and doubtless imported; ♂, Bo'ness, July 1900 (confirmed by Thornley); ♀, Edinburgh, October 1902.
- Corticaria elongata*, Humm.—Kincraig (Spey), August 1889; and several localities about Edinburgh.
- Melanophthalma fuscata*, Humm.—Kincraig, August 1889.
- Cryptophagus cellaris*, Scop.—Kincraig, August 1889; Dunbar, in shop, September 1894; Braidburn, July 1896.
- Aphodius fossor*, L.—♀, Kinross, July 1902; ♂, in flood refuse, Kinghorn Loch, February 1903. *A. constans*, Duft.—Swanston Hill, Pentlands, June 1899. *A. lapponum*, Gyll.—Pentland Hills above Silverburn, May 1895, and above Swanston, June 1899. *A. pusillus*, Hbst.—Aviemore, May 1893.
- Phyllopertha horticola*, L.—Balquhiddel and Lochearnhead, July and August 1902. In 1900 Mr. J. Baxter brought me specimens from the island of Tiree, where the species was abundant in June, and I have a specimen taken by Mr. H. Raeburn near the summit of Ben Nevis on 28th June last.
- Anomala frischii*, F.—St. Andrews Links, common in July 1890; Gullane Sandhills, July 1900, etc. Very plentiful there on 19th July last, flying in the sunshine and crawling on the sand and grass.
- Cetonia florivola*, Herbst.—Towards the end of April 1900 I dug out of large dome-shaped nests of the hill-ant (*Formica rufa*), near Callander and Brig o' Turk (Upper Forth), over a dozen larvæ of this fine beetle. They were of various sizes, some being scarcely a third grown, while others appeared to be about full-fed. They were put into two boxes, each filled with a handful of material from the heart of the ant-hill. In some nests "ant-eggs" were already present, but I did not take any, feeling sure it is not on them but on the vegetable matter of which the "hill" is mainly composed that the beetle grubs feed. When the small supply of this material brought home was used up, a mixture of earth and sawdust was substituted. In June 1901—when several grubs were still alive—an earthen cocoon containing a dead beetle was discovered in one of the boxes, and in September two living beetles made their appearance; only one grub now survived, but it died soon afterwards. In June 1900, Mr. S. M. Macvicar sent me a living example of this beetle from Invermoidart, Argyll. I may mention that

I have a specimen of *Cetonia aurata*, L., which was got in a shop window in Dunbar in June 1891—doubtless accidentally imported.

Melanotus rufipes, Hbst.—Kincaig (Moray), August 1889.

Athous niger, L.—Stirling, 1887; Dunbar, July 1900; Bridge of Allan, July 1901; Dura Den (Tay), July 1890. *A. vittatus*, F.—Newpark, May 1895; Aberfoyle, May 1896.

Agriotes sputator, L.—Aberdour, April 1893.

Corymbetes quercus, Gyll.—Type and var. *ochropterus*, Newpark, Braid, etc.; Heriot, June 1898. *C. cupreus*, F.—Is common in the Forth and Tweed areas.

Microcara livida, F., var. *bohemani*, Mann.—Near Bo'ness, June 1901.

Telephorus rusticus, Fearnan.—Loch Tay, May 1892. *T. pellucidus*, F.—Newpark and Bowhouse, June 1895; Aberfoyle, May 1896. *T. darwinianus*, Sharp.—Aberlady Bay, May 1890, and other years.

Malthodes misellus, Kies.—Dollar, several, July 1901 (*teste* Thornley and Champion). *M. minimus*, L.—Aviemore, June 1893.

Thanasimus formicarius, L.—The Forest, near Dollar, one, 21st May 1901; Bo'ness, one, 1900 (R. G.)—the latter probably imported.

Priobium castaneum, F.—Near Ormiston, East Lothian, two, June 1900.

Anobium paniceum, L.—In a bakehouse, Edinburgh, several, August 1901; in herbarium, Botanic Garden, Edinburgh, August 1902 (from Mr. Jeffrey).

Strangalia quadrifasciata, L.—On 9th August 1902 I captured a ♂ of this fine beetle near Saltoun, East Lothian; it alighted on a bare sunny spot which I was watching for *Aculeates*.

Grammoptera ruficornis, F.—One, north bank of Esk, near Polton, 18th June 1901.

Pogonochærus fasciculatus, De G.—An example of this interesting species, got at Bo'ness Docks, September 1901, was kindly brought to me by Mr. Godfrey. Doubtless it had been introduced with timber.

Bruchus pisi, L.—In store, Bo'ness, June 1900 (R. G.); Tiree, Inner Hebrides, June 1900 (J. B.).

Lema melanopa, L.—Muthill (Tay), September 1901.

Clythra 4-punctata, L.—In April 1900 I found, in a nest of the hill-ant, near Callander, a grub of this beetle in its black case, but failed to rear it.

- Phytodecta olivacea*, Forst., var. *litura*, F.—Heriot (Tweed), common on broom, July 1897. *P. pallida*, L.—Loch Awe, March 1897 (R. G.).
- Gastroidea polygoni*, L.—Braid, May 1889; Kirknewton, April 1895; Swanston, July 1899; etc. *G. viridula*, De G.—Glencorse and Aberfoyle, May 1896; Dollar, April 1897; etc.
- Phædon armoraciæ*, L.—Common on margins of ponds on the Pentland Hills; Bonaly Pond, March; Glencorse, May 1896; Bavelaw, February 1903. *P. tumidulus*, Germ.—Common in “Forth”; Braid, Kirknewton, Cramond, Dollar, Aberlady.
- Phyllodecta vulgatissima*, L.—Newpark, Midlothian, June 1895. *P. vitellinæ*, L.—Is very common in “Forth”; Braidburn, Presmennan, Heriot, Drumshoreland, Aberfoyle, etc.
- Luperus rufipes*, Scop.—Aberfoyle, September 1897. *L. flavipes*, L.—Peebles, July 1890.
- Galerucella tenella*, L.—Elvanfoot (Clyde), September 1900.
- Adimonia tanaceti*, Laich.—Bavelaw Moss, Midlothian, October 1893, and August 1901; Balquhiddel, August 1902. Recorded from Dollar many years ago (“New Stat. Acc.”).
- Longitarsus suturellus*, Duft., v. *fuscicollis*, Steph.—Common; Longniddry, March 1890; Mortonhall, March 1896; Dregghorn, October 1900; Inveravon, February 1903; Heriot, May 1901; etc. *L. holsaticus*, L.—Kirknewton, Midlothian, May 1901. *L. jacobææ*, Wat.—Leven Links, Fife, August 1893; Balerno, June; Heriot, July 1897. *L. luridus*, Scop.—Is common in the Edinburgh district, some examples being quite black, like *L. anchusæ* (which, however, Mr. Thornley thinks they are not).—A revision of this genus and the next is sadly needed.
- Phyllotreta flexuosa*, Ill.—Mr. Thornley refers to this form two specimens taken near Dollar in April 1897.
- Hippuriphila modeeri*, L.—Near Stirling, 1887.
- Plectroscelis concinna*, Marsh.—Dregghorn, March 1896; Dollar, April 1897; Aberfoyle, April 1896; etc.
- Gnathocerus cornutus*, F.—Another specimen has occurred in bread in Edinburgh—in my house, April 1901.
- Cistela murina*, L.—St. David’s, Fife, one, 14th June 1900.
- Salpingus æratus*, Gyll.—Saline, Fife, one, 20th August 1901, (confirmed by Champion).
- Meloë violaceus*, Marsh.—Aberfoyle, one, May 1896; Callander, one, April 1900.
- Brachytarsus varius*, F.—Aberfoyle, one off hazel, 27th April 1902.

- Apion dichroum*, Bed.—Luffness, August; Yester, September; Philpstoun, October 1896; Aberfoyle, September 1897; Kincaig (Spey). *A. pisi*, F.—Presmennan, August 1894; Luffness, August 1896; only probably Scottish in Sharp's Catalogue. *A. vorax*, Hbst., and *A. humile*, Germ.—Heriot (Tweed), June 1898. Have both also from Forth.
- Otiorynchus maurus*, Gyll.—Near top of Am Binnein (Upper Forth), 25th September 1902.
- Strophosomus lateralis*, Payk.—Bonaly Hill, Pentlands, October 1896; Aberfoyle, September 1897; Aviemore, June 1893.
- Polydrusus cervinus*, L.—Kirknewton, May 1895; Dollar, April 1897; Heriot, May 1901.
- Phyllobius oblongus*, L.—Kirknewton, July 1894; Silverburn, near Penicuik, May 1895; Arniston, off hawthorn blossom, June 1898; Longniddry, June 1899; Aberfoyle, May 1896. Recorded many years ago as plentiful on hawthorn hedges about Dollar ("New Stat. Acc. of Scot.").
- P. calcaratus*, F.—Kirknewton, and near Manuel, June 1895; Balerno, June 1897; Arniston and Heriot, June 1898. *P. pyri*, L.—Heriot, Craigentenny, Callander. *P. argentatus*, L.—Aberlady, Arniston, Callander, etc. *P. maculicornis*, Germ.—Near Stirling; Tushielaw, Ettrick, June 1889; Heriot, June 1898. *P. viridiaridis*, Laich.—Braidburn, common, June 1895, etc.; Heriot, June 1898.
- Philopodon geminatus*, F.—Luffness, June 1894; Tيرة, June 1900 (J. Baxter).
- Barynotus obscurus*, F.—St. Andrews, July 1890.
- Sitones tibialis*, Hbst.—Dirleton, January 1897; Aberdour, April 1893; Philpstoun, October 1896.
- Hypera punctata*, F.—Aberlady, September; Comiston, October 1896; Lothianburn, September 1897. *H. plantaginis*, De G.—Heriot, June 1898; Boghall Glen, Pentlands, November 1896; Edgelaw, October 1898.
- Grypoidius equiseti*, F.—Kirknewton, April 1901; Heriot (Tweed), May 1901.
- Gymnetron labilis*, Hbst.—Gorebridge, half-a-dozen, May 1900.
- Anthonomus pedicularius*, L.—Roslin, July 1893; Newpark, July 1895; Longniddry, August 1898.
- Cionus blattariæ*, F.—Gorebridge, May 1900; Culross, July 1900.
- Acalles ptinoides*, Marsh.—Pentlands above Currie, three, October 1900.
- Cæliodes cardui*, Hbst.—Roslin, July 1893; Luffness, August 1898.

Ceuthorhynchus erysimi, F.—Comiston, March 1893. *C. cyanipennis*, Germ.—Corstorphine Hill, October 1896; Morningside, April; Dalmahoy, May 1898; Kirknewton, June 1899; Inveravon, February 1903. Recorded from Dalmeny in Murray's "Scottish Coleoptera" (1853). Mr. Thornley now refers the *C. chalybeus* recorded in my previous list to this form. *C. pollinarius*, Forst.—Braidburn, June 1889; Luffness, August 1896; Philpstoun, October 1896; Heriot, May 1901. *C. pleurostigma*, Marsh.—Mortonhall, October 1896; Comiston, March 1900; etc.

Rhopalomesites tardyi, Curt.—♂ and ♀ brought to me from Tíree by Mr. J. Baxter in June 1900.

Pityogenes quadridens, Hart.—A specimen of this form was got at Bo'ness in May 1901. Have shown it to Dr. Sharp.

NOTES ON THE ANTHOPHILOUS INSECT FAUNA OF THE CLOVA MOUNTAINS.

By J. C. WILLIS, M.A., and I. H. BURKILL, M.A.

(Continued from p. 37.)

LEAVING the seasonal distribution, we proceed to give some details regarding altitudinal distribution. It will be necessary to refer back to Tables III. and IV., and to take the groups in sequence.

Hymenoptera.—*Apis* does not ascend the hills, and only in summer, when the Ericas come into flower, does it cross the 1000 feet contour line: it is consequently of no interest in the fertilisation of alpine plants. *Bombi* ascend the hills willingly. *Bombus lapponicus* nests on them, and is more common above 1000 feet than below it. This bumble-bee is the one which chiefly visits the alpine. As already noticed, it is vernal and æstival. *Bombus pratorum*, L., which is often considered to be one species with *B. lapponicus*, is æstival, and was chiefly seen in the strath. *Bombus agrorum* (*B. muscorum*), which is autumnal, hardly ever leaves the strath. *Bombus venustus*, Smith, like it, hardly leaves the strath; it is æstival. *Bombus hortorum*, the longest tongued, and *B. terrestris*, the shortest tongued of our *Bombi*, both are most abundant in the strath, but are by no means absent from high levels. *Psithyrus quadricolor*, Lep., was seen at all heights. The mid-tongued Hymenoptera are all of low levels, and of summer. *Odynerus* was once seen above 2000 feet. *Vespa* behaves like *Odynerus*. Tenthredinidæ in spring and summer, in some rare species, e.g. *Tenthredo olivacea*, occur high up. These rare species

must be regarded as alpine insects which do not descend the hills. *Allantus arcuatus*, Forst., the common lowland species, does not ascend them. The larger parasitic Hymenoptera, chiefly in summer and autumn, may be watched inadvertently in their short, weak flight to ascend the hills, when upward currents of warm air or gentle winds help them. Ants do not appear on the highest hill slopes.

Lepidoptera.—Among the long-tongued Lepidoptera are one or two true alpine, notably *Erebia epiphron*, Kn., which never descends. *Psodos trepidaria*, Tr., is found at all levels. *Celena Haworthii*, which properly belongs to the strath, was once collected at 1800 feet. With this exception, the long-tongued Lepidoptera of the strath do not ascend the hills. Of mid-tongued Lepidoptera, *Pyrausta alpinalis*, Schiff., is an alpine and the common visitor of the alpine plant *Silene acaulis*. Other species are mostly lowland and do not ascend; but we collected on a flower of *Alchemilla alpina*, on June 19, 1895, at 2400 feet, a single specimen of *Plutella cruciferarum*, L., which could have had its birth only in the strath. *Eriocephala calthella* belongs to the lower hill-sides chiefly, and does not fly more than a few yards.

Diptera.—Of Syrphidæ, the only specimens to be seen above the strath are waifs and strays of weaker flight, and chiefly such as *Syrphus vitripennis*, Mg., a rather flimsy insect, and *Platychirus albimanus*, Fr. *Empis* contains some alpine species which, chiefly in early summer, seem to do yeoman service to alpine plants. Such species are *Empis lucida*, Ztt., and *Empis vernalis*, Mg. *Empis tessellata* very rarely ascends, and *Pachymeria palparis* never does so. Among the short-tongued Empidæ species of *Tachydromia*, of *Hilara*, of *Clinocera*, and sometimes of *Rhamphomyia*, are found high up, in summer chiefly. Muscidæ chiefly keep to low levels, and the shepherds know well that sheep do not get “struck” when grazing high. However, we found *Lucilia* and *Calliphora* to range from the strath to the crag belt at 2000-2500 feet. Tachinidæ chiefly keep low. Of Sarcophagidæ, *Cynomyia* sometimes goes high. Among the Anthomyidæ is one alpine species, *Limnophora solitaria*, Ztt., but most of the order belong to the strath, although apt to ascend.

Coleoptera and other Insects.—Coleoptera include the alpine *Anthrophagus alpinus*, Payk. *Meligethes* and other genera rarely ascend. Of miscellaneous insects the commonest—Thrips—occurs at all levels.

The net result finds expression in the following table, wherein we see (1) *Bombi* working, as it were, in two camps through spring and summer—one camp or centre being in the strath and one about the crags; (2) parasitic Hymenoptera ascending much in autumn; (3) ants at all levels in summer (what happens to them

in autumn, or are they at other work than seeking honey?); (4) Lepidoptera and longer-tongued flies only on the hills in summer; and (5) short-tongued flies and Coleoptera, like the *Bombi*, in summer in two camps.

SPRING.	High Moors.	Crag Belt.	Third Belt.	Second Belt.	Strath.
<i>Apis</i> . . . . .	...	...	...	...	100-00
<i>Bombus</i> and <i>Psithyrus</i> . . . . .	...	12-87	10-66	4-77	71-69
<i>Andrena</i> and <i>Nomada</i> . . . . .	...	...	...	...	100-00
<i>Chrysis</i> and <i>Odynerus</i> . . . . .	...	...	...	...	...
Tenthredinidæ . . . . .	...	...	...	...	100-00
Parasitic Hymenoptera	15-38	...	...	23-07	61-54
Ants . . . . .	...	...	33-33	...	66-66
Wasps . . . . .	...	...	...	...	100-00
Lepidoptera, long-tongued . . . . .	...	...	...	4-35	95-65
Lepidoptera, mid-tongued . . . . .	...	...	...	100-00	...
Lepidoptera, short-tongued . . . . .	...	...	...	...	...
Diptera, mid-tongued . . . . .	...	0-63	1-26	21-51	76-58
Diptera, short-tongued	0-28	4-27	1-59	2-44	91-40
Coleoptera . . . . .	...	...	...	6-06	93-93
Other insects . . . . .	...	...	...	...	100-00
SUMMER.					
<i>Apis</i> . . . . .	...	...	...	13-53	86-46
<i>Bombus</i> and <i>Psithyrus</i>	0-55	29-00	9-39	12-15	48-89
<i>Andrena</i> and <i>Nomada</i> . . . . .	...	...	1-52	15-38	83-08
<i>Chrysis</i> and <i>Odynerus</i> . . . . .	...	16-67	...	...	83-33
Tenthredinidæ . . . . .	...	4-08	0-51	2-04	93-36
Parasitic Hymenoptera	0-33	10-77	3-36	5-05	80-47
Ants . . . . .	...	33-52	15-03	16-18	35-26
Wasps . . . . .	...	2-44	...	29-27	68-29
Lepidoptera, long-tongued	1-32	10-53	5-92	4-61	77-63
Lepidoptera, mid-tongued . . . . .	...	40-00	9-09	5-45	45-45
Lepidoptera, short-tongued . . . . .	...	3-96	0-99	27-72	67-33
Diptera, mid-tongued	4-37	6-42	3-96	7-78	77-46
Diptera, short-tongued	3-43	10-17	6-93	7-90	71-54
Coleoptera	1-22	21-99	7-86	3-56	65-35
Other insects	3-83	62-02	6-27	0-69	27-17
AUTUMN.					
<i>Apis</i> . . . . .	...	...	...	...	100-00
<i>Bombus</i> and <i>Psithyrus</i>	0-66	2-97	1-32	22-44	72-61
<i>Andrena</i> and <i>Nomada</i> . . . . .	...	...	...	...	100-00
<i>Chrysis</i> and <i>Odynerus</i> . . . . .	...	...	...	...	...
Tenthredinidæ . . . . .	...	...	...	...	...
Parasitic Hymenoptera	9-29	17-21	28-47	16-53	28-47
Ants . . . . .	...	...	11-54	30-77	57-67
Wasps . . . . .	...	...	...	...	100-00
Lepidoptera, long-tongued . . . . .	...	...	1-45	4-35	94-20
Lepidoptera, mid-tongued . . . . .	...	...	...	...	100-00
Lepidoptera, short-tongued . . . . .	...	...	...	...	...
Diptera, mid-tongued . . . . .	...	1-26	...	8-43	90-36
Diptera, short-tongued	0-40	4-03	8-63	14-35	72-56
Coleoptera . . . . .	...	0-22	0-45	12-10	87-22
Other insects . . . . .	...	4-59	13-76	11-00	70-64

The greatest number of individuals of any group in any season is to be found in the strath. The number of notable alpine insects is not great. They are as follows:—

HYMENOPTERA, APIDÆ: *Bombus lapponicus*, F. LEPIDOPTERA, RHOPALOCERA: *Erebia ephron*, Kn. HETEROCERA: *Geometridæ*, *Psodos trepidaria*, Tr. CRAMBIDÆ: *Pyrausta alpinalis*, Schiff. DIPTERA, EMPIDÆ: *Empis vernalis*, Mg., *E. lucida*, Ztt. ANTHOMYIDÆ: *Limophora solitaria*, Ztt. TIPULIDÆ: *Tipula excisa*, Schum. COLEOPTERA: *Anthophagus alpinus*, Payk.

The number of strath insects refusing to ascend the hills is far greater. Such are the following:—

HYMENOPTERA, APIDÆ: *Apis mellifica*, L., *Bombus muscorum*, F., *B. lapidarius*, L., *B. venustus*, Smith, *Andrena coitana*, Kirby, *A. analis*, Pan. MYRMICIDÆ: *Myrmica rubra*, L. TENTHREDINIDÆ: *Allantus arcuatus*, Forst. LEPIDOPTERA, RHOPALOCERA: *Argynnis Aglaia*, L., *A. Selene*, Schiff., *Vanessa Urtica*, L., *Polyommatus phleas*, L., *Lycæna Icarus*, L., *Pieris Rapæ*, L., *P. Napi*, L., *P. Brassicæ*, L. HETEROCERA: SPHINGIDÆ: *Macroglossa bombylifformis*, Esp. NOCTUIDÆ: *Hydracia nictitans*. DIPTERA, SYRPHIDÆ: *Rhingia campestris*, Mg., *Eristalis pertinax*, Scop., *E. arbustorum*, L., *E. rupium*, F., *Chrysogaster hirtella*, Lw., *Chilosia fraterna*, Mg., *Helophilus pendulus*, L., *Sericomyia borealis*, Fln., *Volucella bombylans*, L., *Melanostoma mellinum*, L., *Syrphus punctulatus*, Verrall. EMPIDÆ: *Empis bilineata*, Lw., *E. grisea*, Fln., *E. punctata*, Mg., *Pachymeria palparis*, Egg., *Rhamphomyia sulcata*, Fln., *R. cinerascens*, Mg. TACHINIDÆ: *Siphona geniculata*, Deg. MUSCIDÆ: *Mesembrina meridiana*, L., *Pollenia Vespillo*, F., *Cyrtoneura caesia*, Mg.

It is evident that these insects are no use to the alpine plants of the crags, for they never go near them. An entomologist running his eyes over the names will notice that they are nearly all insects of fairly strong flight, long or mid-tongued, and consequently desirable visitors. There are two among them, *Macroglossa bombylifformis* and *Rhingia campestris*, which we have never seen away from that warm corner of Glen Clova, under Craig Mellon, where the shooting-box lies, and the larches are not twisted by the wind at their tops, where the river is well lined with alders and rose bushes, where *Lychnis diurna* first comes into flower, and *Ranunculus Ficaria* reaches its highest limit. It is a very sheltered spot; and the two insects mentioned as confined to it are among the most specialised of the whole insect fauna.

We must now turn to the insects which ascend the hills, bridging the interval between the strath and the crags. First, it is to be remarked that, with the exception of *Bombus terrestris* and perhaps the flesh flies, their presence at high levels is in almost all cases an accident; it is merely due to warm winds, such as Thornley has shown ("Ann. Scot. Nat. Hist." 1896, p. 28), depositing all manner of weak-flying insects on the snows of the top of Ben Nevis. Among the Syrphidæ those which ascend the hills are *Syrphus vitripennis*,

species of *Sphaerophoria* and *Melanostoma*, all of rather weak flight. Among the Anthomyidæ, all from *Drymia hamata* downwards are liable to be found at various heights, especially in summer. The smallest flies also appear at all heights. Meligethes appears at all heights; and, as Thornley has shown, all beetles with large elytra are very liable to be carried upwards. The miscellaneous insects observed high are chiefly Thrips.

It is very difficult to estimate what this unwilling ascending of the hills means to the plants growing high; and though it may not seem to mean much, we are inclined to keep the fact in view in connection with the possibility that plants common to the strath and crags may be helped to maintain themselves on the crags, possibly by the aid of pollen, probably by seed brought up from below. In this connection an observation isolated at present may be cited. Blytt observed that plants of silurian rocks in Norway somehow maintain themselves on gneiss when the two formations are near, but if silurian is not near the gneiss the latter has none of them (Blytt, Essay on the Immigration of the Norwegian Flora, Christiania, 1870, p. 82).

SCOTTISH RUBI.

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

(Continued from p. 47.)

112. SHETLAND.

R. idæus.—R.

R. saxatilis. "Tate, Catalogue," "Top. Bot."—R.

SYSTEMATIC LIST.

R. idæus, L. Recorded from every vice-county in Scotland, on trustworthy evidence.

var. *obtusifolius* (Willd.). Very local. 72, 85, 86, 93, (89), [88].

var. *asperrimus* (Steele). Recorded by Mr. Rogers from Callander Crags, in W. Perth. The variety (with pale amber-coloured ripe fruit) is occasionally found, e.g. in v.c. 92 and 93. Mr. Rogers suggests that it is probably of garden origin usually.

R. fissus, Lindl. 72, 77, 86, 87, 88, 90, 91, 97, 105, 106, 111, (96), [73, 89, 92, 98, 99], 75.

R. suberectus, Anders. 86, 87, 88, 96, 97, 98, 101, 105, (73), [72, 74, 76, 81, 89, 90, 92].

- R. Rogersii*, Linton. Distinguished from others of group *Suberecti* only in 1894. 75, 76, 80, 86, 87, 88, 91, 94, 95, 96, 98, 99, 100, 105, 106, 107.
- R. sulcatus*, Vest. [89], 101.
- R. plicatus*, Wh. and N. 74, 75, 76, 86, 87, 88, 91, 92, 94, 96, 97, 98, 99, 103, 104, 105, 107, (102, 106), [72, 77, 81, 89, 90, 100].
var. *hemistemon* (P. J. Muell.). 86, 95, 96, 106, 109, [88, 89], 92.
- R. nitidus*, Wh. and N. 97, 99 [88].
subsp. *opacus*, Focke. [107].
- R. affinis*, Wh. and N. Records under this name exist for several vice-counties, but all are untrustworthy, owing to the true plant not having been properly understood in Britain formerly. [77, 87, 88, 89], 72, 73, 74, 76, 83, 94, 95, 97, 98, 100, 103 error, 105.
- R. latifolius*, Bab. 84, 88, (83, 89, 92, 97).
- R. imbricatus*, Hort. [88, 89].
- R. carpinifolius*, Wh. and N. 97, 98, 103, 105, (93), [88, 89], 72, 100? 110.
- R. incurvatus*, Bab. 74, 87, 88, 105, (76, 89, 110), (82, 83, 84, Sonntag).
- R. Lindleianus*, Lees. 75, 76, 86, 87, 88, 89, 90, 97, 98, 99, 100, 101, (72, 74).
- R. rhamnifolius*, Wh. and N. 74, 75, 76, 85, 86, 87, 98, 100, (73, 88, 89, 92, 95), 72, 97 in error, 101, 105.
subsp. *Bakeri*, F. A. Lees. 86, 98, 101.
- R. nemoralis*, P. J. Muell. 87.
var. *glabratus*, Bab. 86, 85.
- R. Scheutzii*, Lindeb. Published as a British form only in 1897. Often abundant in Scotland (especially in the midland vice-counties), less so in England. 73, 74, 75, 76, 86, 87, 88, 96, 97, 98, 99.
- R. dumnoniensis*, Bab. (1890). 97, 98, 100, 101, 103, 106.
- R. pulcherrimus*, Neum. (1883). Often common; formerly named *umbrosus* usually in Britain. 73, 74, 75, 76, 87, 88, 97, 98, 99, 100, 101, 103, 104, 105, 110, 72.
- R. Lindebergii*, P. J. Mueller. Used to be included with last in Britain under "*umbrosus*." 75, 85, 87, 88.
- R. villicaulis*. The collective forms included under this name have been recorded from numerous Scotch vice-counties.
subsp. *villicaulis*, Koehl., including var. *insularis*, F. Aresch. 72, 84, 86, 87, 88, 93, 95, 96, 97, 98, 100, 104, 105, 106, 107, 108, 110, [89], 103.
subsp. *Selmeri* (Lindeb.). 73, 74, 75, 76, 84, 86, 87, 88, 89, 96, 97, 98, 99, 100, 101, 103, 105, [77, 95, 106], 104.
subsp. *calvatus*, Blox. [105].
subsp. *rhombofolius*, Weihe. 87, [88, 110].

- R. gratus*, Focke. 87, 99, 104, 110, [88], 89.
R. ramosus, Briggs. [88, 89].
R. thyrsoides, Wimm. 93, [92].
R. argentatus, P. J. Muell. 74.
R. rusticanus, Merc. (*R. discolor*, auct.). Not frequent in Scotland.
 74, 75, 89, 91, 100, 110.
 [*R. macrophyllus* (agg.). Reported from 72, 81, 84, 86, 87, 88, 92,
 95, 96, 97, 98, 100, 105, 106.]
R. macrophyllus, Wh. and N. 72, 76, 86, 87, 97, 98, 100, [81, 88,
 89, 92, 95], 105.
 subsp. *Schlechtendalii* (Weihe). 74, 98, 106, (84, 96), [87].
 var. *macrophylloides* (Genev.). 88, 98.
 var. *amplificatus* (Lees). (72, 88, 100), 89.
R. Salteri, Bab. [88, 89].
R. Colemanni, Blox. [89].
R. Sprengelii, Weihe. 73, 74, [89].
R. micans, Gran. and Godr. [88, 107].
R. hirtifolius, M. and Wirtg. 96.
 var. *danicus*, Focke. 74, 77, 86, 87, 88, 89, 95, 96, 97, 98,
 103, 108, ? 102.
 var. *mollissimus*, Rogers. 108 error.
R. pyramidalis, Kalt. 74, 75, 87, 88, 96, 98, 100, 105, [89], 97
 error, 103 error.
R. leucostachys, Schleich. 107, (81), 105.
R. Borceanus, Genev. [97].
R. cinerosus, Rogers (1896). 98.
R. mucronatus, Blox. 84, 85, 86, 87, 88, 89, 91, 92, 93, 96, 97,
 98, 99, 100, 103, 104, 105, 106, 107, 110, (81, 82, 102).
R. Gelertii, Frider. 106.
R. anglosaxonicus, Gelert.
 subsp. *raduloides*, Rogers. 74.
R. melanoxyton, M. and Wirtg. 75, 76, 86, 87, 88, 93, 94, 95,
 96, 98.
R. infestus, Weihe. 74, 75, 76, 86, 87, 88, 94, 97, 98, 99, 100,
 (93), [72].
R. Borreri, Bell Salter [74].
R. Drejeri, G. Jens. 86, 87, [88].
R. radula, agg. Not given in the "Handbook." 72, 73, 80, 85,
 89.
R. radula, Weihe. 74, 75, 81, 84, 85, 86, 87, 88, 90, 93, 94, 95,
 99, 103, 104, 105, 106, 107, 110, [72, 73, 79, 83, 89, 91].
 subsp. *anglicanus*, Rogers. 87, 99, 101.
 subsp. *echinatoides*, Rogers. 84, 86, 87, 88, 92, [98].
 subsp. *sertiflorus* (P. J. Muell). 76, 87, 98, 99, 101.
R. echinatus, Lindl. 86, 99, (76, 81, 88, 89, 95).
R. oigocladus, M. and Lefv.
 var. *Newbouldii* (Bab.). 85.

- R. Babingtonii*, Bell-Salter. [89].
 [*R. Lejeunei*, Wh. and N. 89].
R. cavatifolius, P. J. Muell. [88?, 89].
R. "humifusus." 72 and 87, "Top. Bot."].
R. thyriger, Bab. [104].
R. foliosus, Wh. and N. 93, 94, 89.
R. rosaceus, Wh. and N. (88, 89), 110?
 var. *hystrix*, Wh. and N. 74 [88, 89].
 subsp. *infecundus*, Rogers. 97, 99.
 subsp. *Purchasianus*, Rogers. [91, 92].
R. Koehleri, Wh. and N. [87, 88, 89], 72, 73.
 subsp., *dasyphyllus*, Rogers (var. *pallidus*, Bab.). 73, 74, 75.
 76, 87, 94, 98, 100 (72, 88, ? 89).
R. plinthostylus, Genev. Very doubtful as Scotch [73].
R. serpens, Wh. and var. *rivularis*, M. and Wirtg [86].
R. hirtus, W. and K. [73].
 [*R. saxicolus*, P. J. Muell. 87.]
R. ochrodermis, A. Ley. 80.
R. dumetorum, Wh. and N., excluding the varieties named below.
 106.
 var. *ferox*, Weihe. 81.
 var. *britannicus*, Rogers. 86, 87, 88.
 var. *diversifolius* (Lindl.) (89, 106), [86].
 var. *tuberculatus*, Bab. (88, 89), [86], (83 Sonntag).
 var. *fasciculatus*, P. J. Muell. [88, 89, 100].
R. corylifolius, Sm., agg. 72, 73, 74, 75, 76, 77, 81, 84, 86, 87,
 88, 89, 90, 91, 92, 93, 94, 96, 97, 100, 101, 104, 106, 107,
 109, 110, 83, 105.
 var. *sublustris* (Lees). 75, 86, 88, 104, (73, 74, 77, 89, 91,
 92, 94).
 var. *cyclophyllus*, Lindeb. 75, 76, 93, 101, (74, 86, 89, 91,
 92, 100), [88].
R. Balfourianus, Blox. 81, 108, (89), [88], 73, 107.
R. cæsius, L. 74, 75, 76, 80, 84, 85, 86, 87, 88, 91, 109, 73,
 81, 83, ? 89.
R. saxatilis, L. 72-77, 79-81, 83, 85, 87-112, 86.
R. chamæmorus, L. 77, 78, 79, 80, 83, 86, 87, 88, 89, 90, 91, 92,
 93, 94, 95, 96, 97, 98, 105, 106, 107, 108, 109, 72, 75,
 81, 99.
 [*R. arcticus*, L., was recorded in the "English Botany," ed. 1, as found
 on Ben-y-glo (89) and in Mull (103); but the records have
 never been confirmed, and are believed to be due to error.]

In Hennedy's "Clydesdale Flora" (*in memoriam* edition, 1878) the following are mentioned in addition to the records given above. They are not included with the latter owing to uncertainty as to the actual forms to which the records in the "Clydesdale Flora" refer.

Some names are certainly used in a significance different from that given in Mr. Rogers' "Handbook."

R. suberectus, And. 77, 100; *R. affinis*, W. and N. (as var. of *rhamnifolius*), 86; *R. Lindleianus*, Lees (as var. of *rhamnifolius*), 77; *R. incurvatus*, Bab. (as var. of *rhamnifolius*), 98, 100; *R. villicaulis*, W. and N. (as var. of *carpinifolius*), 77, 100; "*R. carpinifolius*, Blox.," given as a synonym of "*umbrosus*, Arrh.," and thus very uncertain as to its true name, 77, 100; *R. macrophyllus*, W. and N. (as a variety of "*R. discolor*, W. and N.), 77; *R. mucronatus*, Blox. (as var. *mucronulatus*, Bor. of *R. carpinifolius*, Blox.), 77; *R. radula*, Weihe (as a variety of *R. glandulosus*, Bell), 77, 100; *R. echinatus*, Lindl. (as var. *rudis*, Weihe, of *R. glandulosus*, Bell), 100; "*R. glandulosus*, Bell," 98, 100; *R. dumetorum*, W. and N. var. *diversifolius*, Lindl. (as a variety of *R. carpinifolius*, Blox.), 100; var. *tuberculatus*, Bab. (as variety of *R. carpinifolius*), 76, 77; *R. Koehleri*, W. and N. (as a variety of *R. glandulosus*, Bell), 76, 100; *R. cæsius*, L., 76, 77.

In Sonntag's "Flora of Edinburgh" (1894), the following are mentioned in addition to those noted above, viz. *R. suberectus*, And., 83, 85; *R. carpinifolius*, Blox., 83, 85; *R. glandulosus*, Bell, 82, 83, 86; *R. echinatus*, Lindl., 83; *R. Koehleri*, W. and N., 83, 84, 86; *R. cæsius*, L., 83.

In Mr. P. Ewing's "The Glasgow Catalogue of Native and Established Plants," 1899, several forms are noted under districts not noted above, a number of them with a query:—*R. suberectus*, And., "75, Smith? 99, Watt?"; *R. Lindebergii*, P. J. Muell, "100, King?"; *R. villicaulis*, Koehl., 77? 99 Watt, 101 Ewing?; *R. pubescens*, Weihe, 103 Ewing; *R. macrophyllus*, W. and N., 102; *R. rosaceus*, W. and N., 97, 110?; *R. Koehleri*, W. and N., 98 King?, 99 Watt?, 100?; var. *dasyphyllus*, Rogers (as *pallidus*, Bab.), 99?; "*R. fusco-ater*, Weihe," 98 Druce?; *R. corylifolius*, Sm., 98 King?, 99 Watt?, 102 Ewing?, 103 Ewing?; *R. cæsius*, L., 77 Ewing?, 97 Ewing?, 98 King?, 99 Watt?, 100 King?, 101 Ewing, 110 Somerville?.

ROSA PINIPINELLIFOLIA × RUBIGINOSA IN ABERDEENSHIRE.

By W. BARCLAY.

IN the 'Notes on Aberdeenshire Roses' which appeared in the "Annals of Scottish Natural History" in January 1902,

there occurs on page 43 the following:—"No. 69 from near Turiff, appears to be very different. It puts me very much in mind of *R. pinipinellifolia* \times *rubiginosa*; but the specimens are not sufficient to decide the matter, and therefore I reserve my opinion till I can see better specimens, or, if possible, the bush itself."

In July of last year, when staying at Keith, I took the opportunity of journeying to see the bush in question. Guided by directions from Professor Trail, I had no difficulty in finding it on the Huntly road about two miles from Turiff. A careful examination of its characters convinced me that it was indeed what I had suspected, viz. the hybrid *R. pinipinellifolia* \times *rubiginosa*. Moreover, the leaves had a faint but decided sweet-briar odour not perceptible on dried specimens. What rather surprised me was that I saw neither *R. rubiginosa* nor *R. pinipinellifolia* in the neighbourhood. On proceeding about half a mile farther, I came to a little hamlet, and on the bank just outside a garden I found three other bushes of the same hybrid. This was rather suspicious, and whilst returning next day by road to Keith, I kept a good look-out, with the result that I saw, in at least three gardens, the same rose actually in cultivation. Moreover, I found it also being cultivated in two cases at Keith, the cultivators in both cases imagining that it was the real sweet-briar. It would seem, therefore, that the bush which occurs on the roadside near Turiff must also be an escape from cultivation, and that *R. pinipinellifolia* \times *rubiginosa* is still unknown in Aberdeenshire as a native hybrid.

The question may be asked "Is this rose one which has occurred in Nature and has been taken into cultivation, or is it one which has been formed by the agency of man?" There can be no doubt that the hybrid does occur in Nature, for on the bank of the Tay below Caputh bridge, where I found it in 1897, it was growing beside its parents, and was undoubtedly a natural occurrence. But as to its origin in Aberdeenshire I know nothing. Possibly further research may throw some light upon the matter.

Comparing the Aberdeenshire with the Caputh hybrid, there does not seem to be any very material difference.

The former formed a taller and more luxuriant bush, probably from growing in better soil. Its leaflets are on the average larger, and it was loaded with an extraordinary crop of flower-buds, many of which came off in my fingers whilst examining them. Owing to the lateness of the season, not many flowers were expanded at the time of my visit. Those which I saw, however, were smaller than in the case of the Caputh rose, and unlike the latter, seemed not to open out more than half. The sepals in the Aberdeenshire form are larger and more appendiculate than in the Caputh form, and that seems to be the most important distinction. In all essential points, however, the two forms may be said to be identical.

I should be glad to receive any information as to this rose as a cultivated plant.

SOME SCOTTISH MOSSES.

By DR. JAMES STIRTON, F.L.S., ETC.

IN order to enable me the better to continue my efforts towards the determination of mosses in a barren state, I paid, in August of last year, another visit to Tarbert in Harris, mainly for the purpose of securing specimens in proper condition. This I succeeded in doing in only one instance, while I added little or nothing to its Moss-Flora. I picked up a few stems of *Barbula cirrhifolia* (Sch.) = *Mollia hibernica* (Mitt.) growing intermingled with *Hypnum pro-vectum*, described in these "Annals" for April 1902. I reckon this *Hypnum* distinct from any form of *H. molluscum*, with which I had, for many years, identified it. It differs in the pale perichæcium, in the long arcuate capsules both in a young and mature state, in being on a much larger scale, in being prostrate and rooting as it extends along the substratum, in the irregular branching, bearing, in this respect, much the same relationship to *H. molluscum* that *H. falcatum* does to *H. commutatum*, lastly in the large proportion of the leaves being corrugated transversely. In typical specimens,

especially in those from Tarbert, nearly all the leaves are more or less corrugated or undulated.

There was also detected a patch of *Campylopus melaphanus*, described in the "Annals" for January 1899. Accordingly its area of growth is, in all likelihood, rather a wide one. The following description may be reckoned supplementary to the original. The leaves are shortly acuminate, the apex bluntish, very often slightly cucullate and toothed as well as blackened along with the nerve. Near the base the large quadrate cells with thick walls, which also become quickly blackened as well as the nerve, are characteristic features. The structure of the nerve is somewhat peculiar. The cells of the anterior row enlarge downwards, until near the base they often show a diameter of 17μ . The stereid cells show abundantly on the posterior aspect of the second row of cells, although they are rarely absent anteriorly. The constant presence of the posterior bulging cells downwards, even to the middle of the leaf, is another peculiarity.

I have still another *Campylopus* from Tarbert, and, I may add, from Lewis, although the specimens from the latter place are less typical. The peculiarity in this plant is that the nerve is lost below the apex.

CAMPYLOPUS LEUCOPHÆUS, *n. sp.*—Tufts very dense, from one to two inches in height, green above with a pale-white belt beneath, varying in breadth, at times extending nearly to the base, at others occupying only a fourth of the whole, below fuscous; stems slender, simple or sparsely dichotomously divided, interspersed with pale or reddish radicles; leaves straight, nearly appressed to the stem or spreading slightly, broadly lanceolate, tapering, bluntish at apex, which is hairless but toothed, at times roundish and scarcely toothed, concave almost tubular from the middle upwards, margin plane; nerve from a third to a half the breadth of the leaf near the base, tapering and vanishing below the apex, thin, about 32μ thick, composed of an anterior row of small irregular cells, 4 to 6μ diameter, more constant below, of a middle row of regular cells, pellucid, 5 to 9μ diameter, of a third row of very small cells, of bulging posterior cells in the upper third, diminishing down-

wards from 8 to 5 μ , ultimately merging into the posterior elevated and depressed series of cells, of large groups of stereid cells behind and between the middle row, but of much smaller groups in front of the same row; scarcely any alar groups of cells present, but when seen, composed of small groups of hexagonal hyaline cells with thin walls; central basal cells oblong, pellucid, 20 to 28 by 10 to 12 μ , in 2 to 5 rows, shorter outwards, bluntly rhomboid, and near margin of 4 to 8 rows of narrow cells, but not so narrow as usual, viz. 4 to 5 μ broad, upwards more narrowly rhomboid or even triangular, 20 to 27 by 6 to 8 μ , in upper third of leaf and extending to apex, cells oval, 8 to 13 by 6 to 8 μ .

This moss shows a section of the nerve as having a general resemblance to that of *C. brevipilus*, but the posterior bulging cells are well developed. In much the greater proportion of the specimens, the back of the leaf in the upper third shows pellucid tubercles.

In September of last year, I picked up near Killin another *Campylopus* rather densely tufted, having stems about an inch in length, of a dark green above with a peculiar glossy sheen (rather unusual), dingy brown or blackish below, and sparsely interspersed with slender reddish radicles. The leaves are *slenderly acuminated* and slightly falcate above, toothed pretty far down the margin, and with pellucid teeth on the back of the nerve in the same region, much as *C. Shawii*. As, however, the constitution of the nerve is very nearly that of *C. flexuosus* (although it is a little broader) as well as the general areolation, this moss can only be reckoned as a divergence from the latter towards *C. Shawii*. As I am anxious to record such transitions, I shall meanwhile name this *C. flexuosus*, var. *subnitidus*.

In August last *Leptotrichum flexicaule* was got in fruit in two places near Killin, in one by Mr. D. Haggart, in the other by myself. So far as I am aware, this is the first record of this comparatively common moss in a fertile condition in Great Britain.

As is well known, the areolation of this moss is very dense. The cells near the central base, which are very generally the largest in any moss, vary only from 15 to

28 by 5 to 7 μ , and with only a few rows of this character in the present instance, while those above are very minute, viz. from 5 to 8 μ , diameter. During a search for additional corroboration of the cell-formation of this moss, I came across specimens gathered on the mainland of Orkney in 1886. Although comparatively common there, the most typical tufts were got in a boggy place, which, in such a moist climate, must remain more or less moist throughout the year. The specimens gathered were of much the usual size, but the areolation is quite different and distinct.

LEPTOTRICHUM INFUSCATUM, *n. sp.*—Rather densely tufted, pale green above, rusty red below, from one to three inches in height; stems strong, simple or sparingly branched, and only sparingly radiculose, undulating, undulations longer than usual; leaves from a clasping, slightly dilated base with, very often, a projecting bluntish point near the middle, erect in a dry or wet state, longly and narrowly lanceolate subulate, twisted in the upper half, not secund; central basal cells very long, undulating in outline, narrow, with numerous osculating pores between opposite cells in the lowest third of the leaf, 60 to 90 by 5 to 7 μ , outwards cells quickly shorter until near the margin, 15 to 20 by 5 μ . This relationship of the central and marginal cells is retained for more than a half of the leaf, the central cells retaining the cylindrical form far up, although becoming shorter, viz. 18 to 24 by 4 μ ; nearer the apex the cells are small and oval; nerve indefinite near base and flat, about 70 μ broad or $\frac{1}{5}$ the breadth of the basal portion, appearing, however, broader in thin cross section, longly excurrent; margin incurved above base for a considerable distance, plane elsewhere with rather strong pellucid teeth in upper fourth. Structure of nerve shows much as in *Campylopus brevipilus*. Curiously enough, specimens with the usual minute areolation were found close to those described above.

Last year two new stations for *Bryum barbatum* were discovered, the one on Craig Chailleach, the other on King's Seat, both in the Breadalbane Range of mountains. Four stations for this *Bryum* are now known. The station on King's Seat (discovered by Mr. D. Haggart) was in close apposition to that for another curious *Bryum*, indeed single

stems of *Bryum barbatum* were detected amongst those of the other moss, showing distinctly even to the naked eye.

BRYUM LEPTALEUM, *n. sp.*—Tufts compact, one inch in height or a little more, bright green above, rich red or rather a wine-red colour below, densely matted with strong, papillose, red radicles; stems very slender and fragile, simple or dichotomously branched, leaves rather laxly disposed, spreading a little when wet, laxly accumbent when dry but not twisted, broadly or rather roundly and shortly ovate, a little decurrent, very concave, abruptly extended into a fine, tapering, greenish, slightly reflexed acumen (length 14 to 20 μ), length of leaf 75 μ , or including the acumen 90 μ , breadth 60 μ , rarely of greater dimensions; margin plane or slightly platter-shaped below, entire; nerve tapering upwards, breadth near base about 35 μ , reaching only rather more than half the length of leaf; areolation near base oblong or oblongo-hexagonal, 40 to 50 by 16 to 20 μ , near apex smaller, more distinctly hexagonal, 32 to 40 by 16 μ , marginal, in one, at times two rows, longer but scarcely narrower except near the apex where they are about 12 μ broad; all cells chorophyllose. Structure of leaf very thin and delicate.

This moss, I need scarcely say, differs from *B. barbatum* in the shape of the leaf, size, etc. (that of the latter is twice the length of the other, its areolation larger), in the nerve, which is excurrent, and in the disposition of the leaves round the stem.

The leaf of *Plagiobryum Zierii* bears a resemblance to that of the present moss, but in the former the nerve vanishes just at base of apex which is short, and it has larger nearly colourless areolation. The whole habit of *P. Zierii* is besides quite different.

The next moss is also due to Mr. D. Haggart who discovered it on Ben Lawers in July 1902. It may be said to be almost a hybrid between *Dicranum fuscescens* and *D. Starkii* or *D. Blyttii*.

DICRANUM MEDIELLUM, *n. sp.*—The perigonium is always close to the perichætium, except in one instance, where it was found in the axil of the fourth or fifth leaf

below. Tufts lax and indefinite, stems simple or slightly branched, rather more than half an inch long; leaves laxly disposed below, nearly straight, rather broad near the base, lanceolate, shortly acuminate, lengthening upwards and forming at the summit a somewhat uncinat cluster, slightly clasping below; margin plane but leaf incurved in the middle, less so upwards; margin and back of nerve, in upper third or more, sharply serrated as in *D. fuscescens*, the pellucid teeth on the back from 5 to 7 μ in height, in older leaves these serratures are at times apt to collapse as in the deciduous leaves of *Dicranodontium longirostre* or even in *Dicranum fuscescens* itself; auricles not well defined small, of brownish quadrate cells; central basal areolation long and narrow, 50 to 75 by 6 to 9 μ , outwards broader, marginal much shorter, upwards ultimately small, quadrate, rhomboid or even triangular, 7 to 11 μ long, much as in *Dicranum fuscescens*. The upper cells of *D. Starkii* are on the contrary oblong, 18 to 26 by 6 to 8 μ . Nerve narrow, broadening a little upwards, excurrent; seta reddish, long and strong, capsule oblong, curved, scarcely strumose, rather annular at the base, smooth, slightly striated when old, lid reddish, conico-rostrate scarcely half the length of capsule, peristome red, teeth longly acuminate, split to middle or more, barred and minutely papillose; basilar membrane narrow; spores reddish-brown, spherical, smooth, 12 to 16 μ diameter.

