

The Scottish Naturalist

A Monthly Magazine devoted to Zoology

With which is incorporated

"The Annals of Scottish Natural History"

EDITED BY

WILLIAM EAGLE CLARKE, LL.D., F.R.S.E., ETC.

Keeper, Natural History Department, Royal Scottish Museum

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

Member of the British Ornithologists' Union

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

Assistant-Keeper, Natural History Department, Royal Scottish Museum

ASSISTED BY

EVELYN V. BAXTER, H.M.B.O.U.

JAMES RITCHIE, M.A., D.Sc.

LEONORA J. RINTOUL, H.M.B.O.U.

A. LANDBOROUGH THOMSON, M.A.,

H. S. GLADSTONE, M.A., F.R.S.E., F.Z.S.

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EDITORIAL.

VERY little attention appears to have been bestowed by ornithologists to the question of the rate of digestion in birds, and yet the subject has an important bearing upon the economic status of particular species. A short paper by Walter E. Collinge,¹ describing a few experiments on the Rook, Starling, and House Sparrow, undertaken by himself, and quoting the observations of two other investigators in a similar line of enquiry, forms an interesting and suggestive contribution to the subject. Although the experiments referred to are very few in number, yet the author claims the establishment of two facts, viz., (1) that the rate of digestion in the rook differs from that in the sparrow, and (2) that the three species investigated digest their food in from four to four and a half hours.

À propos of the supposed causation of the disease known as pellagra, referred to in our *Editorial* of October last, we may draw attention to an important memoir by F. W. Edwards of the British Museum, entitled "On the British Species of *Simulium*.—I. The Adults."² Thirteen species of the genus are recognised as native to the British Isles. These are

¹ *Journal of Economic Biology*, September 1915, pp. 65-68.

² *Bulletin of Entomological Research*, vol. vi., pp. 23-42 (June 1915).
(See also synopsis in *Ent. Mo. Mag.* for November.)

described in some detail, while certain useful differentiating characters are carefully elucidated by drawings, and a synoptic table given of the two groups into which the species naturally fall. Full details are also given regarding distribution, including many Scottish records, based upon the examination of over a thousand specimens, and certain points in the structure of the adult flies described and illustrated. We shall look forward to the succeeding portion of this paper, which we understand will deal with the early stages of these important and hitherto little understood insects.

Aerial warfare is an important and characteristic feature in the great struggle which is now raging on the continent of Europe. But attacks in the air do not appear to be confined to the human race, for instances have just been published¹ of beetles boring in aerial cables. The principal case reported is one in which a Bostrychid beetle attacked certain lead-covered aerial cables used for telephone distribution purposes at Yeovil, South Africa. A clean-cut hole about one-eighth of an inch in diameter was found in one of these cables, and a beetle found inside the cable immediately behind the hole in the sheath, which was made of lead. Upon investigation, it appeared likely that the beetles were really attracted by the ropes suspending the cable, so that the evil will apparently not prove a very formidable one. Similar damage has been reported from Shanghai, Hong Kong, Queensland, and the Argentine—in each case the result of attack by beetles of the family Bostrychidæ.

Many methods of reproduction are known amongst the marine Hydroid Zoophytes, from the setting free of eggs to the simple breaking away of runner-like "roots," similar in function to the suckers of a strawberry plant. It has been left to J. H. Ashworth and James Ritchie² to make a complete study of the structure and development of the most peculiar and most rare of these modes of multiplication, that in which the egg, contained in a sporosac, breaks away from the parent and for a time swims freely in the sea by means of one or two tentacles. From the sac the egg later escapes,

¹ *Bulletin of Entomological Research*, September 1915, p. 201.

² *Trans. Roy. Soc., Edinburgh*, vol. li., 1915, p. 257.

having been carried some distance from its point of origin, so the dispersal of the species is accomplished. This method of reproduction is confined to the genus *Dicoryne*, and the researches of the authors lead them to amalgamate with this the genus *Heterocordyle*, found so long ago as 1868 in the neighbourhood of Oban.

HENRY EELES DRESSER.

It is with the deepest regret that we have to record the death, which occurred at Cannes on the 28th of November, of this distinguished ornithologist, in his 78th year. Few men have done more for the advancement of ornithology than Dresser. His great work on the *Birds of Europe* gave an impetus to the study of that science in this country which has not been excelled by any other publication, and has received world-wide recognition as the standard work on the subject. Those who remember the state of our knowledge regarding the bird-life on the Continent prior to the appearance of this famous book will never forget the deep debt of gratitude that is due to its author. It is very remarkable that a busy city man should have been able to accomplish such a stupendous task, for the work forms nine quarto volumes, and contains some 5500 pages and 742 hand-coloured plates. The book is a perfect treasure-house of information, culled from the writings of the leading European authorities, and enriched by the author's extensive personal knowledge gleaned in many parts of the Continent visited for the special purpose. But Dresser's contributions to European ornithology do not end here. As a corollary to his *magnum opus*, he published, in two volumes, *The Eggs of the Birds of Europe*. In this valuable contribution to Oology, the figures for the 106 coloured plates were taken, by photographic process, direct from the eggs themselves, in order to ensure exact reproductions of the originals. This indefatigable worker was also the author of a *Manual of Palearctic Birds*, Monographs on the Bee-eaters and Rollers, and a long series of papers in the *Ibis*, and other serial publications.

A few words must be added relating to Dresser's genial disposition. The writer, who had the privilege of being one of his intimate friends for thirty-five years, finds it impossible to speak in terms too high of his singularly amiable disposition. He was always the personification of good nature, and ever wishful to help those who sought his aid, and they were many. The loss of such a man leaves an irreparable breach in many friendships. His great work, however, remains, and will assuredly have a high place among the classics of ornithology for all time.

HILL BIRDS OF SCOTLAND. By Seton Gordon, F.Z.S., etc. With Illustrations. London: Edward Arnold, 1915. Price 12s. 6d. net.

Under this title Mr Seton Gordon relates many interesting incidents in bird-life which have come under his notice during his rambles over our Scottish mountains, gives some prettily written descriptions of scenery, and narrates a number of Highland legends. Though much that he has written has already appeared in print, these sketches make a volume of pleasant reading. When, however, the author leaves his field experiences and essays to enter wider domains his limited knowledge even in British Ornithology has led him to make many erroneous statements, for instance, on the destination of the migrant Woodcocks on leaving the British Isles, which he would have us believe proceed to Palestine and Egypt; and his remarks on the relationship of the Rock and Common Ptarmigan. He is not quite accurate in his statement regarding the distribution of the Golden Eagle—his favourite bird—in Scotland. The author's conceptions as to what species are to be regarded as "Hill Birds" are somewhat remarkable, for he includes in this category the Woodcock, Snipe, Sandpiper, Oystercatcher and some others, which are equally at home in the Lowlands of Scotland in localities immediately above sea-level. On the other hand, he omits such characteristic sub-alpine species as the Buzzard, the Merlin and the Ring-ouzel. It is surely unnecessary to have given the French, German, Russian and other foreign names for the species treated of, and to have described their plumages and general distribution. There are numerous attractive illustrations devoted chiefly to hills and valleys, lochs and rivers which are perhaps very wisely in some instances nameless.

SOME NOTES ON BIRDS MOULTING IN THEIR WINTER QUARTERS.

By LEONORA JEFFREY RINTOUL, H.M.B.O.U., and EVELYN V.
BAXTER, H.M.B.O.U.

WE have lately had the opportunity of examining some birds in the skin collection of the Royal Scottish Museum; those to which we wish to draw attention in this paper are all birds on the British List, obtained in their far southern winter quarters. We were much interested to find such a large proportion of them in moult. Many of these birds were taken in November, a period at which we expected to find the autumn moult completed and the spring change not yet begun. This is, however, far from being the case; the great majority of those taken during this month showed distinct signs of moult, and we think it may be worth while to place on record the actual state of plumage in which we found them. Although the material is too small to warrant conclusions being drawn, we think the facts are of sufficient interest to merit attention.

The following detailed notes will show how extensive the moult is in some species:—

Two Red-throated Pipits (*Anthus cervinus*), both males from the South Andamans and taken in February (18th February 1873 and February 1874), were in full body moult; the primaries and secondaries were in excellent condition, not the least worn or faded, and the tertiaries were in moult. In each case the outer and centre pairs of tail feathers were partly in quill and not full grown. This last fact strikes us as specially interesting in view of the statement commonly accepted, that the spring moult of Pipits extends to the small feathers only. It is also noteworthy that, in both birds, the tail feathers which are coming in should be the *outer* and *centre* pairs—a most curious combination.

A Red-backed Shrike (*Lanius collurio collurio*), an adult male from Potchefstroom taken on 26th December 1876, had new feathers coming in from the nape to the tail-coverts and from the crop downwards. The primaries were old and worn,

but three of the inner ones in each wing were coming in fresh and were partly in quill. The secondaries were fresh, new tertiaries were coming in, and the whole of the wing-coverts, with the exception of the primary coverts, were in heavy moult, new feathers in quill coming in everywhere. One new centre tail feather was nearly full grown, the rest of the tail feathers being old. The fact that Shrikes moult in their winter quarters is well known, but it may be of interest to place on record the actual state of moult and date of this specimen. A Siberian Chiffchaff (*Phylloscopus collybita tristis*) from Muddapur, India, on 10th November 1880, showed no sign of moult, while of three Arctic Willow-warblers (*Phylloscopus borealis*), two had no sign of moult, though one of these, a female, taken in the South Andamans on 23rd October 1873, had the primaries very old and worn. The third, from the Philippine Islands (no date), was moulting on the back and underside, the primaries, secondaries, and tail being new. Two Isabelline Wheatears (*Ænanthe isabellina*) from India, one without a date and the other in October 1873, showed signs of moult in the small feathers.

Of two Swallows (*Chelidon rustica rustica*) from Zomba, one, taken in February 1894, had the first primary almost entirely in quill, the two outer pairs of tail feathers absent, and the third still partly in quill. The other, taken in March 1894, had the first primary in each wing only about half-grown, the old primary still remaining in one wing; the inner secondary but one was still partly in quill, and the rest of the wing feathers were fresh; the second outermost pair of tail feathers were only two-thirds grown, and the long outer pair were absent. In neither case was there any sign of small feather moult. In the *Dictionary of Birds*, p. 599, the Swallow is stated "to moult in our mid-winter or even later," but the above dates suggest that the moult may be continued even into spring. A male Swallow from Natal, unfortunately without date, is heavily in moult. We examined five Cuckoos (*Cuculus canorus canorus*), but only one, a male from Uganda, in January 1911 showed a little moult on the throat; four immature inner secondaries still remained, but a new grey feather was coming in to replace the innermost.

Turning now to the Waders, we find many of these moult after their arrival in their winter quarters. Among the most interesting birds we examined were the Ruffs (*Machetes pugnax*): of these, three adults were taken on 2nd November 1910 in Uganda. A male had feathers coming in on the top of the head and back, while the throat and breast were heavily in moult; the second primary in both wings was only about an inch long, and some of the tertiaries were partly in quill; the rest of the wing feathers and tail looked new. The other male had the second primary only about an inch and a half long, one of the tertiaries partly in quill, the rest of the plumage freshly moulted except for some of the wing-coverts, which were old. The Reeve had a lot of feathers partly in quill on the head and some on the back, while the whole under-surface was heavily in moult; the primaries, secondaries, and tail looked fresh, and some of the secondary coverts and under tail-coverts were still in quill. Two more winter Ruffs from Uganda (no date) both had signs of moult on the back; one had a secondary covert in quill, while the other had feathers coming in, in front. Another winter Ruff from Uganda showed no sign of moult, and this was also the case with a Reeve from Malta on 25th April 1874. Although the nuptial adornments of the Ruff are cast as early as July, yet it would appear that the full autumn moult is either a very prolonged operation or does not take place till a much later date, as it will be noted that all the above birds taken in November were still moulting freely. Two little Stints (*Erolia minuta minuta*) got in Egypt in September showed no signs of moult. The three young Common Sandpipers (*Tringa hypoleuca*) examined point to the conclusion that this bird migrates in its first feather plumage, moulting into its first winter dress after arrival at its winter quarters. A female, got in Uganda on 26th September 1910, was in first feather plumage and showed no sign of moult; while an October bird from Ternate had the seventh primary and some tertiaries partly in quill. A male from Santa Cruz, near Bombay, 1st November 1912, had a lot of small feathers coming in on the back and some on the head, heavy moult on the whole of the underside, and some tertiaries in quill. Of the adult Common

Sandpipers examined, one from Jeddah and one from Manilla showed no signs of moult, but one from Madagascar, unfortunately without a date, had feathers coming in on the back, while the breast was heavily in moult; the primaries were old, faded, and rather worn, the secondaries looked fresh, but the secondary coverts were old, new lesser wing-coverts were coming in, and the tail feathers, with the exception of the outer pair, were partly in quill. A female Common Sandpiper procured in Uganda on 31st July 1906 had the feathers of the back very much worn, in many cases so much so that, at the terminal part, the shaft only was left; the primaries were slightly worn, the secondaries looked new, and some of the tertiaries were fresh and some old. With the exception of the centre pair, the tail feathers looked new. This is not a date at which one would expect to find this species as far south as Uganda, and it would be interesting to know if this was a very early migrant or a non-breeding bird that had summered in its winter quarters.

The Wood Sandpiper (*Tringa glarcola*) is another species which was moulting in November: of three birds got in Uganda in November 1910 an adult male showed moult on back and crop and heavy moult on all the under parts, including the sides and flanks; the primaries and secondaries were old, some fresh feathers were growing in among the old coverts, there were one or two fresh tertiaries, and some almost wholly in quill; the tail looked fresh, and there was a good deal of moult in the upper tail-coverts. A female was moulting heavily on the back, upper tail-coverts, and breast; in the right wing the first five primaries and the four inner secondaries were old, worn, and faded, the rest fresh; in the left wing only the first four primaries and the three inner secondaries were old, the rest and the tail fresh. The other bird got during this month was a male, with the white axillaries said to be characteristic of immaturity; its plumage was faded and worn but showed no sign of moult. A fourth bird from Uganda, a female, procured on 9th October 1910, also proved interesting. Some of the upper tail-coverts were in quill, the whole underside was heavily in moult, the first three primaries were old, the rest of the

primaries, secondaries, tertiaries, and tail fresh. A bird from Malacca, without date, was also heavily in moult. A female from Uganda, taken on 5th January 1909, proved to be a very interesting bird; it was heavily in moult from the top of the head to the upper tail-coverts and all down the breast and flanks; the tail feathers, primaries, and secondaries looked fresh, the tertiaries and scapulars were worn, and fresh feathers were coming in among them. A male Wood Sandpiper from Damietta, Egypt, 11th February 1899, was in beautiful fresh plumage, the only sign of moult being one or two fresh tertiaries, which were appearing in both wings. Of three winter specimens of the Green Sandpiper (*Tringa ochropus*) the only one to show moult was a bird from Nankin, December 1901, which had feathers coming in on the back of the head and back. The only Greenshank (*Tringa nebularia*) examined, a female from Tenasserim, 20th December 1876, had a good many fresh feathers coming in on the head, back, and breast; the wings and tail seemed to be fresh, with the exception of the two centre tail feathers which were worn, as were the tail-coverts; a new feather was coming in to replace the only old tertiary left, while new scapulars were appearing among the old. A Marsh Sandpiper (*Tringa stagnatilis*), a male from Uganda, 24th November 1909, had a few feathers on the breast and one tertiary still partly in quill. The chief points of interest in connection with these notes on Wader moult seem to us to be the occurrence of moult during every month of the winter, and the fact that both old and young birds were found to be moulting after arrival at their winter quarters. It would appear to be very difficult in the case of these birds to fix any definite period at which the moult may be said to be complete.