DICRANUM INTERLUDENS, *n. sp.*—Loosely tufted, stems generally simple, at times bifurcate, red; lower leaves spreading shorter, elongating upwards, uppermost aggregated into a secund almost cuspidate bundle, lanceolate acuminate, margin plane but the leaf inflexed about the middle or almost tubular, entire except near the apex where it is serrated and shows a few scattered teeth on the back in the same region; nerve slender much as in *D. palustre*, near base from 60 to 80 μ broad, tapering upwards and ending (apparently) at the acute apex, thin 30 to 35 μ thick, slightly convex on the back, smooth and nearly plane in front, composed of a middle row of oval cells, 5 to 9 μ across, and a posterior row of minute cells with numerous stereids on both sides of middle row; near apex nerve on

the back slightly nodular, and presenting a somewhat rectangular outline in cross section much as in *D. palustre*, auricles large well developed, of large oblong cells with thick walls, yellow or reddish yellow; cells in lowest half or less, long, cylindrical, undulating on surface owing to the presence of numerous osculating pores, lateral as well as apical, 50 to 70 by 7 to 11 μ , above, the cells become rapidly smaller and ultimately are rhomboid, bluntly quadrate, triangular or even oval, 14 to 20 by 9 to 13 μ , becoming smaller as the apex is approached.

The leaves of this moss are long, not much shorter than those of *D. majus*, but the areolation differs from that of any of the group of which *D. majus* may be taken as the type. Unfortunately I have very little of this curious moss, and I do not care to make further dissections, as I wish to preserve the few stems left intact. The leaves are much more acute than in *D. palustre*, to which it is closely allied, especially through the constitution of the nerve; but the areolation is quite heterogeneous and differs accordingly from that of *D. palustre* and of the other species of this section of the *Dicrana*, inasmuch as their areolation may be said to be nearly uniform throughout. The only other moss with which this can be associated is *D. congestum*, but the differences of both the lower and upper cells are manifest, inasmuch as the lower cells are those of *D. palustre* and the upper more nearly approach those of *D. fuscescens*. Ben Lawers, 1865.

The occurrence in my herbarium of several specimens of what I have named *Tortula recurvifolia*, now inserted under the genus *Barbula*, and named by Dr. Braithwaite *B. reflexa*, has induced me to institute renewed research concerning it, more especially as the tufts from Ben Lawers show decided differences from the others. Those from this mountain, where it is comparatively common, are of a tawny-yellow instead of the light-brown colour, assumed ultimately by the others in the herbarium. The habit of the plant is also different, as it is on a larger scale and accordingly coarser, and the tufts laxer and much more straggling. The leaves are longer and slightly contracted at the base, and the areolation at central base is quite different from that of the others,

long and narrowly cylindrical, 40 to 65 by 4 to 6 μ , and these long cells continue far up the pagina on its central aspect, while near the margin the cells are abruptly changed into those seen in the upper part of the leaf, viz. roundish, separate, and distinct, and their size as much as half as large again as those in the normal form, 8 to 12 μ ; pagina unistratose; the nerve soon becomes red, is about 55 μ broad, and continues of this breadth for three-fourths up, afterwards it narrows and ends either just below the apex or is prolonged into it, prominent on the back and slightly convex in front, so as to render a cross section broadly elliptical or nearly circular in outline, with a row, in the centre, of 3 to 5 pellucid cells, 9 to 13 μ diameter, and 2 rows of minute cells on either side of the central row, which however, near the apex, degenerate into one row on each side; large hemispherical papillæ (4 to 6 μ in height) cover both surfaces of the nerve as well as both aspects of the pagina, while the margin is merely crenulate or, at times, entire: the margin is closely reflexed to near apex and, near the middle of the leaf, reflexed as much as 60 μ . In the other specimens the papillæ are minute, scarcely half the height and usually bigeminate. I may mention also that the whole areolation of the Lawers' specimens is of a fulvous-yellow, even to the base. Although this moss is barren, I am persuaded that the differences indicated are of sufficient significance to warrant specific distinction. Accordingly I give this moss the name, *Barbula chlorophana*.

Rhacomitrium microcarpum has turned up in two places near Killin, and, in all likelihood, *Didymodon luridus*, on rocks partially covered with earth. As the latter has only been seen in a sterile condition, I fear to pronounce definitely concerning it, as the areolation is scarcely of a sufficiently distinctive character.

ZOOLOGICAL NOTES.

Melanie Mountain Hare in Roxburghshire.—Early in March I received a black variety of the Mountain Hare (*Lepus timidus*) for preservation, which had been shot near Galashiels. It is the first black specimen of this animal that I have ever seen.—ROBERT SMALL, Edinburgh.

Pine Marten in the Highlands.—In January 1903 I saw a magnificent male Marten (*Mustela martes*) in Mr. Small's possession, which he told me came from the neighbourhood of Lairg, East Sutherland. He received it on the 6th December 1902. I do not know the ultimate resting-place of this unusually fine specimen.

On 8th March 1903 I received a good female from Assynt, West Sutherland, trapped at Little Assynt on the 6th March, and the following day a male was captured at the same place. In Assynt one keeper trapped one in 1881, two in 1882, three in 1883, then one in 1886, and none since. On adjoining ground, however, one was obtained about three years ago—say, 1900 or the winter of 1899-1900. In Coygeach five Martens were procured in the winter of 1901-02. Previous to that there had not been one trapped for fifteen years, and the same trapper had got the last one the year before that.—J. A. HARVIE-BROWN.

Polecats in the Highlands.—In Jan. 1903 I saw two Polecats in Mr. Small's premises, which he told me were sent to him from near Lairg, East Sutherland. They were both males, and he received the first on the 4th December 1902, and the second on the 16th December 1902.

Mr. Small also received a third Polecat, also a male, from Loch Inver, on the 10th January 1903, which has been purchased by the authorities of the Edinburgh Museum of Science and Art, and has been added to the National Collection. From West Sutherland I have received a male Polecat which had been trapped upon crofting land at Inchnadamph. I had previously obtained a female, by purchase, which had been trapped by the gamekeeper on Auchmore, about two miles west of Inchnadamph. The male was obtained on the 14th October, and the female about a year before. I may add that between 1880 and 1889 (inclusive) seven had been obtained in all at Inchnadamph, Assynt, and between 1890 and 1899 (inclusive) eighteen were procured.—J. A. HARVIE-BROWN.

Cream-coloured Otter in Islay.—On the 7th of March this year there was captured at Kildalton, Islay, and sent to me for preservation, a cream-coloured Otter (*Lutra lutra*). The specimen was a male and weighed 17 $\frac{3}{4}$ lbs.—CHARLES KIRK, Glasgow.

Bird Notes from North Shetland.—On 16th November last I saw two Red Grouse (*Lagopus scoticus*) on the West Hills, Unst.

On November 23rd an Arctic Skua (*Stercorarius crepidatus*) of the dark variety flew over my head as I was riding through Haroldswick. Several others were reported to me from different parts of Shetland about the same time, and up till 6th December.

A few Lapwings (*Vanellus vulgaris*) were seen by me and others

between 22nd November and 30th December. I saw one again on 8th January.

Many Woodcock (*Scolopax rusticula*) in south end of Unst, between 20th November and 4th December. Many also reported close to Lerwick.

Redbreast (*Erithacus rubecula*). A few here and there since 8th December.

Iceland Gull (*Larus leucopterus*). One, a male, brought to me on 12th December. Several others seen.

Whooper Swan (*Cygnus musicus*). A party of nine flew over my stable in a S.W. direction, time 8.30 A.M., 18th December. They rested for a few minutes on a small sheet of water about a mile away, but being disturbed, rose and flew off to the southward.

Chaffinches (*Fringilla cœlebs*) and Snow Buntings (*Plectrophenax nivalis*) have not been nearly so plentiful this winter as in former years.

Little Auks (*Mergulus alle*), Razorbills (*Alca torda*), and Common Guillemots (*Uria troile*) have come to land in great numbers since 16th January; the heavy storms have been too much for them.

On 20th February I came suddenly upon a Song Thrush (*Turdus musicus*), which was taking shelter from a hail-storm on the lee side of a stone dyke. These birds are very scarce here; I have only seen, I think, three examples.

A Moorhen (*Gallinula chloropus*), an immature male, was caught alive and brought to me on 25th February. It was rather curious to note how the chloroform, with which I killed the bird, completely bleached the colour out of the beak.

A Snowy Owl (*Nyctea scandiaca*), first seen on 5th March, is still haunting the district. This owl is becoming exceedingly rare. Owls of all kinds have been conspicuous by their absence this winter, quite a contrast to last winter, when they were exceptionally abundant.—T. EDMONDSON SAXBY, Unst, Shetland.

A curious incident regarding a Kingfisher.—On the 15th of January a young man brought me a Kingfisher, which he obtained in a remarkable way. He was walking by the bank of the Tay at the Friarton—just below the harbour—when something touched him on the back of his cap. He put up his hand, and feeling something fluffy, which gave a slight struggle, he grasped it, and found it to be a Kingfisher. Just before this he had his attention drawn to a rustling in an alder bush, but did not stop to inquire into the cause. As he made the capture a hawk, which had evidently been after the Kingfisher, flew off and made for Kinnoull.—ALEXANDER M. RODGER, Perth.

Pale variety of the Shag.—A remarkable variety of the Shag (*Phalacrocorax graculus*), showing a decided tendency to albinism,

was obtained near Tarbet, Harris, on the 23rd of February last. I sent the specimen on to Mr. Harvie-Brown, and by him it was sent to the Edinburgh Museum, where it may be seen as a mounted specimen.—ROBERT SINCLAIR, North Harris.

[This specimen—a female—may be described as being white, washed with rufous or brownish buff. The white largely predominates on the under surface, secondaries, wing coverts, and tail. The brownish-buff prevails on the upper surface and flanks. The feathers of the back are deeper brown on their margins, producing that scaled appearance which is characteristic of the plumage of the mantle. The neck, breast, and abdomen are slightly flecked with sandy-buff. The irides are pink; the feet, toes, and webs bright orange yellow; and the bill reddish-brown.—EDS.]

Canada Geese in the Outer Hebrides.—At the end of February there were shot in South Uist two Canada Geese (*Bernicla canadensis*), an adult and an immature male. I believe these to be genuine wild birds. They were wilder than even the White-fronted Geese, and much more difficult to approach, as they keep as a rule on the low muddy flats during the daytime. Mr. Bisshopp, to whom they were sent for preservation, tells me that he has never had this species before, so that they must be rare on the West Coast. Several other Canada Geese are still here (13th March).—DONALD GUTHRIE, South Uist.

Bean Goose in Outer Hebrides.—On 21st March 1903 I received for inspection a very fine specimen of the Bean Goose, in the flesh, from South Uist, along with the accompanying information: "There were three of them about for some time and very wary. As a rule they kept to the highest hillocks, but before a great hail-storm I happened to spot them among some rushes with the telescope, and after a wet crawl I got one of them." The bird weighed $7\frac{3}{4}$ lbs., and is being mounted for Sir Reginald Cathcart's collection.—J. A. HARVIE-BROWN.

Little Gull in Clyde.—My correspondent, Mr. Charles Berry, informs me that on the 16th of December last he shot a Little Gull (*Larus minutus*) near Lendalfoot in the south of Ayrshire. Only two records of the occurrence of this species exist for the Clyde area, as far as I know, and they are both old.—JOHN PATERSON, Glasgow.

Supposed occurrence of *Larus melanocephalus* at Perth.—About the end of January last I saw a Gull on the South Inch here like *L. ridibundus*, in adult plumage, but without black tips to the primaries. At the time I thought it merely a variety of our common Black-headed Gull, but as gulls are not subject to much variation in plumage, I now think that the bird was an example of the Mediterranean *L. melanocephalus*, whose wings are not tipped with black. Unfortunately I did not look for any other distinguishing char-

acteristic of *melanocephalus*, as the probability of the bird being an example of this rare species in Britain did not occur to me at the time. The bird not having been obtained, its identity must remain a matter of conjecture.—T. G. LAIDLAW, Perth.

Richardson's Skua wintering in Shetland.—During the present season, as my friend Mr. Thomas Bowie, Mossbank, informs me, a few Richardson's Skuas (*Stercorarius crepidatus*) have wintered in Yell Sound. In his last letter, dated 16th January, he records the occurrence of single birds up to the previous day, 15th January. The importance of this note lies in the fact that Richardson's Skua is usually considered as merely a summer visitor to Shetland. Its movements, no doubt, largely depend on those of the Arctic Tern and Kittiwake, upon whose energies it relies for its food-supply; Arctic Terns left on 20th September, but large numbers of Kittiwakes—especially immature birds—have remained in Yell Sound throughout the winter.—ROBERT GODFREY, Edinburgh.

Helix lamellata, Jeff., in Midlothian, and Planorbis spirorbis, Müll., in Fife.—By searching among withered beech leaves in Bilston Glen, a few miles south of Edinburgh, on 6th February last, I obtained a dozen specimens of *Helix lamellata*, an interesting addition to the county list of land shells; indeed, the only other record for lower Forth is one by myself for Yester in East Lothian ("Ann. Scot. Nat. Hist.," 1897, p. 47). On 11th February I found *Planorbis spirorbis* rather commonly in flood refuse on the banks of the Orr water, near Thornton; seems to be first record for Fife.—WILLIAM EVANS, Edinburgh.

Chelifer (Chernes) tullgreni, Strand, in Scotland.—In the 1901 vol. of this Magazine (pp. 216 and 241) a Pseudoscorpion found by Mr. Godfrey under stones on a rocky piece of ground near Bo'ness, Linlithgowshire, was recorded under the name of *Chernes phaleratus* (E. Simon). Not being quite satisfied with the identification, I subsequently submitted a specimen to M. Simon, who replied that it was not his *Chelifer phaleratus*, but probably *C. minutus*, Edv. Ellingsen, described in 1896 ("Kristiania Vidensk.—Selskabs Forhandl.") from Norway. I then sent it to Mr. Ellingsen, who wrote me that it differed in several respects, which he clearly set forth, from the type of his species, and suggested that it was probably a form described (but not named) by Alb. Tullgren in 1899 ("Entomologisk Tidskrift") from Sweden, and to which Emb. Strand in 1900 ("Nyt Magazin for Naturvidenskab.") gave the name *Chelifer tullgreni*. I therefore next sent the specimen, and another taken by myself in the same locality in May last, to Mr. Tullgren, who, after comparing them with his type, considers they belong to the same species. With commendable caution he adds: "That this species is a new one I dare not affirm for the present." Two

specimens, apparently of the same form, were got by Mr. Godfrey in May last, near Aberdour, Fife.—WILLIAM EVANS, Edinburgh.

Callidium sanguineum, L., in Edinburgh.—During the early part of last summer (1902) a number (ten) of specimens of this beautiful beetle were obtained in the wood-yard belonging to Messrs. Morrison and Co., cabinetmakers, at Gorgie Road, Edinburgh.—ANDREW PATERSON, Edinburgh.

[Mr. Paterson has very kindly presented three specimens of this interesting species to the Edinburgh Museum of Science and Art. He informs us that the wood upon which the insect was found was, he believes, ash. According to Fowler's "Coleoptera of the British Islands," *Callidium sanguineum* is very rare, having been previously recorded only from London, North Wales, Exeter, and Plaistow. As a Scotch insect it has, we fear, no claim to be called a native, but it is nevertheless interesting to hear of its occurrence even as an introduction.—P. H. G.]

BOTANICAL NOTES AND NEWS.

Plants on Serpentine in Cabrach Parish, Banffshire.—The following plants were seen on or near the Serpentine Rocks at Scores of the Blackwater, in the Duke of Richmond's deer forest in Cabrach Parish, Banffshire, about 2500 feet. This place had evidently not been botanised in the late Professor Dickie's time.

Cochlearia officinalis, Linn.

Polygala serpyllacea, Weihe.

Silene maritima, Withering.

Cerastium alpinum, Linn.

Arenaria verna, Linn.

Rubus saxatilis, Linn.

Rubus Chamæmorus, Linn.

Armeria maritima, Willd.

Narthecium ossifragum, Huds., in wet places.

Festuca serpentina, Wilson, peculiar form of *Festuca*.

Asplenium viride, Huds.

Lastrea dilatata, Presl.

Polypodium vulgare, Linn.

Lycopodium Selago, Linn.

Lycopodium alpinum, Linn.

W. WILSON, Alford, Aberdeenshire.

Aliens at Carolina Port, Dundee.—It may be as well to note the occurrence of the following aliens, which were gathered at Carolina Port, Dundee, by Mr. James Aimer, and sent to me for identification, viz., *Sisymbrium pannonicum*, Jacq.; *Lepidium per-*

foliatum, Lin.; *Lepidium rudemale*, Lin.; *Erysimum cheiranthoides*, Lin.; *Plantago Psyllium*, Lin.—W. BARCLAY.

East Sutherlandshire Notes.—There is little doubt that the Golspie Polygala is *P. oxyptera*, Reichb., var. *collina*, Reichb.

Mr. F. Townsend names some Eyebrights which I gathered at Golspie last August, as follows:—*E. curta*, Fries., var. *glabrescens*, and *E. brevifila*, Burn. and Gremli.

Corrections in my paper in "Ann. Scot. Nat. Hist.," Jan. 1903, p. 40 (of which I saw no proof):—For "*Fraxinus rotundifolia*" read "*Fraxinus excelsior*"; and on p. 38, under "*Lychnis alba* × *dioica*," instead of "Noticed by the Rev. E. S. Marshall at Tongue, and brought by him to me. New to Britain in name, but specimens from Berkshire were distributed through the Exchange Club by me in 1892," read "Noticed by the Rev. E. S. Marshall, Tongue (see "Journ. Bot." 1900, p. 266), and thought by him to be new to Britain in name. But specimens from Berkshire so named were distributed by me through the Exchange Club in 1892."—G. C. DRUCE.

Methods helpful in studying and preserving Fungi.—A valuable contribution to this subject is contained in the Presidential Address of Professor H. Marshall Ward to the British Mycological Society at its meeting in Exeter in 1902 ("Trans. B. M. Soc.," March 1902, pp. 166-178). In it are treated methods of preserving fungi large and small, dry and in fluids, of preparing them for microscopic examination, including staining and section-cutting, and of cultivating the fungi under conditions to prevent admixture with other forms and to secure their healthy growth.

New Scottish Fungi.—The following have been recently recorded in journals:—*Humaria carneola*, Wint., on living moss, Sutherlandshire; and *Microsphaera Bäumléri*, P. Magn., "on *Vicia sylvatica*, New Pitsligo" (probably for Aberdour, N. Aberdeenshire, as *V. sylvatica* is locally abundant there, but not at New Pitsligo—J. W. H. T.), both recorded by E. S. Salmon ("Quekett Micr. Journ.," ser. 2, vii. pp. 371-372, pl. xx.); *Sporormia fimetaria*, de Not., on cow-dung, Aboyne, G. Masee and E. S. Salmon ("Ann. of Bot.," xv. p. 347, pl. xvii. f. 19); *Thelephora vitellina*, Plowr., on dead fir wood, Boat of Garten, Aug. 1901; and *Polyporus flavo-virens*, Berk. and Rav., under *Pinus sylvestris*, Boat of Garten, Sept. 1900 ("Trans. Brit. Myc. Soc.," March 1902, pp. 199-200).

Late Blossoming.—In looking over my notebook for the past season I have found two entries of late blossoming which may be interesting:—

Sept. 21, 1902.—*Cairneyhill*, Fifeshire. Saw a single spray of hawthorn blossom perfectly fresh. The spray itself with rather greener leaves than the rest of the hedge.

October 6.—Mountain Cross, near West Linton (3 miles). A hedge of privet in full bloom. Some of the flowers had turned

brownish, but many were newly out, and there was no trace of berries.—JAMES WATERSTON.

Viola Pesneaui (*Rouy* and *Foucaud*) in Scotland.—This is the Pansy which I recorded as *V. Curtisii*, from the Torr Sands in Wigtownshire, in this Journal, 1899, p. 32. Mr. E. G. Baker has kindly identified it, and he puts it under *V. Curtisii* as a variety.—G. C. DRUCE.

Utricularia ochroleuca, *R. Hartm.*, in "Botaniska Notiser," 35, 1857.

U. brevicornis, Celak., "Oest. Bot. Zeitschr.," 253, 1886.

U. intermedia, Hayne, sub-sp. *ochroleuca*, Lange, "Handb. Danske Fl.," 524, 1887.

This plant, formerly supposed to be confined to Sweden and Norway, has been found in Finland, Denmark, Germany, and Bohemia, and has been described as a species by Celakovsky (*l.c.*); but Ascherson pointed out that it was the same as *R. Hartman's* plant.

The object of this note is to ask botanists who may visit the Isle of Skye to gather any *Utricularias*, especially near Broadford. In this difficult genus specimens without flowers are almost impossible to determine with certainty; but I possess a delicate specimen, gathered by Mr. Symers Macvicar in Skye, that I think may prove to be the above species, though at present this can hardly be called more than a surmise. I have beautiful specimens of the Swedish plant, gathered by *R. Hartman* himself, *e loco classico*, and sent me by Dr. Otto Nordstedt.

In the "Trans. Bot. Soc." of Edinburgh, 110-112, 1894, the Rev. E. F. Linton called attention to several specimens of the genus in the Edinburgh Herbarium, as well as others, and urged the collecting of specimens.

The specimens gathered by the Rev. E. S. Marshall at "Moss of Inschock" I quite think must be referred to *U. Bremii*, Heer. With regard to size and development, the species vary greatly, and Prahl. describes a *f. gigantea* of *U. neglecta*, Lehmann, over three feet long ("Fl. Schleswig-Holstein," 173, 1890).

British specimens of *neglecta* (*G. Nicholson* and *Beckwith*) may be referable to the var. *macroptera*, *G. Brückner* ("Arch. Fr. Nat. Meck.," vii. 234).

"Fl. Danica," t. 1262, has been cited for *U. intermedia*, Hayne, and was so by Lange at p. 42 of "Nom. Fl. Dan.," 1887; but at p. 170 he refers it to *ochroleuca*.

One would suppose it would be very difficult to detect hybrids between these plants, but Melander has described a *U. litoralis* = *U. ochroleuca* × *intermedia* ("Bot. Notiser," 175, 1887). Madauss has described a *U. spectabilis* ("Arch. Ver. Fr. Nat. Mecklb.," xxvi. pp. 49-55, 1873) which Ascherson and Graebner ("Fl. d. Nord. Flachlander," 650, 1899) make merely a synonym of *neglecta*.—A. BENNETT.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—January-March 1903.

[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 FROM ABERDEEN, January to February. W. Wilson. *Zoologist* (March 1903), p. 108. Refers to the Snow Bunting, Bullfinch, Lapwing, and Lark.

COLLECTING IN ROSS-SHIRE, 1902. W. M. Christy. *Entomologist* (March 1903), pp. 72-73. Refers to *Lasiocampa callunæ*, and a few other species of Lepidoptera.

RETROSPECT OF A LEPIDOPTERIST FOR 1902. By Louis B. Prout, F.E.S. *Ent. Record* (February 1903), pp. 29-33. Scottish records referred to.

TROCHILIIUM CRABRONIFORME IN SCOTLAND. William Evans. *Ent. Record* (January 1903), p. 23. Seven imagines taken at Luffness and Aberlady, several larvæ obtained near Midcalder, and pupæ taken at Newpark.

REARING PETASIA NUBECULOSA. John F. Musham. *Ent. Record* (January 1903), p. 21. Pupæ reared from ova deposited by a female received from Rannoch.

SPECIES OF THE GENERA EMMELESIA AND EUPITHECIA TAKEN IN ROXBURGHSHIRE. By W. Renton. *Entomologist* (March 1903), pp. 60-61. Twenty-nine species recorded.

SPILODES STICTICALIS AND BOTYS TERREALIS IN SCOTLAND. Chas. G. Barrett. *Ent. Mo. Mag.* (March 1903), p. 65. Refers to the occurrence of these species in Fife (see *Annals*, 1903, p. 53).

FURTHER NOTES ON THE TORTRICIDÆ AND TINEINA OF DUMBARTONSHIRE. By J. R. Malloch. *Ent. Mo. Mag.* (January 1903), pp. 2-4. Fifteen species of Tortricidæ, twenty-six of Tineina are recorded in this paper.

RETROSPECT OF A COLEOPTERIST FOR 1902. By Prof. T. Hudson Beare. *Ent. Record*, January 1903, pp. 1-5, and February 1903, pp. 34-35. Several Scottish records referred to.

COLEOPTERA IN SCOTLAND. T. Hudson Beare, F.E.S. *Ent. Record* (March 1903), p. 77. Sixteen species taken at Dalmeny.

COLEOPTERA IN THE NEIGHBOURHOOD OF PEEBLES. James E. Black. *Ent. Record* (March 1903), p. 77. Nine species referred to.

COLEOPTERA AT INNERLEITHEN IN PEEBLESSHIRE. T. Hudson Beare. *Ent. Mo. Mag.* (February 1903), p. 39. Forty-seven species are referred to.

NOTES ON COLEOPTERA TAKEN IN WIGTOWNSHIRE. J. G. Gordon, F.E.S. *Ent. Record* (February 1903), pp. 46-49. A long list of species taken in the neighbourhood of Corsemalzie.

APHODIUS TESSULATUS, PAYK. T. Hudson Beare, F.E.S. *Ent. Record*, January 1903, pp. 17-18, and March 1903, p. 76. Refers to the capture of this species on Arthur's Seat, Edinburgh.

ABDERA TRIGUTTATA, GYLL. James E. Black. *Ent. Record* (January 1903), p. 17. One example taken at Newtonmore, Inverness-shire, on 10th September 1902.

COCCINELLA II-PUNCTATA, VAR. BREVIFASCIATA, WEISE. T. Hudson Beare, F.E.S. *Ent. Record* (February 1903), p. 49. Refers to specimens taken on the Culbin sandhills on the Moray coast, and on the sandhills at Machrihanish Bay, in the Mull of Kintyre.

PSECTRA DIPTERA, BURM., IN SCOTLAND. Bertram M'Gowan. *Ent. Mo. Mag.* (January 1903), p. 14. A male captured on the banks of the Nith, between Kingholm and Kelton, on 29th July 1902. This is the first Scottish and third British specimen recorded.

BOTANY.

OBITUARY NOTICE OF THE LATE CHARLES STUART, M.D. By Commander F. M. Norman, R.N. *Trans. Bot. Soc. Ed.* 1902, pp. 191-194.

NOTES FROM THE ARCHIVES OF THE BOTANICAL SOCIETY (of Edinburgh) ON ITS ORIGIN, HISTORY, AND PRIVILEGES. By Symington Grieve. *Trans. Bot. Soc. Ed.* 1902, pp. 194-220.

THE TRACK OF HEREDITY IN PLANTS AND ANIMALS. By J. Beard, D.Sc. *Trans. Bot. Soc. Ed.* 1902, pp. 126-155. An important discussion of "the broad and obvious bearings of certain" (of the author's) "results, relating to the history of germ-cells, on the general problem of heredity."

FUNCTIONAL INERTIA—A PROPERTY OF PROTOPLASM. By David F. Harris, B.Sc., M.D. *Trans. Bot. Soc. Ed.* 1902, pp. 169-178.

THE LATENT LIFE OF PLANTS. By R. A. Robertson, M.A., B.Sc. (*Trans. Bot. Soc. Ed.* 1902, pp. 178-191).

HISTORY AND CULTURE OF THE GRAPE VINE. By J. Leslie. Part II. Culture. *Trans. Perth. Soc. Nat. Sci.* III. pp. 184-190.

A BOTANICAL SURVEY OF SCOTLAND. By William G. Smith, B.Sc., Ph.D. *Scot. Geogr. Mag.* 1902, pp. 132-139; read at the

Meeting of the British Association in Glasgow, 1901.—This is a brief account of Robert Smith's work and methods in tracing plant-associations in Scotland.

BOTANICAL SURVEY FOR LOCAL NATURALISTS' SOCIETIES. By Dr. Wm. G. Smith. *Naturalist*, 1903.

THE ORIGIN OF THE BRITISH FLORA. By J. G. Goodchild, F.G.S., F.Z.S. *Trans. Bot. Soc. Ed.* 1902, pp. 234-248. A discussion of the evidence from a geological standpoint, individual species not being discussed.

NOTES ON THE DRAWINGS FOR "ENGLISH BOTANY." By F. N. A. Garry, M.A. *Journ. Bot.* 1903, Appendix, pp. 1-32, down to *Cerastium triviale*. Of historical interest.

THE BOTANICAL RARITIES OF A SUBALPINE PARISH (Kells, in Kirkcudbrightshire). By James M'Andrew. *Trans. Bot. Soc. Ed.* 1902, pp. 166-169.

THE PHANEROGAMIC FLORA OF THE CLOVA MOUNTAINS IN SPECIAL RELATION TO FLOWER BIOLOGY. By J. C. Willis, M.A., and J. N. Burhill, M.A. *Trans. Bot. Soc. Ed.* 1902, pp. 109-125.—A valuable contribution to the subject, and also to the altitudes reached by the various species in Clova.

CORRECTIONS. By Rev. E. S. Marshall. *Journ. Bot.* 1903, pp. 25-26. "*F. pallidiflora*," Jord., and *F. muralis*, Gondar, recorded by E. S. M. (*Journ. Bot.* 1901, p. 267) from Orkney are determined by Mr. Pugsley to be *F. purpurea*, Pugsley, and *F. confusa*, Jord., *vera*.

THE EUROPEAN SPECIES OF THE GENUS PRIMULA. By Rev. David Paul, LL.D. *Trans. Bot. Soc. Ed.* xxii. 1902, pp. 89-105, with description of species and varieties.

EUPHRASIA SCOTICA. By F. Townsend. *Journ. Bot.* 1903, pp. 57-58.—Mentioned as known to him to occur in the counties of Aberdeen, Argyll, Banff, Elgin, Inverness, Nairn, Orkney, Shetland, Perth, Ross, and Sutherland; and also beyond Scotland—in two counties of England, one of Wales, seven of Ireland, and in the Faroe Islands.

AULACOMNIUM TURGIDUM, SCHWGR., ON BEN MORE. *Proc. Perth. Soc. Nat. Sci.* 1902, IV. p. cxvii.

SQUIRRELS EATING FUNGI (CORTICUM). By Mr. M'Intosh. *Proc. Perth. Soc. Nat. Sci.* IV. pp. cxvii-cxix.

A NEW BRITISH HEPATIC (*Geocalyx graveolens*, Nees). By Symers M. Macvicar. *Journ. Bot.* 1903, pp. 18-19. With description and diagnosis, and notes of occurrence on seashore near Kyle of Lochalsh, West Ross.

HEPATICÆ OF BEN LAWERS DISTRICT. By Symers M. Macvicar. *Trans. Bot. Soc. Ed.* 1903, pp. 220-232. A long list, in which several are recorded as new to Britain.

ON THE HEPATICÆ OF BALMORAL, ABERDEENSHIRE. By G. Stabler. *Trans. Bot. Soc. Ed.* 1902, pp. 249-254. A full list of species observed in the district, with occasional notes from other parts of Braemar also.

NOTES ON RECENT EXPERIENCES WITH DRY ROT. By Dr. James Hunter, F.R.S.E. *Trans. Bot. Soc. Ed.* 1902, pp. 106-109.

FUNGI NEW TO BRITAIN. By Annie Lorrain Smith. *Trans. Brit. Mycol. Soc.*, March 1902, pp. 192-201.—An enumeration of species recently recorded, with descriptions, or with references to the journals in which they are named. They include several from Scotland.

THE FUNGI OF GERMINATING FARM-SEEDS. By Annie Lorrain Smith. *L.c.*, pp. 182-186, pl. ix.—This notes the fungi observed in seeds and fruits of agricultural plants germinating under control in saucers. The plate is reproduced from *R. Microsc. Soc. Journ.*, and shows nine species—three of them regarded as new, one being referred to a new genus.

NOTES ON FRESHWATER ALGÆ, III. By W. West and G. S. West. *Journ. Bot.* 1903, pp. 33-41.—Among many novelties describes *Thamniochaete aculeata*, n. sp., from Balallan, Lewis, Outer Hebrides, and from Galway, Ireland.

CRYPTOGAMIC EXCURSION TO KINNOULL HILL AND KINFAUNS, on October 12, 1901, conducted by Dr. D. Paul. *Proc. Perth. Soc. Nat. Sci.* III. pp. cix.-cxi.—A list of Basidiomycetes observed is given.

NOTES ON CERTAIN PERTHSHIRE FUNGI. By James Menzies. *Trans. Perth. Soc. Nat. Sci.* III. 1902, pp. 175-184, with 2 plates.

BOOK NOTICE.

A MANUAL OF PALÆARCTIC BIRDS. By H. E. Dresser, F.L.S., F.Z.S., etc. Part I. (London: Published by the Author, 3 Hanover Square.)

A handy and authoritative volume on the Birds of Europe has always been a great desideratum, and it has at last been more than supplied by the book under consideration. The work, however, as its title implies, covers a wider area, and furnishes a complete account of the ornithology of that great natural region—the Palæ-

arctic—of which Europe, along with Northern Africa, forms the Western moiety, and Northern and Central Asia the Eastern and somewhat greater portion. This adds a comprehensiveness to the work which is in itself an item of considerable value; the more so because none other is devoted to the avifauna of what is naturally to us the premier zoological region of the globe. It also makes the book specially useful to the student of geographical distribution; while to those who are interested in faunal work it affords descriptions of practically all the species which are likely to occur anywhere within the European area.

It is fortunate that the book is the production of one most fitted for the task, namely, the author of the "Birds of Europe," a great work in eight quarto volumes, and one of the most useful ever written in the interests of ornithology.

As to the treatment of the subject, it is really wonderful what an amount of information Mr. Dresser has been able to give regarding each of the numerous species. Thus, in the part before us, no less than 709 species are dealt with in less than 500 pages; and yet we have for each of them—(1) necessary synonymy and references to literature; (2) the name of the species in the language of each of the countries of Europe in which it occurs; (3) a concise description of the plumage at various seasons and ages; (4) a sketch of its geographical distribution; and (5) a short account of habits, food, nature of haunts, nesting sites, description of eggs, etc.

The work is to consist of two parts—part two is now in the press—and will form a volume of some 1000 pages, though not at all a bulky one. It will afford the information indicated concerning some 1400 species, and contain a map of the Palæarctic Region and a frontispiece reproducing a drawing by the late Joseph Wolf. The price per part is only 12s. 6d., or 25s. for the complete work.

We congratulate Mr. Dresser on the completion of this latest and most useful piece of work, and cordially recommend it to all those who are interested in birds, British or European, or in the subject generally.

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THE LOCH-AN-EILEIN OSPREYS

By C. G. CASH, F.R.S.G.S.

AMONG Scotland's many beautiful places, the Rothiemurchus Loch-an-Eilein deservedly takes a high place; for here are present all the picturesque elements of Highland scenery—great mountain mass, steep crag, narrow pass, forest of fir and birch, tangle of juniper and heather, rushing stream, and placid loch with its solitary island crowned by the ruins of an old castle. And these elements are so arranged and combined as to make a picture that satisfies the fastidious eye of the trained artist, and delights the less sophisticated lover of nature. An additional item of interest is afforded by the fact that the southern turret of the ruined castle has often been the home of the Osprey (*Pandion haliaëtus*), one of the rarest and most beautiful of our birds of prey. There is, perhaps, no other of our raptors at once so interesting and so easy to observe. The dark, stern golden eagle will not brook observation, but sails off indignant on majestic wing; the smaller falcons and hawks dart in arrowy flight from the presence of man. But the Osprey allows of moderately near approach, and permits itself to be inspected as it stands or sits on its nest, or as it soars in wide curves above the loch. At rest or in motion, it is indeed a beautiful

bird: the varied light and dark of its plumage, the large dark gleaming eye, the handsome, alert pose, the wide-spread wing, broad fan-tail, and powerful, easy flight—all mark it as a bird of noble type, and make it very attractive and charming. Certainly its presence at Loch-an-Eilein gives the crowning touch to the beauties of that place; and, should the bird not come, one feels its absence as that of an intimate friend, and wishes the words of one of our minor poets were true:—

King Pandion is not dead;
Loch-an-Eilein to this day
Sees each year his wings outspread,
Hails his coming, owns his sway.

In "The Vertebrate Fauna of the Moray Basin," 1895, Mr. Harvie-Brown gave a summary of the history of the Loch-an-Eilein Ospreys up to that date; and I purpose here to supplement his records from notes made by me from that time to this, premising, however, that my jottings are merely those of a holiday-maker, and not the records of a professed naturalist.

I first saw the Ospreys in August, 1894. I was staying for that month at Loch-an-Eilein Gate, and had many opportunities of seeing the birds, either when I went for a morning swim in the loch, or in the afternoons, which were often spent at the loch side. When I was in the water the bird would fly above me, uttering its screaming cry. I was at first somewhat apprehensive of attack, but afterwards came to regard the flight of the calling bird as adding pleasure to the morning swim.

That year the birds had nested at the castle, and hatched two young ones. I saw the parent bird, presumably the female, feed the young with fish, and noted the gradual growth in the strength of voice of the young birds. On August 24th I saw one of the young birds make its first flight, and the other one trying its wings without rising from the nest. The next morning all the birds were flying. There was but one on the nest when I went to the loch just after 7 A.M., and that one at once rose and flew away. On August 26th, in the forenoon, three birds, I suppose the mother and her two young ones, were flying about near the

nest when a heron flew across the loch and was driven away by the mother bird.

In 1895 I was in the same neighbourhood during August and part of September, but saw the Ospreys only once, as far as I can remember. They had built on the castle, but I have no certain information as to whether they had bred. About the middle of September a cormorant put in an appearance at the loch, and there were fears lest its presence should disturb the Ospreys. Mr. Hinxman, who was there at the time, advised that the cormorant should be shot; but I am told that its departure made this unnecessary. I understand that cormorants, though not previously unknown at Loch-an-Eilein, are somewhat rare visitors there.

In 1896 I was at Loch-an-Eilein during August, and saw the Ospreys several times. They had nested at the castle, and had hatched. I saw three birds flying together, but did not ascertain whether there were two young or only one. The probability is, however, that the three birds were the mother and two young, for I think that the male bird was less tolerant of observation, and usually kept out of sight.

In 1897 I was at Loch-an-Eilein during the latter half of April and during the whole of August. I am told that the two birds arrived on March 29th. They were still at the castle in the summer, and I often saw them. There was then certainly one young bird, and there may have been two. On August 9th, when I was near Loch Gamhna, the tributary loch to the south of Loch-an-Eilein, I saw the two Ospreys flying. One of them alighted on a dead tree near the loch, and was eating an eel. It seemed to grasp the eel between its claw and the tree, and tore at it with its beak, part of the eel dangling below the bough. At the foot of the tree I afterwards found débris of fish. On August 18th I saw one bird fly to the nest on the castle, and shortly afterwards a second bird came to it, bringing a fish, which it carried in its characteristic fore-and-aft manner. Then the second bird flew about, dipping into the water, once somewhat deeply. I suppose it was attempting to catch fish, but it did not get anything. While I was watching the bird did not dive, but, flying along just above the surface of the

water, dipped its feet and legs. Once the under surface of the body touched the water, and several times just the points of the wings did so. The first bird rose from the nest carrying the fish, and both birds flew away. On August 21st I twice saw the pair of birds flying very high. They rose so high that they were lost in the vertical distance. I have similarly seen herons circle upwards over Loch-an-Eilein till the eye could distinguish them no longer, and have often wondered what birds might be high above us and looking down at us.

In 1898 I was at Loch-an-Eilein during most of April, and in the neighbourhood all August and part of September. The Ospreys came on March 29th, and were busy building on the castle when I first saw them on April 9th. On April 11th, in the early morning, I watched them busy with stick and turf, and was amused to see difference of opinion between them as to "furnishing"; the female not approving of the male's selection and placing of turf, he, of course, meekly permitting his arrangement to be altered. That morning I saw the male twice attempt to couple, but apparently without success. The following morning I saw the action a third time, and apparently successful. The male bird rose on wing a few feet above the female and gently dropped toward her, she rising high on her feet to receive him. The action had about it a gracefulness and delicacy that was entirely in keeping with what I feel to be the general dignity that seems to belong to these birds.

In the summer I did not see the birds at all. Apparently they did not hatch at the castle nest; but four birds were seen flying together near Glen Feshie, and it seems probable that they had nested in that neighbourhood. In September, when it was certain that the birds were not using the castle nest and had apparently gone away, I obtained permission to visit the nest, and found it empty and bare, made of branches and twigs, with no lining of any kind.

In 1899 I was at Rothiemurchus during August and part of September. This was the year of the forest fire, which began on August 24th and so seriously damaged the stretch of hillside on the south-east of Loch-an-Eilein (see "Cairngorm Club Journal," January 1900). I did not see the

Ospreys that year at all. A pair of the birds came to the castle on or about April 3rd, and nested there. They were followed by a third bird. Opinions differ as to whether the third was a male or a female, the former seeming the more probable. There ensued much fighting, in the course of which the nest was damaged, and, according to one witness, the eggs were smashed and knocked down into the loch. The result of the fighting is not known; but after it the castle nest was deserted. It is said that another nest was used, of which I shall make further mention; but as far as is known there were no young ones produced. It may be noted that in May of this same year an Osprey was shot at Knockespock, and it has been suggested that the third bird was the mate of the one shot.

In 1900 I was at or near Rothiemurchus during most of April and all August. Several times in the spring I saw one Osprey at the castle nest, but apparently not building; and towards the end of the month I saw the two birds on the tree which I thought had been described to me as the one on which they had nested in the previous year. But they were not then nesting there, nor was there any trace of a nest in the tree, and no one seemed to know where they were nesting. At the end of my spring holiday, being desirous to know about this, I devoted one day to a careful search. Knowing the district well, I was able to choose a point that commanded a wide range of the possible nesting country. Here I spread a plaid, and lay on my back, field-glass in hand, carefully scanning the heavens. I was rewarded; for in the afternoon one of the birds flew into sight, carrying a fish in its claws, and settled on a tall tree. I watched it through the glass, and after a time it flew off to another tree, in the top of which I was delighted to see the nest. The bird remained there awhile, and then flew away, still carrying its fish. I made my way to the tree, the position of which I had carefully noted, and scrambled up to the nest, which was built of biggish twigs, many of them nearly a yard in length, and was roughly lined with heather, loose straw, and the straw wrapper of a wine-bottle. Retiring from the immediate neighbourhood of the tree, I

concealed myself among the heather, and remained on watch. After a time the two birds flew into sight, one of them still carrying a fish. They sailed about for some time, the one with the fish continually calling; but they did not go to the nest. I reported what I had seen to the Laird and to the keeper, and promised to keep the position of the nesting-tree a secret.

In the summer I did not see the birds at all, but I ascertained by inspection that they were not using the nest I had found in the spring. No one seemed to know anything of their nesting.

In 1901 I was at Rothiemurchus during April and August. In the spring I learned that an Osprey had arrived on April 1st, and I saw the one bird several times. It seemed to be building at the castle, and apparently had not visited the other nest. I was told that the men floating the timber from the burnt forest had seen this Osprey and a "black," *i.e.* golden, eagle fighting over Ord Ban. In the summer I did not see the birds at all, and apparently there was but the one in the district.

In 1902 I was at Rothiemurchus in April and in August. A single Osprey came on April 4th, and I saw it several times at the castle nest. It had not used the other nest, which, indeed, was somewhat fallen to pieces. In the summer I did not see the bird at all, and apparently there was again but the one in the district.

This year I was at Rothiemurchus in April. The season was late, and the weather continually cold and stormy. The Osprey had not returned, and up to the time of writing it has not appeared.

Summing up these observations briefly, the record stands thus:—1894, two adults, two young; 1895, two adults, probably young; 1896, two adults, and young, probably two; 1897, two adults, and young, probably two; 1898, two adults and two young; 1899, three adults, no young; 1900, two adults; 1901, one adult; 1902, one adult; 1903, May, no Osprey.

When the birds resume their nesting at Loch-an-Eilein—as it is to be hoped they will do—they should, if possible, be protected even more carefully than in the past, for there

is some reason to fear that their alternative nest has been plundered. It is also to be desired that a systematic record should be kept of such points as dates of arrival, of hatching, and of departure. This could probably be done by arrangement between the keeper and the tenant of the Loch Cottage.

[We cordially endorse Mr. Cash's appeal for greater protection, and, may we add, respect for our Scottish Ospreys. The position of this fine species as a native bird is becoming precarious, for we are informed that this year only one Osprey has appeared at the old-established haunt in West Inverness-shire, and our latest information (May 26) was that it remained mateless.—EDS.]

A LIST OF THE BIRDS OF THE ISLAND OF BUTE.¹

By JOHN ROBERTSON.

THE well-known Island of Bute is fifteen miles long, with an average breadth of about four miles. The physical features of the island are such as suit a large number of species of birds. There are heather-clad hills in the north; while in the central and southern parts the land is well cultivated, with here and there considerable woods and moorlands. Six or seven fresh-water lochs, some of which are reed-girt, afford admirable haunts for aquatic species; and along the sea-shore there are several muddy bays, the resort of various species of waterfowl and waders. So far as I know, no previous attempt at a complete list of the birds of the island has been made, but Mr. William Evans contributed to the "Annals" for July 1895 an excellent paper entitled "Ornithological Notes made in the Island of Bute in Midwinter." Mr. Evans' notes, of which I have made free use in this paper, refer to the winter of 1894-95.

In Blain's "History of the Island of Bute," as well as John Colquhoun's "Sporting Days," there are some notes

¹ Read before the Andersonian Naturalists' Society, Glasgow.

on the birds of Bute. My own observations were made during various short visits to the island within the past seven years. The number of species recorded is 138, of which, I believe, about 90 have nested within the last thirty years. One of the pleasing features of bird-life in Bute is the large number of species which may be observed in a single day. In a long June day I have myself noted as many as 70.

MISTLE THRUSH (*Turdus viscivorus*).—Common. Well on in the summer numerous small flocks are to be met with about Garroch Head. I have heard a Mistle Thrush in full song at Kames Castle as late as 3rd June.

SONG THRUSH (*T. musicus*).—Common. Comparatively few seem to remain throughout the winter.

REDWING (*T. iliacus*).—A common winter bird.

FIELDFARE (*T. pilaris*).—Though more conspicuous than the Redwing, I do not think it is so common as that species.

BLACKBIRD (*T. merula*).—Abundant all the year round.

RING OUZEL (*T. torquatus*).—On 4th June 1898 Mr. John Paterson and I saw a pair, evidently nesting in a gulley leading from the Kyles of Bute up to the Bull Loch.

WHEATEAR (*Saxicola oenanthe*).—Well distributed in spring and summer in suitable localities; and pretty common on all the rough ground south of Kilchattan Bay.

WHINCHAT (*Pratincola rubetra*).—A somewhat scarce summer visitor.

STONECHAT (*P. rubicola*).—A few pairs breed in the furze-covered tracts. It is a resident but by no means numerous species.

REDSTART (*Ruticilla phoenicurus*).—Mr. John Lang observed over twenty Redstarts, in the Kingarth and Mount Stuart districts, in the early autumn of 1896. Mr. John Paterson has seen it in the breeding season on the Argyleshire side of the Kyles at Colintraive.

REDBREAST (*Erithacus rubecula*).—Abundant at all seasons.

COMMON WHITETHROAT (*Sylvia cinerea*).—Common wherever it finds sufficient cover, which near Garroch Head consists of tall brackens only. It is found as far up Glenmore as there are bushes.

[BLACKCAP (*S. atricapilla*).—On 21st May 1896, in a small wood some distance south-west of Greenan Loch, I heard the note of a bird which I believe was of this species, but the song ceased ere I could identify it perfectly.]

GARDEN WARBLER (*S. hortensis*).—A few pairs frequent the policies at Mount Stuart.

GOLDEN-CRESTED WREN (*Regulus cristatus*).—Common and resident.

CHIFFCHAFF (*Phylloscopus rufus*).—A few are to be found in Mount Stuart grounds, and it has been recorded from the wood behind Kilchattan Bay. (“Trans. Nat. Hist. Soc. Glasgow,” v. (N.S.) p. 50).

WILLOW WREN (*P. trochilus*).—An abundant summer visitor.

WOOD WREN (*P. sibilatrix*).—A few about Mount Stuart. I have heard it in the Kyles opposite Colintrave.

SEDGE WARBLER (*Acrocephalus phragmitis*).—Fairly common in summer.

GRASSHOPPER WARBLER (*Locustella naevia*).—One day in June 1898 I heard several times what I thought was the beginning of the song of this species on the side of Quien Hill. At a meeting of the Edinburgh Field Naturalist and Microscopical Society in January 1900, Mr. Archibald Craig read a paper on birds observed in Arran and Bute, in which he recorded this species for Bute. In May 1902 I heard it “reeling” among tall heather near Loch Ascog.

HEDGE SPARROW (*Accentor modularis*).—Common and resident.

DIPPER (*Cinclus aquaticus*).—Mr. Evans says, “A few Dippers, I was told, frequent several of the streams, but I only succeeded in seeing the bird on two occasions.” This species was known to Blain. I am sorry that I cannot add to this information.

LONG-TAILED TITMOUSE (*Acredula rosea*).—A fair number of this species is to be found. I have seen it about Mount Stuart, by the side of Loch Fad, and at the western entrance to the Kyles.

GREAT TITMOUSE (*Parus major*).—Common in suitable localities

COAL TITMOUSE (*P. ater*).—Common in suitable localities.

BLUE TITMOUSE (*P. cæruleus*).—Common in suitable localities.

WREN (*Troglodytes parvulus*).—Common. In winter is especially in evidence by the shore.

TREE CREEPER (*Certhia familiaris*).—A pair or two are to be met with in suitable localities.

PIED WAGTAIL (*Motacilla lugubris*).—Not uncommon.

WHITE WAGTAIL (*M. alba*).—In September 1899 Mr. John Paterson and I saw two or three birds of this species at Scalpsie Bay; and in April 1900 I saw a beautiful male by the side of Greenan Loch.

GREY WAGTAIL (*M. melanope*).—Appears to be rare; it nests, however, near Mount Stuart.

TREE PIPIT (*Anthus trivialis*).—Not nearly so common as in some other parts of the "Clyde" area. I have heard it at Kilchattan Bay in the south, and opposite Colintrave in the north, and at several localities between these two points.

MEADOW PIPIT (*A. pratensis*).—Common in summer, but much less numerous in winter.

ROCK PIPIT (*A. obscurus*).—Common on the rocky portions of the coast.

SPOTTED FLYCATCHER (*Muscicapa grisola*).—A common summer visitor.

SWALLOW (*Hirundo rustica*).—Common.

HOUSE MARTIN (*Chelidon urbica*).—Locally common, as at Kilchattan Bay.

SAND MARTIN (*Cotile riparia*).—Though this bird is quite common on the island, I only know of one nesting colony, and that a small one, at Kilchattan Bay.

GREENFINCH (*Ligurinus chloris*).—Common.

GOLDFINCH (*Carduelis elegans*).—Rare. Mr. D. Thompson, boot-maker, Rothesay, has a specimen in his possession taken at Strad, near St. Ninian's Bay. John Colquhoun, in "Sporting Days," mentions it as nesting near Kames Castle. Formerly it seems to have been not uncommon.

HOUSE SPARROW (*Passer domesticus*).—Abundant.

CHAFFINCH (*Fringilla cœlebs*).—Very common.

BRAMBLING (*F. montifringilla*).—Mr. Evans records having seen several birds during his winter visit.

LINNET (*Linota cannabina*).—Common. It nests freely in the districts where there is furze. Considerable flocks occur in winter.

LESSER REDPOLL (*L. rufescens*).—Very common. It is found all over the island, and is most numerous where there are natural woods, especially of birch.

TWITE (*L. flavirostris*).—Pretty large flocks are to be seen in autumn and winter. A few nest on the island.

BULLFINCH (*Pyrrhula europæa*).—Though not numerous, this species is occasionally seen.

CROSSBILL (*Loxia curvirostra*).—Mr. Evans records two separate birds as having been seen.

CORN BUNTING (*Emberiza miliaria*).—Pretty common on the level, cultivated land near the sea.

YELLOW BUNTING (*E. citrinella*).—Common.

REED BUNTING (*E. schœniclus*).—Not numerous.

SNOW BUNTING (*Plectrophenax nivalis*).—Mr. Evans saw this bird in flocks in January 1895.

STARLING (*Sturnus vulgaris*).—Abundant.

JAY (*Garrulus glandarius*).—Mentioned by Blain, but now unknown.

MAGPIE (*Pica rustica*).—John Colquhoun says in "Sporting Days," "The number of Magpies was so prodigious in North Bute that I often wonder how any lowland winged game had been reared at all." In one season he destroyed eighteen pairs with their nests and eggs, or young. It must be borne in mind that North Bute comprises little more than a third of the island, so that the number of Magpies inhabiting Bute at one time must have been very great. Nowadays the bird is never seen.

JACKDAW (*Corvus monedula*).—Common.

RAVEN (*C. corax*).—Mr. Evans identified the Raven on two occasions in January 1895.

CARRION CROW (*C. corone*).—Numerous in the less frequented parts of the island.

HOODED CROW (*C. cornix*).—Less numerous in summer than the former, but I have seen a fair number in the beginning of April.

ROOK (*C. frugilegus*).—Common. I have the head of a fawn-coloured example, which was brought to Mr. Bodin, Port Bannatyne. It is evidently the head of a young bird, as the base of the bill is feathered.

SKY LARK (*Alauda arvensis*).—Common.

SWIFT (*Cypselus apus*).—Common about Rothesay and neighbourhood. Mr. Robert Wilson saw one bird on 7th September 1900, a late date.

NIGHTJAR (*Caprimulgus europæus*).—Frequent on the rougher parts of the island, such as near Kilchattan Bay, at Loch Quien and Loch Fad, and along the side of the Kyles. Mr. John Torrance heard it at Loch Fad on 23rd April 1900, a very early date.

KINGFISHER (*Alcedo ispida*).—Is rarely seen.

CUCKOO (*Cuculus canorus*).—Common.

BARN OWL (*Strix flammea*); LONG-EARED OWL (*Asio otus*); SHORT-EARED OWL (*A. accipitrinus*); TAWNY OWL (*Syrnium aluco*).—These four species of Owl have all occurred on the island, but they are evidently not common. The Barn, the Short-eared, and the Long-eared Owls are mentioned by John Colquhoun as Bute birds.

HEN HARRIER (*Circus cyaneus*).—John Colquhoun in a footnote to "Sporting Days," published in 1866, says, "Last autumn I saw a female Hen Harrier or Ringtail, skirting the shores of the Kyles, but it soon flew away to Argyleshire."

WHITE-TAILED EAGLE (*Haliaetus albicilla*).—John Colquhoun writes: "The Sea Eagle sometimes rests for a day or two when wandering south, or returning to her mountains again from a winter migration."

SPARROW HAWK (*Accipiter nisus*).—A few are still to be found.

PEREGRINE FALCON (*Falco peregrinus*).—Mr. Evans observed a pair, and subsequently two single birds.

MERLIN (*F. aesalon*).—Mr. Evans observed two single birds, a female and a male. The late Robert Gray considered this a resident and nesting species in Bute.

KESTREL (*F. tinnunculus*).—Fairly common. It seems to be more numerous near Garroch Head than elsewhere, possibly because there is less game there, and "vermin" do not receive so much attention.

CORMORANT (*Phalacrocorax carbo*).—Common all round the island, and often seen on the fresh-water lochs. It does not, however, nest in Bute.

SHAG (*P. graculus*).—Mr. Evans identified this species, which is an uncommon winter visitor to the shores of the island.

GANNET (*Sula bassana*).—A common visitor, often fishing quite close inshore.

COMMON HERON (*Ardea cinerea*).—Common. At present it nests about Mount Stuart, and is also reported to do so in a glen in the north of the island.

COMMON SHELD-DUCK (*Tadorna cornuta*).—Quite common in summer along the west side, where it nests; but only a few remain during the winter. I saw a pair followed by ten young ones, a day or two old, at Scalpsie Bay on 21st May 1896.

MALLARD (*Anas boscas*).—Common.

TEAL (*Nettion crecca*).—Not numerous in summer, but pretty common in winter.

WIGEON (*Mareca penelope*).—Common on all the fresh-water lochs in winter.

POCHARD (*Fuligula ferina*).—Common in winter.

TUFTED DUCK (*F. cristata*).—A few are to be found on all the lochs in winter. Although I have seen birds on Loch Fad and Loch Quen as late as 21st May, I am not aware of this species nesting in Bute.

SCAUP DUCK (*F. marila*).—Mr. Evans saw a small flock of six in the winter of 1894-5.

GOLDEN EYE (*Clangula glaucion*).—A fairly numerous winter duck.

LONG-TAILED DUCK (*Harelda glacialis*).—A winter visitor. Mr. Evans observed a few small parties off the rocky parts of the west coast.

COMMON EIDER DUCK (*Somateria mollissima*).—Mr. John Paterson informs me that on 1st January 1900 Mr. Frank M'Culloch and his brother saw an Eider Duck on the wing at Etterick Bay.

GOOSANDER (*Mergus merganser*).—Mr. Evans saw one pair of Goosanders near St. Ninian's Bay.

RED-BREASTED MERGANSER (*M. serrator*).—Common all round the island at all seasons.

RING DOVE (*Columba palumbus*).—Common.

STOCK DOVE (*C. œnas*).—Not common. It nests in several localities in Bute.

ROCK DOVE (*C. livia*).—Flocks of twenty to twenty-five may be seen, especially in winter.

BLACK GROUSE (*Tetrao tetrix*).—Common in the north of the island, especially round the Kyles.

RED GROUSE (*Lagopus scoticus*).—Common on suitable ground, and may often be flushed from the shore. It is found on Inchmarnock.

PHEASANT (*Phasianus colchicus*).—Common.

PARTRIDGE (*Perdix cinerea*).—Common.

CORNCRAKE (*Crex pratensis*).—Common in summer.

WATER RAIL (*Rallus aquaticus*).—A few occur in winter.

MOORHEN (*Gallinula chloropus*).—Common, being especially numerous about Greenan Loch.

COOT (*Fulica atra*).—Common on suitable sheets of water.

RINGED PLOVER (*Ægialitis hiaticula*).—Abundant in summer on sandy and gravelly beaches where it nests. It is less numerous in winter.

GOLDEN PLOVER (*Charadrius plumbealis*).—Occurs in large flocks on and near the shore, from autumn to spring. A few pairs nest on the hills in North Bute.

LAPWING (*Vanellus vulgaris*).—Common.

TURNSTONE (*Streptilas interpres*).—Common in autumn and spring, and small parties of eight to ten remain throughout the

winter. I have seen flocks in the second half of May in full breeding plumage.

OYSTER-CATCHER (*Hematopus ostralegus*).—This is a common and resident species. The noise made by a number of Oyster-Catchers when one intrudes upon their nesting-ground is deafening. Though the majority of nests have only two or three eggs, I have seen several in which the clutch consisted of four.

WOODCOCK (*Scolopax rusticula*).—A fairly common winter visitant, and I believe some birds remain to breed. I have seen and heard birds on a June evening near Kilchattan Bay.

COMMON SNIPE (*Gallinago caelestis*).—Common. In winter it may often be flushed from wet places by the shore as well as inland. I think, however, that comparatively few nest on the island.

JACK SNIPE (*G. gallinula*).—Frequent in winter.

DUNLIN (*Tringa alpina*).—Common by the shore from September till May. A few remain to breed, particularly on wet ground close to the shore.

LITTLE STINT (*T. minuta*).—Mr. John Paterson in a note on "The Little Stint in the Clyde area" in the "Annals" for January 1897, says, "Mr. M'Culloch, the taxidermist, tells me he handled one at Port Bannatyne, Bute, which was in the possession of Mr. Frew, an artist, who had shot it out of a number in Etterick Bay, Bute."

KNOT (*T. canutus*).—Mr. Evans records a flock of about twenty in Kilchattan Bay, seen during his winter visit, and small parties are occasionally observed in the autumn.

COMMON SANDPIPER (*Totanus hypoleucus*).—This is a common summer visitant, and contrary to some authorities, it is found nesting by the sea-shore as well as by fresh water.

REDSHANK (*T. calidris*).—Abundant by the shore in winter. Many remain to breed. I have not seen this bird more numerous anywhere in the nesting season than it is on some parts of the west coast of Bute.

BAR-TAILED GODWIT (*Limosa lapponica*).—This species is present in small flocks during every month of the year, unless, perhaps, July. In St. Ninian's Bay, if the tide is out, one is pretty sure of finding a few Godwits, busily engaged probing the sand. During a visit paid to this locality on 3rd June 1898, along with Mr. John Paterson, we saw nineteen birds there, three of which were in mature summer plumage.

COMMON CURLEW (*Numenius arquata*).—This is a common nesting species in some parts of Bute. I have seen a nest on the shore at Garroch Head just above high-water mark.

WHIMBREL (*N. borealis*).—A few are seen on passage in spring and autumn. The most I have seen in one flock was seventeen at St. Ninian's Bay on 28th April.

COMMON TERN (*Sterna fluviatilis*).—Common. In some seasons many nest in the Kyles of Bute.

ARCTIC TERN (*Sterna macrura*).—Occasionally seen, but much less common than the former species.

BLACK-HEADED GULL (*Larus ridibundus*).—Fairly numerous in winter, and a few remain in summer.

COMMON GULL (*L. canus*).—Fairly common. A few pairs nest on the island and on Inchmarnock. So far as I know, this is the only Gull that nests in Bute.

HERRING GULL (*L. argentatus*).—Common at all seasons.

LESSER BLACK-BACKED GULL (*L. fuscus*).—Common, unless in mid-winter, when few, if any, are to be seen.

GREAT BLACK-BACKED GULL (*L. marinus*).—A few pairs of this fine species are to be seen, especially in winter.

ICELAND GULL (*L. leucopterus*).—An immature example of this species was exhibited in the flesh, at a meeting of the Andersonian Naturalists' Society, on 12th January 1900. It had been received that day by M'Culloch and Son, taxidermists, Glasgow, from Port Bannatyne, where its presence was known for about three weeks ere it fell a victim to the gun.

KITTIWAKE GULL (*Rissa tridactyla*).—Common at all seasons.

POMATORHINE SKUA (*Stercorarius pomatorhinus*).—Mr. A. M'Cunn, Shipbuilder, Greenock, obtained five, and saw three others, in Kilchattan Bay in October 1879 ("Proceedings of Nat. Hist. Soc. of Glasgow," vol. iv. p. 274).

RAZORBILL (*Alca torda*).—Common in summer all round the island.

GUILLEMOT (*Uria troile*).—Like the Razorbill, common in summer, and numerous parties are to be seen in winter too.

BLACK GUILLEMOT (*U. grylle*).—Mr. Bodin, Port Bannatyne, informed me that this species is sometimes shot in autumn.

PUFFIN (*Fratercula arctica*).—Common in summer off the south and west of the island.

GREAT NORTHERN DIVER (*Colymbus glacialis*), RED-THROATED DIVER (*C. septentrionalis*).—Divers are fairly common just off the shore in winter. Mr. Evans was able to identify both of these species during his visit. I have seen a Red-throated Diver off the west coast as late as the middle of May.

GREAT CRESTED GREBE (*Podiceps cristatus*).—A single example is recorded by Mr. Evans.

SLAVONIAN GREBE (*P. auritus*).—Mr. Evans saw what he says “was most likely a Slavonian Grebe” near Kilmichael, and I saw a stuffed specimen in the possession of Mr. Bodin, Port Bannatyne.

LITTLE GREBE (*P. fluviatilis*).—Nests on most of the lochs and ponds, where its peculiar note often betrays its presence.

LEACH'S FORK-TAILED PETREL (*Oceanodroma leucorhoa*).—On 11th November 1899, after a westerly gale, a bird was found dead in the garden of Mr. James M'Crone, Rothesay. It was sent for preservation to M'Culloch and Son's, where I examined it.

REPORT ON THE MOVEMENTS AND OCCURRENCE OF BIRDS IN SCOTLAND DURING 1902.

By T. G. LAIDLAW, M.B.O.U.

(Continued from p. 89).

PARUS PALUSTRIS (Marsh Tit).

Tweed—Hawick, Dec. 13, one obtained, rare in Roxburghshire.

TROGLODYTES PARVULUS (Wren).

Outer Hebrides—Flannans, Nov. 18, one. *Argyll and Isles*—Skerryvore, Aug. 17, one; Oct. 6, one.

MOTACILLA ALBA (White Wagtail).

Shetland—Dunrossness, April 13, one. *Orkney*—Sule Skerry, April 28, May 8. *Argyll and Isles*—Tiree, April 28 to May 12, passing daily. Dhuheartach, Sept. 1, five; Sept. 15, passing, with Pipits, and going S.E. and S. *Clyde*—Dalbeth, April 6. Lendalfoot, April 20. Kilbirnie, April 23, thirty. *Solway*—Maxwelltown, May 10, one.

MOTACILLA LUGUBRIS (Pied Wagtail).

Orkney—Sule Skerry, Aug. 20, a rush, with Wheatears; Sept. 24, in rush, with Wheatears and Meadow Pipits. Stromness, Aug. 31, more numerous than usual. *Forth*—Isle of May, March 26, two, first. Cramond, Sept. 1, numbers. *Outer Hebrides*—Flannans, May 14, one; May 28, several. *Argyll and Isles*—Skerryvore, Aug. 17, a few. Dhuheartach, March 16, two on rock; May 2, three; 12th, five.

MOTACILLA MELANOPE (Grey Wagtail).

Tay—Auchinblae, March 9, have returned. *West Ross*—Garve, April 3. *Outer Hebrides*—Barra, Oct. 26, one in garden, Eoligary, first time here.

MOTACILLA RAII (Yellow Wagtail).

Clyde—Beith, April 14, Cambuslang, April 15. Lendalfoot, April 19.

ANTHUS PRATENSIS (Meadow Pipit).

Orkney—Sule Skerry, Sept. 24, a rush, with Wheatears and Pied Wagtails. *Dee*—Buchanness, Nov. 4-5, flying round light, several killed, Thrushes, Blackbirds, Starlings, etc. *Tay*—Bell Rock, April 17-18, a few. *Forth*—Davidson's Mains, Sept. 22, fields swarming with migrating Pipits. *Outer Hebrides*—Flannans, Feb. 1, numbers dead on the island through starvation and cold; Sept. 17, very numerous; Sept. 26-27, very numerous, great many killed; Sept. 30 to Oct. 7, rushes of birds, Wheatears, etc., many killed. *Argyll and Isles*—Skerryvore, Feb. 25, at lantern; 27th, with Thrushes at light; Aug. 28, six; Sept. 9, rush of Pipits, Wheatears, etc., twenty killed; Sept. 26-29, numbers at light, with Larks and other birds, many killed striking. Dhuheartach, Feb. 23, numbers at light, Thrushes, Starlings, etc.; March 1-6, at light, with Larks; April 10-14, several on rock; Aug. 22 to Sept. 17, great numbers passing with other birds, going S.E. and S. *Clyde*—Carmichael, Feb. 6, one; March 24, returned to nesting ground.

Principal movements, Feb. 23-28; Sept. 24-27; Nov. 4-5.

ANTHUS TRIVIALIS (Tree Pipit).

Moray—Fochabers, April 16. *Tay*—Rannoch, April 24. *Forth*—Aberfoyle, E. Linton, and Kirkliston, April 24. *Tweed*—Halmyre, April 28. *West Ross*—Garve, April 23. *Clyde*—Lendalfoot, April 16. Beith and Cadder, April 20.

Earliest, Moray and Clyde, April 16.

LANIUS EXCUBITOR (Great Grey Shrike).

Tweed—St. Boswells, April 9, one ("Field," 7th June 1902, p. 893). Halmyre, Nov. 22, a ♂ shot. One was obtained near Leadburn about the end of September.

MUSCICAPA GRISOLA (Spotted Flycatcher).

Moray—Fochabers, May 26. *Dee*—Aberdeen, May 24, four. *Tay*—Auchinblae, May 30; Aug. 10, last. *Forth*—Duddingston, May 3. *Tweed*—Halmyre, May 1. Broughton, May 4. *Clyde*—Lendalfoot, May 3. Queen's Park, Glasgow, Sept. 22. Carmichael, Sept. 24.

Earliest, Tweed, Halmyre, May 1.

HIRUNDO RUSTICA (Swallow).

Orkney—Noup Head, May 3, one; June 4, three. Sule Skerry, April 26, one; June 2-6, a few. *Moray*—Fochabers, April 26. *Dee*—Coveden, April 19. Inverurie, April 25, a pair. *Tay*—Auchinblae, April 16; Sept. 4, last seen. Rannoch, April 19. Bell Rock, June 10, one rested in doorway exhausted, died; Sept. 28, one. *Forth*—Kirkliston, April 8. Gosford, April 20, three or four. Isle of May, May 24, three; Sept. 28, two dozen. Aberlady, Oct. 19, fairly numerous; Nov. 2, a few. Dalmeny, Nov. 9, last seen. *Tweed*—Halmyre, April 16, five. Hawick, April 22, one. Broughton, April 23. Cramilt, April 24, a pair. *Outer Hebrides*—Flannans, May 29, one, captured; June 3, two. *Argyll and Isles*—Tiree, May 29-30, a few. Skerryvore, May 31, two; June 18, one, rested in window. Dhuheartach, May 15, ditto. *Clyde*—Dalry, April 9. Lendalfoot, April 11. Beith, April 13; Oct. 8, still here. *Solway*—Dumfries, April 10, three; May 10, common. Beattock, April 25. Maxwelltown, Oct. 4, about twelve. Earliest, Forth, Kirkliston, April 8.

CHELIDON URBICA (House Martin).

Dee—Aberdeen, May 11, six; Oct. 8, last seen. Kintore, Sept. 23, left nest. *Tay*—Auchinblae, April 20; Oct. 10, last. Rannoch, April 27. Scone, Oct. 3, several. *Forth*—North Berwick, April 18. Longniddry, April 20, two. Aberfoyle, April 25, a dozen. Kirkliston, Oct. 6, last. *West Ross*—Garve, May 30. *Clyde*—Beith, April 13. Lendalfoot, April 18. Crosbie, April 19. Earliest, Clyde, Beith, April 13.

COTILE RIPARIA (Sand Martin).

Orkney—Noup Head, April 28, one killed (bird sent); Oct. 1, one at lantern. *Moray*—Fochabers, April 12, two. *Dee*—Inverurie, April 19, a few. Aberdeen, Oct. 8, last seen. *Tay*—Rannoch, April 17, six. Auchinblae, April 24. *Forth*—Gorebridge, April 17, one. Duddingston, April 18, fifty. Cramond, Oct. 7. *Tweed*—Hawick, April 15, flying on Teviot. West Linton, April 20. *Clyde*—Beith, April 13. Lendalfoot, April 15. Crosslie, Row, and Carmichael, April 19. Earliest, Moray, Fochabers, April 12.

CARDUELIS ELEGANS (Goldfinch)

Forth—Duddingston, Feb. 13, one captured, King's Park ("Annals," 1902, p. 117).

CHRYSOMITRIS SPINUS (Siskin).

Forth—Isle of May, Nov. 4, killed at lantern, 10 P.M. (wing received).

LIGURINUS CHLORIS (Greenfinch).

Tay—Bell Rock, April 10, one on rock. *Forth*—Isle of May, April 19, four. *Outer Hebrides*—Barra, Dec., first week, arrived—few in number and very late. *Argyll and Isles*—Tiree, April 1, have left. *Solway*—Maxwelltown, April 11, large flock passed.

FRINGILLA CEELEBS (Chaffinch).

Shetland—Dunrossness, March 29, two. *Orkney*—Pentland Skerries, Nov., first half, a few about the gardens. *Forth*—Isle of May, April 17, seven; Oct. 6, three. *Outer Hebrides*—Flannans, Jan. 17, several. Island Glass, Feb. 8, two at lantern (leg and wing sent); none seen since Oct. Barra, Nov., first week, arrived, much less numerous than usual. *Argyll and Isles*—Tiree, April 1, have left. Skerryvore, April 10, at lantern, with Wheatears.

FRINGILLA MONTIFRINGILLA (Brambling).

Forth—Kirkliston, Oct. 17, appeared. Dalmeny, Oct. 27, one calling. *Outer Hebrides*—Barra, Oct. 25, a pair, North Bay. *Clyde*—Carmichael, Oct. 9, returned, very abundant this season.

LINOTA CANNABINA (Linnet).

Outer Hebrides—Flannans, Oct. 9, one. *Argyll and Isles*—Tiree, April 1, have left. Skerryvore, Sept. 29, rush of Larks, Pipits, Linnets, etc., numerous all night.

PLECTROPHANES NIVALIS (Snow Bunting).

Orkney—Noup Head, Sept. 23, a number, first seen since Jan. Sule Skerry, March 16, a large flock; May 20, one; Sept. 14, a flock, first of season. *Sutherland*—Cape Wrath, April 4, several. *Dee*—Aberdeen, Oct. 19, three. *Forth*—North Berwick, April 18, a pair, ♂ and ♀. Aberlady, Oct. 28, five. Isle of May, Nov. 4, five. *Outer Hebrides*—Flannans, March 23, great flocks, gathering before leaving; April 9, in rush, Redwings, Wheatears, etc.; April 13, all have left; May 20, chased by Hawk, took refuge in coal-house, almost pure white; Oct. 3, one; Oct. 6-11, several; Nov. 9, large flock. *Argyll and Isles*—Tiree, Oct. 23, flock. *Solway*—Glencaple, Sept. 20, an old ♂.

STURNUS VULGARIS (Starling).

Orkney—Noup Head, Nov. 4, in rush, three killed. Sule Skerry, March 7, a few; April 20, eight; Oct. 1, a few, with Redwings and Fieldfares; Nov. 21, a few; Dec. 7, seven or eight at light. *Sutherland*—Cape Wrath, Oct. 15, a flock on dome. *Dee*—Buchanness, Nov. 4, great numbers, with Thrushes and Blackbirds. *Tay*—Bell Rock, Feb. 27, one at lantern, remained all night; March 2-3, at lantern; March 11, one, midnight; April 11, one on tower; April 15, two; Oct. 29, several at light, with Larks, etc. *Forth*—Isle of May, Nov. 7, numbers at lantern, with Fieldfares, Blackbirds, and Lapwings. *Tweed*—Cramilt, Feb. 21, several. *Outer Hebrides*—Flannans, April 17, a few; Oct. 8, four; Oct. 30, several; Nov. 7, great numbers in rush of Turdidæ, many killed; Nov. 12, twenty-four. *Argyll and Isles*—Dhuheartach, Feb. 23, numbers all night, Thrushes, Larks, and Pipits; March 1, numerous. Skerryvore, March 28, rush of birds, Thrushes, Blackbirds, Starlings, and Larks; Nov. 3-4, in rush of Turdidæ, several killed.

PICA RUSTICA (Magpie).

Orkney—Noup Head, April 14, one, first seen here.

CORVUS CORNIX (Hooded Crow).

Tay—Bell Rock, Oct. 5, one on rock. *Outer Hebrides*—Flannans, March 24, one; Oct. 4-12 and Nov. 20, one each date. *Argyll and Isles*—Tiree, March 10, several.

CORVUS FRUGILEGUS (Rook).

Outer Hebrides—Flannans, April 10, twelve, one shot; May 14, two. Barra, Oct., first week, one. *Argyll and Isles*—Tiree, March 6, small flock. Skerryvore, July 30, four, flying past inland.

ALAUDA ARVENSIS (Skylark).

Orkney—Noup Head, Jan. 29, a rush; March 5, all night. Sule Skerry, Jan. 14, a flock; March 2, a large flock; March 24, a few; Sept. 9, a few at lantern; Sept. 30, all night at lantern. *Tay*—Bell Rock, March 2, about a dozen at lantern, two killed; March 6-7, large numbers, several struck and fell into sea, 11 P.M. to 4 A.M.; March 15, six at lantern; April 9, two; Sept. 28, six; Oct. 29, several. *Forth*—Isle of May, Feb. 28, twelve, first arrivals. *Outer Hebrides*—Island Glass, Feb. 21, four at lantern. Flannans, Jan. 6, a few; Feb. 7, four; Nov. 19, rush of Larks and Turdidæ; Nov. 26, numerous, in rays; Dec. 16, six; Dec. 21, small flock. *Argyll*

and Isles—Skerryvore, March 28, rush, Thrushes, Blackbirds, Starlings, and Larks; April 6, a flock, flying past; May 9, at lantern, midnight; Sept. 26-27, at lantern, striking with other birds; Sept. 29, very numerous all night, several killed; Oct. 6, at lantern, with Pipits; Nov. 5, in rush, with Thrushes, Blackbirds, etc. Dhuheartach, Feb. 23, numbers all night, with Thrushes, Blackbirds, Redwings, etc.; March 1-6, numbers at light; Sept. 1 and 8, numbers, with Wagtails, Pipits, etc. *Solway*—Maxwelltown, Oct. 10, many on the move.

CYPSELUS APUS (Swift).

Orkney—Sule Skerry, Aug. 12, four passed S. *Moray*—Fochabers, May 19; last, Aug. 22. *Dee*—Aberdeen, May 18, one; Aug. 26, last seen. Peterhead, May 19. Crimond, Sept. 21, several; Sept. 25, one. *Tay*—Blackford, May 5. Bell Rock, June 15, one rested in window of tower, caught. Arbroath, Aug. 21, last, some days later than usual. *Forth*—Linlithgow, May 3, two. Isle of May, May 24, two. Kirkliston, Sept. 12, one. *Tweed*—Cramilt, May 17, one passing W. *Argyll and Isles*—Skerryvore, May 30; June 2, one. *Clyde*—Kilbirnie, April 23. Lendalfoot, May 2. Carmichael, Sept. 2, two; 5th, one. *Solway*—Maxwelltown, May 9, a pair arrived and went straight into their nesting hole; none others seen till May 25; Aug. 3, general body left. Auchencairn, Aug. 21, two.

Earliest, Clyde, Kilbirnie, April 23.

CAPRIMULGUS EUROPEUS (Nightjar).

Forth—Isle of May, June 2, one. *Clyde*—Lamlash, May 17.

DENDROCOPUS MAJOR (Great Spotted Woodpecker).

Forth—Stirling, Jan. 7, one from Touch; May 5, nest near Salton, young got safely away ("Annals" 1903, p. 49). *Tweed*—Hawick, May 10, breeding in Minto, Wells, and Weem woods. Cramilt, July 28, a pair; have only seen one here before. *Argyll and Isles*—Taynuilt, Jan. 17, shot at Inverawe, rare visitor in the west (*op. cit.*, 1902, p. 119).

UPUPA EPOPS (Hoopoe).

Moray—April 26, shot in a fir wood near Loch Spynie. *Forth*—Dunbar, April 22, on or about, one killed.

CUCULUS CANORUS (Cuckoo).

Moray—Fochabers, May 2. *Dee*—Thainston, April 29, heard. Aberdeen, April 30, one. *Tay*—Auchinblae, April 19, heard.

Blair Atholl, April 24. *Forth*—Gartmore, April 20. Aberfoyle, April 22. Dalmeny, April 26. Isle of May, May 11, one. Strathyre, Sept. 12, a young bird. *Tweed*—Cramilt, April 22, "earlier than ever I have heard it for twenty years"; Aug. 1, one. Broughton, April 24. *West Ross*—Garve, April 23. *Argyll and Isles*—Earraid, April 28. Tíree, June 2. *Clyde*—Beith, April 21. Lendalfoot and Dalry, April 22. *Solway*—Gatehouse, April 15; May 10, plentiful everywhere. Beattock, April 24.

Earliest, Solway, Gatehouse, April 15.

ASIO ACCIPITRINUS (Short-eared Owl).

Forth—Isle of May, Nov. 4, one killed. *Argyll and Isles*—Skerryvore, July 23, two resting in windows.

ATHENE NOCTUA (Little Owl).

Dee—Kincardine, Feb. 1, a ♀ shot at Blairs ("Annals," 1902, p. 119).

PERNIS APIVORUS (Honey Buzzard).

Tay—Forfarshire, one seen at Teinavon, pursued by Jackdaws ("Annals," 1903, p. 49). *Argyll and Isles*—Loch Fyne, Oct. 9, immat. ♀ shot at Kilfinnan (*op. cit.* 1903, p. 49).

FALCO ÆSALON (Merlin).

Outer Hebrides—Island Glass, Feb. 21, one killing small bird. Flannans, April 3, a ♂ shot; May 10, 14, and 20, seen; Sept. 30, chased a Pipit into engine-house, caught, and killed; Oct. 1, six. *Argyll and Isles*—Dhuheartach, April 9 and 23, one each day. *Solway*—Maxwelltown, April 11, fine old ♂ shot.

FALCO TINNUNCULUS (Kestrel).

Shetland—Dunrossness, April 20, one. *Orkney*—Sule Skerry, Jan. 14, one. *Tay*—Bell Rock, April 14, one on tower.

PANDION HALIAËTUS (Osprey).

Outer Hebrides—Lewis, shot in April. First established record of the species in the Outer Hebrides ("Annals," 1902, p. 184).

SULA BASSANA (Gannet).

Tay—Bell Rock, January, a few passing nearly every day during month. *Outer Hebrides*—Island Glass, Feb. 28, four, first seen since November. Flannans, March 27, flocks passing constantly for St. Kilda; Dec. 16, two, rarely seen at this season.

BOTAURUS STELLARIS (Bittern).

Solway—Balmaghie, Nov. 20, one shot.

PLEGADIS FALCINELLUS (Glossy Ibis).

Tweed—Roxburgh, Nov. 17, one, immature, shot near Kelso ("Annals," 1903, p. 49). *Argyll and Isles*—Islay, Oct. 30, immat. ♀ shot at Kildalton (*op. cit.* 1903, p. 50).

ANSER CINEREUS (Grey-lag Goose).

Sutherland—Cape Wrath, Feb. 26, five. *Argyll and Isles*—Tiree, May 6-7, three; Nov. 5, have returned. *Solway*—Wigtown, Jan. 18, several hundreds in Wigtown Bay, one shot ("Annals," 1902, p. 120). Maxwelltown, April 15, 1.20 P.M., 150 Grey Geese flying N.N.W. by N., and very high; April 18, 29 flying N.N.W.

ANSER SEGETUM (Bean Goose).

Solway—Wigtownshire, Feb. 8, three seen (two shot) near Port Patrick ("Annals," 1902, p. 120).

ANSER BRACHYRHYNCHUS (Pink-footed Goose).

Forth—Aberfoyle, April 27, a skein of 120 flying W., straight up line of Loch Ard. Dalmeny, Oct. 16. Aberlady, Oct. 16, two (one killed), first this winter. *Tweed*—Cramilt, April 26, flock of 200-300 flying N.

ANSER ALBIFRONS (White-fronted Goose).

Outer Hebrides—Island Glass, Jan. 25, flock of twenty-four. *Argyll and Isles*—Tiree, April 24, large flocks leaving; Oct. 20, large flock just arrived; Oct. 22, large flocks arriving.

BERNICLA LEUCOPSIS (Barnacle Goose).

Forth—Aberlady, Oct. 30, one; two seen about 16th. *Outer Hebrides*—Flannans, Jan. 31, twelve (one shot); March 27, large flock; May 13, flock; Oct. 17, twenty-two; Oct. 22, great flocks. Barra, Oct., 3rd week, arrived. *Argyll and Isles*—Tiree, Feb. 25, two. *Solway*—Maxwelltown, April 18, flocks of seven and twenty-seven flying N.N.W.

CYGNUS MUSICUS (Whooper Swan).

Argyll and Isles—Tiree, March 28, have left, enormous flocks on the lochs during winter; Oct. 22, sixteen; Nov. 14, numerous on lochs.

CYGNUS BEWICKI (Bewick's Swan).

Argyll and Isles—Tiree, March 28, have left, numerous on the lochs during winter; Oct. 20, ten on Favil; Nov. 21, numerous on lochs.

TADORNA CORNUTA (Sheld Duck).

Argyll and Isles—Tiree, April 21, several pairs have arrived.

ANAS STREPERUS (Gadwall).

Argyll and Isles—Tiree, April 9; still here, Nov. 6.

DAFILA ACUTA (Pintail).

Tay—Rannoch, April 21-28, a pair, probably nesting. *Clyde*—Mearns, May 24, two.

MARECA PENELOPE (Widgeon).

Orkney—Sule Skerry, Jan. 14, four. *Tay*—Rannoch, April 21-28. *Outer Hebrides*—Barra, Nov., 2nd week, arrived. *Argyll and Isles*—Tiree, April 8, have left, numerous all winter.

FULIGULA FERINA (Pochard).

Forth—Aberlady, Oct. 14, two ♂'s.

FULIGULA CRISTATA (Tufted Duck).

Orkney—Sule Skerry, April 30, a ♂. *Forth*—Aberlady, April 20, one near Gullane Point; Oct. 15-22, several. *Argyll and Isles*—Tiree, April 9, still here.

FULIGULA MARILA (Scaup).

Forth—Aberlady, Oct. 30, flock of 150. *Argyll and Isles*—Tiree, April 11, have left.

CLANGULA GLAUCION (Golden-eye).

Moray—Fochabers, April 19, a flock at Tugnet. *Tay*—Auchinblae, Oct. 13, two. *Forth*—Aberlady, Oct. 15. *Argyll and Isles*—Tiree, April 11, have left. Loch Lochy, Nov. 20-21, several.

HARELDA GLACIALIS (Long-tailed Duck).

Orkney—Sule Skerry, Nov. 1, one shot in summer plumage. *Moray*—Fochabers, April 19, a large flock at Tugnet. *Tay*—Bell Rock, March 28, last seen. *Outer Hebrides*—Barra, Oct., 1st week, arrived. *Argyll and Isles*—Tiree, March 14, numerous, Gott Bay.

SOMATERIA MOLLISSIMA (Eider Duck).

Orkney—Noup Head, Sept. 22, three, first this season. *Tay*—Bell Rock, Feb.-March, seen nearly every day; April 3, last; Sept. 27, four ♂'s. *Outer Hebrides*—Flannans, April 6, five (3 ♂, 2 ♀); Sept. 15, flock of seventy-two. *Argyll and Isles*—Skerryvore, Oct. 3, a flock; Nov. 27, more numerous than in former years.

SOMATERIA SPECTABILIS (King Eider).

Shetland—Dunrossness, March, one seen ("Annals," 1902, p. 183).

ŒDEMA NIGRA (Common Scoter).

Forth—Aberlady, June 7, flock of 176; Oct. 15, Nov. 3, a few pairs seen every day.

ŒDEMA FUSCA (Velvet Scoter).

Forth—Aberlady, April 20, hundreds off Gullane Point; June 7, one; Oct. 15-Nov. 3, numbers. *Solway*—Dumfries, Oct. 29, an old ♂ shot on the Nith, five or six miles from the firth ("Annals," 1903, p. 50).

TURTUR COMMUNIS (Turtle Dove).

Shetland—Dunrossness, May 28, appeared after a gale from S.S.W., and during 2nd and 3rd week in June a good many were about ("Annals," 1902, p. 252).

COTURNIX COMMUNIS (Quail).

Shetland—Dunrossness, must have a considerable number breeding this year; calling all round ("Annals," 1902, p. 252).

CREX PRATENSIS (Corn-crake).

Orkney—Noup Head, May 3, one heard, six days earlier than last year. *Moray*—Fochabers, April 30. *Forth*—Aberfoyle, April 27. Kirkliston, April 28. *Tweed*—Halmyre, April 20. Hawick and Broughton, April 30. *West Ross*—Garve, May 9. *Outer Hebrides*—Flannans, June 5. *Argyll and Isles*—Tiree, June 3. *Clyde*—Dalry, April 22. Giffnock, Beith, and Dunlop, April 24. *Solway*—Maxwelltown, May 5, one; 9th, scarce up till now.

Earliest, Tweed, Halmyre, April 20.

RALLUS AQUATICUS (Water Rail).

Forth—Isle of May. Oct. 13, one. *Outer Hebrides*—Barra, Oct., 2nd week, arrived. *Argyll and Isles*—Dhuheartach, April 7 one killed at lantern; Tiree, Oct. 24.

(To be continued.)

DIPTERA SCOTICA : III.—THE FORTH DISTRICT.

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

IN preparing this, the third of my papers on the Diptera of Scotland, I have thought it advisable to depart somewhat from my original plan, and to take the whole of the Forth area at once rather than deal separately with the small counties which border this important estuary. The list here furnished contains not only the specimens entered in my own register but also all the published records that I have been able to find. It may therefore be taken as a fairly complete summary of all that is as yet known regarding the Diptera of the district, but it is nevertheless strangely incomplete, and many common species which are absolutely certain to occur are not mentioned at all. In my own collection and that of the Edinburgh Museum, as well as in those of my valued friend Mr. Wm. Evans and others whom I know to have collected in the district, there are many thousands of specimens awaiting identification. It may thus be a comparatively simple matter to extend very considerably the number of species here recorded, especially when certain hitherto neglected Families, such as Cecidomyidæ, Mycetophilidæ, Tipulidæ, Chironomidæ, and Tachinidæ, have received their proper share of attention. It is with some reluctance that I venture to publish such a confessedly incomplete list, but with a view to stimulating the interest which I *know* is at last being roused in these insects I have thought it better to issue it for what it is worth rather than delay for an indefinite period.

The only papers that I have been able to find dealing specially with the Diptera of the Forth district are the following :

1. 'List of Insects Found in the Neighbourhood of Edinburgh.' By Mr. C. Stewart. "Memoirs of the Wernerian Natural History Society," vol. i. (1811), pp. 566-577. [*Diptera* on pp. 575-577.]

2. 'List of Insects Taken by Mr. Hardy in June and July 1843, in the Neighbourhood of the Pease Bridge.' By P. J.

Selby, Esq., of Twizell House. "Proceedings of the Berwickshire Naturalists' Club," vol. ii. (1842-49), pp. 110-114.

3. 'Diptera at Braemar, Aberdeen, and Aberlady, including Six Species not hitherto recorded as British.' By G. H. Verrall. "Scottish Naturalist," vol. ii. (1873-74), pp. 199-202.

The records contained in these three papers will be given with the reference number 1, 2, or 3, as the case may be, but all other records will be quoted in full. Those without any reference to a magazine or journal are taken from my own register, and were either collected by myself or by the gentleman whose name the record bears. I must here express my obligations to those friends who have from time to time either given me specimens or allowed me to examine those in their collections. First and foremost I must mention in this connection my esteemed friend Mr. William Evans, whose labours have so considerably enriched our knowledge of the fauna (in all its sections) of the Forth district.

Family PULICIDÆ.

1. PULEX IRRITANS, *L.*—Neighbourhood of Edinburgh—Stewart, 1, p. 577.

Family CECIDOMYIDÆ.

2. CECIDOMYIA CORRUGANS, *F. Lw.*—Galls on *Heracleum sphondylium*, *L.*, common in all parts of Fifeshire—Trail, "Scot. Nat." N.S. vol. iv. (1889-90) p. 231.
3. CECIDOMYIA CRATÆGI, *Winn.*—Galls on *Cratægus oxyacantha*, *L.*, common near Elie, and sparingly in other parts of Fife—Trail, "Scot. Nat." N.S. vol. iv. (1889-90), p. 231.
4. CECIDOMYIA DESTRUCTOR, *Say.*—East Lothian, Haddington—Ormerod, "Entomologist," 1887, p. 263; in small numbers at Dunglass, Chapelhill, Linnhead, and Oldcambus, also Dunbar, all in 1887—Hardy, "Proc. Berw. Nat. Club," vol. xii. (1887-89), p. 78.
5. CECIDOMYIA PERSICARIÆ, *L.*—Near Tynninghame and Beltonford, East Lothian—Hardy, "Proc. Berw. Nat. Club," vol. vii. (1873-75), p. 518; on *P[olygonum] Persicariæ* in E. Lothian (Hardy)—Trail, "Scot. Nat." N.S. vol. iii. (1887-88), p. 315.

6. *CECIDOMYIA TILLÆ*, *Schrk.*—? Ladykirk Churchyard; Cockburnspath; Tynninghame Woods—Hardy, "Proc. Berw. Nat. Club," vol. vii. (1873-75), p. 519.
7. *CECIDOMYIA VICIÆ*, *Kieffer.*—Galls common in Fife—Trail, "Scot. Nat." N.S. vol. iv. (1889-90), p. 231. [This species is not mentioned in Verrall's "List of British Diptera," 2nd ed. 1901.]
8. *DIPLOSIS BOTULARIA*, *Winn.*—Galls on *Fraxinus excelsior*, L., near Elie, and on the Castle Island in Loch Leven—Trail, "Scot. Nat." N.S. vol. iv. (1889-90), p. 231.
9. *DIPLOSIS LOTI*, *Deg.*—[*Cecidomyia*] Galls on *Lotus corniculatus*, L., near Elie, Fife—Trail, "Scot. Nat." N.S. vol. iv. (1889-90), p. 231.

Family MYCETOPHILIDÆ.

10. *GNORISTE APICALIS*, *Mg.*—Pease Bridge, 1843 (Hardy)—Selby, 2. [This record requires confirmation, and is apparently doubted by Verrall, who does not mention the species in either edition of his "List."]
11. *MACROCERA LUTEA*, *Mg.*—Pease Bridge, 1843 (Hardy)—Selby, 2.
12. *MACROCERA PHALERATA*, *Mg.*—Pease Bridge, 1843 (Hardy)—Selby, 2.

Family BIBIONIDÆ.

13. *SCATOPSE NOTATA*, *L.*—Aberlady, July 1898 (Wm. Evans).
14. *SCATOPSE PULICARIA*, *Lw.*—Aberlady, 1873—Verrall, 3, p. 202.
15. *SCATOPSE BREVICORNIS*, *Mg.*—Hawthornden, 26th May 1893 (P. H. G.).
16. *DILOPHUS FEBRILIS*, *L.*—[*Tipula*] Neighbourhood of Edinburgh—Stewart, 1, p. 576; [*D. vulgaris*] Pease Bridge, 1843 (Hardy)—Selby, 2; ♂, Morningside, 1st April 1894 (P. H. G.); ♂ and ♀ *in cop.*, Aberlady, 17th August 1896 (W. Eagle Clarke). Evidently common throughout the district.
17. *DILOPHUS ALBIPENNIS*, *Mg.*—♂, Heriot, 28th June 1898 (Wm. Evans); ♂, Aberlady, July 1898 (Wm. Evans).
18. *DILOPHUS FEMORATUS*, *Mg.*—♀, Aberlady, July 1898 (Wm. Evans). There appears to be some doubt as to the validity of this species. British specimens so named probably belong to *albipennis*.

19. *BIBIO POMONÆ*, *Fab.*—♂, Glencorse, 8th September 1898 (P. H. G.). Probably common throughout the district.
20. *BIBIO MARCI*, *L.*—Pease Bridge, 1843 (Hardy)—Selby, 2. Although I have no other record for this species, it is undoubtedly common in the district.
21. *BIBIO LEUCOPTERUS*, *Mg.*—Pease Bridge, 1843 (Hardy)—Selby, 2.
22. *BIBIO LANIGER*, *Mg.*—♂, Blackford Hill, 21st April 1894, and 12th May 1895 (P. H. G.).
23. *BIBIO JOHANNIS*, *L.*—Common. I have taken it at Glencorse (15th April 1894), Blackford Hill (21st April 1894), Drem (3rd May 1895), and Aberlady (3rd May 1895).
24. *BIBIO LACTEIPENNIS*, *Ztt.*—♂, Morningside, 21st May 1893; ♂, Woods at Polton, 26th May 1893; ♂ and ♀, Braid Hills, 27th May 1894; ♂ and ♀, Glencorse, 6th June 1894 (P. H. G.); ♀, Heriot, 28th June 1898 (Wm. Evans).
25. *BIBIO CLAVIPES*, *Mg.*—Pease Bridge, 1843 (Hardy)—Selby, 2; ♀, Aberlady, 17th August 1896 (W. Eagle Clarke).

Family SIMULIIDÆ.

26. *SIMULIUM REPTANS*, *L.*—I took a ♂ on a window in the Museum on 7th May 1895 (P. H. G.).

Family CHIRONOMIDÆ.

27. *CHIRONOMUS PLUMOSUS*, *L.*—[*Tipula plumosa*] Neighbourhood of Edinburgh—Stewart, 1, p. 576; ♀, Arthur's Seat, 1st July 1893 (P. H. G.); ♂, Glencorse, 8th September 1898 (P. H. G.).
28. *CHIRONOMUS PEDELLUS*, *Deg.*—[*Tipula littoralis*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.
29. *CHIRONOMUS PUSILLUS*, *L.*—[*Tipula pusilla*] Neighbourhood of Edinburgh—Stewart, 1, p. 576. [This record requires confirmation.—P. H. G.]
30. *CRICOTOPUS MOTITATOR*, *L.*—[*Tipula motitatrix*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.
31. *TANYPUS CULICIFORMIS*, *L.*—[*Tipula*] Neighbourhood of Edinburgh—Stewart, 1, p. 576; Pease Bridge, 1843 (Hardy)—Selby, 2.
32. *TANYPUS MONILIS*, *L.*—[*Tipula*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.