Of two Lesser Black-backed Gulls (*Larus fuscus fuscus*), both assuming summer plumage, neither quite mature, one, a male, taken in Uganda in 1911, was in moult on the back of the head, mantle, and breast; the two centre tail feathers, some tertiaries and scapulars, were still in quill. The other, also from Uganda (no date), had a good many new feathers coming in from the back of the neck down to the upper tail-

coverts, and a few new feathers appearing on the underside ; the fourth primary was partly in quill in both wings, longer in the left than in the right, and the secondaries were fresh ; the centre pair of tail feathers were almost wholly in quill.

A Black Tern (*Hydrochelidon nigra nigra*) from the Gold Coast, an immature bird without a date, had a few feathers coming in on the back, some being black, others grey ; the bastard and second primaries and one secondary were partly in quill, and there were three fresh feathers in the tail partly in quill, the rest being old and worn. Four adult and one immature White-winged Black Terns (*Hydrochelidon leucop-tera*) were examined, all from Uganda. The immature bird was taken on 19th September 1906, and had some feathers in quill on the back ; the adults, two of which were assuming summer and two winter plumage, were more interesting. A male, procured on 5th April 1911, was in heavy moult all over the head and body ; another, assuming summer plumage, but without a date, showed heavy moult all over the body ; the tail was chiefly fresh, but one old grey feather remained and one of the new white ones was only half grown ; the sixth primary in each wing was still partly in quill, and the tertiaries and scapulars were in heavy moult : evidently this species indulges in a complete spring moult. A male got on 8th September 1906 was assuming winter dress, and had the second primary in each wing only half grown and a tail feather still in quill ; the other (no date) had a little moult on back of head, back, breast, and some tail coverts : this bird too was assuming winter plumage. Three Gull-billed Terns (*Sterna nilotica nilotica*) from Uganda all showed signs of moult. A male got on 28th November 1910 had the first (bastard), second, and third primaries in both wings partly in quill, new tertiaries were coming in, and one tail feather was partly in quill. A female obtained the same day had the first and second primaries very old and worn ; the new second coming in was quite short and in quill ; some secondaries and a tertiary were coming in fresh on each side, the left outer tail feather was partly in quill, while the corresponding one on the right side was full grown. The other bird, which was not quite adult, unfortunately had no date ; it showed a lot

of moult on the back and throat, some fresh tertiaries were coming in, and the two centre tail feathers were almost wholly in quill.

Seebohm, in his *History of British Birds*, has some interesting notes on birds found moulting in their southern winter quarters, but much seems still to remain to be learnt as to the period and other aspects of moult, and we therefore hope that the above notes may be of service. Best thanks are due to the authorities at the Royal Scottish Museum for permitting us to examine the specimens on which these observations are based.

INSECTS AND MAN. By C. A. Ealand, M.A. London : Grant Richards Ltd., 1915. Price 12s. net.

This is an excellent book. The author, by dint of careful and laborious literary research, has succeeded in producing, in well-chosen language, a capital summary of present-day economic entomology. In a little over 300 pages the reader is furnished with a concise, yet not too stinted, account of the habits and life-histories of the more important insect friends and foes occurring in all parts of the world. From a perusal of this most interesting volume it is easy to realise that insect *enemies* are much in the ascendant, and that the class as a whole is therefore inimical to human welfare. The subject matter is well arranged, the typography good, and the illustrations, which number one hundred (in addition to 16 plates) clear and well-chosen. There is a full index and a bibliography of over 200 titles, the latter enabling more detailed information to be readily found by anyone desirous of supplementing the information given in the preceding text. We can cordially recommend Mr Ealand's work as a most useful and readable epitome of an all-important and fascinating subject. It is an honest and extremely successful endeavour to compress within a moderate compass the main results of many years of research and experiment on the part of man in his effort to take full advantage of the few benefits conferred and to minimise and control the more numerous injuries caused by tiny creatures which out-number, both in individuals and in species, all other classes in the animal kingdom.

Diptera in a Forfarshire Garden.—In the volume of this magazine for 1914 (p. 240) I recorded a few Diptera taken in my garden here. During the present year specimens of the following have been taken, all of which seem to deserve notice. (1) *PACHYMERIA FEMORATA*, F. As is well known to Dipterists, the male of this species, in common with others of the Empidæ, has the remarkable habit of catching other flies as prey, which are transferred to the female at the time of pairing. The exact meaning of this strange procedure is not known: it is apparently essential to the act of copulation, as the female is only seen with prey at this particular time, and it has been proved that it is always provided by the male. A small swarm of males was noted at 9 A.M. on the 10th of June flying under a chestnut tree. The morning was very bright, and by standing under the tree and keeping the flies between me and the light, it was seen they were all carrying prey. In each case the wings of the captured fly hung down below the body of the *Pachymeria*. Eight males were caught with the net (one at a time) and the prey consisted of *Dilophus febrilis*, L., *Bibio varipes*, Mg., *Hydrotea occulta*, Mg., *Fannia armata*, Mg., *F. manicata*, Mg., and two species of *Phorbia* which I cannot identify. All the prey were males. No female *Pachymeria* was taken flying, but later on I caught a pair *in coitu*, and the female had a male of *Dilophus febrilis* as prey. (2) *VERRALLIA AUCTA*, Flh., two males on 22nd June. This interesting fly is parasitic on Frog-hoppers. It has been recorded from Aberfoyle and Bonhill. (3) *ROESSELIA ANTIQUA*, Flh., a female on 6th June, my first capture of this peculiar Tachinid, and my only Scottish record is Orkney (*Ann. Scot. Nat. Hist.*, 1905, p. 27). (4) *METOPTIA LEUCOCEPHALA*, Rossi. Several in June flying over the surface of the ground in bare places. A number of Aculeate Hymenoptera occur in the garden, but I could not associate the Tachinid with any of them. (5) *OPHYRA LEUCOSTOMA*, W., occurred in fair numbers in June and July hovering in small swarms near trees. Their deep blue-black bodies sparkled in the sun. Scottish records of this local fly are all from Perthshire. (6) *PEGOMYIA SQUAMIFER*, Stein, a female of this recent addition to the British List occurred on 30th August.

Of those mentioned last year, *ANTHRAX PANISCUS*, Rossi, again occurred, and *MERODON EQUESTRIS*, F., was abundant, all the varieties mentioned by Verrall being taken.—A. E. J. CARTER, Monifieth.

THE HABITS AND LIFE-HISTORY OF *HYLEMYIA GRISEA*, FALL., AN ANTHOMYIID FLY NEW TO THE SCOTTISH FAUNA.

By (Miss) L. H. HUIE, F.E.S.

THE following notes on *Hylemyia grisea* are the outcome of observations made during visits to Argyllshire. *Hylemyia grisea* has not before been recorded from Scotland, and till now there has been no definite information¹ as to its life-history or the feeding habits of its larvæ. The only statement has been the general one by Zetterstedt that the larvæ live parasitically on the larvæ of Hymenoptera Aculeata.

The wild bee *Andrena analis*, Panz., nests in banks of sandy earth, and in many parts of our West Highlands is very abundant. Although a solitary bee, it is gregarious, and the burrows are often so numerous and close together that it is difficult to decide in making an excavation, whether an exposed set of brood chambers is the work of one bee, or of more than one. The task of investigating an individual burrow from orifice to brood cells is obviously difficult because of the tendency of the sand to fall in and obliterate the tunnel. The plan adopted by me was to insert a small pencil to about half an inch, and carefully scrape away the sand until the pencil was again entirely exposed; then re-insert it and repeat the scraping, sometimes also moistening the excavation with water. Working in this patient way I made out that the burrows usually slope inwards and downwards; a few are nearly vertical. When the burrow has reached a point about $1\frac{1}{2}$ or 2 inches below the soil, that is, a point that might be 3 inches from the entrance of a sloping burrow, the brood chambers may be found. These chambers are just large enough to hold the pupa comfortably;

¹ The adult fly has been described in *Diptera Scandinaviæ* (tom. iv., p. 1422) by Zetterstedt; and in *Dipterologia Italica* (vol. iv., p. 181) by Rondani. All that Schiner says is that the larvæ are found in nests of Hymenoptera.

they are smoothwalled and lined with a varnish that probably keeps them dry. The burrow itself is not so varnished. The full number of brood cells according to my observations is six. Each burrow with its brood chambers is a self-contained dwelling, there being no common tunnel of communication between the nests of the various bees as is the case with *Halictus*. Before ovipositing, *Andrena* provisions the brood cell with a store of food for the future larva, in the form of a paste of honey and pollen worked into a pill-like ball; upon this she lays her egg. The rate of manufacture of the pollen balls and doubtless also the length of the period of incubation of the egg, depend on weather conditions to which the *Andrena* bees are very sensitive. In dull cold weather they remain within their burrows in an inactive state — males as well as females. When the burrowing instinct is upon her, a bee will work very rapidly. One captured in the act of commencing to excavate, was put into a tumbler, three quarters filled with sand well pressed down. As the bee became much excited on finding herself imprisoned, the covered tumbler was placed in a dark cupboard, and when, an hour later it was examined, the bee had entirely disappeared within a burrow she had made.

In excavating many burrows in a sandy bank in Argyllshire during the first half of July I found the contents of the brood chambers varied considerably. Some contained a tiny globular crumb of pollen paste, the nucleus of a pollen ball; others a full-sized ball. Others held a ball being devoured by a newly hatched, or a large bee grub; and in a few it was found that a dipterous maggot was eating the pollen ball. On sunny July days this crowded sandbank presents an interesting spectacle. Numbers of bees may be seen returning to their nests, the masses of yellow pollen with which they are laden rendering them conspicuous objects as they fly. But the sandbank is also the haunt of a grey fly, an apparently lethargic creature that spends the bulk of its time sitting motionless on stones or heather-stems among the bee-burrows. As the pollen-bearing bees arrive, and hover over the bank, each looking for her own entrance hole, the flies rise into the air to meet them, and each fly

singles out a laden bee in order to follow her closely while she flits over the bank, or hesitates a little on the ground, before disappearing within her own burrow to deposit her stores. The fly now takes up a position outside the entrance and facing it, and all the time the bee remains underground unlading and adding the fresh pollen to her ball of nutritive paste—a proceeding which consumes fifteen or twenty minutes—the fly remains motionless. Presently the bee appears at the entrance of her burrow, pausing there before again taking flight in search of further supplies. The fly may betray her eagerness by a forward step or two. A minute or so more and the bee has flown. The fly now darts into the burrow, examines the passage for a second or two, comes out again and re-enters backwards in order to lay an egg on the floor of the burrow, not more than half an inch from its entrance. This is accomplished usually in less than a minute, and the fly has gone long before the return of the bee. From a favourable position one need not lose sight of the ovipositing fly, and the egg can be obtained by lifting the sand from the spot on the blade of a pocket-knife. Should the bee not come out again, as often happened owing to the departure of the sunshine, the patience of the fly becomes in time exhausted and she moves away. At times bees will return to the sandbank bearing no pollen. The flies will spontaneously rise to greet them, but perceiving the absence of the pollen load they make no pursuit.

This then is the state of matters in July:—A dipterous maggot in the bee's nest and a fly laying eggs at the entrance. Two questions naturally suggest themselves. Is the maggot the offspring of the fly; and if so, how is the egg taken down to the nest?

Many burrows were investigated and brood chambers containing fly maggots in the act of devouring the pollen ball were again and again found. Sometimes the chamber was removed almost intact so that the maggot suffered little disturbance and continued to eat the pollen while watched under a lens, but light proved unpleasant to these larvæ, and a few minutes' exposure to it caused them to stop eating and to seek darkness. Placed in small tin boxes containing sand,

the fly maggots burrowed into the sand to avoid the light. I then made two little pits in the sand as far as possible from where the maggot had disappeared. In one pit I placed a pollen ball and in the other a bee grub. Invariably the maggots found the pollen ball and ate it, totally neglecting the bee grub, which itself was too helpless to find the pollen ball. This experiment was repeated many times with fly maggots, each placed in a separate box with a pollen ball and a bee grub. Eventually all these maggots became full fed and pupated. This proves that the food of the fly maggot is the stored pollen and that this larva can complete its entire growth on this diet. I have one record that seems to show that if supplied with insufficient pollen paste the maggots would eat bee grubs. A small fly larva, and a young bee grub were placed in a pill box along with two portions of a pollen ball which quickly became mouldy. The bee grub ceased to eat. The fly maggot first devoured all the pollen food, and then attacked the bee grub.

I never found a maggot eating a bee grub in the brood chamber and never saw any remains of a bee grub that had been eaten. Neither did I ever find both a maggot and a bee grub present in the same brood chamber. That the main food of the maggot is the pollen ball is beyond doubt. I do not wish to convey the impression that a large proportion of bees' nests contain maggots. Only a small proportion were thus parasitised, a much smaller proportion than might be expected from the activities of the female fly. Incidentally I may remark that fungus proves a formidable enemy of both bee and fly larvæ. On many occasions, especially in the wet and warm first fortnight of last July, it was common to find larvæ and pupæ of *Andrena* and larvæ of *Hylemyia*, and the pollen ball also, enveloped in mycelium; as the fungus was not found in the spore stage I am not able to say the species.

After an absence of some weeks I revisited the bee colonies towards the end of August. No flies were to be seen, and in the bees' nests all stores of pollen had been devoured. The full-fed bee grubs were lying ready for hibernation, while most of the dipterous larvæ had already pupated.

Some full-fed fly larvæ were in 1913 still found in brood chambers as late as the third of September. They pupated during the following night. These puparia and a few others were taken to Edinburgh, and passed the winter in a small flower-pot filled with sand, protected from dust by a muslin cover, kept in a cool room, and from time to time watered. From these puparia five flies of the same species as those that haunt the bee colonies emerged in the first week of June 1914. One was a male; the others, female. They were fed on brown sugar and raw beef. They preferred the beef, from which they completely sucked the juices. They showed

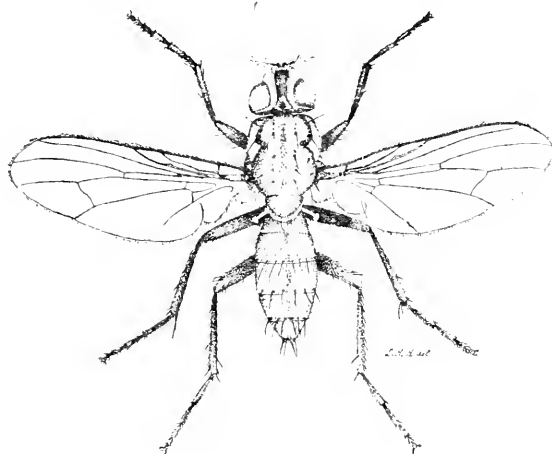


FIG. 1.—Adult female of *Hylemyia grisea*. $\times 5$.

no inclination to pair, perhaps because they were kept too much in the shade. At the end of about two weeks they died. Two of the females were used for dissection. The ovaries consisted of twelve ovarian tubes, six on each side of the body.