33. CERATOPOGON PULICARIS, *L.*—[*Culex*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.

Family PSYCHODIDÆ.

34. PERICOMA CANESCENS, *Mg.*—Blackford Hill, 21st April 1894 (P. H. G.).
35. PSYCHODA PHALÆNOIDES, *L.*—[*Tipula*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.

Family CULICIDÆ.

36. CULEX PIPIENS, *L.*—[*C. pipiens* and *ciliaris*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.

Family LIMNOBIIDÆ.

37. LIMNOBIA NUBECULOSA, *Mg.*—♀, Heriot, 28th June 1898 (Wm. Evans).
38. LIMNOBIA TRIPUNCTATA, *Fab.*—Pease Bridge, 1843 (Hardy)—Selby, 2.
39. RHAMPHIDIA LONGIROSTRIS, *Mg.*—[*Limnobia*] Pease Bridge, 1843 (Hardy)—Selby, 2.
40. RHYPHOLOPHUS VARIUS, *Mg.*—♂, Glencorse, 8th September 1898 (P. H. G.).
41. TRIMICRA PILIPES, *Fab.*—[*Limnobia fimbriata*] Pease Bridge, 1843 (Hardy)—Selby, 2.
42. TRICHOCERA REGELATIONIS, *L.*—[*Tipula*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.
43. TRICHOCERA HIEMALIS, *Deg.*—Common everywhere (P. H. G.).
44. AMALOPIS IMMACULATA, *Mg.*—♂, Glencorse, 8th September 1898 (P. H. G.).
45. AMALOPIS LITTORALIS, *Mg.*—[*Limnobia*] Pease Bridge, 1843 (Hardy)—Selby, 2.
46. PEDICIA RIVOSA, *L.*—[*Tipula rivosa* and *triangularis*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.

Family TIPULIDÆ.

47. PACHYRRHINA CROCATATA, *L.*—[*Tipula*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.
48. PACHYRRHINA HISTRIO, *Fab.*—Pease Bridge, 1843 (Hardy)—Selby, 2; ♀, Aberdour, 6th July 1893 (P. H. G.); ♂, North Berwick, August 1893 (W. Eagle Clarke); ♂, Aberlady, July 1898 (Wm. Evans).

49. *PACHYRRHINA MACULOSA*, *Mg.*—[*Tipula*] Pease Bridge, 1843 (Hardy)—Selby, 2.
50. *PACHYRRHINA PRATENSIS*, *L.*—[*Tipula*] Neighbourhood of Edinburgh—Stewart, 1, p. 576. [This species is only a doubtful native of Britain, and this record therefore requires confirmation.]
51. *TIPULA RUFINA*, *Mg.*—♀, window of house, Edinburgh, 10th May 1894 (P. H. G.).
52. *TIPULA HORTENSIS*, *Mg.*—Pease Bridge, 1843 (Hardy)—Selby, 2.
53. *TIPULA LUNATA*, *L.*—Neighbourhood of Edinburgh—Stewart, 1, p. 576.
54. *TIPULA GIGANTEA*, *Schrk.*—Pease Bridge, 1843 (Hardy)—Selby, 2.
55. *TIPULA LUTESCENS*, *Fab.*—One near Midcalder, July 1900—Wm. Evans, "Ann. Scot. Nat. Hist." 1900, p. 251.
56. *TIPULA OLERACEA*, *L.*—Neighbourhood of Edinburgh—Stewart, 1, p. 576; Pease Bridge, 1843 (Hardy)—Selby, 2; ♀, Glencorse, 8th September 1898 (P. H. G.); ♂, window of Museum, 10th September 1898 (P. H. G.).
57. *TIPULA CLANDESTINA*, *Mg.*—Pease Bridge, 1843 (Hardy)—Selby, 2. Not in Verrall's "List"; a doubtful record.
58. *TIPULA HORTORUM*, *L.*—Neighbourhood of Edinburgh—Stewart, 1, p. 576. The occurrence of this species in Britain requires confirmation.
59. *CTENOPHORA PECTINICORNIS*, *L.*—[*Tipula variegata*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.

Family RHYPHIDÆ.

60. *RHYPHUS FENESTRALIS*, *Scop.*—♀, North Berwick, August 1893 (W. Eagle Clarke).
61. *RHYPHUS PUNCTATUS*, *Fab.*—[*Tipula punctata*] Neighbourhood of Edinburgh—Stewart, 1, p. 576; ♀, window of Museum, 23rd August 1893 (P. H. G.); ♂, Glencorse, 6th June 1894 (P. H. G.); ♀, window of house at Morningside, 19th September 1894 (P. H. G.).

Family STRATIOMYIDÆ.

62. *PACHYGASTER ATRA*, *Panz.*—Aberlady, 1873—Verrall, 3, p. 202.

63. NEMOTELUS ULIGINOSUS, *L.*—Aberlady, June 1870 and in 1873—Verrall, 3, p. 202; several of each sex taken at Aberlady in July 1898 (Wm. Evans).
64. NEMOTELUS NOTATUS, *Ztt.*—Aberlady, June 1870—Verrall, 3, p. 202; ♂, Luffness Links, near Aberlady, 10th July 1895 (Wm. Evans)—Grimshaw, "Ann. Scot. Nat. Hist." 1897, p. 24; also in July 1898 in same locality (Wm. Evans).
65. NEMOTELUS NIGRINUS, *Fln.*—♂ and ♀, Aberlady, July 1898 (Wm. Evans).
66. OXYCERA PYGMÆA, *Fln.*—Two, Luffness Marsh, 14th July 1898—Wm. Evans, "Ann. Scot. Nat. Hist." 1901, p. 52. In a box of unpinned specimens given to me by Mr. Evans, and taken by him on the same day, I found several more examples of both sexes of this interesting species.
67. OXYCERA TRILINEATA, *Fab.*—[*Musca*] Neighbourhood of Edinburgh—Stewart, 1, p. 576; ♀, Luffness Marsh, 14th July 1898—Wm. Evans, "Ann. Scot. Nat. Hist." 1901, p. 52.
68. OXYCERA MUSCARIA, *Fab.*—Tower Dean, above the Pease Mill, Berwickshire—Hardy, "Proc. Berw. Nat. Club," vol. vii. (1873-75), p. 326. This species is given in Part III. of Verrall's "List" (ed. 1), and hence requires confirmation.
69. STRATIOMYS CHAMÆLEON, *L.*—[*Musca*] Neighbourhood of Edinburgh—Stewart, 1, p. 576; "sides of Duddingston Loch, Braid Marshes, and other similar places round Edinburgh, but not frequent"—Duncan, "Mag. Zool. and Bot." vol. i. (1837), p. 149. From this and other records (given below) by James Duncan, who was a thoroughly competent entomologist, it would appear that Duddingston Loch formerly possessed a wonderful variety of insect life, but the most interesting species have, it is to be feared, long disappeared from that locality. The same remark unfortunately applies to the Braid Marshes and other places in the immediate vicinity of the ever-growing Scottish metropolis. The old records are none the less interesting, and should be taken careful note of.
70. STRATIOMYS POTAMIDA, *Mg.*—♂ and ♀, Luffness Links, 15th July 1898: "several others were seen"—Wm. Evans, "Ann. Scot. Nat. Hist." 1901, p. 52.
71. STRATIOMYS RIPARIA, *Mg.*—"Once taken near Duddingston"—Duncan, "Mag. Zool. and Bot." vol. i. (1837), p. 151.
72. ODONTOMYIA ARGENTATA, *Fab.*—[*Musca*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.

73. ODONTOMYIA ORNATA, *Mg.*—"Near Edinburgh; Dalmeny—*Rev. William Little*"—Duncan, "Mag. Zool. and Bot." vol. i. (1837), p. 152.
74. ODONTOMYIA VIRIDULA, *Fab.*—"Taken plentifully about Edinburgh"—Duncan, "Mag. Zool. and Bot." vol. i. (1837), p. 154.
75. CHRYSONOTUS BIPUNCTATUS, *Scop.*—[*Sargus Reaumuri*, *Fab.*] "Noticed in the vicinity of Edinburgh . . . Braid Hills, near Edinburgh"—Duncan, "Mag. Zool. and Bot." vol. i. (1837), p. 163.
76. SARGUS FLAVIPES, *Mg.*—"In the vicinity of Edinburgh it has been taken at Duddingston and in the Botanic Garden; likewise in East Lothian"—Duncan, "Mag. Zool. and Bot." vol. i. (1837), p. 163.
77. SARGUS CUPRARIUS, *L.*—"Sometimes rather plentiful in the Botanic Garden of Edinburgh, and other places near the Scottish metropolis"—Duncan, "Mag. Zool. and Bot." vol. i. (1837), p. 161; Pease Bridge, 1843 (Hardy)—Selby, 2.
78. SARGUS IRIDATUS, *Scop.*—[*infuscatus*, *Mg.*] "Not very rare in gardens near Edinburgh"—Duncan, "Mag. Zool. and Bot." vol. i. (1837), p. 162.
79. CHLOROMYIA FORMOSA, *Scop.*—"Near Edinburgh it is found in many situations, and occasionally in great abundance on the irrigated meadows between Portobello and Leith"—Duncan, "Mag. Zool. and Bot." vol. i. (1837), p. 165; ♂, Smeaton Hepburn, 17th July 1897 (Sir Archibald Buchan-Hepburn); ♂, Aberlady, July 1898 (Wm. Evans).
80. MICROCHRYSA POLITA, *L.*—[*Musca*] Neighbourhood of Edinburgh—Stewart, 1, p. 576; [*Sargus*] Pease Bridge, 1843 (Hardy)—Selby, 2.
81. BERIS VALLATA, *Forst.*—♀, Aberlady, July 1898 (Wm. Evans).
82. BERIS CHALYBEATA, *Forst.*—[*obscura*] Pease Bridge, 1843 (Hardy)—Selby, 2; ♂, Canal bank, Slateford, 9th June 1895 (P. H. G.).
83. BERIS GENICULATA, *Curt.*—Aberlady, 1873—Verrall, 3, p. 202.

Family TABANIDÆ.

84. HÆMATOPOTA PLUVIALIS, *L.*—[*Tabanus*] Neighbourhood of Edinburgh—Stewart, 1, p. 576; Pease Bridge, 1843 (Hardy)—Selby, 2; ♀, Aberlady, July 1898 (Wm. Evans).

85. *THERIOPLECTES TROPICUS*, *Mg.*—[*Tabanus*] “Cramond, near Edinburgh—*Rev. William Little*; Pentland Hills”—Duncan, “*Mag. Zool. and Bot.*” vol. i. (1837), p. 367; Kirknewton and Aberfoyle, July 1900—Wm. Evans, “*Ann. Scot. Nat. Hist.*” 1901, p. 53.
86. *TABANUS AUTUMNALIS*, *L.*—Neighbourhood of Edinburgh—Stewart, 1, p. 576.
87. *TABANUS BROMIUS*, *L.*—Bavelaw Moss, three captured on 24th June 1895—Wm. Evans, “*Ann. Scot. Nat. Hist.*” 1901, p. 53.
88. *CHRYSOPS CÆCUTIENS*, *L.*—[*Tabanus*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.

Family LEPTIDÆ.

89. *LEPTIS SCOLOPACEA*, *L.*—[*Musca*] Neighbourhood of Edinburgh—Stewart, 1, p. 576; Pease Bridge, 1843 (Hardy)—Selby, 2; ♂ and ♀, Aberlady, July 1898 (Wm. Evans).
90. *LEPTIS TRINGARIA*, *L.*—♂, window of house, Morningside, 5th July 1893 (P. H. G.); ♀, North Berwick, August 1893 (W. Eagle Clarke).
91. *LEPTIS CONSPICUA*, *Mg.*—♂, Canty Bay, 4th August 1896 (W. Eagle Clarke).
92. *LEPTIS LINEOLA*, *Fab.*—♂, Aberdour, 6th July 1893 (P. H. G.).
93. *CHRYSOPILUS AURATUS*, *Fab.*—[*Musca aurata*] Neighbourhood of Edinburgh—Stewart, 1, p. 576; ♂ and ♀, Heriot, 28th June 1898 (Wm. Evans); ♂ and ♀, Aberlady, July 1898 (Wm. Evans).
94. *SYMPHROMYIA CRASSICORNIS*, *Panz.*—[*Atherix*] Pease Bridge, 1843 (Hardy)—Selby, 2; ♀, Aberlady, July 1898 (Wm. Evans).
95. *SPANIA NIGRA*, *Mg.*—[*Leptis*] Pease Bridge, 1843 (Hardy)—Selby, 2. [I cannot quite accept this record, especially as many of Hardy's identifications were incorrect.—P. H. G.]

Family ASILIDÆ.

96. *DIOCTRIA ŒLANDICA*, *L.*—[*Asilus*] Neighbourhood of Edinburgh—Stewart, 1, p. 577.
97. *DIOCTRIA LONGICORNIS*, *Mg.*—Pease Bridge, 1843 (Hardy)—Selby, 2. [Probably wrongly identified.—P. H. G.]

98. PHILONICUS ALBICEPS, *Mg.*—♂, Tynninghame, August 1894 (Wm. Evans); ♀, Falkland, Fife, August 1895 (Wm. Evans); North Berwick, 21st August 1896 (W. Eagle Clarke).
99. DYSMACHUS FORCIPATUS, *L.*—[*Asilus*] Neighbourhood of Edinburgh—Stewart, 1, p. 577. [A very doubtful record—P. H. G.]

Family BOMBYLIIDÆ.

100. ANTHRAX PANISCUS, *Rossi.*—Leven Links, a few, August 1893; half-a-dozen, Tynninghame, August 1894; ♂ and ♀, Gullane, 21st July 1898; one, Elie, 24th August 1899—Wm. Evans, "Ann. Scot. Nat. Hist." 1900, p. 251.
101. BOMBYLIUS MINOR, *L.*—"Occurs in some plenty, in the month of June, in many places near Edinburgh, such as the base of Arthur's Seat, [and] fields about Duddingston"—Duncan, "Mag. Zool. and Bot." vol. ii. (1838), p. 209. [I should much like to see recently captured specimens from these localities!—P. H. G.]

Family THEREVIDÆ.

102. THEREVA NOBILITATA, *Fab.*—Pease Bridge, 1843 (Hardy)—Selby, 2; ♀, Aberlady, 17th August 1896 (W. Eagle Clarke); ♂ and ♀, Aberlady, July 1898 (Wm. Evans).
103. THEREVA ANNULATA, *Fab.*—Pease Bridge, 1843 (Hardy)—Selby, 2; ♂, Aberlady, July 1898 (Wm. Evans).
104. DIALINEURA ANILIS, *L.*—[*Musca*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.

Family EMPIDÆ.

105. HYBOS CULICIFORMIS, *Fab.*—Aberlady, 1873—Verrall, 3, p. 202. [This requires confirmation.—P. H. G.]
106. MACROSTOMUS¹ SULCATUS, *Fln.*—♀, Blackford Hill, 12th May 1895.
107. MACROSTOMUS SIMPLEX, *Ztt.*—[*Rhamphomyia*] Aberlady in June—Verrall, "Ent. Mo. Mag." vol. xxii. (1885-86), p. 202.
108. MACROSTOMUS VARIABILIS, *Fln.*—[*Rhamphomyia*] Aberlady, 1873—Verrall, 3, p. 202.

¹ According to Coquillett ("Proc. Ent. Soc. Washington," vol. v. p. 252), the name MACROSTOMUS, *Wied.*, must be substituted for the more familiar one of RHAMPHOMYIA, *Mg.*, since it has five years' priority.

109. MACROSTOMUS UMBRIPENNIS, *Mg.*—[*Rhamphomyia*] Aberlady, 1873—Verrall, 3, p. 202.
110. EMPIS TESSELLATA, *Fab.*—Pease Bridge, 1843 (Hardy)—Selby, 2.
111. EMPIS LIVIDA, *L.*—Neighbourhood of Edinburgh—Stewart, 1, p. 576.
112. EMPIS OPACA, *Fab.*—Pease Bridge, 1843 (Hardy)—Selby, 2.
113. EMPIS STERCOREA, *L.*—Pease Bridge, 1843 (Hardy)—Selby, 2; Aberlady—Verrall, "Ent. Mo. Mag." vol. viii. (1871-72), p. 282.
114. EMPIS TRIGRAMMA, *Mg.*—♂, Canal bank, Slateford, 9th June 1895 (P. H. G.).
115. EMPIS PUNCTATA, *Mg.*—♀, Canal bank, Slateford, 9th June 1895 (P. H. G.).
116. EMPIS CONCOLOR, *Verrall.*—"I captured three males and a female of this species at Aberlady, on June 30, 1870, by sweeping in a wood near the coast, nearly a mile from Aberlady, on the road to the railway station"—Verrall, "Ent. Mo. Mag." vol. viii. (1871-72), p. 284.
117. EMPIS LUTEA, *Mg.*—"In company with *concolor*, at Aberlady"—Verrall, "Ent. Mo. Mag." vol. viii. (1871-72), p. 283; ♀ Aberdour, 6th July 1893 (P. H. G.).
118. EMPIS TESTACEA, *Fab.*—Pease Bridge, 1843 (Hardy)—Selby, 2. [This is probably a wrong identification.—P. H. G.]
119. EMPIS MERIDIONALIS, *Mg.*—Pease Bridge, 1843 (Hardy)—Selby, 2. [? a wrong identification.—P. H. G.]
120. EMPIS BISTORTÆ, *Wlk.*—Pease Bridge, 1843 (Hardy)—Selby, 2. [Verrall places this species in Part II. of his "List"—2nd edition—thus regarding it as unrecognisable.]
121. HILARA INTERSTINCTA, *Fln.*—Aberlady, 1873—Verrall, 3, p. 202.
122. HILARA NIGRINA, *Fln.*—Pease Bridge, 1843 (Hardy)—Selby, 2.
123. HILARA LITOREA, *Fln.*—Aberlady, 1873—Verrall, 3, p. 202.
124. OCYDROMIA GLABRICULA, *Fln.*—Aberdour, 6th July 1893 (P. H. G.).
125. ARDOPTERA IRRORATA, *Fln.*—Aberlady, 2nd June 1903 (P. H. G.).
126. TACHISTA ANNULIMANA, *Mg.*—Fairmilehead, 13th October 1896 (Wm. Evans).
127. CHERSODROMIA HIRTA, *Wlk.*—Aberlady, 1873—Verrall, 3, p. 202.

Family DOLICHOPODIDÆ.

128. *PSILOPUS PLATYPTERUS*, *Fab.*—Aberlady, 1873—Verrall, 3, p. 202; ♂, Aberdour, 6th July 1893 (P. H. G.).
129. *PSILOPUS WIEDEMANNI*, *Fln.*—Aberlady, 1873—Verrall, 3, p. 202.
130. *HYGROCELEUTHUS DIADEMA*, *Hal.*—Aberlady, 1873—Verrall, 3, p. 202.
131. *DOLICHOPUS NUBILUS*, *Mg.*—Aberlady, 1873—Verrall, 3, p. 202.
132. *DOLICHOPUS CLAVIGER*, *Stan.*—In the wood at Aberlady, 1873—Verrall, "Scot. Nat." vol. ii. (1873-74), p. 202, and "Ent. Mo. Mag." vol. xii. (1875-76), p. 32.
133. *DOLICHOPUS PLUMIPES*, *Scop.*—Aberlady, 1873—Verrall, 3, p. 202.
134. *DOLICHOPUS POPULARIS*, *Wied.*—Both sexes, Hawthornden, 26th May 1893 (P. H. G.).
135. *DOLICHOPUS NITIDUS*, *Fln.*—Pease Bridge, 1843 (Hardy)—Selby, 2.
136. *DOLICHOPUS SABINUS*, *Hal.*—On the mud at Aberlady, 1873—Verrall, "Scot. Nat." vol. ii. (1873-74), p. 202, and "Ent. Mo. Mag." vol. xii. (1875-76), p. 34.
137. *DOLICHOPUS TRIVIALIS*, *Hal.*—Aberlady, 1873—Verrall, 3, p. 202.
138. *HERCOSTOMUS CHÆROPHYLLI*, *Mg.*—[*Gymnopternus*] Swarming on *Umbelliferae* in the wood at Aberlady, 1873—Verrall, "Scot. Nat." vol. ii. (1873-74), p. 202, and "Ent. Mo. Mag." vol. xii. (1875-76), p. 34.
139. *GYMNOPTERNUS REGALIS*, *Mg.*—[*Medeterus*] Several specimens in Cockburnspath, Tower Dean, Berwickshire, 9th August 1847—James Hardy, "Zoologist," 1848, p. 1992. [Probably a wrong identification—P. H. G.]
140. *CHRYSOTUS GRAMINEUS*, *Fln.*—Aberlady, 1873—Verrall, 3, p. 202.
141. *ARGYRA DIAPHANA*, *Fab.*—[*Porphyrrops diaphanus*] Pease Bridge, 1843 (Hardy)—Selby, 2.
142. *SYNTORMON PALLIPES*, *Fab.*—[*Synarthrus*] Aberlady, 1873—Verrall, 3, p. 202.
143. *MACHÆRIUM MARITIMÆ*, *Hal.*—Aberlady, 1873—Verrall, 3, p. 202.
144. *MEDETERUS TRUNCORUM*, *Mg.* (? or *TENUICAUDA*, *Lw.*)—Aberlady, 1873—Verrall, 3, p. 202.

145. *SCELLUS NOTATUS*, *Fab.*—Near Midcalder, 11th July 1900 (Wm. Evans).
146. *HYDROPHORUS BALTICUS*, *Mg.*—Aberlady, 1873—Verrall, 3, p. 202.
147. *HYDROPHORUS BISETUS*, *Lw.*—Aberlady, 1873—Verrall, 3, p. 202.
148. *LIANCALUS VIRENS*, *Scop.*—♂, Glencorse, 8th September 1898 (P. H. G.).
149. *CAMPSICNEMUS LORIPES*, *Hal.*—“An almost black-legged variety of this occurs at Aberlady”—Verrall, “Ent. Mo. Mag.” vol. xii. (1875-76), p. 269.
150. *CAMPSICNEMUS ARMATUS*, *Ztt.*—Aberlady, 1873—Verrall, 3, p. 202.
151. *SYMPYCNUM ANNULIPES*, *Mg.*—Aberlady, 1873—Verrall, 3, p. 202.
152. *MICROMORPHUS ALBIPES*, *Ztt.*—Aberlady, 1873—Verrall, 3, p. 202.

(To be continued.)

NOTES ON THE FLORA OF WESTERN ROSS-SHIRE.

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

AFTER visiting East Ross I enjoyed the kind hospitality of Lady Fowler for a few days at Inverbroom, and was thus enabled to explore the upper end of Loch Broom. Here a feature was the abundance of *Prunella vulgaris*, with very large flowers. On the alluvial deposits near Inverbroom a form of *Silene maritima* occurred which recedes towards *Silene Cucubalus*. As the latter species does not occur there, any theory of hybridisation, so very popular just now, is untenable. On bare places within the influence of saline water *Sagina subulata* occurred and a *Cochlearia*, which I think is *groenlandica*, was noticed. We spent a day in walking over the hills to Dundonnell in order to look for *Goodyera* and *Corallorhiza* in the locality where Dr. Lightfoot first added them to the British flora; but we were unable to find either species. The once extensive wood

opposite the mansion house of the Mackenzies has been much curtailed; but there are still likely places for *Corallo-rhiza* if not for *Goodyera* to grow in. The district, however, does not afford plants of much interest, though it was here I gathered *Caltha radicans* some years ago.

The western corrie of Ben Dearg yielded several species new to the vice-county; and there remains much to be done at this land of mountain and flood, especially in investigating the lacustrine flora.

In these and in my excursions in East Ross I had the advantage and pleasure of the companionship of my friend the Rev. H. J. Riddelsdell.

* Signifies a new county record.

† Denotes that the plant is probably not native.

Thalictrum alpinum, *L.*—Near the head of Corrie Lael, Ben Dearg, etc.

**Ranunculus hederaceus*, *L.*—Strathcarron, *S. Macvicar*, 1902.

This corroborates the occurrence in the vice-county, and fills up the only blank left in its general comital distribution.

R. acris, *L.*, var. *vulgatus* (*Jord.*), Inverbroom.

R. Ficaria, *L.*—Foich woods, *Lady Fowler*.

Caltha palustris, *L.*, var. *minor*, *DC.*—Near the summit of Beinn Fiodha (*H. N. Dixon*), on Ben Dearg at 2500 feet.

Capnoides claviculata, *Druce (Corydalis)*. Elphin, *Lady Fowler*.

Fumaria officinalis, *L.*—Inverbroom, *Lady Fowler*.

Cardamine pratensis, *L.*—The true plant, with sessile leaflets, grows near Loch Droma.

Cochlearia groenlandica, *L.*—Near Inverbroom.

Subularia aquatica, *L.*—Loch Feith-an-Leothaid, Gleann na Muice, Loch Maree, *C. E. Salmon*.

**Viola canina*, *L.*—Strathcarron, *W. A. Shoolbred*. This confirms the previous doubtful record for the vice-county.

Silene acaulis, *Jacq.*—Brought to Lady Fowler by one of her stalkers from Ben Dearg, where I found it abundantly, and flowering freely in August 1902, occasionally with white flowers. Sometimes in a diffuse lax form, but usually in the dense cushions so characteristic of the plant. Also on other hills near Braemore.

**Cerastium trigynum*, *Vill.*—Summit of Beinn Fiodha, *H. N. Dixon*

- **C. alpinum*, *L.*—In the Corrie Lael and on the slopes on the northern shoulder of Ben Dearg. A new county record.
- C. vulgatum*, *L.*, var. *alpinum*, *Koch.*—Ben Dearg, and on other hills.
var. *fontanum* (*Baumg.*).—Ben Dearg.
- Arenaria sedoides*, *Schultz.*, Inverlael, *Lady Fowler.*—Abundant on the exposed shoulder of Ben Dearg, and on other hills in the neighbourhood, freely flowering.
- Sagina subulata*, *Presl.*—Inverbroom.
- **Hypericum perforatum*, *L.*—Verified by *Mr. P. Ewing* for *W. Ross* (see “*Ann. Scot. Nat. Hist.*,” 1900, p. 163).
- Geranium sylvaticum*, *L.*—Near Loch Droma, *Lady Fowler.*
- G. dissectum*, *L.*—Inverbroom, *Lady Fowler.*
- G. lucidum*, *L.*, *P. Ewing* (see “*Ann. Scot. Nat. Hist.*,” 1900, p. 163), but is it native, and if so where?
- Vicia hirsuta*, *Koch.*—Inverbroom, *Lady Fowler.*
- V. sylvatica*, *L.*—Loch Duich, *H. N. Dixon.*
- Prunus Padus*, *L.*—Braemore, *Lady Fowler*, Inverbroom, etc.
- Rubus nessensis*, *Hall* (*N. suberectus*, *And.*).—Kinlochewe, *C. E. Salmon.*
- **R. Rogersii*, *Linton.*—Kinlochewe, *C. E. Salmon.* Near Foich Lodge, Braemore.
- R. pyramidalis*, *Kalt.*—Kinlochewe, *C. E. Salmon.*
- R. villicaulis*, *Koel.*—Kinlochewe, *C. E. Salmon.*
- R. saxatilis*, *L.*—Ben Dearg.
- R. Chamæmorus*, *L.*—Ben Dearg, Beinn Liath Beag, etc.
- Potentilla Sibbaldi*, *Hall*, f.—Plentiful on Ben Dearg and other mountains about Braemore above 2800 feet. *Mr. H. N. Dixon* also gathered it on Beinn Fiadha.
- P. palustris*, *Scop.* (*Comarum*).—Accidentally omitted from my 1894 list; but recorded by me for Loch Alsh in 1881. At a loch in Coigach, *Lady Fowler.*
- Oxalis Acetosella*, *L.*—The abundance of this under the larch in the woods at Dundonnell is a very striking feature.
- Alchemilla vulgaris*, *L.*, var. *glabra*, *Wimm. and Grab.*—Inverbroom and in the mountain corries.
var. **flicaulis* (*Buser*).—Inverbroom.
- †*Pyrus intermedia*, *Ehrh.*—Inverbroom, but certainly planted.
Sorbus Scandica *Fries.*
- P. Malus*, *L.*—Native, Braemore, *Lady Fowler.*

- Cratægus Oxyacantha*, *L.* (*C. monogyna*).—Certainly native on An Teallach, etc.
- Saxifraga oppositifolia*, *L.*—Beinn-a-Mhuinidh, *C. E. Salmon*. In fine flower on Ben Dearg, August 1902, and on other hills up to 3200 feet.
- S. hypnoides*, *L.*—Beinn-a-Mhuinidh, and Glen Docherty, *C. E. Salmon*, not seen on the Braemore Hills.
- Parnassia palustris*, *L.*—Kinlochewe, *C. E. Salmon*. Abundant at Strome, *H. N. Dixon*, Dundonnell.
- Sedum roseum*, *Scop.*—Corrie Lael and other hills on the Braemore Forest, and near the sea-level at Grinard.
- Drosera intermedia*, *Hayne* (*D. longifolia*, *L.*).—*A. Evans* in "Ann. Scot. Nat. Hist.," 1900, p. 163.
- D. obovata*, *Mert.* and *Koch.*—Beinn-a-Mhuinidh, *C. E. Salmon*. This hybrid is rather frequent in some districts of Western Ross.
- **Myriophyllum spicatum*, *L.*—*P. Ewing*, see "Ann. Scot. Nat. Hist." 1900, p. 163.
- Callitriche hamulata*, *Kuetz.*—Three localities about Loch Maree, *C. E. Salmon*. In a pool at 2500 feet on Ben Dearg.
- Epilobium angustifolium*, *L.*—Braemore, *Lady Fowler*, native.
- E. alsinefolium*, *Vill.*—Slioch, *C. E. Salmon*. In my 1894 list I queried it for the county, but said I had an impression that I gathered it on Ben Eay. This was the fact; and I have since found my specimen which had been misplaced. It was given in *Dixon's Gairloch list*. A hybrid of it with *E. palustre* was found by *Mr. C. E. Salmon* on the Slioch.
- Circeæ alpina*, *L.*, var. *intermedia* (*Ehrh.*).—Loch Maree, *C. E. Salmon*; and I have also seen a plant there which recedes from *alpina* towards *lutetiana*, and another anomalous form occurs near Inverbroom.
- †*Myrrhis odorata*, *Scop.*—Inverbroom, *Lady Fowler*; but here it appears to be only an escape from cultivation.
- Ligusticum scoticum*, *L.*—Polglass, 1893; Gairloch, *D. Russell*; Summer Islands, *Lady Fowler*.
- Daucus Carota*, *L.*—Coigach, *Lady Fowler*.
- Cornus suecica*, *L.*—Ben Dearg, Ben Liath Beag, and other hills of Braemore.
- Galium boreale*, *L.*—Ben Dearg.
- Gnaphalium sylvaticum*, *L.*—In many places about Kinlochewe and Torridon, *C. E. Salmon*; Braemore, *Lady Fowler*; and, as the var. *alpestre*, *Druce*, on Ben Dearg.

- G. supinum, *L.*—Slioch, *C. E. Salmon*; Ben Dearg and other hills of Braemore, sometimes as the var. *fuscum*, Scop.
- Saussurea alpina, *DC.*—Ben Dearg.
- Lobelia Dortmanna, *L.*—Near Braemore, *Lady Fowler*.
- *Hieracium graniticolum, *W. R. Linton*.—Slioch, *C. E. Salmon*.
- H. holosericeum, *Backh.*—Ben Dearg, etc., 3000 feet.
- *H. atratum, *Fr.*, forma.—Slioch, *C. E. Salmon*.
- *H. senescens, *Backh.*—Slioch, *C. E. Salmon*.
- *H. Schmidtii, *Tausch.*—Stream near Kinlochewe, *C. E. Salmon*.
- *H. Leyi, *F. J. Hanb.*—Garn-a-Ghlinne, Kinlochewe, *C. E. Salmon*.
- *H. argenteum, *Fries.*—Ben Eay, *C. E. Salmon*. I gathered it on Cnochan rocks, in 1893, I think, as the var. *septentrionale*.
- *H. Sommerfeltii, *Lindeb.*—Slioch, *C. E. Salmon*.
- H. rubicundum, *Hanb.*,* var. *Boswelli* (Linton).—Stream near Kinlochewe, and Ben Eay, *C. E. Salmon*. I daresay my Ullapool specimens of 1893 may belong here.
- *H. stenolepis, *Lindeb.*—Dundonnell.
- *H. nitidum, *Backh.*—Braemore.
- H. vulgatum, *Fr.*,* var. *ravusculum*, Dahlst.—Inverbroom, 1902; Strome Ferry, 1882.
- H. murorum, *L.* = H. silvaticum, *Gouan*.
 *var. *pellucidum* (Laestad.).—Inverbroom, Braemore.
 *var. *subulatidens* (Dahlst.).—Braemore.
 *var. *phacotrichum* (Dahlst.).—Inverbroom, *Rev. H. J. Riddelsdell*.
- Campanula rotundifolia, *L.*—Near Braemore, *Lady Fowler*, a rare plant of Western Ross-shire.
- Vaccinium uliginosum, *L.*—Not unfrequent on the hills of the Braemore Forest, but this year usually barren.
- V. Myrtillus, *L.*—On the wind-swept ridge of a hill near Braemore this occurred as a completely prostrate plant (forma *prostrata*), closely appressed to the *Racomitrium* with which it grew.
- Arctostaphylos alpina, *Spreng.*—Western Ross-shire is the head centre of this species, which was unusually luxuriant this season, and was frequent on Ben Dearg and other hills near Braemore, and on exposed rocks on Meall-a-Chairn (about 1300 feet). The plant prefers a bare stony shoulder where it has full sun and wind exposure.
- A. Uva-ursi, *Spreng.*—The narrow-leaved form was noticed in the Braemore and Dundonnell forests.

Loiseleuria procumbens, *Desv.*—Braemore, *Lady Fowler*. Descends to 1600 feet on Beinn Liath Mhor, *S. Macvicar*. In flower on Ben Dearg.

Pyrola minor, *L.*—Glen Docherty and A-Ghairbhe, *C. E. Salmon*.

P. secunda, *L.*—Garn-a-Ghlinne, *C. E. Salmon*.

**Statice pubescens*, *Sm.*—Cliffs of Ben Dearg, etc., up to 3600 feet. Inverbroom, sea-level. Some of the mountain forms had broader leaves which were finely 3 nerved. Var. *planifolia* (Syme). The Holotrichous *S. maritima* was not seen.

Gentiana campestris, *L.*—Kinlochewe, *C. E. Salmon*; Foich Lodge, *Lady Fowler*. Plentiful in 1902 in the latter station.

**G. baltica*, *Murb.*—Letterewe, *D. Russell*.

Trientalis europæa, *L.*—Ben Noa, *D. Russell*; Braemore, Dixon's Gairloch list; Coigach, *Lady Fowler*; confirms the previous record.

Lycopsis arvensis, *L.*—Inverbroom, *Lady Fowler*!

Myosotis repens, *Don.*—Braemore, *Lady Fowler*; near Inverbroom.

†*Atropa Belladonna*, *L.*—On the sea shore, Gairloch, *D. Russell*, "Ann. Scot. Nat. Hist." 1901, p. 107.

Mimulus Langsdorffii, *Donn.*—Inverbroom, *Lady Fowler*. The variety with spotted corolla I gathered in Kintail in 1881.

Veronica humifusa, *Dicks.*—Beinn Fiadha, *H. N. Dixon*. I did not see it on Ben Dearg.

V. Anagallis-aquatica, *L.*, var. *anagalliformis* (Bor.).—Near Kishorn.

Euphrasia brevipila, *Burn.* and *Gren.*—Kinlochewe, *C. E. Salmon*. This was my *E. officinalis* of the 1881 list. It also occurred at Dundonnell and Braemore.

E. scottica, *Wettst.*—Kinlochewe, *C. E. Salmon*; Poolewe, 1897, *F. Townsend*.

E. Foulænsis, *Towns.*—Strathcarron, *Dr. W. Shoolbred*.

E. nemorosa, *H. Mart.*, forma.—Braemore Forest.

E. gracilis, *Fr.*, var. **primaria*.—Kinlochewe, see "Ann. Scot. Nat. Hist." 1899, p. 97.

**Rhinanthus Crista-galli*, *L.*, var. *angustifolius*, Koch (= *R. stenophyllus*, Schur.).—Polglass, Ullapool, etc., 1893; Inverbroom.

R. minor, *Ehrh.*—Polglass.

**R. Drummond-Hayi* (F. B. White), Sterneck, Kinlochewe, 1889; Ben Dearg.

**R. monticola* (*Lan.*).—Ben Dearg.

Utricularia neglecta, *Lehm.* (*U. major*, Schmid).—Lochan Feithan-Leothaid, Loch Gleann-na-Muice, *C. E. Salmon*.

U. intermedia, *Hayne*.—Loch Maireannach; Loch Clair, *C. E. Salmon*.

Lamium amplexicaule, *L.*—Inverbroom, *Lady Fowler*.

The *Lamium album* of Mr. Dixon's Gairloch list is, I find, the white flowered variety of *Galeopsis Tetrahit*.

**Plantago media*, *L.*—See "Ann. Scot. Nat. Hist." 1900, p. 163. Near Talladale Pier, ? introduced.

P. Coronopus, *L.*—Coigach, *Lady Fowler*.

Polygonum viviparum, *L.*—Beinn Fiadha, *H. N. Dixon*; see also my 1894 list.

Betula nana, *L.*—Braemore, *Lady Fowler*. Abundant in many wet boggy places about Braemore, and very luxuriant specimens by Loch Droma.

Salix herbacea, *L.*—Descends to 1500 feet on Beinn Liath Mhor, *S. Macvicar*. Sparingly on Ben Dearg, etc.

Juniperus nana, *Willd.*—Ben Dearg, Meall a Chairn, etc.

Malaxis paludosa, *Sw.*—Gairloch, *D. Russell*. Near Loch Clair, etc., *C. E. Salmon*.

Listera cordata, *Br.*—Near Inverbroom, *Lady Fowler*.

Habenaria albida, *Br.*—Plentiful about Kinlochewe, 1896, *D. Russell*.

Allium ursinum, *L.*—Near A-Ghairbhe, *C. E. Salmon*; Braemore, *Lady Fowler*.

**Orchis maculata*, *L.*, var. *ericetorum*, Linton.—Frequent about Inverbroom and Dundonnell.

Tofieldia palustris, *Huds.*—Braemore, *Lady Fowler*. Near Loch Droma.

Juncus trifidus, *L.*—Not unfrequent on the higher ridges of the Braemore hills up to 3600 feet.

J. triglumis *L.*—Rare, Ben Dearg.

Luzula spicata, *DC.* (*Juncoides spicatum*, Kuntze).—Not uncommon on the higher hills of Braemore,—e.g. Ben Dearg.

Sparganium affine, *Schnizl.* (*S. natans*, Hooker, f. etc.).—Pool at Gairloch, *D. Russell*. This is being introduced into many Highland lochs in order to give food to trout; it has been for this purpose put into Loch Fhiona, near Inverbroom.

S. minimum, *Fries.*—Marsh, Loch Duich, *H. N. Dixon*.

- Zostera marina*, *L.*—Omitted from the 1894 list, but recorded by me in 1882. Jean Town, and I have seen it at Loch Torridon. The Rev. H. E. Fox recorded the narrow leaved variety (*angustifolia*) in 1893.
- Scirpus rufus*, *Wahl.*—Loch Duich, *H. N. Dixon*. I gathered it and the var. *bifolius* in 1893.
- Carex pauciflora*, *Light.*—Near Loch Droma, etc.
- C. canescens*, *L.*—A form which Professor Babington called *C. vitilis* was gathered by *Mr. H. N. Dixon* on Beinn Fiadha.
- C. rigida*, *Good.*—A luxuriant form occurred on Ben Dearg at 3200 feet.
- C. pilulifera*, *L.*, var. *longibracteata*, *Lange.*—Slioch, *C. E. Salmon*. Ben Dearg.
- C. panicea*, *L.*, var. *tumidula*, *Laest.*—Glen Carron, "Ann. Scot. Nat. Hist.," 1897, p. 258.
- **C. limosa*, *L.*—Gairloch.
- C. lævigata*, *Sm.*—Near A-Ghairbhe, *C. E. Salmon*.
- C. fulva*, *Good.*—Gairloch, *T. Cartwright*.
- C. flava*, *L.*—The montane form with dark glumes occurred on Ben Dearg, etc.
- C. saxatilis*, *L.*—Beinn Fiadha, *H. N. Dixon*. On the Inverlael side of Ben Dearg.
- Deschampsia cæspitosa*, *Beauv.*, var. *brevifolia*, *Parn.*—Slioch, *D. Russell*. On the shoulder of Ben Dearg, etc.; var. *alpina*, Ben Dearg.
- **D. alpina*, *Beauv.*—Very rare on Ben Dearg. New to Ross-shire.
- Arrhenatherum avenaceum*, *Beauv.*—The type at Inverbroom, and a handsome woodland form, forma *umbrosa* as well as var. *pauciflora*, *Baenitz*.
- Poa subcærulea*, *Sm.*—Inverbroom, and the small form var. *humilis* (*Ehrh.*) at Cnochan.
- **P. Balfouri*, *Parn.*—Slioch, *C. E. Salmon*.
- Hymenophyllum unilaterale*, *Bory.*—A-Ghairbhe. Below Beinn a Mhuinidh and Talladale, *C. E. Salmon*; Loch Broom, *Lady Fowler*.
- Cryptogramme crispa*, *Br.*—Slioch, *C. E. Salmon*. Ben Dearg, etc.
- Asplenium Adiantum-nigrum*, *L.*, var. *obtusum*.—Gairloch, *D. Russell*.
- A. marinum*, *L.*—Loch Broom, *Lady Fowler*; Gairloch, *D. Russell*; Isle of Longa, *T. Cartwright*.
- A. viride*, *Huds.*—Ravine in Beinn Liath Mhor, *S. Macvicar*; Ben Dearg.

- A. septentrionale, *Hull*.—Ben Dearg; rocks near Gruinard, Lady Fowler confirms the queried record for 105.
- **Athyrium alpestre*, *Milde*.—Ben Dearg. New to Ross-shire.
- Polystichum Lonchitis*, *Roth*.—Ben Dearg, etc. This makes my finding of it on Scurr Fhuaran, of which I had a recollection, very probable. See Report of "Record Club," p. 174, 1881.
- Botrychium Lunaria*, *Sw*.—Inverbroom, *Lady Fowler*.
- Equisetum palustre*, *L*.—A form between the type and the var. *tenellum*. On sandy margin of Loch Maree, *C. E. Salmon*.
- Lycopodium inundatum*, *L*.—Near Loch Maireannach, *C. E. Salmon*. Confirms a previous record.
- L. annotinum*, *L*.—Near Loch Droma.
- Isoetes lacustris*, *L*.—Slioch.
- I. echinospora*, *Dur*.—Feith an Leothaid. Loch Gleann-na Muice, *C. E. Salmon*.
- Chara fragilis*, *Desv*.—With the above and a form approaching var. *barbata* in a stream at Kinlochewe.

In the valuable contribution towards the knowledge of plant distribution which Professor Trail has so painstakingly compiled, he has asked for notes on the subject, which may clear up any difficulties or add to its completeness. I therefore take this opportunity of adding some species of varieties which I have recorded in the "Transactions of the Royal Botanical Society of Edinburgh" for 1894, but which I think are not given for 105, West Ross, in Professor Trail's paper on 'Topographical Botany':—

Sisymbrium officinale, Scop., var. *leiocarpum*, DC., Ullapool; *Viola lutea*, Huds., var. *amoena* (Symon), Braemore; since found by Dr. Shoolbred in Strathcarron; *Viola sabulosa*, Jord. (closely allied to *V. Curtisii*); *Cerastium viscosum*, L., var. *apetalum* (Dumort), seen this year also at Dundonnell; *Arenaria peploides*, L., var. *diffusa*, Hornem, near Ullapool, the type also noticed at Coigach by *Lady Fowler*; *Cherleria sedoides*, L., the Slioch; *Sagina subulata*, Presl., Rhidorroch; seen this year also on bare patches by a stream near Inverbroom; †*Malva sylvestris*, L., on the shingle at Jean Town; †*Prunus insititia*, L., *Geum intermedium*, Ehrh., found near Strome by the Rev. E. F. Linton, and more recently by Mr. S. Macvicar; *Rosa lutetiana*, Mérat, *R. dumalis*, Bechst., *R. urbica*, Lem., *R. glauca*, Vill., *R. coriifolia*, Fries, and *R. Watsoni*, Baker, with the exception of the last, all named by M. Crépin; †*Sedum reflexum*, L., near Kishorn, doubtless an escape; †*Ribes nigrum*, L.; †*R. rubrum*, L.; *R. Grossularia*, L.; *Callitriche hamulata*, Kuetz. (the older name is *C. intermedia*, Hoffm.); †*Ægopodium Podagraria*, L.; *Ligusticum scoticum*, L.; *Galium palustre*, L., var. *Witheringii* (Sm.);

Solidago Virgaurea, L., var. *cambrica* (Huds.), and var. *angustifolia*, Koch.; *Senecio sylvaticus*, L., local; *Cnicus arvensis*, Hoffm., var. *mitis* and var. *horridus*; *Taraxacum palustre*, DC.; *Lobelia Dortmanna*, L., widely distributed; *Armeria maritima*, Willd., var. *planifolia*, Syme; †*Symphytum asperrimum*, Bieb.; †*Volvulus sepium*, Jung., and var. *colorata*, on shingle at Jean Town; †*Mimulus guttatus*, DC.; *Veronica Anagallis-aquatica*, L., var. *anagalliformis*, Bor.; *Rhinanthus Crista-galli*, L., var. *angustifolius*, Koch; the *R. stenophyllus*, Schur.; *Plantago lanceolata*, L., var. *eriophylla*, Dcne., and var. *capitata*, Presl.; *P. maritima*, L., var. *pygmæa*, Lange; *Suaeda maritima*, Dum., var. *procumbens*, Syme [or more correctly *Dondia maritima*, Druce, var. *vulgaris* (Moq.)]; *Atriplex patula*, L., var. *angustifolia* (Sm.); *A. Babingtonii*, Woods, var. *virescens*, Lange; *Carex flava*, L., var. *minor*, Towns; *C. rupestris*, All.; *Scirpus rufus*, Wahl., var. *bifolius*, and *Festuca ovina*, L., var. *paludosa*, Gaud (*i.e.* the *capitata*, Hack.). I may also state that I accidentally omitted from the 1894 list the following four species which I had previously found or recorded:—*Comarum palustre*, L., Loch Alsh; *Hieracium argenteum*, Fries, Cnochán; *Galium uliginosum*, L., Kinlochewe; and *Artemisia vulgaris*, L., Mollan.

There are, on the other hand, six plants included by Professor Trail for West Ross, about which I have no information—namely, *Millegrana Radiola* (if this is based on the record in “Top. Bot.,” ed. i. it is without personal authority; ed. ii. it is an error); *Valerianella olitoria*, Poll. (should this not be 103?); *Arctium nemorosum*, Lej.; *Carex riparia*, Curt., Ewing, 99; *Phleum arenarium*, L., and *Ammophila arundinacea*, Host.

The total number of recorded species for the vice-county is now over 620, besides casuals and numerous varieties. Several critical plants are under examination.

I am indebted to Professor Hackel, Mr. E. J. Baker, Herr Freyn, Dr. J. von Sterneck, the Rev. A. Ley, E. S. Marshall, E. F. Linton, Mr. Arthur Bennett, etc., for critical assistance.

HEPATICÆ OF LOHCARRON DISTRICT, WEST ROSS-SHIRE.

By SYMERS M. MACVICAR.

AS a large part of the immediate surroundings of Lochcarron is low lying, with level and undulating ground, the district is much exposed, and little natural wood is to be seen except in the few ravines, and on the steep slopes near

Strome Ferry. It is only in these sheltered places that hepatics occur in any quantity with the exception of the moorland species. The rocks are mostly composed of Lewisian gneiss, but there is also some Torridon sandstone, and here and there a few limestone rocks. Few species occur on the sandstone, even in the moist sheltered ravines; and the comparative richness of ravines of gneissic rocks although only a few hundred yards distant is striking. In the former the most common species are *Plagiochila spinulosa*, *Nardia hyalina*, and *Saccogyna viticulosa*, while *Marsupella emarginata* is rare. On the other hand, the last species occurs in quantity in the gneissic ravines. The flora is poorer than in the schistose districts of the coast which I have examined, both in the number of species and especially in the quantity in which they occur. The hills are very bare and uninviting. I did not ascend above 2300 ft., and in this way may have missed a few species, but there appeared to be little suitable ground for hepatics. The most interesting plant found during my visit was *Geocalyx graveolens*, an addition to the flora of the British Isles. An account of it will be found in "Journal of Botany," 1903, page 18. The locality was among shady rocks at the side of the small bay of Kyle of Lochalsh.

The following list is the result of a fortnight's visit last June, my headquarters being Strathcarron. I have, in addition, given all the species from West Ross-shire of which I have seen specimens.

FRULLANIA TAMARISCI (*L.*).—Common in both shady and exposed places. *F. fragilifolia*, Tayl.—Frequent on rocks and trees. *F. germana*, Tayl.—Frequent in some of the more sheltered places on rocks and trees; perianths are more common in this species than in *F. Tamarisci*. *F. dilatata* (*L.*).—Rather common on trees in sheltered localities; not seen in exposed places; fruit common.

LEJEUNEA OVATA, Tayl.—Strome Ferry, frequent on dry shady rocks and on trees. *L. hamatifolia* (Hook.).—Udlan ravine, very rare. *L. serpyllifolia* (Dicks.).—Rather common in some of the ravines; very common on wet rocks at Strome Ferry. *L. patens*, Lindb.—Frequent in some of the ravines and at Strome Ferry. *L. ulicina*, Tayl.—Strome Ferry, rather common on trees. *L. calcarea*, Lib.—Rare; on moss tufts on limestone

rocks in Udlan ravine and at Strome Ferry ; perianths common. *L. microscopica*, Tayl.—Allt Clachan and Udlan ravines, rare ; Strome Ferry, common on mosses on moist rocks. *L. calyptrifolia* (Hook.), on *Frullania Tamarisci* and on mosses in several of the ravines in small quantity.

RADULA LINDBERGHII, *Gottsche*.—Ben Liath Mhor at 800 ft. *R. aquilegia*, Tayl.—On wet rocks in Allt Clachan ravine. *R. complanata* (L.).—Frequent on trees in sheltered localities.

PORELLA LÆVIGATA (*Schrad.*).—In wood near Loch Maree, 1889, Dr. Carrington.

PLEUROZIA COCHLEARIFORMIS (*Weiss.*).—Very common on the low-lying ground.

ANTHELIA JULACEA (L.).—Frequent on Glasven.

HERBERTA ADUNCA (*Dicks.*).—Rare on the low ground ; Ben Liath Mhor, in some quantity on steep banks of a stream.

MASTIGOPHORA WOODSII (*Hook.*).—Ben Eay, 1867, C. Howie and C. Jenner.

TRICHOOLEA TOMENTELLA (Ehrh.).—Seen only in one place in ravine on road to Attadale.

BLEPHAROSTOMA TRICHOPHYLLUM (L.).—Common on shady banks ; fruit not rare.

LEPIDOZIA CUPRESSINA (*Sw.*).—On banks, Loch Maree, 1889, Dr. Carrington. *L. reptans* (L.).—Common on shady banks ; fruit frequent. *L. Pearsoni*, Spruce.—Common in the ravine at the Schoolhouse, Strathcarron, with both male and female plants. The latter was not known from Britain until I found it last year in Moidart. It is a larger plant than the male generally is, with stems thicker and base of leaf lobes broader. It is identical with the *L. Wulfsbergii* of Norway, of which, rather curiously, only the female plant has been found in that country. *L. trichoclados*, C. Müll.—Common on shady banks with both male and female plants.—*L. setacea*, Web.—Common on bare peaty banks and mosses.

BAZZANIA TRILOBATA (L.).—On shady banks, uncommon. *B. triangularis* (Schleich.).—Common.

KANTIA TRICHOMANIS (L.).—Common, ascending to 2200 ft. on Glasven. *K. Sprengelii* (Mart.).—Rather common, but less so than the preceding. *K. arguta* (Mont. and Nees).—On moist loamy banks, uncommon.

CEPHALOZIA LUNULÆFOLIA, Dum.—Common on shady banks, especially in ravines. *C. bicuspidata* (L.).—Very common. *C. Lammersiana* (Hüben.).—Only a few plants were seen. *C. connivens* (Dicks.).—Frequent among Sphagnum on peat

mosses. *C. curvifolia* (Dicks.).—Common on bare peaty soil in Strathcarron Moss, rare elsewhere. *C. Francisci* (Hook.).—On bare moist peaty soil at side of drain on the road to Attadale. This is the first locality in the West Highlands from which I have seen a specimen.—The small notch of leaf and the numerous flagellæ, combined with the small size of the plant and its reddish colour, allow it to be readily distinguished in the field. *C. fluitans* (Nees).—Seen only in one place in Strathcarron Moss. *C. Sphagni* (Dicks.).—Abundant in Strathcarron Moss. *C. divaricata* (Sm.).—Very little seen. *C. leucantha*, Spruce.—On a decaying log with *Lophocolea cuspidata* in ravine on road to Attadale; in several places on moist peaty banks; Ben Liath Mhor at 1600 ft.; also at Kyle.

HYGROBIELLA LAXIFOLIA (Hook.).—Sides of stream in ravines; uncommon.

SCAPANIA RESUPINATA, Dum.—Very common in the district, also common with fruit. *S. aspera*, Bernet.—Strome Ferry and ravine, Strathcarron. *S. nemorosa* (L.).—Uncommon. *S. undulata* (L.).—Rather common on Glasven, but not so elsewhere. *S. purpurascens* (Hook.).—Very common. *S. irrigua* (Nees).—Common at sides of ditches and wet places in some localities. *S. curta* (Mart.).—On bare soil near road to Attadale. *S. umbrosa* (Schrad.).—On turfy soil near Coulag; on logs in a ravine; rare.

DIPLOPHYLLUM ALBICANS (L.).—Very common. *D. Dicksoni*, (Hook.).—Very rare; on a boulder, Ben Liath Mhor, at 400 ft., c. per.

LOPHOCOLEA BIDENTATA (L.), and *L. cuspidata*, Limpr.—The aggregate species is common. Typical specimens of the first were gathered on a bank, and of the latter on decaying logs, with fruit.

CHILOSCYPHUS POLYANTHOS (L.).—Common in wet grassy ground, also at sides of ravines.

HARPANTHUS SCUTATUS (Web. and Mohr.).—On moist, shady banks, Strathcarron, rare; peaty banks among rocks on seashore, Kyle.

MYLIA TAYLORI (Hook.).—Very common; on bare soil at sides of a ravine at the schoolhouse, Strathcarron, it occurs in abundance as a low-creeping plant. *M. anomala* (Hook.).—Strathcarron moss; appeared to be uncommon.

PLAGIOCHILA ASPLENIOIDES (L.).—Common; Strome Ferry, with fruit; the large form (*major*, Nees) in ravines rare, but plentiful on banks in the wood at Strome Ferry. *P. spinulosa* (Dicks.).—Very common; common with perianths, but male plants rare. *P. punctata*, Tayl.—Uncommon except in Strome Ferry wood; rather common on shady banks at Kyle.

JAMESONIELLA CARRINGTONI (*Balf.*).—Ben Eay 1867, C. Howie and C. Jenner.

JUNGERMANIA CORDIFOLIA, *Hook.*—Very rare ; Ben Liath Mhor at side of stream at 800 ft. *J. pumila*, *With.*—On wet rocks at the side of stream ; uncommon. *J. riparia*, *Tayl.*—Frequent on rocks at the side of streams. These two species occur in rather different situations. The former requires very little soil, and grows on almost bare rock, to which it is closely attached ; the latter is usually found on rocks with a distinct layer of soil, frequently also in gravelly detritus at the margin of streams. *J. crenulata*, *Sm.*, var. *gracillima* (*Sm.*).—Rather common on roadside banks. *J. inflata*, *Huds.*—Rare ; on wet ground near side of road to Attadale. *J. exsectæformis*, *Breidl.*—Rare ; on stump of tree in ravine, Strathcarron. *J. Floerkii*, *Web. and Mohr.*—In large tufts on rocks by roadside, Strathcarron ; Ben Liath Mhor at 800 ft. *J. barbata*, *Schmid.*—Rare ; one tuft only seen on a parapet by the roadside, Strathcarron Moss. *J. Lyoni*, *Tayl.*—An uncommon plant in the district. *J. incisa*, *Schrad.*—Frequent on moist banks and peat mosses. *J. bicrenata*, *Schmid.*—On a dry gravel bank at side of Strathcarron Moss. *J. alpestris*, *Schleich.*—Glasven at 2200 ft. among *Acolea obtusa*. *J. ventricosa*, *Dicks.*—Very common ; seen also in fruit. *J. orcadensis*, *Hook.*—Rather common from sea-level to 2200 ft. on Glasven ; male plants on Ben Liath Mhor at 800 ft. *J. Muelleri*, *Nees.*—Frequent on wet rocks in some of the ravines. *J. minuta*, *Crantz.*—Rather common on banks.

NARDIA HYALINA (*Iyell.*).—Very common at the side of streams in ravines. *N. obovata* (*Nees.*).—Common in similar places, fruit common. *N. compressa* (*Hook.*).—Side of Loch Maree 1867, C. Howie.—*N. scalaris* (*Schrad.*).—Very common on side of road to Attadale, but otherwise less common than usual.

MARSUPELLA EMARGINATA (*Ehrh.*).—Common in some ravines, frequent on the hills. *M. Funckii* (*Web. and Mohr.*).—Rare ; roadside, Strathcarron Moss.

ACOLEA OBTUSA (*Lindb.*).—Uncommon ; descends to 1500 ft. on Glasven. *A. crenulata* (*Gottsche.*).—Uncommon ; descends to 800 ft. on Ben Liath Mhor.

SACCOGYNA VITICULOSA (*Mich.*).—Common in ravines ; also in Strome Ferry wood, and on moist rocky banks at Kyle.

BLASIA PUSILLA (*L.*).—Common on wet gravelly banks in one of the ravines.

- PELLIA EPIPHYLLA (*L.*).—Very common. *P. Neesiana* (Gottsche).—Wet grassy ground near roadside, Strathcarron. *P. calycina* (*Tayl.*).—Rather common among wet rocks, Strome Ferry; Udlan ravine, on wet limestone rock.
- ANEURA PALMATA (*Hedw.*).—Rare. On moist peaty bank, and on decayed log in a ravine, Strathcarron; moist peat bank on road to Attadale. *A. ambrosioides* (*Nees.*).—Common on wet rocks, especially in ravines; seen also in fruit. *A. latifrons* *Lindb.*.—Common on Strathcarron Moss. *A. pinguis* (*L.*).—Common.
- METZGERIA HAMATA *Lindb.*.—Frequent among mosses on damp banks, Strome Ferry, and in a ravine at Strathcarron, but rare elsewhere. *M. furcata* (*L.*).—Uncommon. *M. conjugata* *Lindb.*.—Frequent in ravines.
- CONOCEPHALUS CONICUS (*L.*).—Common on moist banks among rocks.
- REBOULIA HEMISPHERICA (*L.*).—Rare. Among rather dry rocks at Attadale.
- PREISSIA COMMUTATA (*Lindenb.*).—Frequent on moist rocks, Strome Ferry, uncommon elsewhere.

SCOTTISH PERISPORIACEÆ.

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

TO the "Transactions of the Natural History Society of Glasgow" (N. sec. vol. iii, pp. 9-21, 1888), I contributed a *Revision* of the fungi of this group as far as known to me from the several districts of Scotland. In October 1900 'A Monograph of the Erysiphaceæ,' by Ernest S. Salmon, F.L.S., appeared among the "Memoirs of the Torrey Botanical Club," and has been continued and extended in 'Supplementary Notes on the Erysiphaceæ,' published in the "Bulletin of the Torrey Botanical Club" in 1902. Its author has subjected the group to exhaustive investigation, with the result that he holds that a good many of the so-called species differ structurally in no such way from others as to justify their being kept apart. Thus the number of "species" is considerably reduced, and important alterations follow in the nomenclature. But the result of

experimental researches into the life-histories of parasitic fungi is to show that where a "species," in the structural sense, attacks numerous host plants, especially of widely different orders, the "species" is apt to be composite, and to include groups incapable of passing from host to host beyond a limited range of plants. Thus what have been called "biological" or "physiological species" are distinguished, though these are not practically separable under the microscope. For one of these (*Erysiphe Polygoni*) over 200 hosts are enumerated with confidence, and 400 have been stated to nourish it. For several other fungi the numbers of host plants are also very large, and the range of orders represented by them is often very wide. Over half the species of *Erysiphaceæ*, on the other hand, have been found on only one species, or not beyond one genus of host plants.

In 1902 F. W. Neger ("Flora," pp. 242-267) showed the existence of such races under *Erysiphe cichoracearum* and of *E. Polygoni*; and E. Marchal ("Comptes Rendus," cxxxv. pp. 210-212) asserted that he had found seven such races under *E. graminis*. In the "Journal of Botany" (May and June 1903), Mr. Salmon gives an account of important experiments made by himself to test the infective power of ascospores of *E. graminis*, and concludes that they "seem to give conclusive evidence that *E. graminis* comprises in its ascigerous stage specialised biologic forms."

On comparing our records for Scotland with this monograph, our list would stand as below, the names under which the forms appear in my *Revision* following the mark = in brackets.

ERYSIPHACEÆ, LEV.

PODOSPHÆRA OXYACANTHÆ (DC.), *De Bary* (= *P. Oxycanthæ*, DC.), *De Bary* + *P. myrtillina*, Kze. and Schm.).

var. TRIDACTYLA (*Wallr.*), *De Bary* (= *P. tridactyla*, as a species).

P. leucotricha (Ell. and Everh.) has been determined by Mr. Salmon to be common in parts of Europe, where, as in America, its *Oidium* causes the formation of a white "powdery mildew," very hurtful to apple trees. As it rarely develops perithecia it is difficult to be certain of the species. A mildew much like that described as due to *P. leucotricha* certainly occurs at

Aberdeen, and no doubt elsewhere in Scotland; but perithecia have not been found on it. The *Oidium* on apple has also been referred to *Sphærotheca Castagnei*.

SPHÆROTHECA HUMULI (DC.), Burr. (= *S. Castagnei*, Lev. + *S. Epilobii*, Link).

var. FULIGINEA (Schlecht), (= *S. Castagnei* on *Taraxacum officinale*).

S. PANNOSA (Wallr.), Lev.

UNCINULA SALICIS (DC.), Winter.

U. ACERIS (DC.), Sacc.

U. PRUNASTRI (DC.), Sacc.

MICROSPHÆRA BERBERIDIS (DC.), Lev.

M. ASTRAGALI (DC.), Trev. (= *Erysiphe Astragali*, DC.).

M. ALNI (Wallr.).

M. GROSSULARIÆ (Wallr.), Lev.

M. BÄUMLERI, MAGNUS, on *Vicia sylvatica*, was detected by Salmon in Herb. Berkeley at Kew, on a specimen labelled "New Pitsligo" (no doubt gathered in Aberdour where the vetch abounds), under *Erysiphe communis*. The characters of the species are quoted below.

ERYSIPHE POLYGONI, DC. (= *E. Martii*, Lev. + *E. Umbelliferarum*, De By, + *E. communis* (Wallr.), Fr. + *Oidium Balsamii*, on turnips).

E. CICHORACEARUM, DC. (= *E. Cichoracearum*, DC. + *E. Linkii*, Lev.).

E. GALEOPSISIDIS, DC.

E. GRAMINIS, DC.

PHYLLACTINIA CORYLEA (Pers.), Karst. (= *P. guttata*, Lev.).

We thus have in Scotland 15 of the species and 2 of the varieties in the sense accepted in this monograph, while several species of my *Revision* are regarded as synonyms.

Of several that I named as to be looked for in Scotland, because of their recorded distribution elsewhere, the following are sunk by Salmon in species included in the above 15 viz. :—

Sphærotheca Nieslii, Thüm., on *Pyrus Aria*, and *S. fugax*, Penz. and Sacc., on *Geranium silvaticum*, are referred to *S. Humuli*.

S. detonsa, Kickx, on *Apargia*, and on *Tanacetum*, to *S. Humuli* var. *fuliginca*.

Uncinula Bivonæ, Lev., on *Ulmus* = *U. clandestina* (Biv. Bern.), Schröt., not yet known from Scotland.

U. Tulasnei, Fuck., on *Acer*, is referred as a variety to *U. Aceris*.

Microsphæra Dubyi, Lev., on *Lonicera* } as varieties to *M. Alni*.
M. divaricata (Wallr.), Lev., on *Rhamnus* }

Oidium Tuckeri, Berk., on the vine is determined as belonging to *Uncinula necator* (Schwein), Burr.

MICROSPHÆRA BÄUMLERI, *Magnus* ("Ber. Deutsch. Bot. Gesell.," xvii., p. 148, pl. 9, figs. 17-18, 1899); Salmon (Mem. Torrey Bot. Club, ix., 1900, pp. 170-173, figs. 52-55). Hypophyllous (very rarely amphigenous); mycelium subsistent or evanescent; perithecia more or less densely gregarious in floccose patches covering the surface of the leaf, globose-depressed, becoming hemispherical, 80-150 μ in diameter, appendages 8-20, usually 8-14, 4-6 times (as long as) the diameter of the perithecium, flaccid, penicillate when mature, smooth or slightly rough, colourless, thick-walled at base, apex about 3 times dichotomously branched when mature, branching vague and lax, branches of the higher orders more or less irregularly placed, tips of the ultimate branches not recurved; asci, 4-12, ovate to oblong, usually shortly stalked, 55-70 \times 30-38 μ ; spores 4-6 (8 recorded by Magnus), 20-22 \times 10-12 μ .

Distribution.—Scotland, Italy, Austria-Hungary, Germany, Russia.

M. Bäumlerei is very closely related to *M. Astragali*, from which indeed it seems to differ in little more than the more frequent branching of the tips of the appendages, and further investigation may show them to belong to one species. It is the only species of the family observed by Salmon on *Vicia sylvatica*. This vetch is very frequently covered with the mildew in its habitats on the coast of Kincardine, at Aberdour in N. Aberdeenshire, and at Gamrie in Banffshire.

ZOOLOGICAL NOTES.

Martens in the North-west Highlands.—I have received information regarding the capture of two more examples of the Marten (*Mustela martes*)—namely, a male at Ullapool in West Ross-shire on 3rd April, and another, also a male, taken in the parish of Assynt in West Sutherland, on the 6th of the same month.—J. A. HARVIE-BROWN.

Badger in Argyllshire.—On the 20th of April a fine male Badger (*Meles taxus*) was trapped on Ben Cruachan. I saw the keeper carrying the animal on his back, and learned from him that

it was rare in his district. Very probably it was a wanderer from the colony in the Pass of Brander, where it has been established from time immemorial, according to the "Fauna of Argyll."—JAMES WATERSTON, Edinburgh.

Harp Seals on the East Coast of Scotland.—On 7th March a female Harp Seal (*Phoca grælandica*) was caught in a salmon net at Stonehaven. It measured 6 feet 6 inches long, and is a very beautiful example. On 31st March a male, 6 feet 9 inches long, was caught in the same manner at Don Mouth. Both these came into my hands. The back of the male was, however, completely divested of hair, therefore no part of it was of use except the skull.

Many such animals seem to have visited our coasts of late, specimens of which have been obtained in various quarters.—GEORGE SIM, Aberdeen.

It may be of interest to note the abundance of the Harp Seal on our coasts during the past spring. A fine adult male and female were captured about the mouth of the Don, near Aberdeen. The female is being mounted for the University Museum, Aberdeen; the male was too much injured to be of use for stuffing. A young female was captured about the 1st of April in the River Lossie, close to Lossiemouth. It was only 3 feet long, and was of a uniform grey colour above and buff beneath. This specimen was mounted for Capt. Dunbar Brander. There are reports of this species from elsewhere, including the Firth of Forth, and I fear that many of them have been missed. I wonder if they have been observed on the Caithness coast, or in Orkney and Shetland?—WILLIAM TAYLOR, Lhanbryde.

[The Harp Seal, which has only hitherto been regarded as a rare casual visitor to our shores, is stated to have been very prevalent on the east coast of Scotland during the past spring. The statements regarding it which have come under our notice were chiefly contributed to the newspapers, and we should be glad if our readers would send us further particulars regarding these interesting visitors. In the "Scotsman" of 14th March it is stated that a Harp Seal was captured by some workmen employed at Grangemouth new docks on a slag bank in the Firth of Forth below the lighthouse. The Seal was observed leaving the water, and a tarpaulin was thrown over it and the animal secured. It measured over 5 ft. in length, and was presented to the "Zoo," Glasgow. One, described as "the fifth this season," was captured on the Kincardine coast in the middle of May by the Bervie salmon-fishers, according to the "Fishing Gazette," 23rd May.—EDS.]

Hawfinch in North Dumfriesshire.—I send you herewith a bird which is unknown to me. It was picked up dead near a shepherd's house among the hills near Kinnelhead on the 6th of April. Un-

fortunately the specimen is not in good condition, for it has been pulled about by one of the shepherd's dogs.—JAMES BARTHOLOMEW, Kinnelhead.

[The bird was an adult male Hawfinch (*Coccothraustes vulgaris*).—EDS.]

Great Grey Shrike in Kincardineshire.—On 8th March a Great Grey Shrike (*Lanius excubitor*) was seen at a thorn hedge alongside the road at Drumtochty Kennels, where it evidently had its larder, for there were the remains of several small birds, chiefly Chaffinches. One of the keepers shot it on the 12th of March, and sent it to me. This is new to my list of Kincardineshire birds.—A. NICOL SIMPSON, Fordoun.

Dipper's Nest in Tree.—A Dipper (*Cinclus aquaticus*) this season built its nest in the fork of a tree at Tillyfoure, on the banks of the Don. Unfortunately it was destroyed by a boy. It would have been about 12 feet from the ground, according to the account I got from Mr. Grant, the keeper there.—THOMAS TAIT, Inverurie.

Snowy Owl and Spring Migrants in Southern Shetland.—I have not seen much worth noting this spring, as the wind has always been northerly or westerly. We have a good many Swans on their passage northwards during April; and I saw a fine Snowy Owl (*Nyctea scandiaca*) also passing north on the 23rd of that month. A solitary male Pied Wagtail (*Motacilla lugubris*) appeared on the 21st of April, and is the only one I have seen or heard of this spring. The Wheatears (*Saxicola ananthe*) have been unusually late in arriving this year; I did not see any until the 28th of April. I saw a Redbreast (*Erithacus rubecula*) on the 2nd of May. I had recently a fine view of a pair of Peregrines (*Falco peregrinus*), one of which struck and carried off a Starling within a dozen yards of me.—THOMAS HENDERSON, Jun., Dunrossness.

Greenland Falcon in Orkney.—A fine Falcon was trapped by a shepherd on my property at Hobister, in the parish of Orphit, Mainland, Orkney, on the 23rd of March 1903. The bird was attracted to the shepherd's house by the domestic ducks, at one of which it swooped, killed, and commenced to feed. The shepherd, who had witnessed the incident, ran forward, when the Falcon flew off with its prey, which it dropped on reaching a considerable height. The shepherd, having secured his property, at once procured a trap, and proceeded to set it at the place where he had picked up the duck, using the latter as a bait. The Falcon returned in a little time, hovered over the duck, screaming, then swooped down upon it, and was caught by the leg.—JAMES GRANT, Kirkwall.

[We have examined the bird—a fine adult female Greenland Falcon (*Falco candicans*).—EDS.]

Greenland Falcon in the Outer Hebrides.—On 11th April 1903 I received in the flesh a very handsome Greenland Falcon (*Falco candicans*), which was shot on the island of Mingulay on 2nd April by one of the natives. It was forwarded to me by Mr. John Finlayson. Mr. Finlayson correctly identified the bird, although it is the first he had ever had in his hand. He writes, "When caught, the shrill screams were a duplicate of those of a Peregrine." It may be interesting to add Mr. Finlayson's notes on the weather. He says: "Alarming storms of persistent fury raged here, with few intervals of peace, since the beginning of winter, the store of disturbance oscillating from south-east to a point near west. It is at this point that it reached something like a cyclone, and threatened to carry everything before it."—J. A. HARVIE-BROWN.

Wood Pigeon's Nest on Ground.—A few days ago I was shown a Wood Pigeon's (*Columba palumbus*) nest with two eggs on the ground. It was under some branches laid down for pheasants nesting. I saw several nests a good many years ago on some cut timber about a foot and a half off the ground, but this is the first I have seen on the ground.—THOMAS TAIT, Inverurie.

Glossy Ibises in Scotland.—It may interest your readers to know that I received a specimen of the Glossy Ibis (*Plegadis falcinellus*) which was shot on a small loch near Forres on 2nd October 1902. Another specimen was obtained at Loch Strathbeg, in Aberdeenshire, about a fortnight later, and was sent to Mr. Waters, Naturalist, Aboyne, for preservation. A Hoopoe occurred at Alladale, Ardgay, on 20th June.—W. MACLEAY, Inverness.

[An irruption of Ibises occurred in Britain during the past autumn, and other specimens were obtained in Scotland in Roxburghshire and Islay ("Annals," 1903, pp. 49-50).—EDS.]

Crane and other Migratory Birds at the Pentland Skerries.—Since the last week of April large numbers of Bramblings (*Fringilla montifringilla*) and Chaffinches (*F. œlebs*) have been here, and are a perfect pest in the gardens, rooting up the seedling vegetables. On the 1st of May a large bird was seen on the south side of the island, and on examining it with the telescope, I came to the conclusion that it was a Crane (*Grus cinerea*). It soon after rose on the wing and flew with its neck at full stretch, and not doubled up like a heron. It remained all day hunting over the island for food, but on Sunday morning we found that it had devoted the early hours to our gardens, in which it had committed a great deal of damage. It could be seen all day keeping a respectful distance from the station. On Monday morning it again paid the gardens a visit, and so sentence of death was passed upon it, and, with some difficulty, was duly executed. A Willow Warbler was killed at the lantern on 2nd May; Fieldfares (*Turdus pilaris*) very numerous; there are also

a few Ring Ouzels (*T. torquatus*) and Blackbirds (*T. merula*). Redbreasts (*Erithacus rubecula*) still here (4th May), but not so numerous.—JAMES TOMISON.

[The head of a young Crane was obligingly sent by Mr. Tomison for our inspection.—EDS.]

Callophrys (Theela) rubi (Linn.) in Fife.—My son and I saw the Green Hairstreak Butterfly on 28th May last on Kemback Hill, near Cupar. A considerable number of individuals were on the wing, and these were in good condition. As we know little of the principles which regulate distribution of species, it is possibly worthy of note that the best place for this Butterfly near Elgin, where I formerly found it, was the heather on Quarrywood Hill, which, as its name indicates, is a hill largely composed of sandstone quarried for building purposes. The hill at Kemback has an exactly similar character, and adjoins the famous fossiliferous deposit at Dura Den. On both hills the Green Tiger Beetle (*Cicindela campestris*) is also found, though far more frequently than the Butterfly.—HENRY H. BROWN, Cupar-Fife.

Roncus Cambridgii, L.K., in Argyllshire.—While collecting at Taynult on 21st April I took on the under side of a piece of granite tightly embedded a false scorpion quite new to me. On referring the specimen to Mr. Robert Godfrey, it was determined as a *Roncus*, but species uncertain. In this Mr. Wm. Evans concurred. Accordingly the specimen was sent to the Rev. O. Pickard-Cambridge, who pronounced it to be *R. Cambridgii, L.K.* The difficulty in determining the species arose from the fact that Mr. Godfrey's specimens (from Taycreggan) were immature.—JAMES WATERSTON, Edinburgh.

BOTANICAL NOTES AND NEWS.

The Alien Flora of Britain.—As all that have sought to work out the flora of any part of Britain must soon learn from personal observation, there are many species that clearly owe their place in our islands to human agency, while it is often most difficult to determine the true rank of others from this point of view. The list even of undoubted aliens is large, and includes many species that find a place in floras, often without remark. Mr. S. T. Dunn, B.A., F.L.S., as the result of continued study of these aliens, has prepared and issued a list of "all presumably non-indigenous species hitherto recorded as growing spontaneously in the British Isles; and secondly, all those species which, though probably natives, have so far been exclusively or chiefly recorded in floras in their non-indigenous localities." This list, it is stated by Mr. Dunn, is "merely a

preliminary catalogue," "issued in the hope of eliciting information and opinions from British botanists preparatory to publication of a more elaborate work on the subject." Many hundred species are named as presumably non-indigenous in Britain; and all interested in the British flora will find in it much to suggest inquiry and investigation. Among the species whose names are italicised as "probably natives" appear a good many whose claims to be considered native are not likely to be questioned, in Scotland at least—such as *Ranunculus repens*, *Lepidium hirtum*, *Sisymbrium Thalianum*, *Arenaria serpyllifolia*, etc.; while *Eschscholtzia californica* must have been italicised only by inadvertence. The inquiry into the origin of so large a part of the British flora should commend itself to all field students; and the reinvestigation of local areas in its light would give much information of a kind helpful to a clearer understanding of man's share in the past history of that flora. The list is published by West, Newman, and Co., at the low price of 4d.

New Records for Aberdeenshire.—In September 1902 I found a number of flowering and fruiting plants of *Hypochaeris glabra*, L. (smooth cat's-ear), in a dry gravelly field near the Dee, in the parish of Drumoak, in the vice-county South Aberdeen (92), about ten or eleven miles west of Aberdeen. It has been recorded from Ayr, the Clyde Isles, West Perth (as an introduced plant), Forfar, Kincardine (a doubtful record), Elgin, and East Ness. Its small size no doubt leads to its being overlooked; but it is evidently limited in its distribution in Scotland. There appeared to be no reason to doubt its being native where I found it.

This month (June 1903) I have found another addition to the known flora of Aberdeenshire in the grass *Glyceria plicata*, Fries. It grows by a small stream in the parish of Chapel of Garioch, near the eastern side of the base of Bennachie. The boundary between the vice-counties South Aberdeen and North Aberdeen is there quite imaginary, and the grass grows almost on it, though on the whole it is perhaps in the southern division (92). Recorded from only fourteen vice-counties in Scotland out of forty-one, of which the nearest to Aberdeen are East Perth (89) and East Ness (96), the plant probably has escaped detection in others because of its likeness to *G. fuitans*; but it is not common in Scotland.—JAMES W. H. TRAIL.

Gall-making Fungi on Roots of Juncus.—In the "Scottish Naturalist" in 1884 (pp. 241-243) I described, from examples found by myself near Aberdeen, the small swellings produced on the roots of *Juncus bufonius* by a fungus shortly before described and figured in the "Botanische Zeitung" (1884, pp. 369-379) under the name *Entorrhiza cypericola* by C. Weber, who regarded it as specifically identical with a fungus described by Prof. Magnus in 1878 from roots of *Cyperus flavescens*, and named by him *Schinzia cypericola*. I referred to information given me by Prof. Balfour that he had

found tuberous swellings, probably of similar origin, on roots of *Juncus lamprocarpus*. Mr. P. Cameron ("Proc. and Trans. Nat. Hist. Soc. Glasgow," N. Ser. I. p. 299) in 1886 (read 24th November 1885) records that he had found similar bodies on the roots of *Juncus squarrosus*, and of *J. uliginosus*, on Clober Moor and near Thornhill, and that he had "seen almost identical tumours near the Brother Loch on *Eriophorum vaginatum*, on the stem quite close to the roots." Dr. Magnus published the results of further investigations on the gall-makers of this type in 1888 ("Berichte d. deutsch bot. Gesellsch." vi. pp. 100-104), and distinguished the following, giving figures of their spores: *Schinzia cypericola*, on roots of *Cyperus flavescens*, L.; *S. Aschersoniana*, n. sp., that found in the above-mentioned galls, on *Juncus bufonius*, L.; and *S. Casparyana*, n. sp., on roots of *Juncus Tenageia*, Ehrh. Dr. Lagerheim, also in 1888, described in "Hedwigia" an additional species, which he named *Entorrhiza digitata*, detected by him in palmated small tuberous galls on the roots of *Juncus articulatus*, L. These last have been found near Pontresina in Switzerland, and also at the Titisee in Germany. Other species also have been described, viz. *Entorrhiza Solani*, Fautr. ("Revue Mycologique," 1896, p. 11), in rotten potatoes in France; and *E. scirpicola* (Correns, in "Hedwigia," 1897, p. 40), Saccardo ("Sylloge," xiv. p. 425, 1899), in swellings on roots of *Scirpus pauciflora* in Switzerland; and a doubtful species, *E. (?) cellulicola* (Nægeli in "Linnæa," 1842, p. 279), De Toni, on roots of an *Iris* in Switzerland. The species are distinguished from one another, not only by the plants on which they produce galls, but also by their spores. Those on *Juncus* show the following characters:—*E. Aschersoniana*, in root-galls of *J. bufonius*, has spores oval, $15-17 \times 11-15 \mu$, yellow to chestnut brown, closely covered with numerous largish warts; *E. Casparyana*, in root-galls of *J. Tenageia*, has spores globular, $17-22 \mu$ diameter, pale yellow, covered with large irregular warts; *E. digitata*, in irregularly palmated tuberous galls on roots of *J. articulatus*, has spores globose, $18-30 \mu$ (usually 20μ) diameter, covered with nearly uniform warts. In October 1899 I found numerous galls of the form indicated, and varying in size from a large pinhead to a large vetch seed, on roots of *J. lamprocarpus*, Ehrh., in an old quarry in Drumblade, near Huntly; and in these occurred the characteristic spores of *E. digitata*. By it no doubt were formed the galls found by Professor Balfour on *J. lamprocarpus* near Glasgow. I have not seen swellings on any other *Juncus* or on any Cyperaceous plant in Scotland; but they should be looked for. Mr. Cameron's observations prove that such exist and await examination.—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 1903.

[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 HILL FOX IN SCOTLAND. "H. M." *The Field*, 23rd May 1903, p. 858.

PLAGUE OF FIELD MICE IN WIGTONSHIRE. "Inquirer." *The Field*, 18th April 1903, p. 654.

ORNITHOLOGICAL NOTES FROM SHETLAND. T. Edmonston Saxby. *Zoologist*, April 1903, p. 157.—Eleven species of birds are dealt with in these notes.

THE BLACK-NECKED GREBE IN PERTHSHIRE. *The Field*, 25th April 1903, p. 695.—An editorial note, quoting a letter from Her Grace the Duchess of Bedford, who reports having seen four birds of this species on a loch in Perthshire on 19th April.

EARLY NESTING OF THE SHAG (*PHALACROCORAX GRACULUS*). Harold Raeburn. *Zoologist*, April 1903, p. 153.—The notes refer to various localities in Scotland.

A LIST OF THE LEPIDOPTERA OF ROXBURGHSHIRE. By W. Renton. *Entomologist*, May 1903, pp. 130-135, and June 1903, pp. 162-165.—Three hundred and thirty-five species are here recorded, of which twenty-seven are butterflies.

MACRO-LEPIDOPTERA OF ABERDEEN AND NEIGHBOURHOOD. By Wm. Cowie. *Trans. Aberdeen Working Men's Nat. Hist. and Scient. Soc.* No. I. (1903), pp. 20-35.—Three hundred and seventy-five species recorded, of which thirty are butterflies.

TINEA IMELLA IN DUMBARTONSHIRE. J. R. Malloch. *Ent. Mo. Mag.* June 1903, p. 150.—A long note, giving particulars of habits, life-history, etc.

HYMENOPTERA AROUND ABERDEEN. By J. Mearns. *Trans. Aberdeen Working Men's Nat. Hist. and Scient. Soc.* No. I. (1903), pp. 36-38.—Fifty-eight species recorded.

NOTES FROM THE GATTY MARINE LABORATORY, ST. ANDREWS, No. XXIV. By Prof. M'Intosh, M.D., LL.D., F.R.S., etc.—These notes are on (1) the Frequency of the Occurrence of Pearls in the Mussel; (2) the Effects of Marine Piscatorial Birds on the Food-Fishes; and (3) the British Eunicidæ. Scottish localities are mentioned.

CATALOGUE OF ECHINODERMS FOUND AT ABERDEEN AND NEIGHBOURHOOD. By J. Simpson. *Trans. Aberdeen Working Men's Nat. Hist. and Scient. Soc.* No. I. (1903), pp. 39-43.—Forty-two species recorded.

BOTANY.

NOTES ON THE DRAWINGS FOR "ENGLISH BOTANY," by F. N. A. Garry, M.A., continued as a supplement to the *Journal of Botany*, has reached p. 64, *Rosa Sabini*.

PLANT DISTRIBUTION IN EUROPE IN ITS RELATION TO THE GLACIAL PERIOD. *Scot. Geograph. Mag.* 1903, pp. 302-311.

THE ARRAN ISLE PYRUS. By Arthur Bennett. *Journ. Bot.* 1903, p. 167.—Calls attention to this form having been named *P. Arranensis* as a distinct species by Dr. Heglund (*K. Sv. Vet. Ak. Handl.* 1901-1902, p. 60), though generally regarded as a hybrid.

NOTES ON LIMONIUM. By C. E. Salmon, F.L.S. *Journ. Bot.* 1903, pp. 65-74.—Under synonymy and distribution in Britain is noted "*L. occidentale*, O. Kuntze, 74, Wigtown, Galloway! 1823, Goldie, Hb. Kew." (This is *Statice Dodartii*, "Bab. Man. Brit. Bot.") The Scotch plant is so different from English and Welsh "that it may have to be separated as a variety."

POTAMOGETON PRÆLONGUS, WULF., IN BRITAIN. By Arthur Bennett, F.L.S. *Journ. Bot.* 1903, pp. 165-166.—Discusses its distribution, and mentions several counties in Scotland in which it has been found, up to about 3000 ft. above sea-level.

POA STRICTA, D. DON, AND POA LEPTOSTACHYA, D. DON. By A. B. Rendle, M.A., D.Sc. *Journ. Bot.* 1903, pp. 177-179, pl. 452.—Describes and figures the specimens in D. Don's herbarium, now in the British Museum, identifying *P. stricta* with *P. pratensis*, var. *angustifolia*, and concluding that *P. leptostachya* is a depauperate form of something, probably of *P. compressa*. Both were from Forfarshire.

ASPLENIUM GERMANICUM, WEISS. By C. E. Salmon. *Journ. Bot.* 1903, pp. 167-168.—Notes incidentally Watson's enumeration of four counties in Scotland, and confirms Edinburgh, there being specimens from Blackford Hill in herbaria.

HOLIDAY AMONGST NORTHERN MOSSES. By C. H. Binstead. *Naturalist*, 1903, p. 116.—Among other species observed in Scotland is recorded (p. 116) *Hypnum turgescens*, Schmp. New to British lists.

NOTES ON FRESHWATER ALGÆ. By W. West, F.L.S., and G. S. West, M.A., F.L.S. *Journ. Bot.* 1903, pp. 74-82.—Among many from Wales, etc., occur descriptions of *Chlorobotrys regularis*

(West), Bohlin, a newly-distinguished genus, "generally distributed through all the *Sphagnum* bogs in the British Islands" (Plate 447, Figs. 7-10), and of *Ineffigiata neglecta*, West, "generally distributed in stagnant waters throughout the British Islands."

BOOK NOTICE.

NOTES AND LETTERS ON THE NATURAL HISTORY OF NORFOLK, MORE ESPECIALLY ON THE BIRDS AND FISHES. From the MS. of Sir Thomas Browne, M.D. (1605-1682), with Notes by Thomas Southwell, F.Z.S. (London: Jarrold and Sons, 1902).

Information of a reliable nature concerning the fauna of any portion of Great Britain over three centuries ago is of extreme value and interest, and hence the volume under notice is a particularly acceptable one.

We have to thank Mr. Thomas Southwell for having, at the cost of much time and research, given us these notes and letters on the natural history of Norfolk, written in the middle of the seventeenth century. It is true that the writings of Sir Thomas Browne, which were many and of a varied nature, have been published in their entirety; but those dealing with zoology have not hitherto been collected and issued in the form of a separate volume, nor has anything previously published been illumined by such a series of admirable explanatory and critical notes on the numerous species treated of as those contributed by Mr. Southwell.

Sir Thomas Browne's notes on the birds and fishes are written in quaint but trite language, and though treated of somewhat shortly (for the species are very numerous), reveal an amount of knowledge which is surprising alike for its extent and its accuracy. The Letters to Dr. Merrett, the author of the "Pinax Rerum Naturalium," are also full of observations, and cover wide fields in both zoology and botany.

Mr. Southwell has supplied an interesting sketch of the life and work of this very remarkable doctor of physick, and this forms an appropriate introduction to a volume which we have perused with great interest, pleasure, and advantage.

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[OCTOBER

BIRD MIGRATION IN SOLWAY.

By ROBERT SERVICE, M.B.O.U.

THERE is one special feature appertaining to Solway that I wish to direct particular attention to. A glance at the map will show that all the rivers flow into the Solway Firth. We have the Eden draining Cumberland and a part of Westmoreland on the English side ; then in Solway proper there are the Esk, the Annan, the Nith, the Dee, and the Cree, along with a number of smaller streams. All of these flow in the same general direction, and have for ages been scooping out valleys that all trend southwards. The firth that receives this large volume of fresh water has its outlet into the Irish Channel, the arm of the sea that divides Scotland and England from Ireland. There is no doubt that in comparatively recent geologic times the Irish Channel was a great tidal river, of which the Solway streams were its northernmost tributaries, and that this ancient river valley was the route by which the birds came and went in long bypast ages—a route which has left so strong an impression on posterity that the birds still travel along above what is now a broad sea-way.

Time and space would fail me were I to attempt to do more than record a few of the more salient features of bird

migration as observed during much time spent in this most fascinating study in our area of Solway.

The first birds to leave us are the adult Cuckoos, many going off by the last week in June, and one seen later than mid-July is a fact worth noting.

The next to go is the Swift, and the suddenness of its departure is remarkable. Up till about the end of the first week in August the species is as familiar here as elsewhere. To watch their superlatively graceful flight high in air, as they wheel in circles, and curves, and all manner of geometric evolutions, is one of the most pleasing of occupations. Some evening they are there as usual, sweeping along in unrivalled power of motion, but it may perhaps be noticed that their skirling calls are unheard. The birds are higher and steadier, and the manner of their flight does not seem so exuberant. Perhaps we do not take much notice of these points. But next day, sometime, we suddenly awake to the fact that no Swifts are to be seen. Gone they are, and completely; we shall see not one, until some fine May morning we become aware that the Swifts are back, as silently and suddenly as they left us nine months before.

By the time we have realised that the passing of the Cuckoo and the Swift has taken place the preliminary preparations of other birds have begun. The Swallows and Martins begin to flock together, and to sit in rows upon the telegraph wires and house roofs. Curlews are heard high above, uttering their familiar calls as they travel in twos and threes shorewards. Lapwings and Plovers have left their nesting quarters. Small passerine birds gather into groups, and these accumulate in the copses and hedges, towards the Galloway and Dumfriesshire coasts. From mid-August till mid-September, year after year, the number of birds (as was long ago noticed by Robert Gray) that crowd down upon the shore line is immense indeed. The first few hours of daylight on certain September mornings will show these small land birds sitting about the rocks, and cliffs, and flat merses alongshore in great abundance. Many a time I have lain in hiding amongst the rocks at the point of the long

promontory of Southerness, that juts out so far into the troubled waters of the Solway Firth, where in autumn there is always a great gathering of feathered creatures, some coming, many going. Many of those coming are from the opposite shores of Cumberland, and they have probably begun their journey in Lapland morasses or the great Russian forests. Those going are the bigger proportion, and they are most likely of strictly local origin. Almost invariably they go off in a direction that would take them down channel midway betwixt the Isle of Man and the opposite headlands of England. Although these migrants thus congregated for departure have a certain amount of gregarious adhesion to one another, yet each separate species appears to act independently. Scattered along the shore, their numbers are still being added to, and it requires the minutest attention to see the individual birds arrive one by one. They seem to drop literally from the clouds. Let one's attention be diverted for a moment, next time you look at a particular place there are one, or two, or three birds that were not on the spot last time you glanced at it. If it is difficult to see the coming birds, it is easy enough to see the departing ones. One after another they rise, as the morning wears on, fly upwards and onwards, then they hesitate, fly sideways once or twice, again attempt an upward and onward flight, hesitate again, and down they come once more to earth. Time after time they do this, then comes a flight in which no hesitation occurs and away they go over the sea. By and by only a comparative few are left, and these dawdle about, begin feeding, and this particular migration movement is over for the day, to be renewed as briskly as ever, with fresh accessions to their numbers, on the next favourable morning. But just what constitutes such a morning I am not in a position to say. There is always an indefinable something which is unmistakable to the experienced observer, but that is very difficult to describe. One thing seems tolerably certain, and that is, such migration mornings in autumn always occur when the barometer is stationary, or has just commenced to fall. These shore gatherings that I have described consist almost

exclusively of such species as Warblers, Titlarks, Wagtails, Finches, Robins, Redstarts, Wheatears, and allied species.

The Thrush tribe and the Swallows have a rather different mode of leaving us in autumn. The Song Thrush and the Blackbird are specially interesting. These are both very conspicuous amongst the autumn migrants. This is so to a very noticeable extent in the early mornings of late September and the first week or two of October. And in their migration movements, while it is quite evident that they are actuated by a common migrational impulse, each species keeps well apart. Let me quote a note from my journal of date 12th October 1897, in reference to the Blackbird :—"On this morning, migration was evidently in full swing. There was a very light N.E. current of air, and small wisps of mist hung about the lower grounds. Soon after daylight, my attention was attracted by an unusual number of Blackbirds, mostly young males, sporting and feeding along the sunny side of a hedgerow. The hedgerow was about 150 yards in length, and yet there were more than sixty Blackbirds scattered along its base. Probably they had only newly arrived there, for as I watched them at their play they were being joined by others, singly and in twos and threes. But watch as closely as I could, their direction of arrival could not be distinguished. They came down from the upper air, becoming suddenly visible, sometimes three at a time, and after a short fluttering flight joined their mates on the grass. I saw about a dozen birds thus drop into view, but I quite failed to see any indication of the point of the compass from whence they had come. The new-comers did not show any signs of fatigue, but they were evidently ravenously hungry, for they commenced to search for food most eagerly. By mid-day not a single Blackbird was to be seen at or near the place."

Let me give another such extract of date 1st October 1901 :—"The hedgerows in the parks near my house were found at nine o'clock A.M. to be lined in many places by parties of Thrushes and Blackbirds, each, as usual, keeping apart. If these birds were there at eight o'clock, I had failed to notice them when I passed. There seemed no

doubt that the birds were all resting on migration. At two o'clock, when I specially looked for them, not a single bird of the hundreds seen in the morning could be found."

The last of the Thrushes and Blackbirds have not left when great flocks of Redwings and Fieldfares arrive to take the places of their congeners, and enliven with their presence and chattering calls the duller months of the year. Many a time I have watched the arrival of the Redwings (the Fieldfares are not so readily seen) from an easterly direction, thus crossing at right angles the line of flight of other birds going southwards. That is an exceptionally interesting point in our local migration phenomena.

Every one has seen the Swallows and their kindred gathering for departure. For some days we may have been watching a flock of Swallows. It becomes gradually larger as recruits join its ranks from the surrounding district. Two or more such flocks will sometimes, and often do, coalesce. Some fine sunny morning the flock will be noticed to be unusually active. Sudden flights from the house-tops where they sit will be taken, and after a short wheel or two round the roof they will again alight. Generally soon after noonday these flights become of longer duration, on a wider circuit, each time the flock rises. Then, with that sudden and simultaneous movement that is so conspicuous a feature in the behaviour of the birds at departing time, all head southwards, and move slowly onwards till lost to sight. Sometimes they rise to great heights; usually they remain comparatively low in altitude.

The species discussed so far are all land birds, belonging to the division of the Singers, and while the questions to be solved in the great movements of seasonal migration performed twice a year by them are of the most intricate and complex nature, we must now leave them and consider the fine groups of Waders and Swimmers, whose movements are more easily observed and noted.

These gather in our area, or pass overhead in, for the most part, large bodies, or constant streams of small parties, so that the merest tyro will notice their movements. Foremost amongst them comes the Lapwing, whose hosts are, in

the aggregate, enormous, but large as they seem, they are very considerably less than they were thirty to thirty-five years ago. I have still a note made so long since as October of 1866 of small flocks of Lapwings, passing down Nithsdale for the whole of two consecutive days. Nothing of that extensive character is ever seen nowadays. A steady migration of the species southwards will last, at most, for only an afternoon. Now and again the passing of a huge flock may be noted. One such that I saw in October 1900 literally filled a seven-acre field, and by an easy calculation was estimated to comprise at least 50,000 birds. The subdued murmuring voice of such an immense assemblage was wonderful, in the rising and falling sounds of its undertones, and was audible at nearly 300 yards distant. None of the other Waders is so conspicuous during the autumnal migration as the Lapwing.