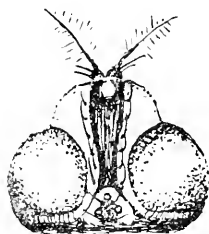
Specimens of the fly were sent to Dr Stein of Treptow, who identified the species as *Hylemyia grisea*, and added the information that "the larvæ live in the nests of Hymenoptera."

My figure 1 represents the female fly, of which I offer the following description:—

Body narrow, conical, $7\frac{1}{2}$ to 8 mm. long, with a wing-spread of about twice that measurement.

Thorax, scutellum, and abdomen pale ash grey in colour.

Head prominent, frons projecting, especially in the male (Fig. 2). The eyes reddish, sub-approximate in the male, far apart in the female. Cheeks white and glistening. Fronto-orbital bristles stout.



♂ H. H.

FIG. 2 —Head of adult male.

Antennæ black, arista long, tapering, feathered on both sides. *Palpi* long, cylindrical, black with yellow bases.

Thorax with a broad median brown stripe, and a more slender and less distinct brown stripe towards each side—on which are situated the inner row of dorso-central bristles, which are very strong. There is on each side a further more or less distinct brown mark bounding the post-humeral region.

Scutellum unstriped.

Abdomen bristly. In the male narrow cylindrical with a very dark median line, in the female more conical with a less distinct dark median line.

Wings hyaline, tinged towards their bases with yellow. Costa ciliate, with some short stiff very sloping spicules; the equally sized squamæ yellowish-white, ciliated; halteres yellow.

Legs rather long. Femora and tibiæ grey, thickly clothed with black hairs; hind tibiæ bristly; tarsi black. Pulvilli and claws small in the female, very large in the male.

HABITAT.—Chiefly near the seashore, for the most part in sandy places.

The following note by Meade appeared in the *Ent. Mo. Mag.*, for Feb. 1899, and shows that the fly has once been recorded from England

“H. GRISEA.—Mr Beaumont sent a specimen of this well-marked species (frequenting the nests of Hymenoptera) which he had captured at Oxshott, in Surrey. It is narrow, conical and pale ash-grey in colour, about 8 mm. long, with a long-haired arista, a very prominent forehead and face (buccate) and sub-approximate male eyes. The thorax has three sub-distinct dark stripes. The palpi antennæ and legs are black. The wings have a yellow tinge.”

The EGG is oval, the surface shows a honeycomb pattern. As previously stated it is laid on the floor of the burrow, just within the entrance; this I observed many times. I

hope to ascertain by further observations how the *Hylemyia* larva reaches the pollen ball. I have never discovered what is the fate of the bee grub for which the pollen ball eaten by a maggot was destined. If the fly maggot hatches out and commences to eat the ball before its completion by the bee, it may be well imagined that no bee's egg would be laid. Otherwise the maggot must devour the unhatched egg or the young grub. That the dipterous egg is the earlier to hatch out can hardly be doubted, since it is laid during the manufacture of the pollen ball, while the bee's egg would not be deposited till after its completion.



FIG. 3.—Mature larva of *Hylemyia grisea*.

The LARVA of *H. grisea* is represented in Fig. 3 (the specimen from which the drawing was made having been preserved in alcohol had undergone some contraction). A full-grown larva measures about 9 mm. The most striking character of this maggot is the great breadth of the hinder portion of the body. The cuticle is thin, and very free from spines. There are thirteen segments of a yellowish white colour. Immediately behind the well-developed mouth-hooks (Fig. 4) are the minute two-jointed antennæ (Fig. 4) and the slightly more laterally placed sensory spots (Fig. 5). The prothoracic spiracles have thirteen stalked lobes (Fig. 6).



FIG. 4.—Buccal-pharyngeal apparatus of mature larva, drawn from a preparation cleared in caustic potash. \times about 40.

The hind face of the last segment exhibits the two distinct areas usual in the larvæ of most Anthomyiidae, the oblique dorsal portion bearing the spiracular area, and a truncated anal region (Fig. 7). The three openings of the posterior spiracles are arranged in the form of a trefoil, and the spiracular area is surrounded by six pairs of fleshy pointed tubercles (Fig. 7).

THE PUPARIUM (Fig. 8).—Length 7 to 8 mm. Oblong oval or almost cylindrical, somewhat conical at the anterior end and blunter at the hind end. Bright golden brown when wet, dull pinkish brown when dry; often much darker towards the extremities. Segments more clearly defined at the sides than on the ventral and dorsal aspects. On the dorsal surface the segmentation is only faintly traceable. Cuticle thin, and little wrinkled. Prothoracic spiracles of the larva still conspicuous as blackish ridges. Posterior tubercles and anal lips clearly discernible.

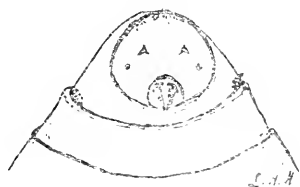


FIG. 5.—Three anterior segments of mature larva, ventral aspect, to show position of antennae and sensory spots.

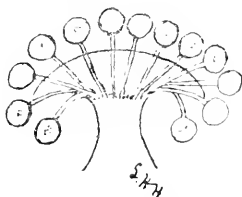


FIG. 6.—Prothoracic spiracle of mature larva. (Greatly magnified; camera lucida drawing.)

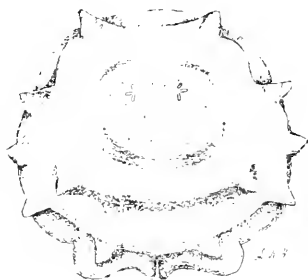


FIG. 7.—Posterior face of ultimate segment of mature larva, showing tubercles and posterior stigmata.



FIG. 8.—Puparium of *Hylemyia grisea*.

As regards the life cycle of *Hylemyia grisea*, there is one generation in the year, and the winter is passed in the pupal stage. I found flies in June and July; eggs in July; larvae in July and August; and puparia in September, October, November, December, January, February, March, April and May.

In concluding this paper I wish to acknowledge my indebtedness to Dr R. Stewart MacDougall for his constant kindly interest and many helpful suggestions.

COLEOPTERA FROM AUSKERRY, ORKNEY.

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

THE following beetles were collected by Mr Eagle Clarke on Auskerry, one of the most easterly of the Orkney Islands, in September 1913. As explained by Mr Clarke in his paper (*Scot. Nat.*, 1914, p. 5) on the birds he met with there, Auskerry is a small low-lying and—but for the lighthouse people—uninhabited island of some 260 acres. Near the cliff-edge there is, he tells me, a small loch said to be fed by a spring and having no visible outlet; from its margin most of the water-beetles were obtained. Our knowledge of the Coleopterous fauna of the Orkneys rests mainly on a paper by B. Poppius (1904-5) in which he records not far short of 200 species and varieties collected in these islands by the late O. M. Reuter of Helsingfors, Finland, in the summer of 1876. A few species from Hoy have been recorded by W. E. Sharp. For the Shetlands we have Blackburn and Lilley's list (1874), Hudson Beare's for Fair Isle (1906, recording specimens collected by W. E. Clarke), and that of Poppius included in the paper above referred to.¹ It would appear that the majority (fourteen or so) of the species noted below from Auskerry have not previously been recorded from Orkney; all but five (perhaps six) are, however, on record for Shetland. In the case of the two Cholevas and one or two other species I am indebted to Professor Beare for kindly checking my determinations.

LIST OF SPECIES.

Carabus catenulatus, Scop.—One specimen.

Nebria brevicollis, F.—Two specimens.

Loricera pilicornis, F.—One specimen.

Pterostichus nigrita, F.—One.

¹ Full references to these papers will be found at the end of Anderson Fergusson's Supplement to Dr D. Sharp's "Coleoptera of Scotland" published in this magazine in 1913-14. Prof. Beare's Fair Isle list appeared in the *Ann. Scot. Nat. Hist.* for April 1906, as well as in the *Ent. Mo. Mag.*

Trechus minutus, F., race *obtus*, Er.—Two.

Hydroporus erythrocephalus, L.—Twelve.

Hydroporus pubescens, Gyll.—One.

Agabus bipustulatus, L.—Thirty-one.

Gyrinus natator, Scop.—Seventeen; from peat-pools on moor.

Hydrobius fuscipes, L., race *picicrus*, Sharp.—Nineteen. I am not aware of any record of this species from either Orkney or Shetland.

Homalota currax, Kr.—Two. The same remark applies to this.

Quedius mesomelinus, Marsh.—Two. It is possible that this is the same as *Q. fulgidus* of Blackburn and Lilley's Shetland list.

Ocytus olens, Mull.—Four examples.

Philonthus decorus, Grav.—One.

Oxytelus laqueatus, Marsh.—One, var. with dark elytra. Not recorded from either Orkney or Shetland so far as I have seen, and the same remark applies to the next two species.

Choleva morio, F.—Four, all males.

Choleva chrysomeloides, Panz.—Six (2 ♂, 4 ♀).

Aphodius contaminatus, Herbst.—Thirteen.

Otiorrhynchus maurus, Gyll.—One specimen. This is a mountain insect on the mainland of Scotland.

I may add that on 2nd September 1913, Mr Clarke saw immense numbers of *Chrysomela fastuosa*, L., specimens of which he has shown to me, between Stromness and Stennis. They were scattered along the roadsides for miles. The species, however, had already been recorded from Orkney.

The Generic Names of the Swallows and Divers.—

British ornithological opinion has been divided of late regarding the correct generic names for the Swallows and Divers—should it be *Hirundo* or *Chelidon* for the former, and for the latter *Colymbus* or *Podiceps*? In *The Auk* for October (p. 525) is an expression of American opinion on the subject, wherein it is declared that the type of *Hirundo* is *rustica* and that of *Colymbus* is *arcticus*, and the nomenclature of the *A.O.U. List of American Birds* is to be altered accordingly. This finding confirms the opinion of the Authors of the *B.O.U. List of British Birds* on these vexed questions in nomenclature.

NOTES.

Birds attracted by Lighted Tents.—When in camp at Glencorse, I was interested in observing on 18th September at 10 P.M., a large flock of Golden Plover hovering round the camp, evidently attracted by the whiteness of the tents. Their general behaviour was not unlike the flitting to and fro of bats. They kept very low but none came in contact with the tents. On the 23rd September at 10.30 P.M., during a dense fog, a flock of Black-headed Gulls, apparently lost in the mist, kept flying round the tents, till shortly after midnight when it became clear. During the night of 7th to 8th October I heard small birds twittering, evidently unable to locate their bearings in the mist. These I think were mostly Pipits and Wagtails, and next morning the whole place was dotted with Pied Wagtails, very tame. There were some sixty or seventy searching the gravel for insects on the barrack square. All these birds seem to have been under the influence of the white tents and the lamps which shone through them, the whole having much the same effect as a lighthouse.—FRED S. BEVERIDGE, 3rd Batt. Royal Scots.

Strange Diet of the Song Thrush.—Over a year ago I recounted in the "*Scottish Naturalist*" an interesting incident in regard to Song Thrushes feeding their young with the full-blown flowers of the common daisy. By coincidence in the same issue Mr William Evans recorded that he had observed a Blackbird indulging in a similar diet. Last spring I again saw evidence of the Song Thrush extending its bill of fare in flower dietary. On this occasion I observed the full-fledged young being supplied with the flower-heads of the Meadow Rush (*Luzula campestris*) which they eagerly accepted from the parent bird as she plucked them from the stem. As on the previous occasion, this incident took place in the Edinburgh Botanic Garden.—J. KIRKE NASH, Edinburgh.

Uncommon Birds in Orkney.—On 6th October I was taking my usual turn round the island, beating up the turnip and potato patches, though in no great hope of seeing anything uncommon, nothing having been on the island for the last week, in spite of the wind having been easterly. However in the last patch of turnips I flushed a Yellow-browed Warbler (*Phylloscopus superciliosus*) and next day, there being a moderate gale from the south-east, on the lee side of the island on the grassy side of a small geo, I saw a

Red-breasted Flycatcher (*Muscicapa parva*) sitting with spread tail and the white tail patches showing clearly. I identified it at once, it having been my good fortune to have got this species before. On the afternoon of the 16th October I saw two Shore Larks (*Eremophila alpestris*) feeding on a tuft of Sea-pinks.—JOHN BAIN, Swona Fog-signal Station, Orkney.

On 8th October I procured a bird in the lighthouse garden, and not being very sure what it was, sent it to Mr Eagle Clarke, who kindly informs me that it was a Yellow-browed Warbler (*Phylloscopus superciliosus*). The following day two more were seen catching flies in the garden; I had no difficulty in getting quite close to them, and having had an excellent view of them, have no doubt that they belonged to the same species.—JOHN G. THOMSON, Pentland Skerries Lighthouse, Orkney.

Crested Titmouse in East Rosshire.—At the meeting of the British Ornithologists' Club on the 10th of November, Mr Ogilvie Grant exhibited a male specimen of the Crested Titmouse (*Parus cristatus scoticus*) one of several which he observed on 18th October in company with a large travelling flock composed of Coal Titmice, Long-tailed Titmice, Goldcrests and one or two Tree Creepers. This flock when under observation was feeding in the tops of some large Scotch fir-trees. This is the first authentic instance of the occurrence of this bird north of the Moray Firth. (*Bull. B.O.C.*, xxxvi., p. 10.)

Bee-eater and Yellow-browed Warbler in Shetland.—A female Bee-eater (*Merops apiaster*) frequented the neighbourhood of Lerwick from the 4th to 11th of July last and appeared to be a female. A Yellow-browed Warbler (*Phylloscopus superciliosus*), a female, was procured at Lerwick on the 18th of October.—GEORGE W. RUSSELL, LERWICK.

Great Grey Shrike in Dumfriesshire.—I hear that my gamekeeper shot a Great Grey Shrike (*Lanius excubitor*, Linnæus) at Capenoch, Thornhill, Dumfriesshire, on 16th November 1915. It was of the single-barred variety with black bases to the secondaries, which variety was at one time regarded as a distinct species (*Lanius major*, Pallas). So far as I am aware, the last specimen of a Great Grey Shrike to be killed in Dumfriesshire was shot at Newtonairs on 27th December 1906.—HUGH S. GLADSTONE, War Office, London.

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[FEBRUARY

EDITORIAL.