Some of the early October nights are fairly vocal with the calls of passing migrants, amongst which Curlews, Sea-pies, Redshanks, Golden Plover, and Dunlin are always largely represented.

There is nothing strikes the listener so much as he strains his ears to hear, and distinguish the myriad calls that float down to him on a quiet autumn night, as his utter inability to identify more than one-third to one-half of these voices. Since boyhood I have heard the calls of almost every bird that nests or sojourns in Solway, and amongst those who read these lines are many whose experience is far greater and more extended than mine. But let any of us listen to the calls that come down to earth when a really big migration movement is in progress during the darkness of night, and there is not one of us but will be confounded and humiliated to find that a very large proportion of the sounds cannot be assigned to any known species with certainty. Of course the explanation lies in the fact that birds when on migration use notes that are not required at other periods of their lives. We know their notes when feeding, courting, nesting, and roosting, because we have all seen and watched and listened to them at these times. Migration being for the most part carried on high above our heads, and after nightfall, we fail

to correlate the migration voices with the birds that utter them.

As an example of the Swimmers let me instance the Barnacle Goose, which is the characteristic wild goose of the Solway flats, found in more or less abundance from autumn till late in spring on the particular kind of haunt that suits its habits. About the closing days of September one seldom fails to note them coming down from their summer habitat. I have always seen them on this flight in the afternoon and towards evening, and only seldom have I detected their well-known repeated calls after nightfall. It would thus appear that they prefer the daylight for flight. They are, in clear weather, at so high an altitude that they can be seen only with difficulty, although even at such a height their calls will be distinctly audible to a sharp ear. If one of those calm sunny days with a few streaks of white fleecy clouds specking the blue sky should come at the period mentioned: on such a day as the gossamer threads float along on the gentlest of breezes, when the Starlings and Jackdaws and Black-headed Gulls, hawk, swallow-like, after flies; then lift your eyes skywards, watch keenly and listen intently, and almost certainly one will detect the forerunners of the Barnacle Geese that during winter form such an interesting part of the avifauna of the Solway banks. On a day in early October in the year 1881 my dear old friend, William Lennon, the entomologist, and myself were having a ramble across the Blackshaw, the wide sandbank that stretches for miles eastwards from the left side of the entrance to the Nith. We came upon a flock of Barnacles resting after their long journey from the Arctics. The vast majority of a flock, that we estimated at not less than 10,000 birds, were sound asleep, and those at the side of the assemblage that we approached were so tired that they merely lifted their heads and looked at us, walking away, and not flying unless we came nearer than thirty yards. I never saw such a sight before or since. These geese could have been walked up to, and shot, by anybody, but once they had wakened up from the sleep of utter exhaustion, an hour or two later, the best gunner on the firth would have required to "put in all he knew" to get within range at all.

Within the last half-dozen of years quite a revolution has taken place in the species of geese frequenting the Solway banks. Barnacles have been, and are yet, the characteristic Solway species. Formerly the Bean Goose was the prevailing "grey goose," but now the Grey Lag predominates and comes in very large numbers too. Brents, once very scarce, are far more often seen. Whence come these striking changes unless through some shift in the flow of the migration stream?

The vernal migration of the Whaups usually begins in February, and the big general movement may be looked for about the end of the first week in March. In the fine season of 1893 this general movement took place so early as 5th February. Every year a very extended and simultaneous migration of Whaups occurs, about the time stated, along the whole length and breadth of Solway. I have notes of such a spring movement over many years. On some quiet day towards mid-afternoon one may notice, when such a migration is setting in, little parties of Curlews, threes or fours or more in number, flying in a direct N. or N.N.W. direction at a great altitude, looking like little dots against the blue sky. Their arrow-like formation in flight, and the long-drawn shrill calls floating down to the watcher, will enable him to identify the species. As night closes in, the little parties of birds will become larger, more of these detached flocks will be seen, and after darkness has fairly settled down their calls may be heard coming from all directions. And so with this vernal movement the great business of the year is begun by this interesting species.

One of the most prominent of the spring migrants is the Lesser Black-back Gull. By the end of November all have gone elsewhere, and till near the end of February very few ever put in an appearance. With the lengthening days and stronger sunshine, small parties of these fine gulls come soaring overhead, generally moving directly northwards, laughing and talking in that noisy and lively language of theirs, flying in circles and playing the while as they move onwards, till the whole air resounds with their merriment.

Amongst all our spring migrants, the Corncrake is

the species that keeps its appointment to return to the land of its birth by a certain date with most commendable regularity. Whereas other birds may turn up any time within a fortnight or three weeks, the Landrail rarely deviates more than a couple of days on either side of 29th April.

It has long been a belief of mine that the dates of arrival of spring migrants are earlier along the west coast of England and Scotland. That is to say, the birds are seen sooner on the west coast than they are on the same latitude of the east coast. So far as I am aware, the matter has not been discussed yet, but it is an interesting point that might easily be settled. The conclusion stated has been reached from the experience of years, and from the perusal of a multiplicity of records of bird arrivals.

If a broad belt of bad weather intervenes anywhere across the flight of a bird from its winter to its summer home, its progress is at once arrested: that is, if its flight is overland; but if it is over the sea, the meteorological influences of a bad weather belt are not felt to the same extent. Hence the extreme western flank of the advancing spring migrants coming along from the Spanish and French headlands has a strong tendency to get here quicker, and so the dates of arrival will be earlier on the west of our islands.

The altitude and direction of flight are two of the phenomena of migration that are of prime importance in any discussion of the subject.

Skylarks and Swallows (and I include the two species of martins in the term) are about the only birds I am acquainted with that migrate at a comparatively low level. Quite invariably other birds that I have seen actually starting on their long journey mount very quickly upwards in a slanting direction, till they reach a height at which they can only be recognised by some special peculiarity of flight. A strong beam wind will bring the birds—even those of strongest powers—down to 200 to 500 feet of the surface, and it is most interesting to see whole flocks with heads turned almost completely to wind, and yet travelling along at nearly their normal speed, at right

angles to their position. Both in autumn and in spring I have often watched large numbers passing along at heights at which there was no chance of identification. A Gull might be distinguished from a Curlew, or a Wild Duck from a Cormorant, or a Sea-pie from a Sparrowhawk, but generally even this cannot be done. There seems every reason to believe that on such clear days as these, when the birds can only be distinguished as dots, multitudes were in flight higher still, beyond the limits of vision.

In Solway, one of the most interesting observations is the crossing of the lines of flight. Long since, the Rev. Hugh A. Macpherson, whose death in the full vigour of his powers and usefulness every British ornithologist still mourns,—long since Mr. Macpherson called the Solway Firth a great ornithological junction. This likening of the meeting-place of the two main lines of bird flight to a railway junction was a very happy analogy. Species that are quite abundant along the east coasts of England and Scotland may cross England at its narrowest part opposite the Solway Firth, either in scanty numbers, very rarely, or not at all. West of the Solway Firth such species become scarcer still.

It is noteworthy that a directly northward flight in spring is rather exceptional; all have a more or less westward bend in their direction. On the contrary the autumn flight is far more direct, and goes almost, if not quite, due south.

Some spring times the Redwings and Fieldfares “crowd down” in Solway to a very large extent during April, and they occasionally remain well on into May. Then it is of peculiar interest to see them going off about sunset, or later, mounting high into the clear sky, and going along in compact bodies, due east, uttering their chattering calls as they fly rapidly out of sight. The late stay of these birds when they cover the pasture fields, their voices mingling with the songs of the Willow Warblers, the Cuckoo, and the Corncrake, is of somewhat incongruous effect, but is a pleasant and not rare experience.

So far I have dealt only with the two regular seasonal

periods. But some of the irregular migration phenomena must also be briefly referred to.

A warm and genial summer will attract certain species beyond their usual northern limits, and hence we have, at long intervals, visits from such as the Quail and the Turtle-dove. A winter of arctic severity sends the outward fringe of such things as the Bohemian Waxwing, the Mealy Redpoll, and the Smew.

A vole plague augments our very few resident Short-eared Owls with hordes of the same species, and seasons in which beech-mast is plentiful will surely see the Bramble-finch in Solway in myriads. One of the very largest flocks of small birds that I have ever seen was in December of 1894 in the case of these Cocks o' the North, as our country folks call them. That same winter was one of unusual severity, and during January birds of many species passed through Solway *en route* to Ireland in immense flocks, seeking shelter and food in the only place in Western Europe where the frost was endurable.

Many of the most common migration phenomena are, even yet, most obscure and ill-known in their why and wherefore. Wind and weather and temperature have of course the greatest influence on the movements of the feathered voyagers; the amount and intensity of sunlight have perhaps a big share also, but the action of these influences are not well understood. If we could trace, hour by hour, the movements of any individual migrant from the time it arrives over the southern shores of England till it reaches the place where it makes its summer home, a complete knowledge of migration would not be unattainable. Such a record is well-nigh impossible. All we can hope to do is to note the movements of a species. Even that is far, very far, from being perfect. We want a thoroughly detailed series of dates, and other particulars, from the moment a species, the Cuckoo for example, lands on this side of the English Channel until it has passed through the Shetlands. And all the migrating species must be treated in a similar way.

There is a tremendous attraction to the nature lover in watching for the return of the birds. While the noting of

dates is a comparatively common doing on the part of those who watch the birds coming in spring, it must be said that it is rather rudimentary work. He who wishes to go deeper into the mystery of migration will do much more than this. He will note the hour of arrival—even the minute is of importance. The direction of the wind is all-important, and the character of the weather must also be noted. In fact, all the meteorological data must go down if a complete record is wanted. And there is the direction of flight, condition of birds (whether tired-looking or otherwise), height they are flying at, number of birds seen, and a whole list of minutiae that must be taken down. The observer who goes in for this will find himself amongst a maze of new facts. And if he is new to this line of observation he will be perfectly astonished at his introduction to so many things that “are not in the books.”

In the spring-time of the year any mild, moist, and therefore dark night, with not too strong a wind from any compass except the north, is pretty sure to give the observer matter for noting. Perhaps “observer” is not the correct word, for it implies the use of eyesight. It is however on such a night that ears must be used. From all directions of the air and heavens will be heard notes and calls of birds. Some of them are little chirps and squeaks, hardly discernible by the best ears. Others may be loud enough, such as the quack of Wild Duck or the scream of a Diver. The piping of Waders is always conspicuous. Familiar as one may be with the winter notes or summer songs and calls of our birds, whose every modulation may be fixed in our memory, still, as I have already stated in dealing with the off-going flight, with the notes of migrating birds the case is quite different. The best field ornithologist will scarcely identify more than half the calls he may hear during a really big movement. The migrating call is only uttered when the birds are travelling high overhead, and only then when the night is not a quite clear one. The whole subject is a singularly attractive one, and I wish heartily that it had more attention from my fellow-workers.

REPORT ON THE MOVEMENTS AND OCCURRENCE OF BIRDS IN SCOTLAND DURING 1902.

By T. G. LAIDLAW, M.B.O.U.

(Continued from p. 153).

EUDROMIAS MORINELLUS (Dotterel).

Dee—Peterhead, May 29, on golf course, first I have ever seen in the district.

CHARADRIUS PLUVIALIS (Golden Plover).

Orkney—Sule Skerry, April 20, two; Aug. 20, Sept. 8, a few. *Dee*—Aberdeen, Oct. 5, many. *Tweed*—Cramilt, Feb. 21, several. *Outer Hebrides*—Flannans, April 9 and 20, several; Aug. 28, one; Sept. 18, Oct. 9, a few between these dates. *Argyll and Isles*—Tiree, April 18, large flocks on their way N.; Oct. 21, large flocks all over island.

SQUATAROLA HELVETICA (Grey Plover).

Outer Hebrides—Flannans, May 28, several; June 11, one; Aug. 2, one.

VANELLUS VULGARIS (Lapwing).

Orkney—Noup Head, March 3, thirteen. *Tay*—Auchinblae, March 8, returned to breeding ground. *Forth*—Isle of May, Nov. 7, at lantern from midnight till daylight, with Fieldfares, Blackbirds, and Starlings. *Tweed*—Cramilt, Feb. 25, several. *Outer Hebrides*—Flannans, Nov. 6 and 20, one each date; Dec. 9, flock. *Clyde*—Carmichael, March 2, returned. *Solway*—Maxwelltown, Oct. 10, large flocks going S.

STREPSILAS INTERPRES (Turnstone).

Orkney—Sule Skerry, April 28, last seen; May 20, a flock on passage; July 11, large flock passed south; 15th, about thirty going S.; July 20, residents returned for the winter. *Moray*—Fochabers, Aug. 22, a flock of twenty. *Dee*—Peterhead, May 26, numerous during whole month of May. A large flock on 26th, in summer plumage. *Outer Hebrides*—Lochmaddy, April 9, large flock. Flannans, Dec. 7 and 16, several. *Argyll and Isles*—Skerryvore, Aug. 18, returned; Dec. 1, at lantern, rarely seen at light. Dhuheartach, April 14, visits the rock on rare occasions; Aug. 19, flock in winter plumage. *Clyde*—Turnberry, June 2, two. Fairlie, Sept. 5, one.

HÆMATOPUS OSTRALEGUS (Oyster-catcher).

Orkney—Sule Skerry, Feb. 20, arrived. *Moray*—Fochabers, March 1, returned to breeding-grounds on Spey. *Flannans*, March 27, six pairs.

PHALAROPUS HYPERBOREUS (Red-necked Phalarope).

Orkney—Stromness, Aug. 28, one shot, only bird seen. *Argyll and Isles*—Tiree, June 10, have arrived.

SCOLOPAX RUSTICULA (Woodcock).

Shetland—Dunrossness, Feb. 14, one; Oct., 2nd week, earliest appearance; March 20, latest known to occur, 1902. *Orkney*—Noup Head, Nov. 4, a number were killed. Sule Skerry, Sept. 30, one; Dec. 13, one. *Forth*—Isle of May, Nov. 6, a large number on island. *Outer Hebrides*—Flannans, Oct. 17, one; Nov. 5, four at lantern, three killed; Nov. 9, two; Dec. 5, one. *Argyll and Isles*—Skerryvore, Nov. 5, three, one on rock; Nov. 21-22, on the rock. Tiree, Dec. 12, one. *Clyde*—Arran (South), March 7-18, numerous, "becoming more numerous daily." *Solway*—Craigend, Oct. 11, one killed.

GALLINAGO CÆLESTIS (Snipe).

Orkney—Sule Skerry, May 11, last seen; July 10, one. *Tay*—Auchinblae, Oct. 23, over sixty seen on moor. *Forth*—Isle of May, Nov. 7, killed at lantern. *Outer Hebrides*—Island Glass, Jan. 9, killed at lantern (leg and wing); Jan. 28, numerous since 9th. Flannans, March 29, one; April 2, two; May 11, one; Dec. 16, one; 21st, three. *Argyll and Isles*—Skerryvore, May 8, one killed at light.

GALLINAGO GALLINULA (Jack Snipe).

Forth—Aberlady, Oct. 29, one shot. *Outer Hebrides*—Flannans, Feb. 1, two killed; Oct. 1, four; Nov. 20, one. *Argyll and Isles*—Skerryvore, May 9, at lantern. Tiree, Oct. 22, have come.

TRINGA MINUTA (Little Stint).

Argyll and Isles—Coll, observed late in February; not seen in March; April, many about Crossapol sands ("Annals," 1902, p. 251).

TRINGA SUBARQUATA (Curlew Sandpiper).

Forth—Isle of May, Oct. 14, one killed (wing sent). *Argyll and Isles*—Skerryvore, July 31, one.

TRINGA CANUTUS (Knot).

Forth—Isle of May, Nov. 7, six killed at lantern. *Outer Hebrides*—Flannans, Nov. 18, one killed (leg and wing sent).

CALIDRIS ARENARIA (Sanderling).

Orkney—Stromness, Aug. 19, one shot; 22nd, three; Sept. 1, one. *Argyll and Isles*—Coll, June 12, a lot of nine, eight perfect summer plumage, one partly so ("Annals," 1902, p. 251). Skerryvore, Aug. 18.

TOTANUS HYPOLEUCUS (Common Sandpiper).

Moray—Fochabers, April 15. *Tay*—Rannoch, April 16. *Forth*—Duddingston, April 14. *Tweed*—Hawick, April 12, on Teviot. Halmyre and Broughton, April 15. *Argyll and Isles*—Tiree, June 9. *Clyde*—Cadzow (Avon), April 12. Beith and Busby, April 13. Dalbeth and Balgray, Sept. 20. *Solway*—Cairn, April 14. Beattock, April 17; May 10, seen everywhere.

TOTANUS GLAREOLA (Wood Sandpiper).

Orkney—Eday, Sept. 1, one shot ("Zoologist," 1902, p. 391).

TOTANUS CALIDRIS (Redshank).

Tay—Auchinblae, March 2, returned to breeding-ground; Sept. 1, last seen. *Forth*—Dalmeny, July 8, returned to sea-shore. *Tweed*—Broughton, March 4. Cramilt, March 12. *Clyde*—Carmichael, March 2, returned.

TOTANUS CANESCENS (Greenshank).

Forth—North Berwick, Feb. 6, one shot. *Argyll and Isles*—Tiree, April 14, two; Aug. 25, several.

LIMOSA LAPPONICA (Bar-tailed Godwit).

Orkney—Sule Skerry, May 13, one. *Argyll and Isles*—Tiree, Oct. 9, a small flock.

LIMOSA BELGICA (Black-tailed Godwit).

Forth—Isle of May, May, end of, one killed (leg and wing sent). *Argyll and Isles*—Tiree, Aug. 23, three; 27th, four; Sept. 5, one. Not very rare in Tiree on migration.

NUMENIUS ARQUATA (Curlew).

Orkney—Noup Head, March 7, one. Sule Skerry, April 28, last seen; Aug. 1, eight returned for winter. *Tay*—Auchinblae,

March 6, returned to breeding-ground. *Forth*—Dalmeny, July 8, returning to sea-shore. *Tweed*—Broughton, Feb. 20, returned. *Outer Hebrides*—Flannans, April 6, one; Aug. 5, six; Aug. 28-Sept. 15, a good many. *Argyll and Isles*—Dhuheartach, Feb. 23, about a dozen flying in rays; March 1, flying in rays with Oyster-catchers. Skerryvore, May 26, a flock flying N.; Aug. 13, a flock. *Clyde*—Carmichael, March 2, returned.

NUMENIUS PHÆOPUS (Whimbrel).

Orkney—Sule Skerry, April 26, three. Stromness, Aug. 22, one. *Forth*—Dalmeny, July 20. *Outer Hebrides*—Flannans, May 10-14, several; May 18, nine; July 30, two; Aug. 5, one. *Argyll and Isles*—Tiree, April 17, four; 22nd, a few; April 29-May 20, flocks passing daily; Aug. 26, several along shore. Dhuheartach, May 9, four; 22nd, one on rock. Skerryvore, May 31, one. *Clyde*—Lendalfoot, April 26. Millport, May 3. Bute, May 5.

HYDROCHELIDON NIGRA (Black Tern).

Tweed—Hawick, June 2, several seen, one shot ("Annals," 1902, p. 253).

STERNA CANTIACA (Sandwich Tern).

Forth—North Berwick, April 27, seven. Dalmeny, Sept. 19.

STERNA FLUVIATILIS (Common Tern).

Shetland—Bred in 1901, not hitherto known as a breeding species in the Islands ("Annals," 1902, p. 121). *Moray*—Fochabers, April 18. *Dee*—Peterhead, May 8. Aberdeen, May 11, a few; Sept. 20, last. *Tay*—Bell Rock, April 28, two, first. *Forth*—North Berwick, April 13, arrived. *Argyll and Isles*—Tiree, May 15, have arrived.

STERNA MACRURA (Arctic Tern).

Orkney—Sule Skerry, May 14, first; Sept. 5, last. *Dee*—Aberdeen, May 11, many; Sept. 22, about thirty, last seen. *Outer Hebrides*—Flannans, June 11, two. *Argyll and Isles*—Tiree, May 15, have arrived.

STERNA MINUTA (Lesser Tern).

Dee—Aberdeen, May 11, twelve; Sept. 20, last. *Tay*—Bell Rock, Sept. 27, about thirty passing N.E. *Argyll and Isles*—Tiree, May 26, have arrived.

LARUS LEUCOPTERUS (Iceland Gull).

Sutherland—Castlehill, Jan. 20, a ♂. *Forth*—Aberlady, Oct. 16, one picked up on tide-line. *Outer Hebrides*—Barra, Jan. 18,

adult found dead on shore at Eoligary. *Argyll and Isles*—Tobermory, Feb. 27, two came with other birds to food placed out for them ("Annals," 1902, p. 185).

RISSA TRIDACTYLA (Kittiwake).

Orkney—Sule Skerry, June 1, about a thousand arrived and remained till Aug. 8. *Outer Hebrides*—Flannans, Feb. 25, great numbers, first arrivals.

MEGALESTRIS CATARRHACTES (Great Skua).

Forth—Aberlady, Oct. 14, one.

STERCORARIUS POMATORHINUS (Pomatorhine Skua).

Forth—Sept. 19, one obtained in Firth. *Clyde*—Luss, Loch Lomond, Oct. 5, immat. ♀ found on shore at Midross, choked while endeavouring to swallow a powan ("Annals," 1903, p. 51). *Solway*—Oct. 29, immat. bird shot at Glencaple Quay (*op. cit.* 1903, p. 51).

STERCORARIUS CREPIDATUS (Arctic Skua).

Sutherland—Scotscladder, June 13, several. *Argyll and Isles*—Tiree, May 12, two. Dhuheartach, Sept. 14, nineteen flying S. Skerryvore, July 27, one. *Solway*—Glenkens, Aug. 26, one shot.

ALCA TORDA (Razorbill).

Orkney—Noup Head, Feb. 20, all day, early this season. Sule Skerry, March 25, first. *Outer Hebrides*—Flannans, Feb. 25, great numbers.

URIA TROILE (Guillemot).

Orkney—Noup Head, Feb. 20, very early this year. *Tay*—Bell Rock, January, seen nearly every day during month. *Outer Hebrides*—Flannans, Feb. 25, great numbers; June 5, shot variety with white head.

FRATERCULA ARCTICA (Puffin).

Orkney—Sule Skerry, April 6, first; Sept. 2, last seen. *Outer Hebrides*—Flannans, April 6, one; April 17, millions, first landing on island.

MERGULUS ALLE (Little Auk).

Shetland—Dunrossness, January, last week; many in Spiggie Bay. *Argyll and Isles*—Skerryvore, Feb. 17, first seen this year.

COLYMBUS GLACIALIS (Great Northern Diver).

Forth—Aberlady, Oct. 21, two; Oct. 25, four (one shot).

COLYMBUS SEPTENTRIONALIS (Red-throated Diver).

Forth—Aberlady, April 20, several; Oct. 16, two.

PODICIPES GRISEIGENA (Red-necked Grebe).

Forth—Dalmeny, Sept. 18, Longgreen Bay.

FULMARIS GLACIALIS (Fulmar).

Sutherland—Handa and Clo Head, June and July, several.

Outer Hebrides—Flannans, April 10, plentiful.

PUFFINUS GRISEUS (Sooty Shearwater).

Orkney—Stromness, Oct. 16, one caught in harbour.

OCEANODROMA LEUCORRHOA (Fork-tailed Petrel).

Orkney—Sule Skerry, May 3, one struck lantern (11 P.M.); Aug. 4, 7, 27, 31, one on each date at lantern. *Outer Hebrides*—Flannans, Oct. 9, one killed; Oct. 10, several flying in rays; Aug. 2, one struck lantern; Aug. 11, several flying round light.

PROCELLARIA PELAGICA (Storm Petrel).

Orkney—Sule Skerry, June 1, one. *Forth*—Isle of May, Oct. 14, one killed (wing sent). *Argyll and Isles*—Skerryvore, Sept. 20, two, first this year.

BIRD NOTES FROM UNST, SHETLAND.

By Dr. T. EDMONDSTON SAXBY.

WHITE-TAILED EAGLE (*Haliaetus albicilla*).—Two seen, 28th March.

WHOOPEE SWAN (*Cygnus musicus*).—Heard overhead, 8 P.M., 30th March, wind S.W. Heard again passing north about 9 P.M., 21st April, wind N.E., strong.

GREAT SKUA (*Megalestris catarrhactes*).—Arrived 9th April.

BRENT GOOSE (*Bernicla brenta*).—Four seen at Norwick, 27th April.

REDBREAST (*Erithacus rubecula*).—Several seen on 4th May and following days.

WHEATEAR (*Saxicola ananthe*).—Arrived 1st May, wind E. by E.N.E.

- BLACKBIRD (*Turdus merula*).—First nest, with four eggs, found 3rd May.
- RING-DOVE (*Columba palumbus*).—First seen at Halligairth on 10th May, wind N.E., strong. Last seen 25th May.
- FIELDFARE (*Turdus pilaris*).—Numbers largely increased on 3rd May. Last seen 14th May.
- SWIFT (*Cypselus apus*).—One seen at Baltasound, 25th May.
- MARTIN (*Chelidon urbica*).—Eight seen at Baltasound, 25th May.
- CUCKOO (*Cuculus canorus*).—One seen at Maillans, 28th May, wind W.
- GANNET (*Sula Bassana*).—Caught alive at Norwick by a woman on 28th May. The bird had ventured up a narrow burn, and being unable to rise for want of room, was easily captured by the woman, who threw her jacket round it.
- ARCTIC TERN (*Sterna macrura*).—Arrived 29th May.
- LANDRAIL (*Crex pratensis*).—First heard, 11.30 P.M., 5th June.
- RED-BREASTED MERGANSER (*Mergus serrator*).—Nest with eight fresh eggs found 13th June.
- TREE SPARROW (*Passer montanus*).—For several years I have believed that the Tree Sparrow has nested here, having seen it under circumstances which allowed of little doubt that such was the case. At last my watching has led to a satisfactory result, for on 13th June I found a nest with five eggs. The nest was built into a hole in the south wall of the family burial-ground which adjoins the garden at Halligarth; it was composed externally of grass and some rootlets, and was lined with feathers of gulls, hens, crows, etc., and a little black horse-hair. It was altogether a more tidy, or rather less untidy, structure than the nest of the House Sparrow. I cannot claim the credit of being the first observer to report the occurrence of the Tree Sparrow in Shetland during the breeding season, though I do not think the nest or eggs have been found and identified before.
- GREAT NORTHERN DIVER (*Colymbus glacialis*).—A fine specimen, a male, was brought to me alive on 10th July. A fisher lad had caught it sitting on a rock at the mouth of the harbour of Baltasound; it seemed in a very exhausted condition. The lad said the bird was "sitting on its stomach" and tried to scramble to the sea, shuffling along with its breast close to the ground. I kept the bird for some time, but never once saw it assume an erect attitude.
- CROSSBILL (*Loxia curvirostra*).—Four seen by Mr. Henry Sutherland of Baltasound on Sunday, 19th July. Wind, E. to N.E.

to N., strong. Two of the birds were bright coloured ("mostly red") and two were dark coloured. The cat brought in the head of one the same day. The birds were sitting on a goose-berry bush close to the house and were not wild.

CHAFFINCH (*Fringilla coelebs*).—A pair have been about the shrubbery all summer, coming to be fed along with the other birds. I have not been able to discover any nest, but on 7th August my wife called me to see four young Chaffinchs which were feeding along with the two old ones.

WRYNECK (*Iynx torquilla*).—One, a male, captured alive at Haroldswick on 2nd September and brought to me. The bird was in fine plumage and in good condition, though when I opened the stomach it was empty. It weighed 362 grains. Though several captures and occurrences have been reported for Shetland, this is the first Wryneck I have seen since August 1884, when my younger brother shot one in front of this house.

DIPTERA SCOTICA: III.—THE FORTH DISTRICT.

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

(Continued from p. 166.)

Family PIPUNCULIDÆ.

153. PIPUNCULUS RURALIS, *Mg.*—Pease Bridge, 1843 (Hardy)—Selby, 2.

Family SYRPHIDÆ.

154. PARAGUS TIBIALIS, *Fln.*—♂, Aberfoyle, July 1903 (A. E. J. Carter).
155. PIPIZELLA VIRENS, *Fab.*—Musselburgh (A. E. J. Carter).
156. PIPIZELLA FLAVITARSIS, *Mg.*—♂, Aberfoyle, July 1903 (A. E. J. Carter).
157. CHRYSOGASTER SPLENDENS, *Mg.*—Musselburgh (A. E. J. Carter); ♂, Braid Burn, Morningside, July 1899 (Wm. Evans).
158. LIOGASTER METALLINA, *Fab.*—♀, Aberlady, July 1898 (Wm. Evans); ♀ (common), Winchburgh, 24th June 1902 (James Waterston).
159. CHRYSOGASTER HIRTELLA, *Lw.*—♀, Heriot, 28th June 1898 (Wm. Evans).

160. *CHILOSIA VARIABILIS*, *Panz.*—[*Syrphus*] Pease Bridge, 1843 (Hardy)—Selby, 2.
161. *CHILOSIA* [?] *INTONSA*, *Lw.*—♀, Glencorse, 15th April 1894 (P. H. G.).
162. *CHILOSIA ILLUSTRATA*, *Harr.*—[*Syrphus astracea*] Pease Bridge, 1843 (Hardy)—Selby, 2; Morningside, July 1893, Mid-Calder, 10th July 1899, Inverkeithing, 29th July 1899 (Wm. Evans).
163. *CHILOSIA ALBITARSIS*, *Mg.*—Polton and Musselburgh (A. E. J. Carter).
164. *CHILOSIA FRATERNA*, *Mg.*—[*Syrphus chloris*] Pease Bridge, 1843 (Hardy)—Selby, 2; [*Chilosia chloris*] Aberlady, 1873—Verrall, 3.
165. *CHILOSIA VERNALIS*, *Fln.*—♂, Canty Bay, 4th August 1896 (W. Eagle Clarke).
166. *PLATYCHIRUS MANICATUS*, *Mg.*—♂ and ♀, Morningside, June 1893 (P. H. G.); ♀, Aberdour, 6th July 1893 (P. H. G.); ♀♀, North Berwick, August 1893 (W. Eagle Clarke); ♂, North Berwick, 12th August 1894, and ♀, Dirleton, 5th August 1896 (W. Eagle Clarke); ♀, Heriot, 28th June 1898, ♀, Aberlady, July 1898, and ♀, Craigentenny, 22nd August 1898 (Wm. Evans).
167. *PLATYCHIRUS PELTATUS*, *Mg.*—♂ and ♀, Morningside, June 1893 (P. H. G.); ♀, Aberlady, July 1898 (Wm. Evans).
168. *PLATYCHIRUS SCUTATUS*, *Mg.*—♀, North Berwick, August 1893 (W. Eagle Clarke); ♂, Morningside, 9th September 1894 (P. H. G.); ♀, Aberlady, July 1898 (Wm. Evans); ♂, Aberlady, 2nd June 1903 (P. H. G.).
169. *PLATYCHIRUS ALBIMANUS*, *Fab.*—♂ and ♀, Balerno, 13th May 1893, ♀ Loch Vennachar, 17th May 1893, ♂, Morningside, 21st May 1893, ♀, Morningside, 15th April 1894, and ♀, Glencorse, 6th June 1894 (P. H. G.); ♂, Canty Bay, 4th August 1896 (W. Eagle Clarke); ♀, Gosford Park, 5th May 1898 (P. H. G.); ♀, Heriot, 28th June 1898 (Wm. Evans); Polton (A. E. J. Carter).
170. *PLATYCHIRUS SCAMBUS*, *Staeg.*—♀, Glencorse, 6th June 1894 (P. H. G.); Polton (A. E. J. Carter).
171. *PLATYCHIRUS CLYPEATUS*, *Mg.*—♂, Moor at Balerno, 13th May 1893, ♀, Morningside, 11th June 1893, and ♂, Glencorse, 6th June 1894 (P. H. G.); ♀, Smeaton Hepburn, 17th July 1897 (Sir Archibald Buchan-Hepburn); ♂, Heriot, 28th June 1898, ♂ and ♀, Aberlady, July 1898, and ♀, Craigentenny, 22nd August 1898 (Wm. Evans).

172. PLATYCHIRUS ANGUSTATUS, *Ztt.*—♀, Aberlady, July 1898 (Wm. Evans).
173. PYROPHÆNA ROSARUM, *Fab.*—Two at Aberfoyle, 27th July 1900—Wm. Evans, "Ann. Scot. Nat. Hist." 1900, p. 251.
174. MELANOSTOMA MELLINUM, *L.*—Common throughout the district. I have records from Morningside, Glencorse, Balerno, Dalmeny, Hawthornden, Craigentenny, Heriot, and Aberlady. The specimens were taken from May to September.
175. MELANGYNA QUADRIMACULATA, *Verr.*—[*Melanostoma*] ♂, Morningside, 1st April 1894 (P. H. G.).
176. XANTHANDRUS COMTUS, *Harr.*—[*Syrphus hyalinatus*] Pease Bridge, 1843 (Hardy)—Selby, 2.
177. LEUCOZONA LUCORUM, *L.*—[*Syrphus*] Pease Bridge, 1843 (Hardy)—Selby, 2; Morningside, July 1893, Swanston, 29th July 1899; Mid-Calder, 10th July 1899, and Drumshoreland, 4th June 1900 (Wm. Evans).
178. ISCHYROSYPHUS GLAUCIUS, *L.*—[*Syrphus*] Aberlady, 1873—Verrall, 3; Tynehead, 24th August 1901 (Wm. Evans); Oakley, 13th August 1898 (Wm. Evans).
179. CATABOMBA PYRASTRI, *L.*—Gullane and Longniddry (A. E. J. Carter); Penicuik, July 1893; Morningside, July 1893, Linlithgow, 9th August 1899 (Wm. Evans).
180. SYRPHUS ALBOSTRIATUS, *Fln.*—♀, Craiglockhart, 10th September 1893 (P. H. G.); ♀, Aberlady, August 1896 (Wm. Evans).
181. SYRPHUS TRICINCTUS, *Fln.*—Aberlady, 1873—Verrall, 3; ♂♂, Balerno and Threipmuir, 13th May 1893 (P. H. G.); Luffness, 16th May 1896 (Wm. Evans); ♀, Dirleton, 5th August 1896 (W. Eagle Clarke); Drumshoreland, 4th June 1900 (Wm. Evans); Aberlady, 30th June 1899 (Wm. Evans).
182. SYRPHUS VENUSTUS, *Mg.*—♀, Aberlady, 2nd June 1903 (P. H. G.); ♂, Corstorphine, May 1901 (Wm. Evans).
183. SYRPHUS NIGRICORNIS, *Verr.*—♀, Heriot, 28th June 1898 (Wm. Evans).
184. SYRPHUS ANNULIPES, *Ztt.*—♀, near Balerno, 30th May 1900—Wm. Evans, "Ann. Scot. Nat. Hist." 1900, p. 251; ♀, near Strathyre, 9th September 1902 (Wm. Evans).
185. SYRPHUS TORVUS, *Ost.-Sack.*—[*topiarius*, *Mg.*] Pease Bridge, 1843 (Hardy)—Selby, 2.
186. SYRPHUS GROSSULARIÆ, *Mg.*—Morningside, ♂, 4th August 1895, and ♀, 9th September 1894 (P. H. G.); in large numbers in Dalmeny Park, 1st September 1896—(Rev.

Alfred Thornley)—Grimshaw, "Ann. Scot. Nat. Hist." 1897, p. 24; Aberdour, 4th August 1900 (Wm. Evans).

187. *SYRPHUS RIBESII*, *L.*—Common throughout the district. I have seen specimens from Morningside, Balerno, Dalmeny, Threipmuir, Dirleton, Aberdour, Gosford, and Aberlady, caught on various dates, and ranging from 23rd April to 10th September. Some of the examples may belong to the form *vitripennis*, *Mg.*, which I do not recognise as a distinct species.
188. *SYRPHUS LATIFASCIATUS*, *Mcg.*—Slateford, 12th May 1896—Grimshaw, "Ann. Scot. Nat. Hist." 1897, p. 24.
189. *SYRPHUS COROLLÆ*, *Fab.*—[*lucerus*] Pease Bridge, 1843 (Hardy)—Selby, 2.
190. *SYRPHUS LUNIGER*, *Mg.*—Morningside, ♂, 9th September 1894, and ♀, 6th June 1893 (P. H. G.); ♀, Aberlady, 3rd May 1895 (P. H. G.); ♀, Dirleton, 5th August 1896 (W. Eagle Clarke).
191. *SYRPHUS BALTEATUS*, *Deg.*—♂, Aberdour, 6th July 1893 (P. H. G.); ♂, Kirknewton, July 1893; ♂, Morningside, July 1893; ♂, Aberlady, August 1896 (Wm. Evans).
192. *SYRPHUS CINTELLUS*, *Ztt.*—♀, Dalmeny Park, 1st September 1896 (Rev. Alfred Thornley).
193. *SYRPHUS UMBELLATARUM*, *Fab.*—[*umbellatarius*] Pease Bridge, 1843 (Hardy)—Selby, 2.
194. *SYRPHUS LASIOPHTHALMUS*, *Ztt.*—♂, Glencorse, and ♀, Morningside, 15th April 1894 (P. H. G.).
195. *SPHÆROPHORIA DISPAR*, *Loew.*—Pettycur, Fife, 3rd September 1900 (Wm. Evans); ♂, Aberfoyle, July 1903 (A. E. J. Carter).
196. *SPHÆROPHORIA FLAVICAUDA*, *Ztt.*—[*Cheilosia melissæ*] Pease Bridge, 1843 (Hardy)—Selby, 2. [The synonymy of this species is doubtful.—P. H. G.]
197. *SPHEGINA CLUNIPES*, *Fln.*—Pease Bridge, 1843 (Hardy)—Selby, 2; Gosford Park, Aberlady, 4th June 1896—Grimshaw, "Ann. Scot. Nat. Hist." 1897, p. 24; ♂, Heriot, 28th June 1898 (Wm. Evans); Bridge of Allan, 28th June 1901 (Wm. Evans); ♂, Dollar, 9th July 1901 (Wm. Evans).
198. *ASCIA DISPAR*, *Mg.*—♂, Heriot, 28th June 1898 (Wm. Evans); ♂ and ♀, several specimens, Aberlady, July 1898 (Wm. Evans).
199. *ASCIA FLORALIS*, *Mg.*—Aberlady, 2nd June 1903 (P. H. G.).
200. *RHINGIA ROSTRATA*, *L.*—[*Stomoxys*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.

201. RHINGIA CAMPESTRIS, *Mg.*—Pease Bridge, 1843 (Hardy)—Selby, 2; on turnip flowers at Cockburnspath, 18th June 1853—Geo. Tate, in Anniversary Address, "Proc. Berw. Nat. Club," iii. p. 132 (1850-1856); Musselburgh (A. E. J. Carter); ♂, Canty Bay, 4th August 1896 (W. Eagle Clarke); Braid Burn, Morningside, August 1903 (Jas. Waterston); Loganlee, May 1895, and Manuel, June 1895 (Wm. Evans).
202. VOLUCELLA BOMBYLANS, *L.*—Pease Bridge, 1843 (Hardy)—Selby, 2; Dreghorn, Mid-Calder, Gullane, Tynhead, Heriot, and Aberfoyle—Wm. Evans, "Ann. Scot. Nat. Hist." 1901, p. 53; Aberfoyle (A. E. J. Carter).
203. VOLUCELLA PELLUCENS, *L.*—[*Musca*] Neighbourhood of Edinburgh—Stewart, 1, p. 576; Musselburgh and Aberfoyle (A. E. J. Carter); Mid-Calder, 10th July 1899 (Wm. Evans); Braid Burn, 4th July 1899 (Wm. Evans); Dunbar, 7th July 1900 (Wm. Evans).
204. ERISTALIS SEPULCHRALIS, *L.*—♂, Aberlady, July 1898 (Wm. Evans); ♂♂, Corstorphine Hill and Davidson's Mains, 24th May 1901 (Wm. Evans); ♂, Inveresk, 22nd May 1901; ♀, Polton, 18th June 1901 (Wm. Evans).
205. ERISTALIS TENAX, *L.*—Common throughout the district; I have records from Edinburgh, Morningside, Craiglockhart, Glencorse, Dalmeny, Dirleton, Canty Bay, and North Berwick (22nd April to 10th September).
206. ERISTALIS ARBUSTORUM, *L.*—Common throughout the district; I have seen specimens from Morning-side, Davidson's Mains, Glencorse, Gosford Park, Drem, Dirleton, North Berwick, caught between 22nd April and 22nd September.
207. ERISTALIS NEMORUM, *L.*—[*Musca*] Neighbourhood of Edinburgh—Stewart, 1, p. 576; Pease Bridge, 1843 (Hardy)—Selby, 2.
208. ERISTALIS PERTINAX, *Scop.*—♂, North Berwick, August 1893 (W. Eagle Clarke); ♀, Davidson's Mains, 24th May 1901, and Salton, 18th September 1903 (Wm. Evans). [This species *must* occur throughout the district.—P. H. G.]
209. ERISTALIS HORTICOLA, *Deg.*—Pease Bridge, 1843 (Hardy)—Selby, 2; ♂, Mid-Calder, 10th July 1899; ♀, Forest Mill, 13th July 1901; ♀, Saline, 20th August 1901 (Wm. Evans).
210. HELOPHILUS TRIVITTATUS, *Fab.*—Pease Bridge, 1843 (Hardy)—Selby, 2; Aberlady, 1873—Verrall, 3.
211. HELOPHILUS PENDULUS, *L.*—[*Musca*] Neighbourhood of Edinburgh—Stewart, 1, p. 576; North Berwick, August 1893, and Morningside, 3rd September 1893 (W. Eagle Clarke);

- ♂, Aberlady, July 1898 (Wm. Evans); ♂, Glencorse, 8th September 1898 (P. H. G.); Musselburgh (A. E. J. Carter).
212. *HELOPHILUS LINEATUS*, *Fab.*—♀, Aberlady, 17th August 1896 (W. Eagle Clarke); ♂ and ♀, Aberlady, July 1898 (Wm. Evans); ♂, Davidson's Mains, 24th May 1901 (Wm. Evans).
213. *MERODON EQUESTRIS*, *Fab.*—♂, Newbattle Terrace, Edinburgh, 6th June 1899—Wm. Evans, "Ann. Scot. Nat. Hist." 1900, p. 251.
214. *XYLOTA SEGNIS*, *L.*—Polton (A. E. J. Carter); ♂, Corstorphine Hill, 24th May 1901; ♂, Gorebridge, 18th June 1900; and ♂, Aberdour, 4th August 1900 (Wm. Evans).
215. *XYLOTA SYLVARUM*, *L.*—"Last summer I met with this fly near Kirknewton (quite common), Gorebridge, Dunbar, and Aberdour. In August 1895 I took one at Falkland. James Wilson ('Ency. Brit.' 7th ed. Entom., p. 241) has recorded it from near Edinburgh"—Wm. Evans, "Ann. Scot. Nat. Hist." 1901, p. 53.
216. *SYRITTA PIPIENS*, *L.*—[*Xylota*] Pease Bridge, 1843 (Hardy)—Selby, 2; ♂ and ♀, North Berwick, August 1893 (W. Eagle Clarke); ♂, Craigentenny, 22nd August 1898 (Wm. Evans); ♂, Leven, August 1893, ♀, Arthur's Seat, July 1893, ♂, Davidson's Mains, August 1898 (Wm. Evans).
217. *CHRYSOCHLAMYS CUPREA*, *Scop.*—Aberfoyle (A. E. J. Carter).
218. *ARCTOPHILA MUSSITANS*, *Fab.*—[*Sericomyia superbiens*] Woodhouselea, Pentlands—R. C. R. Jordan, "Scot. Nat." vol. ii. (1873-74), p. 63; Falkland, Fife, 14th August 1895 (Wm. Evans)—Grimshaw, "Ann. Scot. Nat. Hist." 1897, p. 24; Loch Voil, 2nd September 1902 (Wm. Evans).
219. *SERICOMYIA BOREALIS*, *Flm.*—Pease Bridge, 1843 (Hardy)—Selby, 2; ♂, Glencorse, 17th June 1893, and ♂♂, Braid Hills, 18th June 1893 (P. H. G.); Aberfoyle (A. E. J. Carter); "common in the district"—Wm. Evans, "Ann. Scot. Nat. Hist." 1901, p. 53. [Mr. Evans has shown me specimens from Leadburn, Newpark, Gardrum, Bavelaw, and Aberdour.—P. H. G.]
220. *SERICOMYIA LAPPONA*, *L.*—"In the course of the past five or six years I have taken this interesting species in the following localities: Bavelaw, Kirknewton, Silverburn. . . . Sixty years ago it was recorded by James Wilson as occurring 'among the Pentland Hills' ('Ency. Brit.' 7th ed., Entom., p. 241)"—Wm. Evans, "Ann. Scot. Nat. Hist." 1901, p. 53.

221. *CHRYSOTOXUM ARCUATUM*, *L.*—"One captured near Aberdour last August, and another seen near Inverkeithing in June"—Wm. Evans, "Ann. Scot. Nat. Hist." 1901, p. 53; ♂, Aberfoyle, July 1903 (A. E. J. Carter).
222. *CHRYSOTOXUM BICINCTUM*, *L.*—Near Kirknewton, July 1900—Wm. Evans, "Ann. Scot. Nat. Hist." 1901, p. 53; Aberfoyle (A. E. J. Carter).
223. *MICRODON MUTABILIS*, *L.*—Aberfoyle (A. E. J. Carter).

Family CONOPIDÆ.

224. *PHYSOCEPHALA RUFIPES*, *Fab.*—[*Conops*] "Dalmeny—*Rev. William Little*"—Duncan, "Mag. Zool. and Bot." vol. ii. (1838), p. 217.
225. *ONCOMYIA ATRA*, *Fab.*—[*Myopa*] "Neighbourhood of Edinburgh"—Duncan, "Mag. Zool. and Bot." vol. ii. (1838), p. 222.
226. *SICUS FERRUGINEUS*, *L.*—[*Myopa*] "We notice it every summer in the neighbourhood of Edinburgh"—Duncan, "Mag. Zool. and Bot." vol. ii. (1838), p. 221. Brucefield near Alloa, 25th July 1903 (Wm. Evans). [Mr. Evans's capture is an interesting confirmation of the occurrence of this species—P. H. G.]
227. *MYOPA TESTACEA*, *L.*—"This insect seems to appear not infrequently, but at somewhat uncertain intervals, and on some occasions we have observed it in great profusion. This was particularly the case in the neighbourhood of Edinburgh, in the summer of 1835, when scarcely a flowering plant, especially of the umbelliferous kind, could be examined without finding specimens"—Duncan, "Mag. Zool. and Bot." vol. ii. (1838), p. 220.
228. *MYOPA PICTA*, *Panz.*—"We once found a specimen in the Edinburgh Botanic Garden"—Duncan, "Mag. Zool. and Bot." vol. ii. (1838), p. 219. [The occurrence of this species in the Forth district, and indeed in any part of Britain, requires confirmation—P. H. G.]

Family CESTRIDÆ.

229. *GASTROPHILUS EQUI*, *Fab.*—[*Cestrus*] Neighbourhood of Edinburgh—Stewart, 1, p. 575.
230. *GASTROPHILUS HÆMORRHOIDALIS*, *L.*—[*Cestrus*] Neighbourhood of Edinburgh—Stewart, 1, p. 575; bred from larvæ obtained at Hunter's Tryst Dairy, Edinburgh, in 1899 (Wm. Evans).

231. *HYPODERMA BOVIS*, *Deg.*—[*Æstrus*] Neighbourhood of Edinburgh—Stewart, 1, p. 575.
232. *ÆSTRUS OVIS*, *L.*—Neighbourhood of Edinburgh—Stewart, 1, p. 575.

Family TACHINIDÆ.

233. *GYMNOCHÆTA VIRIDIS*, *Fln.*—Blackford Hill, 21st April 1894 (P. H. G.); Musselburgh and Polton (A. E. J. Carter).
234. *BLEPHARIDEA VULGARIS*, *Fln.*—♂, Aberlady, July 1898 (Wm. Evans); ♀, bred from *Hadena oleracea*, L. from Slateford, May 1899 (James Waterston).
235. *TACHINA LARVARUM*, *L.*—[*Musca*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.
236. *GONIA CAPITATA*, *Deg.*—Gullane Links, 23rd April 1893 and 3rd May 1895 (P. H. G.); one taken near Kilconquhar, Fife, on 26th May 1900—Wm. Evans, "Ann. Scot. Nat. Hist." 1901, p. 53.
237. *ANTHRACOMYIA MELANOPTERA*, *Mg.*—♂, Glencorse, 6th June 1894 (P. H. G.).
238. *ZOPHOMYIA TEMULA*, *Scop.*—[*Musca tremula*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.
239. *OLIVIERIA LATERALIS*, *Fab.*—Longniddry (A. E. J. Carter); Oakley, 13th August 1898, and Aberlady, August 1896 (Wm. Evans).
240. *MICROPALPUS VULPINUS*, *Fln.*—Aberfoyle (A. E. J. Carter and Wm. Evans); Thornton, 11th August 1900 (Wm. Evans).
241. *ECHINOMYIA GROSSA*, *L.*—[*Musca*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.
242. *SIPHONA CRISTATA*, *Fab.*—♂, Morningside, 7th May 1893, and ♂, Gosford Park, 5th May 1898 (P. H. G.); ♂, Aberlady, July 1898 (Wm. Evans).
243. *SIPHONA GENICULATA*, *Deg.*—♂, Morningside, 30th May and 6th June 1893 (P. H. G.); ♂, and ♀, Braid Hills, 23rd July 1893 (P. H. G.); ♂, Glencorse, 8th September 1898 (P. H. G.).
244. *TRIXA ÆSTROIDEA*, *Dsv.*—Aberfoyle (A. E. J. Carter).
245. *MELANOPHORA ATRA*, *Mcq.*—Aberlady, July 1898 (Wm. Evans).
246. *CYNOMYIA ALPINA*, *Ztt.*—♂, Loch Ard, July 1903 (A. E. J. Carter).
247. *CYNOMYIA MORTUORUM*, *L.*—Morningside, 22nd April 1894 (P. H. G.); ♀, Polwarth, Edinburgh, May 1899 (James Waterston); ♂, Arthur Seat, July 1893, ♂, Roslin, July 1893, ♂, Luffness, 19th July 1898 (Wm. Evans).

248. *SARCOPHAGA CARNARIA*, *L.*—[*Musca*] Neighbourhood of Edinburgh—Stewart, 1, p. 576; Pease Bridge, 1843 (Hardy)—Selby, 2; Aberfoyle (A. E. J. Carter).
249. *SARCOPHAGA ATROPOS*, *Mg.*—Aberfoyle (A. E. J. Carter).
250. *SARCOPHAGA ?INTRICARIA*, *Mg.*—Pease Bridge, 1843 (Hardy)—Selby, 2. [This record is of little value, and probably erroneous.—P. H. G.]
251. *DEXIOSOMA CANINUM*, *Fab.*—Aberfoyle (A. E. J. Carter); ♀, Falkland, 9th August 1895 (Wm. Evans).
252. *DEXIA VACUA*, *Fln.*—♂, Dirleton, 5th August 1896 (W. Eagle Clarke); ♂, Aberlady, July 1898 (Wm. Evans).
253. *MYIOCERA CARINIFRONS*, *Fln.*—♂, Glencorse, 8th September 1898 (P. H. G.); Aberfoyle, July 1903 (A. E. J. Carter).

Family MUSCIDÆ.

254. *STOMOXYS CALCITRANS*, *L.*—Neighbourhood of Edinburgh—Stewart, 1, p. 576.
255. *HÆMATOBIA IRRITANS*, *L.*—[*Stomoxys*] Neighbourhood of Edinburgh—Stewart, 1, p. 576.
256. *POLLENIA RUDIS*, *Fab.*—♂ and ♀, Morningside, 1st April 1894 and 17th March 1895 (P. H. G.).
257. *GRAPHOMYIA MACULATA*, *Scop.*—♂, Aberlady, July 1898 (Wm. Evans); ♂, Mid-Calder, 10th July 1899 (Wm. Evans).
258. *GRAPHOMYIA PICTA*, *Ztt.*—♂, Aberlady, July 1898 (Wm. Evans); ♂, Kirknewton, 7th July 1900 (Wm. Evans).
259. *MUSCA DOMESTICA*, *L.*—Common throughout the district.
260. *CYRTONEURA STABULANS*, *Fln.*—♂, North Berwick, August 1893 (W. Eagle Clarke).
261. *MORELLIA HORTORUM*, *Fln.*—Musselburgh (A. E. J. Carter); ♀, Aberfoyle, July 1903 (A. E. J. Carter).
262. *MESEMBRINA MERIDIANA*, *L.*—[*Musca*] Neighbourhood of Edinburgh—Stewart, 1, p. 576; ♂ and ♀, Balerno, 13th May 1893; ♀, Glencorse, 8th September 1898; ♀, Leven, August 1893 (Wm. Evans).
263. *PYRELLIA LASIOPHTHALMA*, *Mcq.*—♀, Blackford Hill, 21st April 1894 (P. H. G.); ♀, Dalmeny Park, 2nd May 1898 (P. H. G.); ♂ and ♀, Gosford Park, 5th May 1898 (P. H. G.); ♀, Aberlady, July 1898 (Wm. Evans).
264. *PROTOCALLIPHORA GRÆNLANDICA*, *Ztt.*—♂, Aberfoyle, July 1903 (A. E. J. Carter); Roslin, July 1893, and Haddington, 21st September 1903 (Wm. Evans).

265. CALLIPHORA ERYTHROCEPHALA, *Mg.*—Common everywhere; I have taken it from April to November.
266. CALLIPHORA VOMITORIA, *L.*—Equally common with the preceding. On the 17th May 1893 I took a ♂ of *C. ERYTHROCEPHALA in cop.* with a ♀ of this species, at Callander.
267. EUPHORIA CORNICINA, *Fab.*—Of frequent occurrence throughout the district. I have records from Morningside, Aberdour, Aberlady, Drem, and North Berwick, with dates varying from 1st April to 12th September.
268. LUCILIA CÆSAR, *L.*—Very common. I have seen specimens from Morningside, Craigentenny, Aberdour, Stirling, Aberfoyle, Dirleton, and Aberlady.
269. LUCILIA SERICATA, *Mg.*—♂, Braid Hills, 18th June 1893.
270. LUCILIA ILLUSTRIS, *Mg.*—[*Musca*] Pease Bridge, 1843 (Hardy)—Selby, 2. [Probably a wrong identification.—P. H. G.]

Family ANTHOMYIIDÆ.

271. POLIETES LARDARIA, *Fab.*—♂ and ♀, Glencorse, 8th September 1898 (P. H. G.); ♂, Aberfoyle, July 1903 (A. E. J. Carter).
272. POLIETES ALBOLINEATA, *Fln.*—♂, Aberfoyle, July 1903 (A. E. J. Carter).
273. HYETODESIA INCANA, *Wied.*—♂ and ♀, Glencorse, 6th June 1894 (P. H. G.); Musselburgh (A. E. J. Carter).
274. HYETODESIA LUCORUM, *Fln.*—♂, Morningside, 22nd April 1894 (P. H. G.); ♂ and ♀, Gullane and Aberlady, 3rd May 1895 (P. H. G.); Musselburgh (A. E. J. Carter).
275. HYETODESIA MARMORATA, *Ztt.*—♀, Glencorse, 6th June 1894 (P. H. G.).
276. HYETODESIA SERVA, *Mg.*—♂, Morningside, 21st May 1893, and ♂, Glencorse, 6th June 1894 (P. H. G.).
277. HYETODESIA LONGIPES, *Ztt.*—♂, Hawthornden, 26th May 1893, and ♂, Glencorse, 6th June 1894 (P. H. G.).
278. HYETODESIA SEMICINEREA, *Wied.*—♂, Roslin, 26th May 1893 (P. H. G.); ♂, Aberfoyle, July 1903 (A. E. J. Carter).
279. HYETODESIA ERRANS, *Mg.*—♂, Stirling, 23rd May 1893, and ♂, Hawthornden, 26th May 1893 (P. H. G.).
280. HYETODESIA SIGNATA, *Mg.*—♂, Aberfoyle, July 1903 (A. E. J. Carter).
281. HYETODESIA ERRATICA, *Fln.*—Musselburgh (A. E. J. Carter).

282. *HYETODESIA BASALIS*, *Ztt.*—♀, Dalmeny Park, 1st September 1896, and ♀, Livingston, Linlithgow, 1896 (Rev. Alfred Thornley); ♂, Glencorse, 8th September 1898 (P. H. G.); ♂, Loch Ard, July 1903 (A. E. J. Carter).
283. *HYETODESIA SCUTELLARIS*, *Fln.*—♂, Loch Ard, July 1903 (A. E. J. Carter).
284. *HYETODESIA PALLIDA*, *Fab.*—Aberfoyle (A. E. J. Carter).
285. *ALLÆOSTYLUS SIMPLEX*, *Wied.*—[*Hyetodesia*] A single ♀ captured near Edinburgh, August 1875—Meade, "Ent. Mo. Mag." vol. xxiii. (1887), p. 181.
286. *ALLÆOSTYLUS FLAVEOLA*, *Fln.*—Musselburgh (A. E. J. Carter).
287. *MYDÆA NIGRITELLA*, *Ztt.*—♂, Aberfoyle, July 1903 (A. E. J. Carter).
288. *MYDÆA URBANA*, *Mg.*—Aberfoyle (A. E. J. Carter).
289. *MYDÆA IMPUNCTA*, *Fln.*—♂, Aberfoyle, July 1903 (A. E. J. Carter).
290. *SPHECOLYMA INANIS*, *Fln.*—♂, Aberfoyle, July 1903 (A. E. J. Carter).
291. *SPILOGASTER DUPLICATA*, *Mg.*—♂, Gosford Park, 23rd April 1893 (P. H. G.); ♂, Braid Hills, 7th May 1893, ♀, Aberlady Bay, 12th September 1893 and 3rd May 1895, ♀, Gosford Park, 5th May 1898 (P. H. G.); ♂, Aberlady, July 1898 (Wm. Evans); Musselburgh (A. E. J. Carter).
292. *SPILOGASTER DUPLARIS*, *Ztt.*—"The only specimens I have seen were captured in the neighbourhood of Edinburgh"—Meade, "Ent. Mo. Mag." vol. xviii. (1881), p. 64; ♂, North Berwick, 7th August 1894 (W. Eagle Clarke).
293. *SPILOGASTER QUADRUM*, *Fab.*—♂ and ♀, North Berwick, August 1894 (W. Eagle Clarke); ♂, Aberlady, July 1898 (Wm. Evans).
294. *SPILOGASTER CONSIMILIS*, *Fln.*—I have seen a specimen, which I believe to be this species, taken at Aberfoyle by Mr. A. E. J. Carter.
295. *LIMNOPHORA SORORCULA*, *Ztt.*—I possess a ♂ of this species, named for me by the late Mr. R. H. Meade, and taken at Aberlady by Mr. Wm. Evans in July 1898.
296. *LIMNOPHORA SOLITARIA*, *Ztt.*—Mr. A. E. J. Carter has taken several specimens (both sexes), of what I believe is this species, at Aberfoyle.
297. *LIMNOPHORA TRIANGULIGERA*, *Ztt.*—"I captured several males of this species on the borders of Loch Katrine, in August 1874, where it seemed abundant."—Meade, "Ent. Mo. Mag." vol. xviii. (1881), p. 101.

298. *HYDROTÆA IRRITANS*, *Fln.*—Aberfoyle (A. E. J. Carter).
299. *HYDROTÆA DENTIPES*, *Fab.*—♂, Morningside, 23rd May 1895 (P. H. G.); Musselburgh (A. E. J. Carter).
300. *HYDROTÆA SIMILIS*, *Meade.*—♂, Loch Ard, June 1903 (A. E. J. Carter).
301. *HYDROTÆA RONDANII*, *Meade.*—♂, Aberfoyle, July 1903 (A. E. J. Carter).
302. *HYDROTÆA IMPEXA*, *Lw.*—♂, Loch Ard, July 1903 (A. E. J. Carter).
303. *HYDROTÆA METEORICA*, *L.*—[*Musca*] Neighbourhood of Edinburgh.—Stewart, 1, p. 576.
304. *HYDROTÆA ALBIPUNCTA*, *Ztt.*—Musselburgh (A. E. J. Carter).
305. *OPHYRA LEUCOSTOMA*, *Wied.*—♂, Aberfoyle, July 1903 (A. E. J. Carter).
306. *DRYMYA HAMATA*, *Fln.*—♀, Aberlady, 17th August 1896 (W. Eagle Clarke).
307. *HYDROPHORIA CONICA*, *Wied.*—♂, canal bank, Slateford, 9th June 1895 (P. H. G.); Musselburgh (A. E. J. Carter).
308. *HYLEMVIA VARIATA*, *Fln.*—♀, Glencorse, 6th June 1894 (P. H. G.); ♂♂, Drem and Aberlady, 3rd May 1895 (P. H. G.).
309. *HYLEMVIA SETICRURA*, *Rond.*—♂, North Berwick, 12th August 1894 (W. Eagle Clarke); ♂, Canty Bay, 4th August 1896 (W. Eagle Clarke).
310. *HYLEMVIA NIGRESCENS*, *Rond.*—? Portobello (A. E. J. Carter).
311. *HYLEMVIA STRIGOSA*, *Fab.*—♂, Balerno, 13th May 1893, and ♂, Aberdour, 6th July 1893 (P. H. G.); Musselburgh (A. E. J. Carter). [This species is probably common throughout the district.—P. H. G.]
312. *HYLEMVIA NIGRIMANA*, *Mg.*—♂, Aberdour, 6th July 1893 (P. H. G.); ♂, Aberfoyle, July 1903 (A. E. J. Carter).
313. *HYLEMVIA COARCTATA*, *Fln.*—“I have found several specimens in the neighbourhood of Edinburgh in August, 1875.”—Meade, “*Ent. Mo. Mag.*” vol. xviii. (1882), p. 270.
314. *MYCOPHAGA FUNGORUM*, *Deg.*—Musselburgh (A. E. J. Carter).
315. *ANTHOMYIA PLUVIALIS*, *L.*—Musselburgh (A. E. J. Carter).
316. *ANTHOMYIA RADICUM*, *L.*—♂, Morningside, 10th April 1894, and ♂, Blackford Hill, 21st April 1894 (P. H. G.).
- [“*ANTHOMYIA RANUNCULARIA.*”—Pease Bridge, 1843 (Hardy)—Selby, 2. I do not know what is meant by this species.—P. H. G.]

317. *CHORTOPHILA BUCCATA*, *Fln.*—Parasitic on *Andrena fucata*, near Edinburgh.—Wm. Evans, "Ent. Mo. Mag." 1900, p. 243.
318. *CHORTOPHILA STRIOLATA*, *Fln.*—[*Anthomyia*] Aberlady.—Verrall, "Ent. Mo. Mag." vol. xxii. (1885-6), p. 232.
319. *CHORTOPHILA SYLVESTRIS*, *Fln.*—[*Anthomyia*] ♂♂ and ♀, Aberlady, 23rd June 1884.—Verrall, "Ent. Mo. Mag." vol. xxii. (1885-6), p. 232.
320. *PHORBIA FLOCCOSA*, *Mag.*—"I reared several myself last summer from cabbage plants sent to me by Mr. Dunn of Dalkeith"—Meade, "Ent. Mo. Mag." vol. xix. (1883), p. 214.
321. *PHORBIA CILICRURA*, *Rond.*—"I bred a number of specimens of both sexes last summer, from onion plants . . . sent me by . . . Mr. Dunn of Dalkeith"—Meade, "Ent. Mo. Mag." vol. xix. (1883), p. 217.
322. *PHORBIA TRICHODACTYLA*, *Rond.*—♂, Glencorse, 6th June 1894 (P. H. G.).
323. *PEGOMYIA TRANSVERSA*, *Fln.*—Aberfoyle (A. E. J. Carter).
324. *PEGOMYIA BICOLOR*, *Wied.*—Musselburgh (A. E. J. Carter).
325. *HOMALOMYIA HAMATA*, *Mcq.*—♂, Woods at Polton, 26th May 1893 (P. H. G.); Musselburgh (A. E. J. Carter).
326. *HOMALOMYIA FUSCULA*, *Fln.*—"I have only seen a single female, which I captured near Edinburgh in August 1875"—Meade, "Ent. Mo. Mag." vol. xviii. (1882), p. 202.
327. *HOMALOMYIA CANICULARIS*, *L.*—Common throughout the district, both in and out of doors (P. H. G.).
328. *AZELIA MACQUARTI*, *Staeg.*—♂, Gosford Park, 5th May 1898 (P. H. G.); ♂, Musselburgh (A. E. J. Carter).
329. *AZELIA CILIPES*, *Hal.*—♂, Glencorse, 8th September 1898 (P. H. G.).
330. *CARICEA TIGRINA*, *Fab.*—♀, Aberlady, July 1898 (Wm. Evans).
331. *CARICEA INTERMEDIA*, *Fln.*—♂ and ♀, Smeaton Hepburn, 17th July 1897 (Sir A. Buchan-Hepburn); ♂ and ♀, Aberlady, July 1898 (Wm. Evans).
332. *ALLOGNOTA AGROMYZELLA*, *Rond.*—I have a female, named for me by the late Mr. R. H. Meade, taken at Aberlady by Mr. Wm. Evans in July 1898.
333. *CENOSIA SEXNOTATA*, *Mg.*—♂, window of house, Edinburgh, 22nd July 1897 (P. H. G.).

334. *CÆNOSIA ? PACIFICA*, *Mg.*—♀, Morningside, 30th May 1893 (P. H. G.).
335. *LISPE CRASSIUSCULA*, *Lw.*—♀, Aberlady, 23rd June 1884—Verrall, "Ent. Mo. Mag." (2) vol. v. (1894), p. 143.
336. *FUCELLIA FUCORUM*, *Fln.*—♂ and ♀, North Berwick, 19th May 1893 (P. H. G.); ♂, Aberlady Bay, 12th September 1893 (P. H. G.); ♂, Gullane, 3rd May 1895 (P. H. G.).

Family CORDYLURIDÆ.

337. *CORDYLURA PUDICA*, *Mg.*—♂ and ♀, Aberlady, July 1898 (Wm. Evans).
338. *NORELLIA SPINIMANA*, *Fln.*—Musselburgh (A. E. J. Carter).
339. *POGONOTA HIRCUS*, *Ztt.*—♀, Aberlady, July 1898 (Wm. Evans).
340. *TRICHOPALPUS PUNCTIPES*, *Mg.*—♂, Aberlady, July 1898 (Wm. Evans).
341. *SCATOPHAGA INQUINATA*, *Mg.*—♀, Morningside, 30th May 1893 (P. H. G.).
342. *SCATOPHAGA LUTARIA*, *Fab.*—♂, Morningside, 10th May 1893 (P. H. G.); ♂, Loch Ard, July 1903 (A. E. J. Carter), Musselburgh (A. E. J. Carter).
343. *SCATOPHAGA STERCORARIA*, *L.*—Abundant everywhere. I have taken specimens from 1st April to 25th November, and no doubt the species may be seen at any period of the year [P. H. G.].
344. *SCATOPHAGA SQUALIDA*, *Mg.*—♂, Glencorse, 8th September 1898 (P. H. G.).
345. *SCATOPHAGA LITOREA*, *Fln.*—Pease Bridge, 1843 (Hardy)—Selby, 2; ♂, Aberlady Bay, 12th September 1893 (P. H. G.); ♂, Drem, 3rd May 1895 (P. H. G.); ♀, Aberlady, July 1898, and ♀, Craigentiny, 22nd August 1898 (Wm. Evans).
346. *SCATOPHAGA LATERALIS*, *Mg.*—Pease Bridge, 1843 (Hardy)—Selby, 2. [Probably a wrong identification.—P. H. G.]

Family HELOMYZIDÆ.

347. *HELOMYZA PECTORALIS*, *Lw.*—♂, Aberdour, 6th July 1893 (P. H. G.).
348. *HELOMYZA PALLIDA*, *Fln.*—♂, Aberdour, 6th July 1893 (P. H. G.).

349. *CECOTHEA FENESTRALIS*, *Fln.*—Smeaton Hepburn, 17th July 1897 (Sir A. Buchan-Hepburn).
350. *BLEPHAROPTERA SERRATA*, *L.*—Taken on windows of Museum, 6th May 1895 and 9th March 1896 (P. H. G.).
351. *TEPHROCHLAMYS RUFIVENTRIS*, *Mg.*—♀ ♀, Morningside, 15th April and 24th May (P. H. G.); ♀, Blackford Hill, 11th November 1894 (P. H. G.).

(*To be continued.*)

NOTES ON THE FLORA OF EASTERN ROSS-SHIRE.

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

THE abnormally cold and dull summer of 1902 found me once more on my way to Ross-shire, but I postponed my visit to the latest date possible, as the season was so backward. Lady Fowler of Braemore has been most kind in giving me information and allowing me permission to visit her estate, on which is situated the lofty and large mountain Ben Dearg, 3647 feet high, which is the more interesting as it forms the water-parting of Eastern and Western Ross. I am also indebted to the lessee, Mr. Walter Parrott, for permission to go over the Braemore forest. I stayed at Aultguish, in the midst of the dreary and wind-swept Dirie Moor, over which I had frequently journeyed on my way to the western coast. I may say that I found vegetation more backward even than I had expected, so that with critical forms of *Rumices*, *Atriplices*, etc., nothing could be done. Again, few Hawkweeds were in flower, and the Sedges were in bad condition and were sparingly setting fruit. On the contrary, the Grasses were luxuriant. Ben Dearg is a long and toilsome walk from Loch Droma, to which I drove, and I had the bad luck to sprain my ankle in Corrie Granda; but I worked round that handsome corrie to the grassy slope of the watershed, and although on the eastern side the day had been grim and gray, yet from the ridge, 2500 feet high, a magnificent view was obtained of the Long Island or

Lews, lying in the bluest of seas, under a beautiful blue sky, while the mountains of Ross and Sutherland—Ben More of Coigach, Stack Polly, Canisp, and Suilven showed deeper shades of the same colour, till those most distant were almost cobalt in hue. On the ridge are a few pools in which a *Sparganium*, probably *affine*, but too young to differentiate, was growing with *Callitriche hamulata*. The grassy slopes on each side, *i.e.* east and west, afforded *Carex saxatilis*; and on the west *Cerastium alpinum* grew in quantity. I then climbed to the summit, on the way picking *Deschampsia alpina*, new to Ross-shire; and *Cherleria* was frequent, and with *Silene acaulis*, both pink and white, was flowering freely. The view from the summit was even more extensive than from the ridge, and the magnificent outline of An Teallach was a prominent object in the south-west, while Loch Broom, with the Summer Islands, made a charming prospect. The way homewards led over bare, rocky shoulders, on which *Arctostaphylos alpina* was a prominent feature, or over damp heathery moors, where *Betula nana* was common. Another day was spent in exploring the ravine of a small stream near Aultguish and the banks of the river Glascarnoch. Here we noticed *Agrostis pumila* perfectly fertile and free from *Tilletia*, so that its characters are not necessarily owing to the presence of that fungus. A third day was spent in climbing the splendid Sgur Mhor Fannich, 3637 feet high, and Ben Liath Beag, etc.; while a fourth was occupied in walking to Tollymuick Forest at the head of Strath Vaich, but the corrie at the head was very disappointing. *Betula nana* and *Arctostaphylos alpina* were characteristic plants, and *Epilobium angustifolium* grew high up on the cliffs above Gorm Loch, most certainly native.

We also spent a short time at Garve and a day at Tain, where we explored the curious tract of shell-sand stretching towards Tarbert, near which is such a curious feature of the district. Here the pretty form of *Polygala oxyptera*, which was found by the Rev. E. S. Marshall, was gathered, and I afterwards met with a form at Golspie which approaches it. The dwarfed condition of *Draba incana* is striking, as in some instances the leaves are closely aggregated into a

globular shape at the base of the stem. A prostrate form of *Trifolium pratense* was remarkable, as the branches were appressed to the ground so that they stood rigidly at right angles to the strong tap-root. Compact masses of *Juniperus communis* also occurred here with *Empetrum nigrum*, practically at sea-level.

Thalictrum alpinum, *L.*—Rather frequent in the corrie of Ben Dearg and on Meall Gorm, from 1800 to 3000 feet.

T. dunense, *Dum.*—Rather frequent, but very dwarf, on the shell-sand at Tain.

Ranunculus Flammula, *L.*, **var. radicans*, *Nolte.*—Strath Vaich, sometimes wholly submerged.

Caltha palustris, *L.*, **var. minor*, *DC.*—Ben Dearg, up to 3200 feet.

Cardamine pratensis, *L.*—The true plant with sessile leaflets, near Aultguish.

**Drosera obovata*, *Mert.* and *Koch.*—Boggy place at base of Creag Brech Mhor, at entrance of Strath Vaich, growing with both parents. New to E. Ross.

Viola canina, *L.*—Strath Vaich.

Polygala oxyptera, *Reichb.*, *var. collina*, *Reichb.*—A pretty form growing in almost pure sand, as described by the Rev. E. S. Marshall, near Tain, with red flowers, and associated with a dwarf form of *Draba incana*.

**Silene acaulis*, *Jacq.*—Abundant on Ben Dearg, and flowering freely in August with both white and red blossoms; also on several other hills in the neighbourhood, ascending to 3300 feet.

Cerastium vulgatum, *L.*, *var. alpinum*, *Koch.*—In the corrie of Ben Dearg, and in a different form on another mountain in the vicinity.

**C. alpinum*, *L.*—Sparingly on Ben Dearg, on the eastern watershed; more frequent on the Inverlael side. Not in "Top. Bot. for Ross-shire." Ascending to 3300 feet.

**Arenaria leptoclados*, *Guss.*—Near Tain, on the railway. A distinct species in my opinion.

**Arenaria sedoides*, *Froel.*—Abundant on the ridges of Ben Dearg and two other hills in the district. From 2400 to 3600 feet. New to E. Ross.

**Sagina subulata*, *Presl.*—Near Garve.

- **Spergula sativa*, *Boenn.*—Aultguish. The valerianaceous odour is well marked, especially in warm, damp weather.
- Buda rubra*, *Dum.*—Railway near Tain.
- Montia fontana*, *L.*, *var. major*, *All.*
- Trifolium pratense*, *L.*, as forma *prostata*, with strong tap-root, grew on the shell-sand at Tain.
- **Astragalus danicus*, *Retz.*—In shell-sand at Tain. Not in Prof. Trail's list.
- Lathyrus montanus*, *Bernh.*, **var. linifolius*, *Asch.*—In a ravine near Aultguish.
- Lotus corniculatus*, *L.*, forma *grandiflora*.—By the river near Aultguish.
- Sibbaldia procumbens*, *L.*—In good condition on Ben Dearg and other hills.
- Rubus Chamæmorus*, *L.*, and *R. saxatilis*, *L.*—Both occurred on Ben Dearg and on the other hills in the district.
- Alchemilla vulgaris*, *L.*, **var. glabra*, *Wimm. and Grab.*—Ben Dearg, ravine near Aultguish, and by the Glascarnoch river.
**var. pratensis* (*Schmidt*).—Near Tain.
**var. filicaulis* (*Buser*).—Near Garve.
- **Rosa tomentosa*, *Sm.*, and *R. mollissima*, *Willd.*—Near Garve, etc.; not in "Top. Bot." for 106.
- **R. glauca*, *Vill.*, near Tain.
**var. coriifolia* (*Fr.*).—Near Garve.
- Pyrus torminalis*, *Ehrh.*—"106†" in Prof. Trail's list, but if this is based on the record by the Rev. E. S. Marshall, it is an error, since his specimen he says is *P. latifolia*.
- Myriophyllum alterniflorum*, *DC.*—Gorm Loch.
- Callitriche hamulata*, *Kuetz.*—Ben Dearg.
- Saxifraga oppositifolia*, *L.*—Ben Dearg, 3000 feet.
- Epilobium angustifolium*, *L.*—Native without doubt; on precipitous and inaccessible rocks above Gorm Loch, and in the river bed of Allt a Ghlas Tuill Bhig, in Tollymuick Forest, ascending to over 2000 feet.
- E. alpinum*, *L.*—Ben Dearg, descending to 900 feet in Strath Vaich.
- Cornus suecica*, *L.*—Plentiful on the Braemore and Strath Vaich Hills.
- Leontodon autumnalis*, *L.*, *var. pratensis* (*Koch*).—The alpine form on Ben Dearg, etc., and the larger plant with shaggy involucre,
**var. sordidus*, *Bab.*, near Garve, etc.

- **Hieracium holosericeum*, *Backh.*—At about 2300 feet on Ben Dearg.
- **H. tenellum* (*Backh.*).—At about 2400 feet, in a corrie near Aultguish.
- H. senescens*, *Backh.*—Strath Vaich, *Rev. H. J. Riddelsdell*; Aultguish.
- H. insulare*, *F. J. Hanb.*—With the above, growing sparingly in the crevices of bare rock, sloping at an acute angle, with a northern exposure. New to the county.
- **H. Carenorum*, *F. J. H.*—Aultguish, *Rev. H. J. Riddelsdell*. New to the county.
- **H. Oreades*, *Fr.*, *var. subglabratum*, *F. J. H.*—Aultguish. New to the county.
- **H. nitidum*, *Backh.*—By the river near Aultguish. New to the county.
- **H. rivale*, *F. J. Hanb.*—Near the lower slopes of Ben Dearg.
- **H. cæsius*, *Fries.*, *var. Smithii*, *Baker* (*H. flocculosum*, *var. Bakeri*, *F. N. Williams*).—Aultguish.
- **H. murorum*, *L.*, *var. crebridens*, *Dahlst.*—By the river near Aultguish. New to Scotland.
- **H. murorum*, *L.*, *var. microcladium*, *Dahlst.*—Aultguish; (*H. silvaticum*, *Gouan*, *var. microcladium*, *Williams*), Aultguish.
- **H. murorum*, *L.*, *var. sanguineum*, *A. Ley* (*H. silvaticum*, *Gouan*, *var. sanguineum*).—Strath Vaich. New to Scotland. Named by the *Rev. A. Ley*, who says that the variety has not changed under seven years' cultivation.
- **H. euprepes*, *F. J. H.*—Near Braemore, *Rev. H. J. Riddelsdell*.
- **H. sciaphilum*, *Uechtr.*—Strath Vaich. New to the county.
- H. vulgatum*, *Fr.*—Ben Dearg, Aultguish, etc.
- **H. rigidum*, *Hartm.*, *var. strigosum*, *A. Ley*.—In the corrie where *H. insulare* grew. New to Scotland. Named by the *Rev. A. Ley*.
- **H. anglicum*, *Fries.*—Aultguish.
- **H. dissimile*, *Lindeb. f.*—Aultguish.
- **H. prenanthoides*, *Fr.*—In the ravine at Aultguish.
- **H. sparsifolium*, *Lindeb.*—With the foregoing.

I am indebted to the *Rev. A. Ley* for kindly naming the *Hieracia*.

Taraxacum palustre, *DC.*—Ben Dearg.

Solidago Virgaurea, *L.*—On Ben Dearg, at 3600 feet.

- Saussurea alpina*, *DC.*—In Corrie Ghranda of Ben Dearg, and in other rocky corries. New to E. Ross.
- Antennaria dioica*, *Br.*, **var. pedicellata*, *F. B. White.*—In the ravine near Aultguish.
- †*Anaphalis margaritacea*, *B. and Hk. f.*—Near Strathpeffer.
- **Gnaphalium norvegicum*, *Gunn.*—Very sparingly on some rocks facing north and east near Braemore, at about 2000 feet altitude; associated with *Sibbaldia*, *Carex panicea*, *Deschampsia flexuosa*, *var. montana*, etc. This rare alpine has so frequently been confused with alpine forms of *G. sylvaticum* that an addition to the few known localities is of some interest. Syme, in "E. Bot." vol. v. p. 76, records it for Ben Wyvis, but the record has since been queried. This discovery, therefore, puts its occurrence in Eastern Ross beyond doubt. The specimens grew on an exposed rocky shelf, and were only scattered over a limited area, and few in number, hence I do not give the precise locality. In August this year they were not mature, and the specimens were rather smaller than those which I gathered on Loch-na-gar.
- G. sylvaticum*, *L.*, **var. alpestre*, *Mihi.*—Occurred in several places on the Braemore and Strath Vaich forests.
- G. supinum*, *L.*, and as the **var. fuscum*, *Scop.*—On Ben Dearg and other hills.
- Azalea procumbens*, *L. (Loiseleuria procumbens, Desv.)*.—Ben Dearg, up to 3000 feet.
- Arctostaphylos alpina*, *Spreng.*—On the exposed shoulder of the hill above Choire Granda, Ben Dearg, and on Creag Mholach, Tollymuick Forest, etc.
- Vaccinium Myrtilus*, *L.*, *forma prostrata*.—Occurred on the wind-swept ridge of a mountain near the Braemore Forest. It grew absolutely prostrate, and the branches spread in a fan-like manner upon and among the *Racomitrium*, with which it grew, fruiting freely. The leaves were somewhat narrower and more acute than the type.
- V. uliginosum*, *L.*—Rather frequent, but usually barren, on Ben Dearg, Tollymuick, etc.
- Pyrola secunda*, *L.*—Sparingly in Strath Vaich.
- P. media*, *Sw.*—Strath Vaich, local.
- Gentiana Amarella*, *L.*, *var. multicaulis*, *Lange*, on the sand-dunes at Tain.
- Galeopsis Tetrahit*, *L.*, *var. bifida*, *Boenn.*—Tain.
- Veronica Tournefortii*, *Gmel.*—Tain.

Trientalis europæa, *L.*—Strath Vaich.

†*Symphytum asperrimum*, *Bieb.*—Tain, introduced.

**Statice pubescens*, *Sm.* (*see* Druce, in "Linn. Soc. Journ." pp. 66-77, 1900). On the coast at Tain and on the cliffs of mountains, as Ben Dearg (to 3600 feet) on the northern shoulder of which it was common. Some of the mountain forms had broader leaves, faintly three-nerved, being var. **planifolia* (Syme).

**Euphrasia Rostkoviana*, *Hayne.*—Aultguish.

E. curta, *Fries*, var. *glabrescens*, on the shell-sand at Tain and on the moorland in Strath Vaich.

**E. nemorosa*, *H. Mart.*, at Aultguish, and as an uncommon form with short erect branches and short capsules at Aultguish and on Ben Dearg.

E. brevipila, *Burn. and Grenli.*—Aultguish, and on shell-sand, Tain.

**E. gracilis*, *Fries.*—Aultguish.

I am indebted to Mr. Fred. Townsend for kindly naming the *Euphrasia*.

Plantago maritima, *L.*—Ben Dearg up to 2800 feet; a curious form with large tap-root occurred in the shell-sand at Tain, where the var. *capitata* of *P. lanceolata* also grew.

Polygonum viviparum, *L.*—Ben Dearg.

**Rumex domesticus*, *Hartm.*—Near Tain.

Oxyria digyna, *Hill.*—Ben Dearg, Strath Vaich, etc.

Empetrum nigrum, *L.*—Grows in the shell-sand at Tain nearly at sea level.

Rhinanthus monticola (*Sterneck*), Druce.—Munloch, Black Isle, 1880. Strath Vaich.—Ben Dearg.

R. stenophyllus, *Schur.*—Tain. Strath Vaich, etc.

**R. Drummond-Hayi* (*Sterneck*), Druce.—Shell-sand at Tain, the first time it has been recorded at so low a level.

R. minor, *Ehrh.*—Aultguish.

**Quercus sessiliflora*, *Salisb.*—Dingwall, but probably planted.

**Betula pubescens*, *Ehrh.*—Garve.

B. nana, *L.*—Plentiful on the lower ground about Braemore Forest, and on boggy heathy ground near Loch Gorm in Tollymuick Forest, descending to 1000 feet or less.

**Salix phylicifolia*, *L.*—In the ravine of the stream near Aultguish, only a single bush, but certainly native. Not in "Top. Bot."

**S. herbacea*, *L.*—On the ridges of Ben Dearg, and on another hill near Braemore Forest; new to East Ross.

- S. repens*, *L.*, **var.* *parvifolia*.—Tain sand hills.
- **Pinus sylvestris*, *L.*.—Certainly native in Strath Vaich. New to East Ross.
- Juniperus communis*, *L.*.—On the sand dunes at Tain, as a prostrate form.
- J. nana*, *Willd.*.—On the Braemore and Strath Vaich hills.
- Orchis maculata*, *L.*.—Type near Aultguish; **var.* *ericetorum* (*Linton*) common on heathy boggy ground, but appearing to me to merge into the type; also on Ben Dearg.
- Habenaria bifolia*, *Br.*.—Aultguish.
- **Tofieldia palustris*, *Huds.*.—In the Corrie Ghranda of Ben Dearg. rare; new to E. Ross.
- Juncus Gerardi*, *Lois.*.—Tain in the sea marshes.
- **J. triglumis*, *L.*.—Ben Dearg, rare at about 2000 feet; new to 106.
- J. bufonius*, *L.*, **var.* *fasciculatus*, *Koch.*.—Near Garve.
- **Juncoides multiflorum*, *Druce* (*Luzula multiflora*, *Lej.*).—Near Garve; **var.* *congestum*, *Mihi*, Strath Vaich; *var.* *sudeticum* (*Syme*), Ben Dearg.
- Eriophorum angustifolium*, *L.*, *var.* *alpinum*, *Gaud.*, Ben Dearg, 2600 feet.
- **Carex saxatilis*, *L.*.—On the grassy slope of the upper part of Corrie on Ben Dearg; new to 106.
- C. flava*, *L.*.—As the form with darker glumes, on Ben Dearg.
- C. pallescens*, *L.*, **var.* *undulata*, *Kunze*, Strath Vaich.
- C. leporina*, *L.*.—Strath Vaich.
- Carex fulva*, *Good* (*C. Hornschuchiana*, *Hoppe*), Braemore, Strath Vaich.
- **C. xanthocarpa*, *Deseg.*.—Near Loch a Garbh Raoin; new to 106.
- C. binervis*, *Sm.*, **var.* *nigrescens*, *Mihi* (? *alpina*, *Drejer*).—Braemore, and Strath Vaich.
- C. rigida*, *Good.*.—Ben Dearg at 3200 feet.
- **Agrostis pumila*, *L.*.—Near Aultguish; not infected with *Tilletia*.
- A. alba*, *L.*, *var.* *coarctata*, *Hoffm.*.—Strath Vaich.
- Phleum pratense*, *L.*, **var.* *nodosum*, *L.*.—Sand dunes at Tain.
- Deschampsia cæspitosa*, *Beauv.*, **var.* *alpina*, *Gaud.*.—Ridge of Ben Dearg, over 3000 feet, etc.
var. *pseudo-alpina*. With the foregoing.
 **var.* *brevifolia* (*Parnell*).—Near Tain.
- **D. alpina*, *Beauv.*.—Near the summit (about 3300 feet) of Ben Dearg; new to county.
- D. flexuosa*, *Trin.*, **var.* *montana* (*Huds.*).—Ben Dearg, etc.

- **Arrhenatherum precatorium*, *Beauv.* (*A. bulbosum*, Presl.)—Tain.
A. avenaceum, *Beauv.*—Near Tain.
var. pauciflora, *Baenitz* (in *Asch. Fl. Brandenb.*, 1826, 1864).
 —Near Tain.
- Agropyron repens*, *L.*, **var. Vaillantianum*, *Schran.*—Tain.
 **var. Leersianum*.—S. F. Gray, Tain.
- Kœleria cristata*, *Pers.*—On the sand dunes, Tain. Some specimens had very broad spikes.
 **var. gracilis* (*Pers.*).—With the above.
- **Poa Balfouri*, *Parn.*—On rocks in a remote corrie near the Braemore Forest, very rare. A new record to East Ross. Prof. Häckel queries it as *P. Balfouri*; and it is an intermediate form.
- P. pratensis*, *L.*, *var. subcœrulea* (*Sm.*).—On a dry bank near Aultguish, on the sand dunes at Tain, and in Strath Vaich, etc.
P. annua, *L.*, *var. supina* (*Gaud.*)—Ben Dearg.
- Festuca ovina*, *L.*, **var. paludosa*, *Gaud.* (*F. tenuifolia*, *Sibth.*).—Near Aultguish, etc.
- I am indebted to Prof. Häckel for his kindness in examining the grasses.
- Cryptogramme crispa*, *Br.*—In a corrie near the Braemore Forest, and in corrie of Ben Dearg.
- Polystichum Lonchitis*, *Roth.*—In Corrie Ghlanda, Ben Dearg, etc.
- Lastrea Filix-mas*, *Presl.* (*Dryopteris Filix-mas*, Schott), **var. abbreviata*, *Bab.*—Ben Dearg and Sgur Mhor.
- **Athyrium alpestre*, *Milde.*—Ben Dearg, and in another corrie in the neighbourhood. An addition to the Ross-shire flora.
- **Lycopodium annotinum*, *L.*—Very rare on the slopes of Ben Dearg. A new record to E. Ross.
- L. alpinum*, *L.*, **var. decipiens*.—Ben Dearg, Ben Liath Beag, etc.
- L. Selago*, *L.*, **var. recurvum*, *Desv.*—Near Gorm Loch.
- Equisetum variegatum*, *Schleicher.*—Near Tain, as the **var. arenarium*, *Newm.*—Variety not recorded for E. Ross.
- E. sylvaticum*, *L.*, **var. capillare* (*Hoffm.*).—Near Garve.

An asterisk signifies that the plant is not included in Prof. Trail's list, or is not given in Topographical Botany, while a dagger means that the plant is possibly introduced.

A considerable number of plants are still awaiting critical examination, and on these I hope to report at no distant date.

The Rev. H. J. Riddelsdell was my companion on the above expedition, and I owe him many thanks for assistance.

HEPATICÆ OF THE BREADALBANE RANGE.

By P. EWING, F.L.S.

THAT tract of country forming a very large part of the Watsonian Vice-County known as Mid-Perth, and the more mountainous portion of it known as Breadalbane, has been much wrought and reported on as far as its botany generally is concerned, but its Hepaticæ seem to have been left alone. Why this should be so I cannot tell, but possibly one very strong reason is that which has hitherto kept me from putting the knowledge I have gained of the order during the last fifteen years into permanent form, namely the want of literature on the subject of such a kind as to tempt me away from other botanical studies. We cannot say we have got satisfactory literature even yet, so far as the critical species are concerned; but of recent years Mr. Macvicar has supplied what has proved to me of far greater value, namely that kindly help, and those valuable remarks regarding specific differences, which only one of his critical acumen could give.

The larger forms I have collected all these years, but it was only three years ago, after a day or two spent with Mr. Macvicar on the hills already referred to, that I began to pay any serious attention to the smaller forms which are so abundant on the exposed parts of the mountains.

The area indicated seems to lend itself admirably to the requirements of this class of plants, embracing as it does shady woods, alpine heights, and a great number of streams forming in many cases fairly deep ravines, and draining large tracts of bog land. A glance at the Geological map of the Ordnance Survey will at once show that the rock formation is as varied as the scenery, and judging from the rapid decomposition of its surface, it is probable that lime plays a very important part in its composition and may account to some extent for the varied flora, although on the almost pure limestone outcrops the number of species likely to find the conditions most suitable for their growth on this type of rock are not so numerous as one might expect, or at least they have not as yet been detected.

The limestone outcrops are easily followed on the range by the fruiting of *Bryum alpinum*, which moss, though common all over the range, seems to fruit only on limestone rocks, this being the case even in Finlarig Woods.

Speaking from a general point of view regarding the number of alpine species found on schistose rocks, and especially on the micaceous schists so abundant on this range, one is apt to infer that these play an important part in the distribution of alpine plants. A well-marked band of schistose rock known by the name of sericite which traverses the upper portion of the range is considered by certain geologists (and their conclusions have been favourably received also by some botanists) to be the substratum most affected by the alpine plants. Some have even gone the length of asserting that the presence of this schist is a necessary part of their environment. These schists are finely laminated, contorted, and lying at all angles, thereby forming a good foothold for plants, even to the fine laminated dust of their decomposed parts so well adapted for retaining the moisture and affording a suitable nidus for the smaller and simpler forms of vegetation. A larger experience of alpine localities, however, urges one to the conclusion that nidus is, after all, only a secondary matter. Climate and exposure seem to be the great factors in all plant life. You may find plants on the schists you do not find on the shales, and others on the granite that you do not find on either, or *vice versa*, but this can very often be determined by exposure in the case of flowering plants and by moisture in the case of hepatics.

During the last three years Mr. Macvicar has devoted some time to the investigation of the north-east part of the range, and in the following list his name will be found attached to those species which have been gathered by him, and which I had not previously collected, or had not been able to identify. I have also been fortunate enough to find a number of species not noted by Mr. Macvicar, and this, I think, goes to prove that the district under review is not yet exhausted, of which indeed I feel very confident. This remark holds good, without doubt, as regards the smaller species, and possibly among the larger species also where

the rarer forms do not differ much from the commoner in the field, such as *Scapania purpurea*, *S. aspera*, and *S. intermedia*.

Although the mountains from Ben Lawers to Creag-na-Chaillich have been fairly well searched by botanists who took the hepatics along with mosses and other plants, so far as I am aware little or nothing has been done on that fine range of mountains draining into Glen Lochay, which seems to me to present the most suitable conditions for the propagation of these plants, and where, no doubt, most of the future finds will be made.

I do not consider myself in a condition to speak learnedly of this group of plants, consequently I have submitted all the more critical species and many of the commoner forms which seem to me to vary from the type, to Mr. Macvicar for certification, so that the list herewith submitted may be of value to those interested. I am also in hope that it may tempt botanical workers to aid in the exploration of this field or of other districts, as the distribution of the order in Scotland seems hitherto to have received very little attention, and the work offers many inducements to those interested especially in microscopical botany.

FRULLANIA TAMARISCI, *L.*—Common everywhere. Small forms found near the tops of the highest hills. *F. fragilifolia*, Tayl.—Fairly plentiful. Very common on the hazels and birches in the glens, and found on the rocks at considerable elevations. *F. dilatata*, *L.*—Common on the trees and rocks; fruiting freely.

LEJEUNEA SERPYLLIFOLIA, *Dicks.*—Common everywhere, and found near the tops of the hills. Var. *planiuscula*, Lindb.—Creag-an-Lochain. Var. *cavifolia*, Lindb.—Finlarig Burn. * *L. patens*, Lindb.—Finlarig Burn. I do not think this is a rare form, but it is difficult to separate from forms of *serpyllifolia*—Ben Laoigh. *L. calcarea*, Lindb.—Western ravine, Ben Lawers; Creag-an-Lochain, Cam Creag, Creag-na-Chaillich, Finlarig Burn among boulders; always in very small patches.

RADULA LINDBERGHII, *Gottsche.*—Common on the hills. Following Mr. Macvicar and some continental authorities, I include *R. germana*, Jack., with this, although these seem to me two distinct forms on the hills. Ben Lawers, Meal nan Tarmachan, Ben Heasgarnich, Ben Laoigh. *R. complanata*, *L.*—Common on trees and rocks, Ben Lawers; Finlarig Woods.

- PORELLA LÆVIGATA, *Schrad.*—Very common in woods and by the roadsides, gets somewhat attenuated as it ascends the hills. Var. *viride*, Creag Mhor. *P. platyphylla*, L.—Common in the woods and shady glens. * *P. rivularis*, Nees.—Common in the woods and shady damp places.
- PLEUROZIA COCHLEARIFORMIS, *Weiss.*—Common on the hills. Often found mixed with *Rhacomitrium lanuginosum*.
- ANTHELIA JULACEA, L.—Common from the rocks at Loch Tay-side up as far as it can find constant moisture. † *A. Juratzkana*, Limpr.—Although I found this on Ben Laoigh many years ago, it is to me a rare plant.
- HERBERTA ADUNCA, *Dicks.*—Very common. A few very fine patches of it are growing on the summit of Cam Creag.
- BLEPHAROZIA CILIARIS, L.—Frequent. Found growing mixed with *Rhacomitrium lanuginosum*. *B. pulcherrima*, Hoffm.—Rare; on Fir trees. Finlarig Wood, Mr. Macvicar.
- TRICHOCOLEA TOMENTELLA, *Ehrh.*—Frequent, but only in moist shady glens. Finlarig Burn and Tyndrum.
- BLEPHAROSTOMA TRICHOPHYLLUM, L.—Seems to be everywhere, but very seldom unmixed with other species.
- LEPIDOZIA REPTANS.—Frequent in the woods. * *L. setacea*, Web.—Rare. Meal Ghaordie and Ben Laoigh. *L. trichoclados*, C. Müll.—Craig-an-Lochain, west.
- BAZZANIA TRILOBATA, L.—Common in the woods and glens, but only in the low country. * *B. triangularis*, Scheich.—Very common on all the hills. Var. *flaccida*.—I have only seen on Cam Creag. *B. tricrenata*, Wahlenb. Ben Lawers.
- KANTIA TRICHOMANIS, L.—Common everywhere. * *K. Sprengelii*, Mart.—Finlarig Burn.
- CEPHALOZIA BICUSPIDATA, L.—Common. Creag-an-Lochain, Tyndrum; Ben Laoigh. † *C. Lammersiana*, Huben.—Ben Lawers; Finlarig Woods; Glen Lochay. † *C. curvifolia*, Dicks.—Common on decaying logs in Finlarig Wood; Glen Lochay woods, and woods near Tyndrum. † *C. pleniceps*, Aust.-Lindl.—Creag-an-Lochain, Mr. Macvicar. Notes on this species will be found in "Journal of Bot." 1901, p. 36. * *C. denudata*, Nees.—Rare. Var. *alpina*, Ben Heasgarnich. *C. divaricata*, Sm.—Rare. On old oak tree roots, Finlarig Woods and Creag Mhor. * *C. leucantha*, Spruce.—Lochan-na-Lairige, Mr. Macvicar.
- * PLEUROCLADA ALBESCENS, *Hook.*—Rare; Ben Lawers and Ben Laoigh.