WE have been favoured by the author, Dr James Ritchie, with a reprint of an interesting paper, entitled "The Animal Remains from Constantine's Cave, Fife Ness."¹ The material examined was derived from a stratum $2\frac{1}{2}$ feet thick in its thickest part and about a foot below the present surface. It was associated with many relics of human habitation, and revealed a great variety of animal life. The list of mammals represented includes the Wild Cat, Badger, and Grey Seal, a species of Whale (possibly the Pilot Whale), the Wild Boar, Red Deer, Short-horned Celtic Ox, Turbary Sheep, Horse, and Rabbit. Of birds we notice the Shag, a species of Goose, a Gull (possibly the Herring Gull), and the Red-throated Diver. Some bones of a fish's skull, probably the Haddock, were also found, while many "pincers" of the Edible Crab and five species of Mollusca close the list. The bones of many of the mammals showed evidence of the work of human implements, most of which appear to have been fashioned from the antlers of the Red Deer.

The food of the Crossbill forms the subject of a recent

¹ *Proceedings of the Society of Antiquaries of Scotland*, vol. xlix., pp. 251-55.

paper by C. B. Moffat,¹ one of whose objects is to induce observations likely to throw light on the question of the particular conifer preferred by the birds now settled in Ireland. The two invasions of 1888 and 1909 are contrasted, inasmuch as the Crossbills of the former year and their descendants appeared to feed principally on the seeds of the larch, while those of 1909 and subsequent years, probably derived from a second large incursion, seemed to favour the Scots pine. The author suggests that this difference in taste may indicate that the Crossbills arriving in Ireland in 1909 may have come from a different part of Europe from that which sent out the migration of 1888. He remarks upon Seebohm's statement to the effect that the Parrot Crossbill feeds on Scots pine while the Common Crossbill restricts itself to the spruce and larch, and criticises Selous' theory (founded on this statement) that the former is a stronger and newer bird evolved from the latter "by the necessities of its heavier task when reduced to feeding on Scotch fir-cones." In Mr Moffat's opinion the exact opposite is more likely to have been the case, since the cones of the spruce and larch present no difficulty to the much smaller Siskin, Lesser Redpole, and Goldfinch, and that therefore "the earliest Crossbill would never have needed to *be* a Crossbill at all unless it had wanted to force open cones with a strong close structure like those of the Scotch fir." Lastly, the author states that in the south-eastern part (and probably throughout the rest) of Ireland the Crossbill seems never to touch the cones of the spruce, a fact which requires some explanation.

A paper by J. C. Adam, in the recently issued part of the *Transactions of the Edinburgh Field Naturalists' and Microscopical Society*,² entitled "A Pair of Long-eared Owls," should appeal to those of our readers—and we hope they are many—who are interested in "that elusive entity, the bird behind the feathers." For two consecutive years, 1910 and 1911, the owls, which inhabited a wood of Scots pine and spruce in West Lothian, were closely watched by the author and S. E. Brock, and the almost daily, or rather

¹ *Irish Naturalist*, January 1916, pp. 1-6.

² Vol. vii., parts ii., iii., pp. 63-91, 1915.

nightly, observations made are narrated in ample detail in the paper under the three divisions, Pre-nesting Period, Nesting Period, and Post-nesting Period. A summary of the deductions to be drawn from these observations would have added much to the value of the paper. Whatever light it may shed on the behaviour of the nightbirds, it bears eloquent testimony to the patience and tenacity of the observers in carrying out their self-imposed task.

In the January number of *British Birds* (vol. ix., pp. 197-208) no fewer than six species and subspecies are recorded as new to the British List. They are the following : Moustached Warbler (*Luscinola melanopogon melanopogon*), Olivaceous Warbler (*Hypolais pallida pallida*), North African Black Wheatear (*Enanthe leucura syenitica*), Cape Verde Little Shearwater (*Puffinus assimilis boydi*), North Atlantic Great Shearwater (*Puffinus kuhlii borealis*), and Grey-rumped Sandpiper (*Tringa incana brevipes*). It appears to us not a little remarkable that all these birds were picked up or shot on the coast of Sussex within a limit of twenty miles. We should have liked more precise details regarding the actual capture of these birds.

The libraries of our British entomologists have received a welcome addition through the publication of an important volume on Ants, by H. St. J. K. Donisthorpe.¹ In the limited space at our disposal it is impossible to do justice to a book consisting of 373 closely printed pages, stored as they are with an immense number of facts, and we may therefore remark at once that the work, which embodies the results of over twenty years' continuous labour and research, is quite indispensable to the student of British Hymenoptera. We are much pleased with the general appearance and arrangement of the book, its clear and well selected type, and the unusual abundance of excellent illustrations. The systematic part of the volume is preceded by several sections (there are no "chapters") giving a clear and sufficiently detailed account of the structure, external and internal, of ants in general, after which follow others of perhaps wider interest, since they deal with the details of life and habit

¹ *British Ants, their Life-history and Classification*, 1915.

presented by these fascinating insects. The psychology of ants, their distribution in space and time, and the practical methods of collecting and observing, are also discussed in turn, and then follows the main portion of the book, which treats of the various genera and species found in Britain, systematically and exhaustively. In this section will be found, as we should naturally expect, full details of distribution, and here (for example) the Scottish worker may learn at once in what counties any particular species has been observed. Of special interest are the lists of insects of other groups (known as myrmecophiles) which are found associated with the various species of ants in their nests, and in this branch of the subject Mr Donisthorpe is specially qualified to speak. We offer him our hearty congratulations on the completion of this volume, which is indeed a work of the first importance.

Black-headed Gulls at Inver, Dunkeld, in winter.—In the *Scottish Naturalist* for January 1916, there is a Note by Mr Fred. S. Beveridge on Birds attracted by Lighted Tents, in which he speaks of the visits of Black-headed Gulls to the camp. My friend, Mr Charles M'Intosh of Inver, near Dunkeld, a well-known local naturalist, writes to me regarding a similar occurrence at the Scottish Horse Camp at Inver. He says, "They came early last spring, and were then in their summer plumage. They continued to frequent the camp till about the 15th December last, although the Braan was often covered with ice. The latter end of December was milder, with much rain, and heavy floods of the river. It was then that the gulls left. So far as I can ascertain, the Black-headed Gull was never before seen in this district in its winter plumage, *with the head white*. No doubt it was the camp refuse that induced them to remain in the district so long past their usual time."—HENRY COATES, Perthshire Natural History Museum.

NOTES ON MIGRANTS AND MOULT, WITH
SPECIAL REFERENCE TO THE MOULTS
OF SOME OF OUR SUMMER VISITANTS

By CLAUD B. TICEHURST, M.A., M.R.C.S., M.B.O.U.

IN "*The Scottish Naturalist*" for November 1914, there was a paper by Miss Baxter and Miss Rintoul on "Some Passerine Birds found migrating in Moul't," in which I was very interested, and as this is a subject to which I have long given attention I thought it would be of some interest to give my experience, which is founded on birds known to have been on migration and which for the most part are in my collection and have either been obtained by myself in Orkney or the coasts of Yorkshire and Suffolk, etc., or have come from St Catherine's Lighthouse (Isle of Wight) or some other Light. The number of specimens cited does not always accurately represent the number of birds handled, as I have received many of the commoner species from the Lights which, not being in moul't, were not always preserved.

The few Corvidæ handled (Rooks, Grey Crows, Jackdaws) have not shown any moul't, nor have the vast majority of Starlings, though I have seen odd birds retaining some of the juvenile plumage. Of Siskins, six out of seven at the end of September have some feathers of the crown and chin still in quill, and one has a few old juvenile feathers; one adult at the end of August has the first primary not fully grown. About a score of Redpoles were all apparently fully moul'ted, and the only Goldfinch, a coastal migrant, was in full body moul't, much of the juvenile plumage yet unmoul'ted. A fair number of Bramblings, Greenfinches and Treesparrows in autumn have been examined, but only a single Greenfinch on 14th October showed any moul't, a few feathers on the chin. Of nine Crossbills (old and juvenile birds), five showed some moul't of body feathers, while two were still in juvenile plumage. My experience in Buntings coincides with that of Miss Baxter, none of them (Reed, Ortolan, Little, Lapp, and Snow Buntings) showing any moul't. Of hundreds of Skylarks I have not detected any in moul't.

Of Tree Pipits I have seven spring birds in April and May; these are all slightly to moderately worn all over, none in moult; this species moults, in February and March, the body feathers, often including the tertials, some of the wing coverts, and the central tail feathers. Of autumn birds, three are adults with the first two primaries still in quill and are still moulting in the chin, the rest are in first winter plumage and show no moult. Meadow Pipits moult at the same time as does the Tree Pipit, but I am not sure that every individual completes the moult. Of two at the end of March, one is just completing a full body moult (including the tertials) with the central tail feathers not fully grown, the other is in fresh feather moulting still on the forehead; another on 11th March is worn all over, but some new feathers show here and there, but none in quill; again one on 31st March has only changed a few feathers including the tertials, but the tail, tail coverts, and most of the body plumage is worn, no feathers in quill. One on 1st May is moderately worn all over. Of autumn birds, three at the end of September show no moult and one on 10th September has a few crown feathers in quill.

I have only three Grey Wagtails, 27th September and 12th October, no moult, and only one autumn Pied Wagtail, an adult which, on 15th October, still has a few body feathers in quill; of five spring birds, two (26th February and 10th March) are in fresh summer plumage, two on 20th March have a fair number of body feathers in quill, and one on 30th March has also a few. Of white Wagtails, eight spring birds (6th to 17th May) are all more or less worn, which is what one would expect seeing that this species goes through much the same amount of moult at the same time of year as does the Tree Pipit; five September birds show no moult. Three Yellow Wagtails in first half of April and one on 8th May are but slightly worn and show no moult, but two young birds performing a coastal migration on 6th August and 3rd September are performing a full body moult.

The only Tits I have are six Continental Great Tits (first half of October) and one British Long-tailed Tit (27th October); none show any moult. Some fifteen Goldcrests examined

(15th September to 25th October) exhibited no moult, neither did one on 11th March.

Spotted Flycatchers (six in May) are slightly worn but none in moult, but of nine autumn birds there were only two which did not show active moult:—thus two adults at the end of August are in full body moult, including tertials and great coverts but not the flight or tail feathers which, in spite of belonging to the old breeding plumage, are not so greatly abraded; two young birds (mid-September) and one (2nd October) have a few body feathers still in quill, and two (14th September and 2nd October) have a considerable trace of the juvenile plumage unmoulted. Birds obtained in their winter quarters show that this species has a spring moult; thus one on 7th February is very worn all over; others in March are moulting the body feathers, tail, median and lesser coverts and some of the greater coverts, while the tertials look quite fresh. Seven Pied Flycatchers (end of April or early May) are all in fairly fresh plumage all over, and of ten autumn birds, one on 14th August has a few body feathers in quill, and one (2nd September) in addition has a sprinkling of juvenile feathers left, while a Red-breasted Flycatcher on 22nd September also shows a few juvenile feathers unmoulted.

The results of my examination of the *Phylloscopi* bear out those of Miss Baxter and Miss Rintoul: briefly I find that Willow Wrens, Northern Willow Wrens, and Chiffchaffs on early spring migration are in but slightly worn and Wood Wrens in very fresh plumage, but here and there one may find a bird (*e.g.*, a Chiffchaff on 20th March) with feathers of two ages, the one fresh, the other very worn; our *Phylloscopi* have evidently moulted since they left us in the autumn. Turning to evidence from specimens obtained in the winter quarters, I find that Chiffchaffs in February which I have examined are *in very worn plumage all over*, so that one may surmise that this species moults some time between then and their arrival here; whether all moult completely or not is uncertain, but the specimen above alluded to had only done a very partial moult. Willow Wrens from Africa in November are very

worn, especially on the wings and tail, one adult on 16th December is also in very worn plumage, one (bird of the year) on 17th December has the old plumage very worn, but the *moult of the body, wings and tail has just commenced*. I have examined a good many specimens in February from very different parts of Africa—all are in full moult, the wings and tail nearly through, some show feathers of the head and neck still unmoulted and very abraded; two examples in March (*Ph. t. eversmanni*) show a stage further, entire moult nearly complete, but still odd feathers have not been cast. From this it seems that Willow Wrens do a complete moult in December to February, but that individuals may retain some old feathers. Wood Wrens I have not seen from the winter quarters, but from the extreme freshness of the plumage of April birds it cannot be doubted that they also do a complete winter-spring moult. The Siberian Chiffchaff would appear also to have a spring moult. I have examined birds at the end of March which are in full body moult, with the central pair or two pairs of tail feathers and inner tertials fresh, the wings and rest of tail being moderately worn. Of many autumn *Phylloscopi* examined only two Willow Wrens show odd body feathers in quill; all are in fresh moulted plumage.

Some Sedge Warblers at any rate moult in spring, others apparently do not; nineteen specimens, 29th April to 16th May, one (2nd May) is in quite fresh body feather, chin in quill, two others (same date) are very worn, but one has some chin feathers in quill, in all three the wings and tail are but slightly worn; again one on 29th April is in fairly fresh feather, and another (5th May) is extremely abraded all over; all the other specimens are fairly worn.

Of nine autumn specimens only one shows moult, an adult (11th August) has the body and half the tail in full moult, but the wings are old. Reed Warblers (14th April to 2nd June) are only slightly worn everywhere, but two autumn birds (30th September and 27th October) have a few body feathers still in quill. Grasshopper Warblers on arrival here are in fresh plumage all over. Some specimens of Blyth's Reed Warbler certainly moult in

spring, body and tail or part; others do not appear to do so.

My experience of Whitethroats seems to be much the same as that of Miss Baxter and Miss Rintoul: thus, of twenty-three spring Common Whitethroats, three specimens show active moult; one on 6th May has a few chin feathers in quill, and another (same date) has odd body feathers in quill and many old worn feathers, another (29th April) has the central tail feathers not fully grown. Of the rest, some are in fairly fresh plumage everywhere, some are very abraded everywhere, but many show feathers of two ages, *i.e.*, quite fresh and quite abraded, but no active moult; thus one on 7th May has part of the upper tail coverts, part of the body plumage, and the central pair of tail feathers quite fresh, the rest very worn, the wings are abraded but some of the inner secondaries seem newer. That some Whitethroats of both species moult in spring and others do not has long been known to me, and the same explanation had often occurred to me, *viz.*, that only the birds of the previous year do a complete moult in spring (body, wings and tail). Whether this is so or not is a very difficult matter to prove, as unfortunately (as I have before pointed out, *Ibis*, 1911, p. 401) there is a dearth of material of our summer visitors obtained in their winter quarters during the season of expected moult, and until this want is made good many problems cannot be satisfactorily solved; however, as regards the Common Whitethroat I think that this explanation does not hold good for this reason: the first winter males are distinguishable from the adult winter males by their much browner heads and lesser coverts and usually less pure white in the tail. Now I have several spring males obtained on migration in May in England showing no active moult which are *retaining unmoulted and very worn the brown head and lesser coverts of the first winter plumage*—individual feathers of the tail, and possibly of the wing also, have been renewed, but most are worn. Furthermore, the very fact that the spring moult in this species is often variable and incomplete tends, I think, to show that age is not a factor. I think one may safely surmise that those birds which in April or May show

fresh or only slightly worn wings and tail, among Common Whitethroats, and many other *Sylvinae*, have moulted those feathers earlier in the year, and those that are very abraded have not done so; evidence towards this is afforded by examination of winter specimens. Thus I find that Common Whitethroats in December and January are in a very worn state of plumage, while one on 8th February was in new, fresh feather all over, but one again on 9th March was also very worn all over. It would be interesting to know on what grounds Mr Pycraft makes the statement that only the small feathers are moulted in spring (*A History of Birds*, p. 282).