- HYGROBIELLA LAXIFOLIA*, *Hook.*—Common on the sides of streams both on the low ground and on the hills.
- EREMONOTUS MYRIOCARPUS*, *Carr.*—Lind. and Kaalaas.—On wet rocks. Rare. Creag-an-Lochain. Mr. Macvicar.
- SCAPANIA COMPACTA*, *Lindenb.*—Finlarig and Ben Laoigh. *S. resupinata*, L.—Plentiful in the woods on rocks. Finlarig; Glen Lochay and Tyndrum. *S. subalpina*, Nees.—Common near streams where the sand gets washed over it. Finlarig Burn; Rivers Lochay, Dochart; and mountain streams. *S. aquiloba*, Schwaege.—Rare. On rock ledges among mosses; Creag-an-Lochain and Ben Laoigh. †† *S. aspera*, Müll. and Bern.—Rare; Finlarig Woods, Creag Mhor, and Ben Laoigh. †† *S. crassiretis*, Bryhn.—Rare; on a wet rock near the top of Ben Heasgarnich. Notes on this species will be found in the "Journal of Bot." 1901, p. 210. † *S. nimbose*, Tayl.—Rare; Ben Laoigh, Jas. Murray. *S. undulata*, L.—Common; Ben Lawers, Ben Challuim, Ben Laoigh. *S. purpurea*, Dill.—Found in much the same localities as the last. Ben Lawers to Ben Laoigh. †† *S. intermedia*, Husn.—Rare; on rocks, Finlarig Burn. *S. irrigua*, Nees.—I do not think this is a rare species, but it grows on rocks and in the bogs, scattered among mosses, and it is difficult to collect. Ben Lawers to Ben Laoigh. * *S. uliginosa*, Swartz.—Rare, or difficult to distinguish from *undulata* in the field. Ben Lawers and Ben Laoigh. *S. rosacea*, Corda. Not rare, but very difficult to collect. Only found in very small patches on thin layers of soil on the rocks. Creag-an-Lochain. *S. curta*, Mart.—Rare; Finlarig Woods. Var. *spinulosa*.—Finlarig Burn. *S. umbrosa*, Schrad.—Common on decayed trees in woods or in the glens, but only wood in the last stages of decay, consequently in small patches. Finlarig Woods and Glen Lochay.
- DIPLOPHYLLUM ALBICANS*, L.—Very common. Ascending to the tops of the mountains. *D. taxifolium*, Wahlenb.—Ben Lawers, Macvicar. *D. Dicksoni*, Hook.—Rare; on rocks and bare soil. Ben Lawers, Creag-an-Lochain, Creag Caillich, Ben Heasgarnich.
- LOPHOCOLEA BIDENTATA*, L.—Common in woods. * *L. cuspidata*, Limpr.—Rare; Finlarig Burn. * *L. heterophylla*, Schrad.—Rare; Kiltyrie, Macvicar.
- CHILOSCYPHUS POLYANTHUS*, L.—This does not seem to be a hill species. Finlarig Burn, near the road, and Tyndrum.
- HARPANTHUS FLOTOWII*, *Nees.*—Rare; Ben Lawers, Macvicar.
- MYLIA TAYLORI*, *Hook.*—Common. Very fine among the heather, and found at considerable elevations; Ben Lawers to Ben

Laoigh. **M. anomala*, Hook.—Common in wet boggy places, but never in large patches. Ben Lawers, Creag-an-Lochain, Meal Ghaordie, Creag Mhor, and Ben Laoigh.

PLAGIOCHILA ASPLENIODES, *L.*—The large form (*major*, Nees) is very common in shady ravines, and the small form (*minor*, Ldg.) fruits freely in Finlarig Burn and Laoigh Burn. *P. spinulosa*, Dicks.—Common on rocks in the woods, and among the boulders in the western ravine, Ben Lawers; Creag Caillich and Ben Laoigh.

JAMESONIELLA CARRINGTONII, *Balf.*—Ben Laoigh.

JUNGERMANIA CORDIFOLIA, *Hook.*—Common in all the mountain wells and streams. Fruits freely in June and July; often found pretty low down, but seems at its best at an altitude of about 2500 to 3000 feet. *J. pumila*, With.—Very common on wet rocks at the sides of Lawers Burn, Laoigh Burn; and in all the ravines on the mountain slopes. ††*J. atrovirens*, Schleich.—Rare; Creag-an-Lochain, Macvicar. Notes on this plant will be found in "Journal of Bot." 1901, p. 37. *J. riparia*, Tayl.—Rather common by the sides of streams and wet places on the hills, Ben Lawers to Ben Laoigh. *J. lurida*, Dum.—Rare; Creag-na-Caillich, Macvicar. **J. crenulata*, Sm.—Creag-an-Lochain. Var. *gracillima*, Sm.—On the banks on the low ground, Ben Lawers, Killin, Aïdmore. *J. subapicalis*, Nees.—On rocks in Finlarig Woods, Macvicar. *J. inflata*, Huds.—This plant seems rare. I had confused it with *Hygrobrella laxifolia*. Bog at foot of Ben Lawers, Cam Creag, Loch Achlarich, and foot of Ben Laoigh. *J. bantriensis*, Hook.—Rare; Finlarig Burn. Var. *Mülleri*, Nees.—Rather common both on the low ground and on the hills, Creag-an-Lochain, Finlarig Woods, Creag-na-Caillich and Ben Laoigh. ††*J. heterocolpas*, Thed.—Creag-an-Lochain; Macvicar. Notes on this species will be found in "Journal of Bot." 1902, p. 158. *J. bicrenata*, Schmid.—Rare; Ben Lawers, Finlarig Woods, and Auchmore Woods. *J. ventricosa*, Dicks.—Common in woods and on walls, Killin. *J. porphyroleuca*, Nees.—Ben Challuim. *J. alpestris*, Schleich.—Common on the hills, Ben Lawers, Finlarig Woods, and Ben Laoigh. *J. incisa*, Schrad.—Common, Ben Lawers to Ben Laoigh, but not on the upper exposed parts of the hills. *J. exsecta*, Schmid.—Rare; Ben Laoigh, perhaps overlooked. **J. Lyonii*, Tayl.—Not rare; Ben Lawers, Creag Mohr, Ben Laoigh. **J. gracilis*, Schleich.—Finlarig Woods. *J. barbata*, Schmid.—Rare; Creag-an-Lochain and Finlarig Burn. *J. lycopodioides*, Wallr.—Rare†; Ben Lawers and Finlarig Burn above the woods. *J. Floerkii*, Web. and Mohr.—Common

everywhere from Ben Lawers to Ben Laoigh. ††*J. quadriloba*, Lindl.—Creag-an-Lochain. Notes on this plant will be found in “Journal of Bot.” vol. 1901, p. 37. ††*J. polita*, Nees.—Lawers, collected in 1885, but only now named by Mr. Macvicar. See notes in “Journal of Bot.” vol. 1901, p. 37. ††*J. Kunzeana*, Hub.—Rare; Ben Lawers above Lochan a’ Chait, Macvicar. ††*J. Helleriana*, Nees.—On decaying stumps of fir in Finlarig Wood, Macvicar. *J. minuta*, Crantz.—Ben Lawers. *J. saxicola*, Schrad.—Very rare. On a boulder at Creag-an-Lochain, Macvicar. See notes in “Journal of Bot.” 1901, p. 315. *J. orcadensis*, Hook.—Common on all the hills, and very fine in Finlarig and Auchmore Woods. As a rule mixed with mosses.

NARDIA HYALINA, *Lyell*.—Morenish Burn, Macvicar. *N. obovata*, Nees.—Common on the sides of streams on the low ground and also on the hills, Lawers Burn, Finlarig Burn, and Laoigh Burn; fruiting freely. ††*N. subelliptica*, Lindl.—Creag-an-Lochain: Macvicar, who is inclined to consider this an alpine variety of *N. obovata*. See notes in “Journal of Bot.” 1901, p. 37. *N. compressa*, Hook.—Not a common plant; Meal-nan, Tarmachan, Lochan on Creag Mhor, Ben Laoigh. *N. scalaris*, Schrad.—Common everywhere, but varying so much in size, colour, and situation that it is very troublesome to the young collector. ††*N. siluretta*, Gotts.—Creag-na-Caillich; Macvicar.

MARSUPELLA EMARGINATA, *Ehrh.*—Common; Very varied in size, colour, and situation. The forms *saccata minor*, Carr.—*robusta*, De Not.—*aquatica*, Lindenb.—are easily detected. *M. Funchii*, Web. and Mohr.—Seems rare; possibly a low country plant. It is reported from the mountains, but I have not collected it in this district; Ben Lawers, Macvicar. *M. sphacelata*, Gier.—Rare; on boulders, Creag-na-Caillich. ††*S. ustulata*, Spruce.—Creag-an-Lochain, Ben Lawers. ††*S. condensata*, Angstr.-Kaalaas, non Lindl.—Ben Lawers, Macvicar. This is said to be common on the mountains, but I do not know the plant. Notes on this plant will be found in the “Journal of Bot.” vol. 1902, p. 58. ††*M. conferta*, Limpr.—Ben Lawers, Macvicar. *M. alpina*, Gottsche.—Creag-an-Lochain and Cam Creag.

ACOLEA CRASSIFOLIA, *Carr.*—Ben Lawers, Ben Heasgarnich, Creag Mhor, and Ben Laoigh. *A. corallioides*, Nees.—Rather common on boulders, Ben Lawers; Creag-na-Caillich, Creag Mhor, and Ben Laoigh. *A. concinnata*, Lightf.—Common on the higher parts of Ben Lawers, Meal-nan-Tarmachan, Meal Ghaordie, Ben Heasgarnich, and Ben Laoigh. *A. obtusa*,

Lindl.—On boulders and exposed rocks; Ben Lawers and Ben Laoigh. *A. crenulata*, Gottsche.—Creag-na-Caillich.

SACCOGYNA VITICULOSA, *Mich.*—I have only seen this on the sides of Finlarig Burn, but I do not think it is a rare plant on the low ground.

†FOSSOMBRONIA DUMORTIERI, *Lindl.*—On shore of Loch Tay, growing on sandy peat. I gathered this first in 1883 in mistake for another species, an error which Mr. Macvicar has now corrected.

PALLAVICINIA BLYTHII, *Moerck.*—Ben Lawers, Macvicar; Creag-an-Lochain, Creag-na-Caillich, Creag Mhor, Ben Heasgarnich, and Ben Laoigh. On the ground among *Salix herbacea*. Difficult to collect, but I do not think it is rare.

BLASIA PUSILLA, *L.*—Common in wet gravelly places on the low ground, but I have never seen it to my knowledge on the hills; foot of Ben Laoigh.

PELLIA EPIPHYLLA, *L.*—Common on wet places; ascending well up the glens. **P. Neesiana* Gottsche, *Limpr.*—This form seems more common than the above, especially on the hills, although very fine patches of it are to be found both in the Killin and Tyndrum districts quite low down. Finlarig, Ben Challuim, Ben Laoigh. *P. calycina*, *Tayl.*—I do not think this is a rare species, but it varies so much in size and form that I have a difficulty in distinguishing it; Ben Lawers to Ben Laoigh.

ANEURA PALMATA, *Hedw.*—On decaying timber, Finlarig Woods. **A. ambrosioides* *Nees*, *Pears.*—Common among wet rocks, Finlarig Burn and Glen Lochay; in fine patches on the wet ground at the head of the western ravine, Ben Lawers. **A. pinguis*, *L.*—Common on wet ground; Ben Lawers to Ben Laoigh.

*METZGERIA PUBESCENS, *Schrank.*—Common; Ben Lawers, Creag-an-Lochain, Cam Creag, Finlarig Burn, and Creag Mhor. †*M. hamata*, *Lindl.*—Rare; Finlarig Burn. †*M. conjugata*, *Lindl.*—Common in all the glens, but I have not observed it on the exposed rocks; Ben Lawers, Ben Heasgarnich, and Ben Laoigh. *M. furcata*, *L.*—This does not appear to be a hill-species. Pretty common on trees in the woods. On dry rocks in Finlarig Wood and Glen Lochay.

MARCHANTIA POLYMORPHA, *L.*—Although growing very freely among the boulders above Lochan a' Chait, the western ravine, Ben Lawers, and Creag-na-Caillich, I have only seen it on the road to Killin Pier on the low ground.

CONOCEPHALUS CONICUS, *L.*—Finlarig Wood, Glen Lochay, and Tyndrum. I found it fruiting in June well up Ben Laoigh.

REBOULIA HEMISPHERICA, *L.*—This seems rare. I have only seen it growing on the road to Killin Pier.

PREISSIA COMMUTATA, *Lindenb.*—Common everywhere and found near the tops of the mountains fruiting freely.

*RICCIA GLAUCA, *L.*—Common on all the turf-topped walls about Finlarig and Glen Lochay. **R. bifurca*, Hoffm.—My attention was drawn to this by Mr. Macvicar on Creag-an-Lochain. It is frequent on moist loose soil on the mountains. I had passed it as young *Pressia commutata*.

In the above list there are twenty-two plants (prefixed by an *) which have not been formerly recorded for the district in the Eighth Edition of the "London Catalogue"; eight (prefixed by a †) not recorded there for Scotland; and fourteen (prefixed by a ††) new to the British flora. This of itself proves that there is still much to be done in this department of botanical work, not only in this district but all over the country.

ZOOLOGICAL NOTES.

Badger at Corstorphine Hill, Edinburgh.—On Sunday the 15th August a male Badger (*Meles taxus*) was killed by a band of roughs on Corstorphine Hill. For two years, at least, there has been a badger's earth in the immediate neighbourhood, and it is interesting to find these animals breeding within four miles of the centre of Edinburgh.—CHARLES CAMPBELL, Cramond Bridge.

Note on the Harp Seal.—It may be of some interest to place on record the fact that the Harp Seal (*Phoca grænlandica*), recorded in page 184 of the "Annals of Scottish Natural History," and caught at Grangemouth in March last and subsequently presented to the Glasgow Zoo, lived there until the 9th April, when it died, and was presented to the Corporation Museum, Glasgow, by Mr. Bostock. It was rather diffident in feeding, but seemed to be in good condition otherwise.—J. MACNAUGHT CAMPBELL, Glasgow.

Notes from Coll.—From 6th until 10th June, when from illness I had to leave the island, I observed a male Greenfinch (*Ligurinus chloris*) on the iron rails close to the Castle. This bird had been noticed for some time previously by the servants; though I did not see a hen bird, it is probable that there was a nest near. As

yet this species is not in the list of birds breeding in Coll ("Ann. Scot. Nat. Hist." 1899, pp. 206-9).

At the same date I saw a pair of Yellow Hammers (*E. citrinella*) feeding their young, having for the first time seen them at Coll in the nesting season of last year ("Ann. Scot. Nat. Hist." 1902, pp. 251-2).

About the 1st July a male Great Northern Diver (*C. glacialis*) in excellent plumage was picked up dead on the shore; this is a very late date to be found so far south.

About the 22nd July a male Kingfisher (*A. ispida*) was, I regret to say, shot; this is the first recorded occurrence of the species in Coll. The pair of Whitethroats (*S. cinerea*) were at the place where I have seen them during every spring that I have been in Coll. Presuming that these birds bring up their young, why is there never more than one pair to be seen?—L. H. IRBY, Regent's Park, N.W.

Crossbills in Barra.—My brother shot a pair of Crossbills (*Loxia curvirostra*), an adult male and female, in the Eoligary Garden, Barra, on the 9th July last. From six to eight years ago, five Crossbills were seen at North Bay, Barra, by Dr. MacRury and my brother, and this year again is the second time on record.—W. L. MACGILLIVRAY, Barra.

[Crossbills occurred in Faroe and in Shetland about the same time.—EDS.]

Great Grey Shrike in Kincardineshire.—By an oversight the record in the last number of the "Annals" (p. 185) appeared over the signature of Mr. Nicol Simpson. It should have been that of Mr. John Milne, of Auchinblae, who further informs us that the specimen belongs to the form with only one white bar on the wing and recognised by some as a distinct species under the name of *Lanius major*, Pallas.—EDS.

Swift nesting on Lochnagar.—On 7th July 1903 six Swifts (*Cypselus apus*) were haunting the highest summit of Lochnagar—Cac Carn Beag (3786 ft.). They kept going in and out of a crevice in a crag near the north-east end of the high precipices which encircle the great Corrie. The spot, which is not far from the top of the "Black Spout," could not be got at, but it was well seen in the brilliant sunshine of one of the finest summer days I have ever experienced on our Scottish hills. The birds were under observation for about an hour, and it can scarcely be doubted that they were nesting. There can be few, if any, breeding-places of this species in the British Isles over 3700 ft. above sea-level. It would be interesting to know the July mean temperature as compared with that of Braemar, where the Swift is abundant. There was at least one nest this summer under the eaves of a house in the centre of the village.—HUGH BOYD WATT, Glasgow.

Nesting of Great Spotted Woodpecker in East Lothian.—I recorded ("Annals," January 1903) the nesting of this bird (*Dendrocopus major*) in 1902 in my neighbourhood. I am pleased to be able to record it again in the same spot this spring. A new hole was bored, in the end of April, and the eggs have been hatched. I spent two afternoons watching the parent birds going in and out of the nesting-hole feeding their young. On the last day on which I visited the nest (4th June) the young were pretty vigorous and vociferous. The parents were by no means shy and would let me get pretty close to them.—H. N. BONAR, Salton.

Great Spotted Woodpecker in Roxburghshire.—In connection with the notes on the recent extension of the distribution of *Dendrocopus major* in the south-east of Scotland, I should like to record the occurrence of a young bird near Roxburgh on the 22nd of August. This example was captured alive, and after being carefully examined was set at liberty. There is little doubt that the bird was bred in the neighbourhood, for Mr. Robert Godfrey has been informed by one of the foresters that he occasionally sees the species about.—HENRY D. SIMPSON, Edinburgh.

Kingfishers in Islay.—As the Kingfisher (*Alcedo ispida*) is not mentioned for Islay in the "Fauna of Argyll and the Inner Hebrides," it may be interesting to record the following occurrences in the island. One was seen by Mr. Morrison, of Islay House, on Sorn River sometime in 1901. A second by Mr. Martin, of Dunlossit, on a burn in November 1902, after a severe storm. And lastly, one was seen by me on Loch Allan, Dunlossit, on 20th July 1903.—JAMES LUMSDEN, Arden.

Teal nesting in Lewis.—Two eggs sent me by Mr. Watters in proof of Teals nesting in Lewis (see notes under species as given in my contribution to the "Fauna of the Outer Hebrides" in "Annals," 1902, p. 209). This is the first actual record of the nesting of this species in the island.—J. A. HARVIE-BROWN.

Shoveller and Tufted Duck nesting in South Uist.—Mr. D. Guthrie sent me one Shoveller's (*Spatula clypeata*) egg taken for me by him from a nest in South Uist this year in May. This is the first record of actual nesting, though believed by him to have nested before. Mr. D. Guthrie also sent me one egg of the Tufted Duck (*Fuligula cristata*), taken by him for me from a nest in early summer. This is also the first record of actual nesting there, though suspected of nesting on more than one occasion by him previously.—J. A. HARVIE-BROWN.

Forth—Pied Lapwing.—In September I received in the flesh a rather handsome pied variety of the Lapwing in the year's plumage—shot at Inverardoch by the gamekeeper, Mr. Potts—and sent it on

to Dr. Ramsay H. Traquair for the Edinburgh Museum the same day.—J. A. HARVIE-BROWN.

Common Gull breeding at High Levels.—This Gull (*Larus canus*) nests at considerable elevations within and near the upper "Dee" area. Near the entrance to the large west Corrie of Lochnagar—Coirrie Lochan an Eoin—lies the Sandy Loch (alt. about 2600 ft.), misnamed Lochan an Eoin in the Ordnance Survey map (see A. I. McConnochie's "Lochnagar," 1891, pp. 137-139, for notes on the lochs of this Corrie and their bird associations). On 7th July 1903 there were about six pairs of Common Gulls frequenting this loch. Two young birds were on the water, unable to fly: pointing to retarded nesting as compared with lower situations. On 11th July Loch nan Eun, near the head of Glen Ey, was visited, where, as is well known, there is a breeding colony of Gulls. The species is *L. canus*, and about 150 birds were present. The young, very few of which were seen, were full grown. The loch has two grassy islets, good nesting sites; and, by pocket aneroid, its elevation is about 2550 feet. It is on the "Tay" side of the watershed. On 13th of the same month I also saw a pair of Common Gulls, with young, on the lochans at the south end of Loch Builg (alt. 1586 ft.). I was informed that this was the first time they had nested there. Other birds joined company with them every night. In connection with these observations it may be recalled that all that Wm. Macgillivray knew of the occurrence of this species in Braemar was a report of it having been seen at Crathie (see "Nat. Hist. of Deeside and Braemar," 1855, p. 409). A considerable number frequented the Dee at Braemar this summer.—HUGH BOYD WATT, Glasgow.

Great Northern Diver and Kingfisher at Coll in July.—I received from Island of Coll a very fine male Great Northern Diver (*Colymbus glacialis*) on 2nd July, found dead on the shore. This is about the latest date I have heard of them about here. I received a Kingfisher (*Alcedo ispida*) from Island of Coll on 24th July. This is the first time I have heard of the bird having occurred there.—CECIL H. BISSHOPP, Oban.

Swordfish in Loch Fyne.—A large Swordfish was found on the 17th of August on the beach at Dunderave Castle, near Inverary. The sword measured 34 inches in length.—DAILY PRESS.

Vertigo pygmæa, etc., in Mid-Perth.—On 20th April I found a specimen of this shell near the Falls of Turret, Crieff, which I have forwarded to Mr. Taylor, Leeds, for "authentication" under the vice-county. Other interesting shells taken on the same day were *Helix lamellata* and *Helix pulchella*; of the latter, eight were found on the hillside. I took two specimens of *Helix aculeata* in Ochertyre grounds on 18th April. I may also mention here that I

took an adult example of *Limax cinereo-niger* in Glen Ogle on 11th July.—ROBERT GODFREY.

Ichneumon bred from *Obisium muscorum*, Leach.—On 4th April 1903, at Woodcockdale, West Lothian, in a nest of *Obisium muscorum* containing chitinous fragments of the animal, I found the pupa of an ichneumon which had apparently fed on the *Obisium*. I handed the pupa to Mr. Waterston, with whom in due course it hatched out. The perfect insect was then forwarded to Mr. Morley, who replies concerning it: "The little ichneumon from *Obisium muscorum* is extremely interesting, since, though other species of the genus *Stibentes*—to which it appears to belong—have been bred from spiders' eggs, I know of no instance of an ichneumon of any kind being bred from a pseudo-scorpion."—ROBERT GODFREY, Edinburgh.

Monomorium pharaonis in Crieff.—While staying at Crieff Hydro. on 20th April last, I saw a very small ant running on the serviette of the lady sitting opposite me at lunch. I rightly conjectured it to be of this species, and have shown it to Mr. Wm. Evans, who confirms the identification. Mr. Evans recorded it, from an Edinburgh hotel, in the "Annals," 1899, p. 117.—ROBERT GODFREY, Edinburgh.

Butterflies and Dragonflies in Banffshire.—I was again at Cullen on the coast of Banffshire in July last. The cold, stormy weather was most unfavourable to insect life. I confirmed my last year's observations as to *Argynnis aglaia*, Linn., *Polyommatus artaxerxes*, Fabr., and *A. Filipendula*, Linn. Of the last, however, I did not see a dozen where in former years I have seen a hundred. I caught a few dragonflies at Crannoch Loch near Cullen, which lies in a hollow on a heath-clad hill within a mile of the sea. Mr. Grimshaw of the Edinburgh Museum of Science and Art was good enough to determine the species as follows:—*Libellula quadrimaculata*, Linn., *Pyrrosoma nymphula*, Sulz., *Ischnura elegans*, Lind., and *Enallagma cyathigerum*, Charp.,—the last both male and female.—HENRY H. BROWN, Cupar-Fife.

Sesia bembeciformis (Hb.) in Argyllshire.—On 18th April I took a larva of this species from burrowings in willow by the side of a small pond at Inverawe, Tainuilt. A crippled female resulted on 9th July. In two other places within an eight-mile radius the willows showed signs of attack.—JAMES WATERSTON, Edinburgh.

Orthoneura nobilis (Fln.) in Peeblesshire.—On 2nd August I took a female of this fly at rest on the flowers of *Heracleum* growing in ditch near Merlindale Bridge, Drummelzier. Seen and confirmed by Mr. Percy H. Grimshaw.—JAMES WATERSTON, Edinburgh.

Diptera in the Edinburgh (Forth) District.—To my records in previous notes ("Annals," 1900, p. 251, and 1901, p. 52), I should

like to add the following. I am glad Mr. Grimshaw is publishing a list of "Forth" Diptera. He shall have all my specimens to examine whenever he can find time to do so. I am indebted to him for helping me to identify most of those here mentioned.

Sciara thomæ, L.—Two, Aberfoyle, September 1897.

Bibio marci, L.—♂ s and ♀ s, Longniddry, Kinghorn, and Kilconquhar, May 1900; ♀, Drumshoreland, June 1900. *B. pomonæ*, F., is common in the district: I have specimens (both sexes) from Leven and Thornton, August 1893; Oakley and Bavelaw, August 1898.

Simulium latipes, Mg.—Several on wall, Comiston, September 1896. I have to thank Mr. E. E. Austen of the British Museum for this and the next four names.

Chironomus venustus, Stæg.—♀, Craigentiny Meadows, and ♂, Thornton, August 1898. Mr. Grimshaw tells me *C. venustus*, Stæg., is a synonym for *C. dorsalis*, Mg.

Tanypus nebulosus, Mg.—Duddingston Loch, October 1896.

Culex cantans, Mg.—♀, Aberfoyle, 11th September 1897. *C. nigripes*, Ztt.—♀, Aberfoyle, 27th July 1900.

Ptychoptera paludosa, Mg.—Two, Braidburn, June 1900; one, Luffness Marsh, August 1896.

Pedicia rivosa, L.—Roslin, July 1893; Newpark and Thornton, July 1901; Cleish, August 1900.

Pachyrrhina crocata, L.—Two ♀ s, Polton, 30th June 1902.

Tipula gigantea, Schrk.—♀, Braidburn, July 1892. *T. lutescens*, F.—♀, near Dollar, 24th June 1903.

Chrysops cæcutiens, L.—This prettily marked "cleg" is locally common in the district: Inverkeithing, July 1899; Newpark and Forest Mill, July 1900; Thornton, July 1901; Aberfoyle, 27th May 1896.

Bombylius canescens, Mik.—A good many on railway bank near Kinross, 22nd June 1901 and 5th July 1902.

Empis borealis, L.—Aberfoyle, April 1896.

Liancalus virens, Scop.—Aberdour, September 1900; Craigmillar Quarry, May 1901.

Chilosia grossa, Fln.—I took two males of this fine fly at flowering willows near Dollar on 17th April 1897, and another near Callander on 22nd April 1900. *C. albipila*, Mg.—♂, Swanston Hill, Pentlands, 1st June 1899.

Melangyna quadrimaculata, Verr.—I find this commonly in spring at flowering willows and blackthorn: ♂, Blackford Hill, 1st April 1894; ♂ s and ♀ s, Kirknewton, 6th April 1895, 3rd May 1901, and 2nd April 1903; ♂ s, Bavelaw, 12th May 1897; ♂, Dollar, April 1897.

Ischyrosyrphus glaucius, L.—Oakley, August 1898; Aberdour, August 1900; Tynehead, August 1901. *I. laternarius*, Mull.—♂ near Kirknewton, Midlothian, 10th July 1900.

Syrphus tricinctus, Flin.—Luffness, August 1896; Drumshoreland, June 1900. *S. bifasciatus*, F.—Common on Corstorphine Hill, 24th May 1901. *S. lunulatus*, Mg.—Drumshoreland, June 1900.

Baccha elongata, F.—♂, Leven, August 1893; ♂ and ♀, Dalmeny, 10th June 1903.

Sphagina clunipes, Flin.—♂, Bridge of Allan, 28th June 1901; ♂, Dollar, 9th July 1901.

Ascia podagrica, F.—Kinghorn, September 1900; Heriot, June 1898.

Eristalis sepulchralis, L.—Luffness Marsh, July 1898; Inveresk, and marl pit near Davidson's Mains, May 1901; Polton, June 1901.

Myiatropa florea, L.—Longniddry, June, and Braid Burn, July 1899; near Midcalder, July 1899 and July 1900.

Helophilus hybridus, Lw.—♀, Luffness Marsh, 9th August 1898. *H. lineatus*, F.—Luffness, July 1895, August 1896, etc.; Davidson's Mains, May 1901.

Xylota florum, F.—Two captured on outskirts of fir wood, Forest Mill, near Dollar, 13th July 1901.

Arctophila mussitans, F.—Common at flowers of *Scabiosa succisa* in meadows by side of Loch Voil, Balquhiddel, 2nd September 1902. Of six taken all are ♂s but one.

Sicus ferrugineus, L.—♂ got by sweeping herbage in meadow at Brucefield between Dunfermline and Alloa, 25th July 1903.

Myopa buccata, L.—On 21st May 1901 I got three specimens of this curious fly off *Vaccinium myrillus* at Forest Mill.

Gastrophilus hæmorrhoidalis, L.—Two ♀s reared from larvæ on point of pupating, got from 'Hunter's Tryst dairy, near Edinburgh, 30th May 1899; hatched 16th July.

Echinomyia fera, L.—♀, L. Doine, Balquhiddel, 29th August 1902.

Micropeza corrigiolata, L.—One, Polmaise, 4th July 1903.

Pterobæctria frondescentiæ, L.—This pretty little fly is frequent among herbage: Kirknewton and Allermuir Glen, July 1895; Oakley, August 1898; etc.

Ornithomyia avicularia, L.—One off a young Ringed Plover, Aberlady, June 1890.—WILLIAM EVANS, Edinburgh.

Chernes dubius, *Cambr.* (= *C. tullgreni*, *Strand*), in Scotland.—Referring to my note in the "Annals" for April last (p. 120), I have to state that the *Chernes* found by Mr. Godfrey at Bo'ness, etc., is now confidently referred by the Rev. O. P. Cambridge to his *C. dubius*, described in 1892. This opinion, expressed in a letter to me dated 12th September 1903, is based on the examination of several specimens, including the original one which I resubmitted to him. Seeing that Mr. Tullgren has identified two of these same specimens as belonging to *Ch. Tullgreni*, Strand, this name, it seems

to me, may safely be treated as a synonym for *Ch. dubius*, Cambr., which has priority.—WILLIAM EVANS, Edinburgh.

On the occurrence of *Simocephalus serrulatus* in Scotland.—This Cladoceran has been found in a few localities in England, as mentioned by Mr. Scourfield in his "Synopsis of the known Species of British Freshwater Entomostraca, Part I. Cladocera." We are now able to record its occurrence in Scotland also. My father and I found several specimens last June in a catch taken from a small swamp near Grantown-on-Spey. It is readily distinguished from *S. vetulus* by the small tooth-like projections on the forehead and by the curious bulge on the posterior margin of the valves. Our specimens were brown in colour, and the largest of them measured 1.6 mm., exclusive of the antennæ.—BEATRICE SPRAGUE, Edinburgh.

BOTANICAL NOTES AND NEWS.

Ranunculus sardous, Crantz. (Pale hairy Buttercup or Crow-foot).—Though recorded from the eastern counties of Scotland from Berwickshire to Forfar (Haddington excepted), usually without any mark of doubt as to its claim to be considered native, this buttercup appears to be extremely rare beyond Forfarshire, and during a long acquaintance with the flora of north-east Scotland I had not myself gathered it, though I had evidence of its having been once found in Slains; and some years ago living plants were brought me that had been found in a street in Aberdeen growing round the roots of trees recently imported and planted. In both cases the plants appeared to be mere casuals. On 25th August 1903, while crossing an artificial pasture close to the sea near Catterline on the coast of Kincardineshire, my eye was caught by the pale-green foliage and rather small flowers of a plant of this species, which I soon found to be plentiful in this field and unmixed with other species. The characters of the plant made it very easily recognised, and led me to believe that had I met with it elsewhere I could scarcely have overlooked it. I saw none beyond the one field, hence I feel in doubt whether it may not have at some time been introduced with farm seeds. It had not been noted for Kincardine before.—JAMES W. H. TRAIL.

Utricularia ochroleuca, R. Hartm.—Dr. L. M. Neuman has kindly sent me specimens of the above plant in two forms. The following represents these forms and that of Melander ("Bot. Not." 1887).

1. *Utricularia intermedia*, Hayne \times *U. minor*, L. = *U. ochroleuca*, R. Hartm. et auct. plur.

2. *U. intermedia* × *ochroleuca*, Melander = f. *subintermedia*.
3. *U. intermedia* × *minor*, L., f. *subminor*, Neum. = *U. ochroleuca*, R. Hartm., f. *microceras*, J. Strandmark, in exsicc.

In the "Bot. Notiser," 1900, pp. 65-66, Dr. Neuman discusses these plants, and the above is the result of his study of them.

The specimens sent are both in flower and so are satisfactory; but I have seen no specimens that seem to be referable to these from Scotland that are in flower; so we are left in the unsatisfactory state of relying simply on the other characters.

So far as these will allow of being compared, I think the following specimens are probably referable to one or the other of these *ochroleuca* forms.

1. *Utricularia*, sp.—Lochan Feior, near Skaig Bridge, Loch Assynt, West Sutherland, 14th September 1887, E. S. Marshall.
2. Mr. Macvicar's specimens from near Broadford, Skye, July 1895.

U. intermedia and *U. minor* both occur in West Sutherland; and I have specimens of *U. intermedia* from Broadford (*leg.* H. N. Dixon). *U. minor* also grows near there.

Other specimens I am inclined to refer to *ochroleuca* are:—

3. Specimens from Moidart, Argyle, July 1893 and August 1894 (*leg.* S. M. Macvicar).
4. Loch Urr, Dumfries, *leg.* J. Fingland, July 1887.
5. Capenoch Moss, Wigtownshire, J. M'Andrew.

These all vary as much as such plants usually do; the Dumfries specimen represents a very slender and delicate form; while the Wigtown probably represent *subintermedia*. When Mr. Macvicar kindly sent numerous specimens from Moidart, both he and I were much puzzled by the various forms; some apparently true *minor*, others receding from it, and such as could only be doubtfully referred to any species. These specimens are all destitute of flowers; so the identification must be held doubtful, though I have little doubt it will prove correct.

***Juncus tenuis*, Willd., in Kincardineshire.**—This rush has already been recorded from widely-scattered localities in England and the west of Scotland, and its claim to be regarded as not an alien in at least some of these habitats is now generally admitted to be strong. But as yet it has not been noted, so far as I know, in east Scotland, except a single example found by me in 1894 on a newly filled-up portion of the bed of the river Dee at Aberdeen. As many undoubted casuals sprung up on the same ground, its occurrence there could not be regarded as giving reason to look on it as other than itself a casual. But on 17th August 1903 I met with plants in flower and in fruit among short vegetation on a wet

cart-track over a moor in the part of the parish of Banchory Ternan south of the Dee. In such a situation its introduction by man seems at least unlikely; while it might very easily escape detection where growing among grassy vegetation of its own height.—JAMES W. H. TRAIL.

Glyceria plicata, Fries., and *G. aquatica*, Sm.—In the last issue I noticed the detection of *G. plicata* on the border between the vice-counties of South Aberdeen (92) and North Aberdeen (93). I have now to add Kincardine (91) to the list of counties in which it has been observed in Scotland, as I found it on 25th August at Catterline, growing in a roadside ditch along with *G. fluitans*. *Glyceria aquatica*, Sm., is mentioned in Dickie's "Botanist's Guide to the Counties of Aberdeen, Banff, and Kincardine," published in 1860, as follows: "*Poa aquatica*, Linn.—Pond at Breda in Alford, from which it has escaped into the river Don and is now naturalised on its banks several miles below Breda, Rev. J. Minto." Professor Dickie does not seem to have himself seen it in these counties. It is now one of the most plentiful grasses along the Don, forming very conspicuous beds almost wherever the banks are suited to it, and it grows even among sand near the mouth of the river. There is a bed of it near the mouth of a small stream on the Belhelvie Links about six miles north of Aberdeen; and I found it in 1900 by the Ythan about two miles below Ellon. Last year I found a small patch of it on the south bank of the Dee (*i.e.* in Kincardine, from which it had not been recorded) about a mile above the Bridge of Ruthrieston, and this year I found a good deal of it near the mouth of a stream that opens into the Dee from the north near Murtle. In 1901 I found it in small quantity by the Deveron below Turriff, and in August 1903 saw it above Turriff in considerable quantity. Though now so widespread, the evidence points to its introduction by man last century. Possibly it has been spread by water-birds.—JAMES W. H. TRAIL.

Edinburgh University Gold Medal for Herbarium of not less than 800 Species and Varieties of British Flowering-Plants and Ferns, made during the year June 1902 to June 1903, has been awarded to Wm. Edgar Evans, Edinburgh—the son of our old friend and valued contributor, Mr. Wm. Evans. This herbarium contained 863 species and varieties. With the exception of about a dozen kinds, mostly from Falls of Clyde and the neighbourhood of Berwick, all the plants were collected in the Forth District. The following are some few of the rarer species in the collection:—*Ranunculus reptans*, L.; *Glaucium luteum*, Scop.; *Sisymbrium Irio*, L.; *Ornithopus perpusillus*, L.; *Sedum rupestre*, Huds.; *Linnæa borealis*, Gronov.; *Specularia hybrida*, DC.; *Utricularia intermedia*,

Hayne; *Nepeta cataria*, L.; *Lamium galeobdolon*, Crantz; *Corallo-rhiza innata*, Br.; *Goodyera repens*, Br.; *Scilla verna*, Huds.; *Tulipa sylvestris*, L.; *Gagea lutea*, Ker.; *Paris quadrifolia*, L.; *Lepturus filiformis*, Trin.; and *Aspidium angulare*, Willd.

It is, we understand, eight or nine years since the previous award of this medal.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—July-September 1903.

[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 WHITE WILD CATTLE OF CADZOW. J. Whitaker. *The Field*, 18th July 1903, p. 138.—Quotes a short account of a visit paid by the King of Saxony, given in a work published in 1844 under the title "The King of Saxony's Journey through England."

COLEOPTERA IN SCOTLAND. (Professor) T. Hudson Beare, B.Sc. *Ent. Record*, 1st July 1903, pp. 181-183.—A long note on species taken at Cobinshaw, Harperrig, Threipmuir, Fauldhouse Moor, Gordon (Berwickshire), Arniston, Arthur's Seat, Aberlady, and the Pentland Hills.

COLEOPTERA AT NEWTONMORE. T. Hudson Beare. *Ent. Mo. Mag.* August 1903, pp. 206-207.

BEMBIDIUM VIRENS, GYLL., IN INVERNESS-SHIRE (?) A. J. Chitty. *Ent. Mo. Mag.* August 1903, p. 205.—Refers to specimens in the author's collection labelled "Beauly, Inverness" which may have been obtained in Norway.

PACHYTA SEXMACULATA AT AVIEMORE. James J. F. X. King. *Ent. Mo. Mag.* August 1903, p. 207.—Specimen captured on 4th July 1903.

AGRION HASTULATUM, CHARP., AT AVIEMORE. James J. F. X. King. *Ent. Mo. Mag.* August 1903, p. 202.—Specimens taken at intervals from 22nd June of this year.

LAPHRIA FLAVA AT AVIEMORE. James J. F. X. King. *Ent. Mo. Mag.* September 1903, p. 227.—Specimen seen, but not captured, on 14th July 1903.

CHAMESYRPHUS LUSITANICUS, MIK.: A NEW BRITISH SYRPHID FLY. By D. Sharp, M.A., M.B., F.R.S. *Ent. Mo. Mag.* August

1903, pp. 197-198.—Records the capture of this species at Boat o' Garten in July last.

BOTANY.

NOTES ON WESTERNNESS PLANTS. By C. E. Salmon, F.L.S. *Journ. Bot.* 1903, pp. 271-275.—A record of a fortnight's botanising near Corpach and at Invermoidart, several species and varieties being added to the list for the vice-county (97).

CAMPANULA PERSICIFOLIA, L., IN BRITAIN. By G. C. DRUCE, F.L.S. *Journ. Bot.* 1903, pp. 289-290.—Refers to notices of its occurrence in Scotland, none of these being regarded as proving it to be native.

ON THE BRITISH FORMS OF RHINANTHUS. By Rev. E. S. Marshall, M.A., F.L.S. *Journ. Bot.* 1903, pp. 291-300.—A full discussion of the forms, following Sterneck's "Monographie der Gattung Alectorolophus," with numerous records from localities in Scotland.

THE MARINE ALGÆ OF THE SHETLANDS. By F. Bórgesen. *Journ. Bot.* 1903, pp. 300-306.—A list of species found, with critical notes.

NOTES ON THE DRAWINGS FOR "ENGLISH BOTANY." By F. N. A. GARRY, M.A. *Journ. Bot.* 1903, July and September, as separate paging 65-96.—Continues these notes to *Cnicus tuberosus*.

BOOK NOTICES.

A TREATISE ON ZOOLOGY. Edited by E. Ray Lankester. Part I. Introduction and Protozoa—Second Fascicle. By J. B. Farmer, D.Sc., F.R.S., J. J. Lister, M.A., F.R.S., E. A. Minchin, M.A., and S. J. Hickson, F.R.S. (London: Adam and Charles Black, 1903. Price 15s. net.)

This admirable treatise, of which the present part is the fourth in order of publication, promises to form one of the most useful general works on Zoology that we possess, and we are glad to note that its various sections are appearing with commendable promptitude. From one point of view it is unfortunate that the volumes cannot be brought out according to their zoological sequence, but perhaps, owing to its divided authorship, this cannot be avoided. The present part contains four sections, lettered H, I, K, and L, and devoted to the Structure of Animal and Vegetable Cells, the Foraminifera, the Sporozoa, and the Infusoria respectively. These will ultimately form Chapter I., the remaining sections of which

(lettered A to G) will form the first fascicle of Part I., containing the Introduction and remaining groups of Protozoa.

Dr. Farmer's section on the Structure of Cells, though not very easy reading, is of extreme interest, and appears to be thoroughly up to date and carefully prepared. It commences with a brief historical sketch of our knowledge of the cellular structure of organisms, beginning with Hooke in 1665. Following this we find careful accounts of the structure of the resting nucleus, nuclear and cell division, and "reduction-divisions," all accompanied by excellent figures. The account of the Foraminifera by J. J. Lister occupies just over a hundred pages, is profusely illustrated, and concludes with a careful summary of the classification of these interesting organisms, and a bibliographic list of sixty-seven titles. The Sporozoa are splendidly treated by Professor Minchin, and the couple of hundred pages devoted to them form probably one of the most interesting and valuable sections of the whole work. The Infusoria, of somewhat less economic interest than the Sporozoa, are nevertheless thoroughly well treated by Professor Hickson, and the section concludes, as in other cases, with a careful classificatory summary of the group. A capital Index is given to the whole volume, which in bulk surpasses any of its predecessors, and in common with them is beautifully printed and illustrated.

A MANUAL OF PALÆARCTIC BIRDS. By H. E. Dresser, F.Z.S. etc. Part II. (London: Published by the Author, 3 Hanover Square.)

With commendable promptness Part II., completing this important and useful work, has been issued, and we congratulate the author on the completion of another valuable contribution to the literature of ornithology. Part I. was noticed and highly commended in the April number of the "Annals"; and it only remains to be remarked that the Part under notice is embellished with reproductions, one by the three-colour process, of two beautiful drawings by the late Joseph Wolf, and is furnished with a copious Index to the complete work. We believe Mr. Dresser contemplates issuing a supplementary volume, wherein will be given the latitudinal and longitudinal range of each palæarctic bird. We trust he will be encouraged to undertake such a desirable corollary to the work just successfully completed.

THE BIRDS OF BEMPTON CLIFFS. By E. W. Wade. (Hull: A. Brown and Sons, 1903. 2s. net.)

The Flamborough range of cliffs, of which the Bempton section offers the greatest attractions to ornithologists, has long been famous, among other features, as the nesting resort of vast numbers of sea-fowl. These cliffs are well worthy of adequate and full description, and Mr. Wade's account of them is the best known to us, and is moreover illustrated by reproductions of a series of nineteen most

interesting photographs of the cliffs, their bird tenants (with portraits of their chicks), and the methods adopted by the daring professional climbers who descend to reap the harvest of eggs deposited on the ledges below.

SOME RECENT BOOKS USEFUL FOR SCOTTISH BOTANY.

Scottish botanists desirous to compare the vascular flora of Scotland with that of the European continent, from which almost all our so-called indigenous plants are derived, will find great value in the "Synopsis der Mitteleuropäischen Flora," by Professor P. Ascherson and Dr. P. Græbner, which is now appearing in several volumes, the first (in 1896-1898) containing the Vascular Cryptogams, the Gymnosperms, and the following families of the Monocotyledons: *Typhaceæ*, *Sparganiaceæ*, *Potamogetonaceæ*, *Najadaceæ*, *Juncaginaceæ*, *Alismaceæ*, *Butomaceæ*, and *Hydrocharitaceæ*. The second volume (or rather first division thereof—issued in 1902) extends to 795 large octavo pages; yet it is wholly occupied with the *Gramina*, or Grasses. The treatment is very thorough and exhaustive. The following grades are employed: COLLECTIVE SPECIES (almost equivalent often to "species" in the Linnean sense), including groups of nearly related SPECIES, as accepted in this Synopsis; SUBSPECIES, differing from one another in well-defined characters, but connected by intermediate not-hybrid forms; RACES, forms characterised by a marked geographical distribution or phylogeny; VARIETIES, forms of intermediate type marked by clear characters; SUBVARIETIES, with characters of less value, passing into SPORTS and DEFORMITIES. The work is a mine of information and of lucid exposition in regard to the numerous forms of each plant, including hybrids, their synonymy, references to figures in standard works, and geographical distribution; and numerous footnotes supply much information on the origins and meanings of the scientific names, and often also on the personal history and work of botanists from whom the names have been derived. These volumes make very evident the reason for the slowness with which the work is being issued, but arouse an eager desire for its completion.

The Scandinavian flora is rendered more accessible to those who can understand the Scandinavian languages, by the "Sveriges Flora (Fanerogamerna)" of Dr. L. M. Neuman and Dr. F. Ahlfvengren (issued in 1901, for about 7s.), and a new edition of the well-known "Norges Flora" of Blytt, at present being issued in parts, at a low price. Both these works are of much interest in relation to the flora of Scotland.

The "Botany of the Færøes," Part I., issued in 1901, and the "Flora Arctica," Part I., in 1902 (both works published by aid of the Carlsberg Fund), are full of interest to all students of the flora of Scotland, especially of the mountains and of the northern and

western coasts. The "Botany of the Færöes" gives full lists of all land and freshwater plants, with frequent critical notes and some figures. The "Flora Arctica" includes the flora of the entire area "north of the wood-boundary." The Part published includes the Pteridophyta, Gymnosperms, and Monocotyledons. Each species is described and its distribution stated, and many are figured. These two works are written in English.

Another book of much value, though unfortunately rendered difficult of use through being in the Danish language, is C. Raunkiær's "De Danske Blomsterplanter Naturhistorie" (The Natural History of Danish Flowering Plants). The first volume only has as yet been issued (1895-1899), and is restricted to Monocotyledons, but it forms a large 8vo. of 724 pages and is illustrated with 1089 separate figures, of which by far the larger number are original. By those students of the plants of Scotland who overcome the difficulties of the language the book will be found of great value, as much information is contained in it that is not accessible in English works.

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