Of autumn Common Whitethroats it would appear usual to find some in moult on migration among the adults, thus all seven adults in my collection (10th to 14th September) show some body feathers in quill as well as the first two primaries; of nine young birds (11th August to 10th September) only one shows a few body feathers in quill.

Of Lesser Whitethroats I have only six spring specimens, three (29th April to 15th May) are very worn everywhere, and evidently have not moulted, one, 28th March, is in fresh body plumage, worn wings and tail, while two on 2nd May are only slightly worn everywhere. Turning to evidence of birds in winter quarters I find that specimens on 23rd November, 11th January, and 8th February, are very worn everywhere, especially wings and tail; one on 5th February has the body feathers, two tertials on one side and two tertials and the next two or three secondaries on the other side, all in quill, also the whole tail (except one very worn old feather); another (2nd March) has the whole of the body plumage fresh, wings and tail slightly worn; one on 25th March, body feathers slightly worn, wings and tail very abraded; another (same date) has the whole plumage beautifully new. Only one specimen on migration in autumn shows any moult—one on 13th September with a few chin feathers in quill. I may remark in passing that the Indian Lesser Whitethroat (*Sylvia c. affinis*) (which only constantly differs from the western race in wing formula) appears to

perform the same spring moult as our bird, some moulting completely, others not.

Of Garden Warblers I have seventeen (29th April to 17th May); all are in quite fresh plumage, body, wings, and tail; this is quite explainable by examination of specimens from winter quarters: thus I find that November, December, and January specimens are all in very worn plumage all over, but two of them (in December and on 10th January) had begun to moult the primaries and secondaries. February birds are in full moult, body, wings, and tail, while March birds are in full new plumage. Nine birds in the autumn (18th August to 2nd October) are in fresh plumage and no active moult. One Barred Warbler (17th September) also exhibits no moult; this is a species which also has of course a spring moult at least of the body feathers. Ten spring Blackcaps (April and May) show no moult and are not very worn anywhere; two winter-quarter birds (December and February) are rather more worn; although this species probably moults in spring, I have nothing definite to say about it; of autumn migrants, seven in early October or September exhibit no moult except one (9th September) which is still moulting on the chin.

I have examined a great many Song Thrushes (both races), Redwings, Blackbirds, several Ring Ouzels, and a few Mistle Thrushes on spring and autumn passage, and I have not seen any in moult except one Mistle Thrush which had (24th February) part of the rump in quill and one Ring Ouzel (18th October) with half of its tail a quarter grown—both were obviously accidental moults. Accidental loss of a tail or part thereof may, as I have on several occasions witnessed, delay a bird at some spot on its migration for days, *e.g.*, this Ring Ouzel remained in the same place some days after its companions had passed on. Accidental moult (which is naturally usually unilateral) must be a fairly common phenomenon and one which anyone studying moult must be on guard against; to watch birds hit a lighthouse and see the cloud of feathers lost without killing the bird gives one an idea of at least one cause of loss of feathers to which migrants are subject.

I have examined hundreds of Wheatears (both races), and have only found one Greenland Wheatear (6th May) in moult, odd feathers on the chin, and one or two Common Wheatears with the innermost tertials in quill; the spring moult, which takes place in February and involves the body feathers and sometimes odd tertials and great coverts (see *British Birds Mag.*, vol. iii., p. 391-2), is therefore usually finished prior to arrival here, at which time the body feathers are slightly worn. Of many Redstarts examined only three show any moult—two adults on 16th September have still a few body feathers in quill and one young bird on 18th September has a few quills on the chin. No Whinchats, Robins, Bluethroats or Black Redstarts exhibited any moult, nor did Nightingales which in May are moderately worn everywhere.

I have but three Swallows obtained on migration (two spring and one autumn); they exhibit no moult. Swallows leave us in autumn usually before moulting, as do House Martins, *i.e.*, in juvenile and in worn breeding dress, and both old and young do a complete moult in their winter quarters from November to February. Spring Sand and House Martins which I have are in beautiful fresh feather and had evidently moulted before arrival, but one House Martin (24th April) has a few feathers still in quill on chin; the only other exhibiting moult was an adult Sand Martin which on 29th August had begun a full body moult, but not wings nor tail. My spring Red-Back Shrikes are in fairly fresh feather but show no moult; one in September had still some juvenile feathers left; this is another species which moults in its winter quarters, whence I have seen a specimen (26th December) which had just begun a complete moult, and others (9th April) which were just completing a full moult.

Swifts leave us in full juvenile plumage and in old breeding dress, one adult (18th August) is just commencing to moult a few body feathers; so that this species must do a complete moult in more southern climes. Such Cuckoos as I have seen on migration show no moult; they leave us in juvenile and in old breeding dress and do a complete moult,

starting early in November. Wrynecks on both passages also showed no moult, they are in fairly fresh plumage. I have seen March specimens from a more southern latitude moulting body plumage, whole tail, inner tertials and lesser median coverts. Continental Great Spotted Woodpeckers do not often offer opportunity of examination; however, I have seen autumn migrants in full juvenile plumage, and one just beginning to moult and two others nearly through the moult; this species, like the Green Woodpecker, performs a *complete* moult out of juvenile feather.

Several Kestrels and Sparrow Hawks in the autumn passage were all in full juvenile plumage; of two Merlins one was in full juvenile, the other full adult plumage—while one Honey Buzzard was in juvenile dress, another in worn breeding dress.

Of Ducks and Geese I cannot say much, as it is usually difficult to be sure that the birds obtained were actually on migration; however, I have seen newly arrived Bernicle and Grey Lag Geese showing some moult and parts of the juvenile plumage still unshed. I have an adult Scaup which was certainly on migration and which was moulting the body feathers; my experience in the south of England is that most diving Ducks as well as Teal and Wigeon are still, if young, in their juvenile dress on first arrival. Turtle Doves arrive in fresh plumage all over in spring and leave us in juvenile and old breeding dress—none were in moult; a complete moult of both young and adults takes place in their winter quarters. Water Rails are nearly always fully moulted when emigrating, but I have seen odd juvenile feathers still unshed. It is not apparently uncommon to find Terns performing their somewhat leisurely autumn migration and moulting at the same time; of six Sandwich Terns all are moulting into winter plumage, both adults and juvenile, only the former moulting their wings and tail; one Arctic Tern had not started to lose its juvenile dress; some Common Terns would appear to leave us in this dress also, others again moulting into first winter plumage before leaving our shores, and some adults at least start a complete moult before quitting. The first winter plumage appears to

be completely moulted in more southern latitudes early in the year in all species.

Razorbills and Guillemots arrive off the Suffolk coast in the early autumn, but whether in moult or not I cannot say for certain, but during the autumn here both old and young cast all their flight feathers simultaneously, also the tail. I have seen but two specimens of Storm Petrels taken at Lighthouses in autumn which showed moult, one on 29th September and one on 25th November, both from the Eddystone, and both were casting their flight feathers in pairs

CONCLUSION.—I think one may say that the vast majority of *Passeres* moult before migrating with the exception of the Swallow and House Martin, but that individuals of practically every species may be found in which the moult is not finished; such unfinished moult is nearly always confined to the body plumage, quite exceptional in the tail, and practically never in the wings.

Barn Owl in Dumfriesshire.—A Barn Owl has taken up its abode in an old ruin at Kinnelhead, Beattock, Dumfriesshire, where I saw it on 17th November last. In *The Birds of Dumfriesshire* Mr Gladstone terms it "An uncommon local resident."—JAMES BARTHOLOMEW, Torrance, near Glasgow.

Black-tailed Godwits in Moray Area in summer.—Mr Abel Chapman records in *British Birds* for November, that in June 1914 he was informed that a pair of Godwits had established themselves on a certain loch in the Moray area. He naturally had some doubts as to the accuracy of this report, but on reaching the place on 26th June he found a Black-tailed Godwit in full summer plumage. A search was made in the boggy ground in the hope of finding a second bird, but without success; hence whether they actually bred there and reared their young remains unproven.

Little Stint near Glasgow.—Nicol Hopkins records (*The Glasgow Naturalist*, December 1915, p. 119) the occurrence of this bird at Hogganfield Loch on 3rd October last.

BIRDS AND AEROPLANES.

By WILLIAM EVANS, M.B.O.U.

IN these days of "flying men," the behaviour of birds in the presence of aeroplanes has doubtless often been noted. Yet very little appears to have been recorded on the subject, and it is mainly in the hope of inducing others to make known their experiences in the matter that I venture to record my own very limited observations. Were some ornithologist resident in the vicinity of a thorough-going aerodrome to set himself the task of observing, for say a year, the effects of the establishment on the habits of the birds of the locality, material for a highly interesting and valuable chapter on bird-life would, it is safe to say, reward him for his trouble.

The device of flying kites—to simulate birds of prey on the wing—for the purpose of concentrating the game and making them sit close, has long been known to sportsmen. That birds should, in the same way, regard an aeroplane, especially one of the monoplane type, as a huge Falcon or other Raptor—they are scarcely likely to look upon it as a Dove (Taube!)—might be considered not only probable but natural. Nevertheless, I am disposed to think that were it not for the noise of the engine, they would pay little heed to a passing "plane." The noise of the engine rather than the shape of the machine is, it seems to me, what really arrests their attention and creates alarm in them, and even to that they probably soon become familiarised.

It was during the memorable aviation meeting at Lanark, in August 1910, that I first had an opportunity of noting the behaviour of birds in the presence of aeroplanes. Within the barricades, the density of the crowd rendered observations of this kind practically impossible. I therefore, on my second visit, made my way to a point outside, but close to the course, at a part well removed from that to which the public were admitted. During the couple of hours spent there, binoculars in hand, Rooks, Wood-pigeons, and Gulls were several times seen crossing the course while aeroplanes were

up. Except when a machine was encountered at fairly close quarters they appeared to regard it with indifference, and when they did find themselves in the way of one, a quickening of their pace with some slight and temporary deviation in the direction of their flight was, as a rule, all the visible effect it produced on them. Once a small flock of Black-headed Gulls proceeding leisurely along the course appeared suddenly to become aware that they were right in front of an approaching monoplane. Realising their danger they flurriedly scattered to right and left, forming up again, however, immediately the aeroplane had passed, and continuing their flight as if nothing had happened. At another time, a group of Starlings and a party of Meadow Pipits flying along the outskirts of the course, were in turn overtaken by a monoplane; both sought shelter, the former in a young fir plantation, the latter on the ground among long grass.

In July 1911 Edinburgh was in the circuit of a long-distance air race, but the uncertainty as to the times of arrival and departure of the air-men, and the exact lines they might follow, gave little promise of ornithological observations. Half-a-dozen rooks unconcernedly crossing the Braid valley as a monoplane was rapidly approaching from the east was the only incident of the kind that came under my eye. This or another monoplane caused, I was told, considerable commotion, including some cackling, among the poultry in an enclosure over which it passed.

A better opportunity occurred in 1912, when I had the luck to be on the coast at Dalmeny Park while several hydroplanes were engaged in flight practice over the Firth of Forth. It was a beautiful September day, and large flocks of Black-headed, Herring, and other Gulls were floating lazily on the placid water. So long as the hydroplanes were at a distance, the Gulls appeared to take no notice of them, and even when they passed high overhead they were, as far as I could see, regarded with little or no anxiety. But when, as several times happened, one approached a flock at a low altitude or made a sudden descent in their direction, the birds very soon showed signs of alarm, and, rising in a body, flew off at a tangent, either all to the same side or some to

the right and some to the left, according to the course the aeroplane was pursuing. These scares were, however, of short duration, and the Gulls never went more than a few hundred yards before again settling on the water. Their behaviour reminded me very much of that of a flock of Lapwings in a field alongside a railway line when an express train goes past.

My latest and most interesting experience was at Aberlady Bay on 7th August 1915. The tide had been ebbing for some hours, and on the uncovered mud-flats and extensive sands in the western portion of Aberlady Bay, great numbers of birds had congregated. While going towards this "congested" area from the opposite side of the bay, my attention was arrested by the now familiar rattle of a flying machine, and next moment I had my binoculars fixed on a large aeroplane coming from the east over Gullane Hill. Travelling fast, and at no great height, it was soon passing over the bay, causing a great commotion among the birds. Its approach, being evidently something to which they were unaccustomed, was the signal for a general stampede. Flying off in front of it, and on either side of its track, were thousands of Gulls (Herring, Black-backed, Common, and Black-headed), many Terns (Common and Sandwich), and large flocks of Waders (Curlews, Godwits, Oyster-catchers, Knots, Golden Plovers, Lapwings, etc.) The majority of the Gulls seemed to start with the intention of making for Gosford Bay, but, finding themselves being overtaken by the aeroplane, many—especially the Black-heads—turned inland, and so back to the bay by a wide detour, while the others turned in the opposite or seaward direction. The Terns, having at the outset taken the "tangent" line of escape, were the first to settle down again on the sands. The Waders seemed to be the most scared, Curlews, Golden Plovers, and Lapwings leaving the bay altogether, while flocks of Godwits, Oyster-catchers, and Knots kept flying round for nearly ten minutes before settling. The simultaneous rising on the wing of practically all the birds in the bay, which was more than I had anticipated was a sight to be remembered.

Since writing the above I have received from Misses Baxter and Rintoul the following interesting extract from their journal:—

13th June 1913, *Edenmouth*.—"An aeroplane passed over us when we were near the Eden; it put up the birds and they flew off in flocks. The majority we saw were Sheldrake, Oyster-catchers, and Curlew. The Sheldrake and Curlew flew right off in the direction of the sea; the Oyster-catchers, on the other hand, were more inclined to circle round and settle again on the sand."

Some Mountain Spiders, including *Erigone tirolensis*, L. Koch, from the Tay and the Forth Areas.—For the critical determination of the following spiders, collected by me a number of years ago on two fairly high hills in Perthshire, I am indebted to Dr Randell Jackson, Chester, the author of the two most recent contributions to our knowledge of the Spider-fauna of the Scottish Highlands.

1. From under stones on the very summit of Cru Ben (3250 feet), Tarmachans, near Killin, 20th August 1905:—*Erigone tirolensis*, L. Koch, 2 ♂, 1 ♀; *Hilaira frigida*, Thor., several ♀; also *Mitopus morio*, F. (Phalangid), two. On Craig Cailliach, another of the Tarmachans, *Harpactes hombergii*, Scop., 1 ♂, and some immature Argiopids, etc., were found.

2. From Stuc-a-Chroin (3189 feet), near Callander, 17th September 1906, under stones on the Forth side of the summit ridge:—*Erigone tirolensis*, L. Koch, 1 ♂, 1 ♀; *Hilaira frigida*, Thor., 2 ♀; *Peciloneta globosa*, Wid. (*Bathyphantes variegatus*, Bl.), 2 ♀; *Macrargus abnormis*, Bl., 1 ♀; *Caledonia evansii*, Cb., 1 ♂; also the Phalangids, *Mitopus morio*, F., and *Nemastoma chrysomelas*, Herbst.

Erigone tirolensis was added to the British list by Dr Jackson so recently as 1913, he having discovered it on Ben Nevis in July of that year. In 1914 he again found it on the same mountain, and also on Cairn Toul and Ben Muich Dhui. *Hilaira frigida*—under the name of *Tmeticus montigena*, L. Koch—has already been recorded by me from Tay (Ben Vorlich) and Forth (Am Binnein) in *Ann. Scot. Nat. Hist.*, 1905, p. 120.—WILLIAM EVANS, Edinburgh.

THE GREVILLE COLLECTION OF CHALCIDIDÆ
AND PROCTOTRYPIDÆ IN THE ROYAL
SCOTTISH MUSEUM, WITH SOME REFER-
ENCES TO WALKER'S TYPES.

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

(Concluded from 1915, page 351.)

- Omphale ætius*, Walk.—two specimens, labelled *Entedon ætius*,
Edinburgh.
,, *salicis*, Hal.—one specimen, labelled *Entedon salicis*,
Edinburgh.
Closterocerus eutropius, Walk.—two specimens, labelled *Entedon*
eutropius, Edinburgh.
Derostenus gemmeus, Westw.—two specimens, labelled *Entedon*
gemmeus, Edinburgh.
Entedon acamas, Walk.—two specimens, Edinburgh.
,, *alaspharus*, Walk.—one specimen, Edinburgh.
,, *alcæus*, Walk.—two specimens, Edinburgh.
,, *altadas*, Walk.—two specimens, Edinburgh.
,, *amyte*, Walk.—two specimens, Edinburgh.
,, *amyntas*, Walk.—two specimens, Edinburgh.
,, *amyrtaeus*, Walk.—two specimens, Edinburgh.
,, *anthylla*, Walk.—two specimens, Edinburgh.
,, *aso*, Walk.—two specimens, Edinburgh.
,, *cænus*, Walk.—one specimen, Edinburgh.
,, *cæsius*, Walk.—one specimen, Edinburgh.
,, *charaxus*, Walk.—one specimen, Edinburgh.
,, *cydon*, Walk.—two specimens, Edinburgh.
,, *daunus*, Walk.—one specimen, Edinburgh.
,, *cubius*, Walk.—one specimen, Edinburgh.
,, *inarius*, Walk.—one specimen, Edinburgh.
,, *lyæus*, Walk.—two specimens, Edinburgh.
,, *lycoris*, Walk.—two specimens, Edinburgh.
,, *metallicus*, Nees—two specimens, labelled *Entedon epigonus*,
Edinburgh.
,, *nephereus*, Walk.—two specimens, Edinburgh.
,, *nephthe*, Walk.—one specimen, Edinburgh.
,, *novellus*, Walk.—one specimen, Edinburgh.
,, *parmys*, Walk.—two specimens, Edinburgh.



- Entedon phruron*, Walk.—one specimen, Edinburgh.
 „ *phryne*, Walk.—one specimen, Edinburgh.
 „ *sosarmus*, Walk.—one specimen, Edinburgh.
 „ *sparetus*, Walk.—two specimens, Edinburgh.
 „ *tanis*, Walk.—two specimens, Edinburgh.
 „ *termerus*, Walk.—one specimen, Edinburgh.
 „ *turcicus*, Nees—one specimen, without locality, named by Haliday *Closterocerus turcicus*.
Tetrastichus agathocles, Walk.—one specimen, labelled *Cirrospilus agathocles*, Edinburgh.
 „ *agrus*, Walk.—two specimens, labelled *Cirrospilus agrus*, Twizel.
 „ *anteius*, Walk.—two specimens, labelled *Cirrospilus anteius*, Edinburgh.
 „ *athyrte*, Walk.—one specimen, labelled *Cirrospilus athyrte*, Edinburgh.
 „ *bunus*, Walk.—two specimens, labelled *Cirrospilus bunus*, Edinburgh.
 „ *deioces*, Walk.—two specimens, labelled *Cirrospilus deioces*, Edinburgh and Twizell.
 „ *lamius*, Walk.—one specimen, labelled *Cirrospilus lamius*, Edinburgh.
 „ *mutilia*, Walk.—one specimen, labelled *Cirrospilus mutilia*, Edinburgh.
 „ *nerio*, Walk.—two specimens, labelled *Cirrospilus nerio*, Edinburgh.
 „ *orodes*, Walk.—two specimens, labelled *Cirrospilus orodes*, Edinburgh.
 „ *rhosaces*, Walk.—two specimens, labelled *Cirrospilus rhosaces*, Edinburgh.
 „ *sinope*, Walk.—two specimens, labelled *Cirrospilus sinope*, Edinburgh.
 „ *vacuna*, Walk.—one specimen, labelled *Cirrospilus vacuna*, Edinburgh.
Aprostocetus catius, Walk.—one specimen, labelled *Cirrospilus catius*, Edinburgh.

PROCTOTRYPIDÆ.

- Prosacantha mermerus*, Walk.—two specimens, labelled *Teleas mermerus*, Edinburgh.
 „ *pedestris*, Nees—two specimens, labelled *Teleas procris*, Edinburgh.

- Prosacantha timareta*, Walk.—one specimen, labelled *Telas timareta*, Edinburgh.
- Telenomus othus*, Hal.—one specimen, without locality, named by Haliday.
- Metaclisis areolata*, Hal.—one specimen, without locality, named *Inostemma areolata* by Haliday.
- Inostemma bosci*, Jurine—one specimen, without locality, named by Haliday.
- Amblyaspis tritici*, Hal.—two specimens, labelled *Platygaster tritici*, Edinburgh.
- „ *roboris*, Hal.—two specimens, labelled *Platygaster roboris*, Edinburgh.
- Synopeas ozines*, Walk.—one specimen, labelled *Platygaster ozines*, Edinburgh.
- Isocybus grandis*, Nees—one specimen, labelled *Platygaster ruficornis*, Edinburgh.
- Trichacis remulus*, Walk.—two specimens, labelled *Platygaster remulus*, Edinburgh.
- Platygaster prorsa*, Walk.—one specimen, Edinburgh.
- „ *cyrsilus*, Walk.—one specimen, Edinburgh.
- „ *otanes*, Walk.—two specimens, Edinburgh.
- „ *pleuron*, Walk.—two specimens, Edinburgh.
- „ *sonchis*, Walk.—two specimens, Edinburgh.
- „ *taras*, Walk.—two specimens, Edinburgh.
- „ *orus*, Walk.—two specimens, Edinburgh.
- „ *philinna*, Walk.—one specimen, Edinburgh.
- „ *olorus*, Walk.—one specimen, Edinburgh.
- „ *sterope*, Walk.—two specimens, Edinburgh.
- „ *eriphyle*, Walk.—one specimen, Edinburgh.
- „ *evadne*, Walk.—one specimen, Edinburgh.
- „ *cleodæus*, Walk.—two specimens, Edinburgh.
- „ *abisares*, Walk.—two specimens, Edinburgh.
- „ *niger*, Nees.—one specimen, Edinburgh.
- „ *manto*, Walk.—two specimens, Twizell.
- „ *athamas*, Walk.—one specimen, Edinburgh.
- „ *plotinus*, Walk.—one specimen, Edinburgh.

BOOK NOTICE.

THE ANTIQUITY OF MAN. By Arthur Keith, M.D., LL.D., F.R.S., pp. xx. + 519, and 189 illustrations. London: Williams & Norgate. Price 10s. 6d. net.

Professor Keith sets himself to interpret the evolution of the human races from the phases of physical development through which man has passed. To this narrow path of research he confines himself almost to the extent of abstracting the individual from his surroundings that he may exhibit him in the anatomical museum. From the naturalist's point of view there is much to be said for such a method of treatment, for only thus can be gained a sound knowledge of man's scramble up the zoological tree from the point where he parted company with the ancestral primates. Yet one cannot forget that brain capacities are but rough indices to man's progress, and that his mental development—a matter of vital significance—is perhaps better gauged by a study of the products of his handiwork. Therefore the author wisely suggests that his anatomical description may profitably be considered in relation with the researches of the anthropologist.

Professor Keith discusses the characteristics of primitive man, from the neolithic peoples backward through the ages, and his estimates of the relationships of the early types have led to many conclusions of interest to the naturalist. He considers that man made many false starts on the evolutionary track, before the ancestor of the modern races arose. On the side branches of the evolutionary tree he places such forms as the Neandertal and Piltdown man; and since the latter lived not later than the beginning of the Pleistocene period—say 400,000 years ago—he would place the parting point between the human and primate stems more than a million years back, in the early half of Tertiary times. The diagrams which illustrate the development of the human stock and its relationship to that of the higher monkeys illustrate vividly the long ages involved in the evolution of animal life.

Apart from its general appeal as a lucid history of the prehistoric races of humanity, Professor Keith's book will prove a useful guide to the student on account of its detailed description and its excellent exposition of the methods employed by the anatomist in interpreting the fragments which, unfortunately, too often represent all that remains of ancient man. Special commendation is due to the illustrative method of enclosing the reconstructed skulls in a standard frame representing the average dimensions of a modern English skull, an innovation which emphasises at a glance changes in form scarcely to be appreciated in series of numbers.—J. R.

Fox-shark and Basking Shark off the Ayrshire Coast.—

In *The Glasgow Naturalist* for December last (pp. 117-118), John M'Crindle records the capture, in a trawl net, of a Thrasher or Fox-shark (*Alopias vulpes*), on 25th October 1915, about three miles north-west from Lady Isle (off Troon). The fish measured "from 16 to 18 feet," with a tail $7\frac{1}{2}$ feet in length. Several Basking Sharks (*Selache maxima*) are reported in the same note as having occurred in the same neighbourhood during the autumn months.

Eriophyes tristriatus, var. erineum, Nal, in Edinburgh.—

In October last I noticed that the leaves of a walnut-tree in Church-hill, Edinburgh, were extensively deformed by the blister-like galls of this mite. On examination with a strong lens, the "pockets" of the galls, on the undersides of the leaves, were seen to be full of tiny mites moving about in the felt-like pubescence. In the February 1914 number of this magazine reference is made to a record, by J. W. Munro, of the occurrence of this mite on the leaves of a walnut-tree at Brechin, Forfarshire.—WILLIAM EVANS, Edinburgh.

Asthena luteata, Schiff., and Oxyptilus teucarii, Jord., in the Forth Area.—When looking over Mr J. W. Bowhill's 1915 entomological captures recently, I was pleased to find among them a specimen of the pretty "Yellow Wave" moth, *Asthena luteata*, from the Pass of Leny, south-west Perthshire, where it was captured on the 20th of June. The species is known to occur in mid-Perth: but this, so far as I am aware, is the first record of its presence in the Forth drainage area. Of still greater interest to me were two Plume-moths, taken at Pressmennan, East Lothian, on 4th July, which on careful examination I made out to be *Oxyptilus teucarii*, Jordan. To be quite sure, however, I have submitted one of them, which Mr Bowhill kindly gave me, to Mr J. Hartley Durrant, British Museum, and he confirms my identification. The only Scottish record of this "Plume" appears to be that by C. T. Cruttwell referred to in Tutt's *British Lepidoptera*, vol. v. Cruttwell's record is in a note on Lepidoptera collected in Scotland in June 1905 which he contributed to the *Ent. Mo. Mag.* for November, 1905 (p. 260), and runs thus: "Most surprising of all [*i.e.*, of his captures], a specimen of what Mr W. Holland has returned to me as *Oxyptilus teucarii*, from the extreme north of Sutherlandshire." In Tutt's work, *Capperia heterodactylus*, Müll., is the name applied to this insect, but, as Mr Durrant has explained to me, the identity of Müller's insect with *teucarii*, Jordan, is by no means certain.—WILLIAM EVANS, Edinburgh.

Ceropales maculata near Nairn.—Last July, while looking for wasps and bees on wild flowers, near Nairn, I observed an insect that I had not seen before. I captured it, and noticed the peculiar sheath for holding its sting separate from the end of the body, and wondered if it was a true stinging insect. I borrowed a book on Hymenoptera, and identified it as a female *Ceropales maculata*. I sent it to the Royal Scottish Museum, where Mr Grimshaw confirmed my identification, and stated that the genus had not hitherto been recorded from Scotland. It was captured on the flower-head of an umbelliferous plant, when the sun shone brightly for a few minutes, and then clouded for short intervals.—WILLIAM TAYLOR.

[Saunders, in his *Hymenoptera Aculeata of the British Islands* (p. 75), stated that this species was “not recorded from Scotland.” Since writing Mr Taylor, however, I have ascertained that this statement is not strictly correct, and that there are several more recent records. Mr Taylor’s discovery of this local and interesting insect, however, extends its known range much further to the north. The species is apparently only seen on hot, sunny days.—P. H. G.]

Hylemyia grisea, Flin., in the Forth District.—With reference to the very interesting paper by Miss Huie in last month’s number on *Hylemyia grisea*, Flin., it may be of interest to record that I have taken this fly at Aberfoyle in 1903, and at Polton in 1906. At Polton there is (or used to be) a sandy bank not very far from the station where species of *Andrena* burrow, the widely-spread and common *albicrus*, Kirby, being in numbers. I remember on various occasions watching flies rise from the ground and follow female bees as they approached their burrows, but unfortunately I am not now certain that *Hylemyia grisea* occurred at this bank. I have specimens of another parasitic Anthomyiid—which I take to be *Chortophila buccata*, Flin.—from Polton, and it may have been this species that I saw with the bees. For an interesting note on *Chortophila buccata* and *Andrena labialis*, cf. A. Piffard in *Ent. Mo. Mag.*, 1900, p. 190. I may add that my identification of *Hylemyia grisea* was confirmed by Mr J. E. Collin in 1913.—A. E. J. CARTER, Monifieth.

[In the *Ent. Mo. Mag.* for 1900, p. 243, there is a note by W. Evans, recording the occurrence of *Chortophila buccata* in association with *Andrena fucata* in an old quarry near Edinburgh.—EDS.]

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EDITORIAL.

THROUGH the death of Sir William Turner, K.C.B., LL.D., Principal of Edinburgh University, which occurred on the 15th February, Scotland has lost one of its greatest scientific teachers and leaders of thought. Born in Lancaster in 1832, he came to Edinburgh as early as 1854, as senior demonstrator in anatomy in the University, and continued to reside in the Scottish metropolis until the day of his decease—a period of sixty-two years, during which he devoted himself untiringly to the interests of Scottish students, building up a school of anatomy which has contributed materially to the fame of the University. Apart from his incessant work as a teacher he carried on scientific investigation until the last, and soon became acknowledged as an authority in many branches of anatomical research. Among his many contributions to science probably those dealing with the anatomy of the Cetacea are of the most outstanding interest to Scottish naturalists, and the magnificent collection of the remains of whales and dolphins in the University Museum will form a lasting monument of his zeal and industry in this direction. One of the most remarkable features in his character was his many-sidedness; he was keenly interested in museums and in field natural history, and in spite of his four-score years showed the keen delight of youth in the acquisition of a new

specimen for his museum, especially when an opportunity was afforded by the stranding of a rare Cetacean on the Scottish coasts. Particulars of some of these occurrences were contributed by Sir William to our pages.

From time to time the inhabitants of dwelling-houses have been annoyed by the appearance of swarms of flies in one or other of their apartments, the swarm sometimes consisting of several thousands of individuals, and occasionally recurring year after year in the same room. The chief offender in most cases appears to be a two-winged fly—one of those pretty little black and yellow striped flies known as *Chloropidæ*, but other families also contribute to the nuisance, notably the true *Muscidæ*, occasionally *Anthomyiidæ*, and even the tiny *Psocidæ*, which belong to a totally different order of insects, viz., *Neuroptera*. In this connection a very interesting note (worthy of larger type!) appears from the pen of Hugh Scott, of the Cambridge University Museum of Zoology.¹ Accompanied by Dr A. E. Shipley, the author recently paid a visit to a house near Cambridge and had the opportunity of inspecting one of these interesting but unwelcome visitations. The rooms concerned were the drawing-room on the ground floor and one immediately above. The appearance of the swarm is described as a "truly astonishing sight. In the large bay-window every pane of glass was densely covered with countless myriads of small flies: on the upper sides of the projecting cross-pieces of wood between the panes the flies rested in masses, literally crawling over each other, while all the part of the ceiling near the window was almost as thickly covered as the window itself." An investigation of the swarm proved that the principal constituents were the Chloropid known as *Chloropisca ornata* and a species belonging to the family *Anthomyiidæ*.² A few days previous to the visit the former much smaller fly preponderated, but later the *Anthomyiid* became the dominant species. Several other kinds of flies were found, but in

¹ *Ent. Mo. Mag.*, January 1916, pp. 18-21.

² Since identified as *Limnophora 7-notata*, Ztt. (*Ent. Mo. Mag.*, February 1916).

small numbers, while the "common House-Fly" (*Musca domestica*) is not mentioned as even present! One of the most interesting features of the phenomenon is the fact that the invasion has occurred for "at least five or six years in succession," varying in intensity, but always reaching its maximum in the upper room. As yet there does not seem to be any satisfactory explanation of these troublesome fly-raids. They always occur in the autumn, and Dr Sharp, in the *Cambridge Natural History* (vol. vi.), repeats a suggestion that "the individuals are seeking winter quarters." Since, however, we have as yet very little information, if any, as to how and where flies in general pass the winter, such an explanation must be taken for what it is worth.

BIRD-PARASITES AND BIRD-PHYLOGENY.

AT a meeting of the British Ornithologists' Club, held on the 12th January last, an interesting discussion took place upon the value of a close study of bird-parasites as a means of obtaining a more accurate knowledge of the inter-relations of the various groups (*e.g.* Orders) into which birds have been classified. The discussion was opened by Mr Launcelot Harrison, B.Sc., Research Scholar, Quick Laboratory, Cambridge, and continued by Mr Bruce Cummings, of the Entomological Department, British Museum, Mr T. Iredale, and others. A detailed report is promised for the next number of the *Ibis*; but as this publication may not be accessible to the majority of our readers we have decided to reproduce, at least partially, the summary of the discussion which has just appeared in Bulletin No. ccxii. of the Club.

The *résumé* of Mr Harrison's opening paper includes the following remarks:—"The bird-parasites referred to belong to the insect order Mallophaga, and are minute insects, of an average length of two millimetres, found upon all birds. They are completely parasitic in all stages of their life-history, the eggs being attached to the feathers of the

host, and giving rise to a larva generally similar to the adult. They are incapable of maintaining life for more than a couple of days off the body of the host, and usually die fixed by their mandibles to the feathers. Transference to a new host can only take place at actual bodily contact.

"Owing to the fact that these insects have lived for a very long time under very equable conditions, on a nutrition of epidermal products which varies little in chemical composition, and at a body-temperature which remains practically uniform, they exhibit a condition of 'retarded evolution.' Parasites of any group of birds, such as Crows, Kingfishers, Hawks, Plovers, or Petrels, are recognisable as such, whether their host-origin be known or not. The only reasonable explanation of this condition is that parasites of these groups have evolved from parasites of their ancestral stocks. And, as they have evolved at a slower rate, the gaps to be bridged are smaller in the case of the parasites than in that of the hosts.

"That the Mallophaga have a long-standing history of parasitism is proved by the fact that the Ostrich and the Rheas have parasites hardly specifically distinct, which are distinguished from all other Mallophaga by a curious asymmetry of the chitinous framework of the head. Consequently, the parasitic history of the group must antedate the isolation of these birds in the Ethiopian and Neotropical regions.

"Although opportunities of invading a new host are limited, it is admitted that straggling can, and does, take place. Bird-parasites have been found living on mammals; marsupial parasites on carnivores; and a Petrel-infesting species has become established as a normal parasite of Skuas. But such cases are few, and are almost always capable of detection.

"Although birds have been split up into obviously natural ordinal groups, the inter-relation of these groups is not understood, and no satisfactory characters of phyletic value have been found. A closer study of bird-parasites may, from the conditions outlined, afford valuable suggestions to the bird-morphologist.

"Some such suggestions have already been published.

The family Gonioididæ, of Mallophaga, is found solely upon Fowls, Tinamous, Pigeons, *Opisthocomus*, and Penguins, all of which groups agree in the absence of Philopteridæ. The first four are now usually admitted to be related, but parasitic evidence would appear to demand the same affinity for the Penguins. Parasites of the Palamedeidæ link up with those of Ducks, Geese, and Swans, thus confirming the Anserine affinities of this somewhat anomalous group. The Parridæ would appear to be Rails, not Limicolines; and the Apterygidæ more nearly akin to the Rails than to any other living birds."

In his ensuing remarks Mr Harrison attempted to indicate a natural classification of the Petrels by means of their parasites of the genus *Lipeurus*, and showed that on this basis these birds fall into six well-marked groups. The arrangement he thus obtained agreed, he said, very well with that proposed by Forbes in vol. iv. of the *Challenger* Reports, with some minor exceptions. The summary of his paper concludes with the following sentence:—"The Mallophaga require to be much more assiduously collected and studied before more general statements can be made, and it is hoped that ornithologists, when collecting specimens, will pay more attention to the preservation of these minute parasites, especially in the case of rare birds and those of doubtful affinities." With this suggestion we heartily concur, but we would especially emphasise the need of the utmost care in carrying out his wishes. The possibility of the interchange of parasites while the birds are lying in the game-bag must be absolutely avoided, and this can only be done either by taking the parasites off each specimen immediately after death, or if this is not practicable, confining each bird (or at least species of bird) in a separate bag. If these points are not rigidly attended to, then the parasites obtained are worse than useless for the purposes indicated in the above paper.

Mr Harrison was followed by Mr Bruce Cummings, a well-known authority on the Mallophaga. He laid stress on the care with which the phylogenetic test should be applied, and pointed out that two important factors must be borne in

mind, viz., the principle of convergence and the chance straggling of the parasites on to other hosts. For example, is the Gallinaceous parasite on Penguins really Gallinaceous, or has it had an independent origin, and merely converged on the Gallinaceous genus *Goniodes*? Mr Cummings concluded by criticising the idea that "the parasites in their evolution have necessarily lagged behind the evolution of the host," and pointed out that "the parasites' evolution sometimes appeared to progress *pari passu* with, and sometimes to progress beyond, that of the host."

The next speaker, Mr T. Iredale, in the course of his remarks emphasised the necessity for caution in regard to the Petrels. Since, he said, these birds always breed in colonies, with four or five distinct genera occurring in the same breeding-district, there is a good chance of interchange of parasites. "If 'stragglers' among the parasites are not frequent under these circumstances, the students of Mallophaga in the present connection have a very strong case in their favour." Mr Iredale concludes that "the parasites will come into use when there is a doubt about the systematic position of a genus, and *after* considering the factors we get from the birds' skins."

In his reply Mr Harrison said that with regard to the question of convergence he did not think any serious student of these parasites who really examines the evidence closely would insist very much upon convergence as a serious factor in deciding relations in general. He added that we practically knew nothing about Mallophaga yet. The question of straggling, adduced by Mr Cummings, he admitted, but with regard to the rate of evolution he maintained that the general rate had been slower, while at the same time he was willing to admit that there might be varying rates at the ultimate ends of the evolutionary branches.

MOVEMENTS OF THE GANNET AS OBSERVED
AT THE BUTT OF LEWIS.

By ROBERT CLYNE.

AN eight years' residence at the northern promontory of the Lewis has in no wise lessened the writer's interest in the wonderful procession of Gannet life which all summer continues to pass east and west in close proximity. As a means of gaining further knowledge, or arriving at some conclusion as to the why and wherefore of the movements, a special observation and record has been kept during the past summer (1915). From previous observations at other outlying points we know that at certain periods of the year vast numbers of Gannets pass along the coast, usually following out and in the contour of the land, but here there is during the summer months a daily passing of thousands. The explanation of a well-known naturalist that the Gannets "follow the shoals of herring and mackerel," does not, in my opinion, satisfactorily solve the problem as regards this particular locality.

The Butt of Lewis being the extreme turning point or gateway from the Minch to the open West Atlantic, and centrally situated between the gannetries of St Kilda, Sulesgeir, and Stack of Skerry, is doubtless the reason for so many passing, but leaves us none the wiser as to whether they are St Kilda or Stack Gannets, nor what necessitates their quest so far afield. From the Butt, St Kilda is about 90 miles S.W., Sulesgeir about 30 north, and the Stack about 65 in a N.N.E. direction. At these gannetries J. H. Gurney in his interesting book on the Gannet gives the number of birds approximately as 30,000 at the St Kilda group of islets, and 8000 at each of the other two places. A compulsory close season of the herring fishing in this district did not to any extent affect the number of Gannets passing. They were seen earlier and more numerous in January 1915 than usual, then occurred a blank for two weeks, before a gradual and continued increase of passing birds set in. So numerous and continuous were

they passing in large flocks from S.E. to S.W. during the first week of April, that from a certain standpoint it was possible to see with one sweep of the eye a lane of at least a thousand birds in flight.

At the outset it may be stated that early hatching of Gannets at the Bass Rock is 10th May; late, end of July. At these farther north gannetries mentioned, the first or second week of June is probably the earliest date of hatching. The following remarks are made from observations noted during the year.

20th to 28th June.—In the many flocks passing east a fair number of piebald birds are seen, often two or three in a small flock of eight or ten mature birds. Three young piebald birds and one old bird were an unusual party. A black bird or yearling, with only the under parts white, is occasionally seen following in the rear of a flock, but never many of these are seen. The grey birds are in all stages of plumage; of some the head-yellow was quite bright, while others were still untinted.

6th July, 3.15 to 4 A.M.—The first hour after sunrise, birds were passing very numerous in both directions. During five minutes 125 were counted going S.W., and the number going east was about the same. The east-going birds were flying low and in scattered parties; the west-going in close flocks, and higher. Wind N.W., light breeze.

6th July.—From sunset at 9 P.M. till 9.45 small flocks continue passing to N.E. Going west during same period, only four birds were seen. The passing certainly ceases, as it is still clear enough to see the local gulls flying about quite distinctly.

9th July, 2.30 A.M.—Half an hour before sunrise scattered single birds began passing east, and a few S.W. At sunset many were passing in both directions, but the majority eastwards. Ceased as usual in about forty-five minutes. Strong westerly breeze. On this date about sixty were shot when flying over an outlying point, and sold at 4d. each, as they were mostly in poor condition. These were birds passing east.

15th July.—At 5 A.M. Gannets very numerous round

a drifter hauling her nets $1\frac{1}{2}$ miles west. A large area around was speckled with drifting birds apparently gorged. Some flocks passing flew to the place, others passed on S.W. unheeding. From 6 to 7 P.M. till after sunset Gannets passed very numerous east and S.E., very few west.

18th July.—Half an hour before sunrise Gannets began passing in both directions. Birds coming from the west were flying high before a fresh S.W. wind, those going S.W. flying low over the surface of the water.

24th July, 7 to 8 A.M.—Gannets passing west at the rate of one every second for an hour, after which there was a slight decrease. Only a few going S.E., the direction whence all the others were coming. About two miles north about a thousand were continuously diving among a shoal of herring or mackerel. Over a hundred gorged birds rested on the water to gradually rise and fly westward. Several were seen going north in the direction of Sulesgeir. About a dozen were at the same time diving within a few yards of the rocks for saith. West-going birds flying low; S.E.-going, much higher. Light S.W. wind.

5th Aug.—Half an hour before sunset Gannets flying numerous east and west. At and after sunset none seen. Weather fine; little or no wind. Next morning (6th) single birds began coming from S.W. half an hour before sunrise, then gradually in small flocks, till at half an hour after sunrise they were passing at the rate of 200 every five minutes. The first coming from S.E. about fifteen minutes before sunrise was also a single bird; but small flocks soon followed, till at half an hour after sunrise they were passing at the rate of 150 every five minutes. It is noted that the first seen in the mornings and the last at nights are generally single birds.

15th Aug.—All afternoon flying as numerous as ever, both east and west, till the usual time after sunset.

3rd Sept.—No apparent abatement in numbers of Gannets passing.

Motor boat from Port of Ness, at Sulesgeir from 7th to 10th Sept., brought about 1100 young Gannets, which sold at 1s. each, an advance of 3d. or 4d. on the usual price.

19th Sept.—Stormy weather for the last four days. Gannets flying more scattered and singly, but nearly as numerous. After sunset to-night all were flying in a N.E., direction.

23rd Sept.—An evident decrease in numbers passing. Many fishing locally within a few feet of the rocks.

29th Sept.—Strong north wind, but many passing late in evening and early next morning, in both directions.

10th Oct.—No Gannets are now seen passing before sunrise or after sunset, but during the forenoon about a score per hour continue to pass in both directions.

25th Oct.—Still a passage of a few birds for part of the day. No young or immature birds are seen.

12th Nov.—After a week of wild, stormy weather no Gannets have been seen since 8th. It is generally with wild, breezy weather we see occasional Gannets in late November, December, and early January; so also with strong winds is their usual travelling east and west completely broken up.

In continuation, it may be interesting to remark here that in December 1915 and January 1916 more Gannets have been seen than I ever saw previously in winter, here or elsewhere. One or two a week was the usual winter record, but this season they were seen several at a time, and every day. The weather has been unusually wild and stormy.

The above are only a few extracts from observations noted down at the time, but from them interesting comments may be made, or opinions formed, and a general conclusion arrived at relative to this great movement of Gannets.

It is peculiar that we seldom or never see Gannets passing in the direction to or from Sulesgeir, our nearest gannetry. But neither do we see them coming from, or going direct to, the Stack, but from the S.E. to round the Butt, and go westward. Evidently the Stack Gannets approach the Cape Wrath shore before making across the Minch, for on the few occasions when observed from the cliffs on the east of the Lewis they were seen coming from Cape Wrath direction.

Presuming that the birds on westward flight in the early mornings are Stack Gannets, and those on eastward St Kilda

birds, one is surprised that either should have to come so far in search of food for themselves or hungry nestlings. One bird in a flock passing east was carrying in its bill replenishing for its nest, so it obviously was a Stack bird. Why such an overlapping, for evidently the Stack Gannets go west to feed and the St Kildans east?

It is unreasonable to suppose that Gannets can fish during the night, so we believe that those passing after sunset are making for home, though it must be late before they arrive there—the Stack or St Kilda. On the other hand, from the evidence of watchers at the Bass and other places, Gannets are said to be seldom early astir in the mornings, so why do they pass here in small parties before sunrise, and in thousands so soon after?

In their usual summer passing here winds do not to any extent influence the direction of their flight. To reach their goal they may sometimes wing their way in a more zigzag and lengthened flight, but in the strongest of gales they are seen flying in the teeth of the wind, low over the surface of the water, and high before the breeze. They have a mission to pursue—a homing instinct—and go they must, blow the winds high or low.

By the middle of September, when the family affairs of the year are approaching completion—the young Gannets having reached the fasting stage preparatory to descending into the sea—it is noted that the number of birds passing gradually lessens during daytime, and altogether ceases at evening and morning twilights. They are now seen more frequently flying in scattered units, or fishing close inshore, until with breezy weather, and even though herring are in shoals in the vicinity, they betake themselves to the open ocean, there to pass a roving, discursive existence for the winter.

[Mr Clyne's notes should be read in connection with Dr Harvie-Brown's remarks on this subject in *Ann. Scot. Nat. Hist.*, 1902, p. 203. It is there stated that "the main stream of the birds do not return through the Pentland Firth till July comes in, and then . . . pass from W. to E. in continuous battalions; and not one, unless fishing at the time, is ever seen to fly from E. to W. after this real movement fairly sets in again."—EDS.]

The "Milkman's Whistle" of the Barn Owl.—The Barn Owl is rather a scarce species in Renfrewshire, and it was not until the early spring of 1914 that I became acquainted with some of its notes, particularly of one which locally we have named the "milkman's whistle." When first I heard this note I thought it was the whistling of the county motor fire brigade passing along a good distance away, although actually the pair of owls were only 100 or 200 yards from me. Hearing the note often after that, I always referred to it as the Barn Owl's fire brigade whistle, until my friends, Messrs Robert and Hugh Wilson, happening to ask a West Renfrew farmer, at whose farm the bird breeds, if he ever heard it utter any note when it was flying about, were told that it passed overhead at night with a whistle "just like a milkman's whistle." We thought the farmer's description most apt, and adopted it. Most people who have been near a Barn Owl's nest in the evening, especially if the young were well grown, must be familiar with the snoring or hissing sound emitted then by old and young alike, at rest and on the wing. Most vehement when an old bird arrives with a luckless mouse, one can liken it in one's imagination to the heavy breathing of some slumbering giant, or, to be more prosaic, to the hiss which escapes at regular intervals from the Westinghouse brake mechanism of a railway engine which is standing at a wayside station. This hissing note at the nest is the background, as it were, of the whistle, which is reinforced by many vibratory "birls," producing an effect so like an ordinary alarm-whistle that even yet, at times, when I hear it, I cannot decide instantly whether it is really the Barn Owl or some person blowing a whistle. I have often heard it when two birds, evidently paired, were flying together. What I take to be the female has a shriller whistle with more hiss in it than the male has. The male—at least I believe it is the male—in addition to the "milkman's whistle" has a round note, liquid and tremulous, a note so beautiful that unless one actually knew, one could scarcely give an Owl credit for having such a melodious voice. It has some resemblance to a succession of short hoots which the Tawny Owl sometimes runs together, but it is much softer and more liquid than these. The whistling note is oftenest heard just at dusk, but on moonlight nights I have heard it at all hours. On dark nights it is not so often heard. As to seasons, the note is most frequently uttered in spring and summer, although I have heard it in every month but December, and probably it is to be heard then too. The melodious note of the male I have heard only when he was escorting his partner over the meadows in spring.—JOHN ROBERTSON, Glasgow.

OBSERVATIONS ON THE HATCHING OF
STENOPSOCUS CRUCIATUS.

By (Miss) L. H. HUIE, F.E.S.

(PLATE I.)

AMONG the many adaptive structures of insect anatomy, "hatching spines" are not the least interesting. These temporary structures for breaking the egg-shell have been described in several cases. Packard in his *Textbook of Entomology* cites five such instances, while three others are mentioned by P. de Peyerimhoff in a paper to which I shall again refer. Amongst other Arthropods similar structures are known, varying in form, from a simple tooth to a file or sawlike implement.

The eggs of the Psocid *Stenopsocus cruciatus* are laid on the under side of holly leaves in clusters of six to twenty or so. They are fixed to the leaf by a gummy substance, and further fastened on, and to each other, by a slight webbing. Laid in the late summer, they hatch in the following spring. They are oval in shape, and measure less than half a millimetre in length. At first they are white, but as they ripen they become brown and exhibit at one end a little black stripe. The presence of this peculiar mark led me to pay attention to the eggs, and examine them microscopically. The egg-shell is very transparent, and in a ripe egg the embryo appears as shown in Fig. 3, which represents the ventral aspect. The back of the head and thorax are towards the under side of the egg, and the abdomen is doubled up in front. On each side of the bulging clypeus are seen the 8-jointed antennæ, and the palps and folded legs fill up the oval. But the most conspicuous object of all is the dark-coloured egg-breaker, the origin of the short black mark I have mentioned. It is a comblike file or saw (Figs. 1, 3, 4) borne vertically on the head, and received at its upper extremity into a notch in the fore part of the epicranium. The lower end of the file indents the centre of the still soft clypeus, through which is often traceable a converging

system of muscles at the back of the clypeus, radiating from a plate placed under the anterior part of the œsophagus.¹ The egg-breaker forms no part of the embryo, for it belongs to the amnion skin, and is shed with it immediately after hatching, and the amnion is to be regarded as the innermost layer of the egg-shell, rather than the outermost skin of the embryo.

For some days before the hatching of the eggs, occasional movements of the mouth-parts may be observed through the semitransparent labrum, also—especially when the eggs were suddenly subjected to brilliant transmitted light under a microscope—contractile movements at the head-end. When hatching is about to commence a rhythmical movement of the mouth-parts begins, and immediately afterwards is set up a pulsating, alternately expansive and contractile movement of the tissue within the epicranial notch, where the upper end of the file is attached. This causes the file to rub against the egg-shell, which in a few minutes ruptures. The head of the larval Psocid protrudes and the tail-end comes to touch the base of the egg-shell. The body next bends over the front of the egg, and the observer gets a view for the first time of the eyes and epicranium. The latter is much more arched than it becomes after complete hatching, and viewed from the anterior apex the body is at this time fairly cylindrical. By continued wormlike movements the whole larva gradually emerges and then lies still, like a pupa, in the amnion skin (Fig. 4), except for the pulsations at the head which still move the file, while the rhythmical mouth movements become increasingly vigorous. Large bubbles of air are now seen moving from the mouth inwards, inflating the alimentary canal as far as the third abdominal segment. The antennæ and legs, although in sheaths of their own, are useless and inextensible. In about fifteen minutes the shedding of the amnion skin commences by a split between

¹ Burgess (*Pr. Boston Soc.*, xix., 178), who studied the mouth-parts of Psocids, calls this plate "the œsophageal bone," and the muscles the "clypeal muscles." I do not think the latter assist in the movement of the hatching spine, and as they persist throughout adult life this seems the more unlikely.

the eyes, and the rupture continues down the back to about the fourth dorsal segment. There is often a pause here, but all the pulsating movements continue; then suddenly and gently the enveloping membrane slips off the clypeus, down the front, taking the egg-breaker with it; the mouth-parts are uncovered, and the labrum flaps up and down; the antennæ in their turn are set free and expand; immediately afterwards the first pair of legs for a moment are thrown out to their fullest extent, then instantly retract to kick the amnion skin over the second pair, which push it over the third pair without delay, and all six legs give it a final kick into a little crumpled pellet in which the chitinised egg-breaker is conspicuous.

The freed larva is no longer cylindrical, but has assumed a flattened appearance proclaiming its relationship to the Book-Louse, which it now closely resembles.

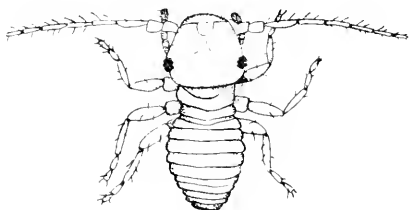


FIG. 5.

The pulsating movement at the head subsides, and ceases in one and a half or two minutes. Air-bubbles continue to come in at the mouth. As the body is extended to its full length at first, they are clearly seen in a chain reaching to the sixth segment behind the head. Soon the abdomen contracts as in Fig. 5, and they can only be observed through the epicranium. In a short time they are no more to be seen, though not till after the larva has begun to run actively about in search of food.

M'Lachlan¹ states that Psocids moult four times, an advance towards the winged adult form being accomplished at each moult. According to my experience here in Edinburgh, oviposition takes place in July. After depositing a number of eggs in a cluster on the under side of a leaf, the female secures them in a network of silken threads, drawing the cord from her mouth, and stooping her head to peg it down at the turning places, with some organ situated at the side

¹ *Ent. Mo. Mag.*, 1866-7

of her mouth. It seemed to me that this might be the structure that Burgess calls "the fork," a use for which he was at a loss to suggest. It is a chitinous tube forming a quite unique part of each maxilla, and slightly forked at the end in many species, though not bifurcating in *S. cruciatus*.

The above observations were made in an Edinburgh garden in 1911, where *S. cruciatus* was very abundant. Since that year, however, I have searched there for it in vain.

The following are the characters of *S. cruciatus* as given by M'Lachlan in his monograph on the Psocidæ in the *Ent. Mo. Mag.* for 1866-7 :—

"Antennæ not so long as the wings, moderately thick, varying from yellowish to fuscous, according to the degree of maturity attained by the insect. Head shining chestnut brown; the vertex on either side of the ocelli yellowish. Thorax chestnut brown. Abdomen yellowish or fuscous. Legs pale yellow, the tarsi obscure. Wings hyaline; anterior wings with four elongate fuscous spots near the base, two of which are placed on the posterior margin and the other two above them. These spots vary greatly in intensity. The apical half of these wings is without spots, but there are pale greyish brown bands, one placed along the apical margin and the others following the course of the veins; pterostigma elongate, dilated in the middle; veins brown; the posterior wings have frequently two pale greyish brown spots on the dorsal margin near the base.

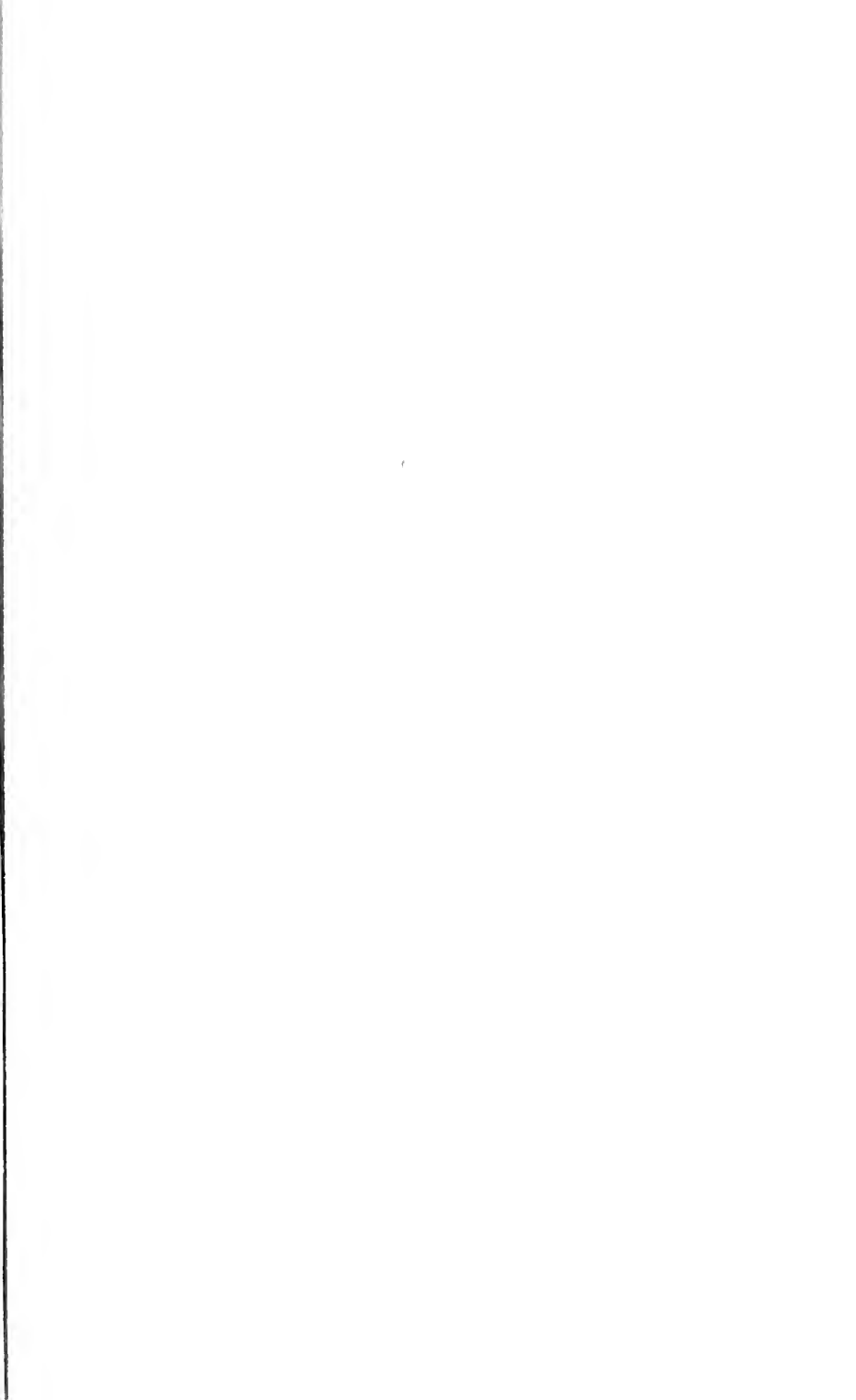
"Length of the body, 1 to $1\frac{1}{4}$ ''; expanse of fore-wings, 3 to $3\frac{1}{2}$ ''.

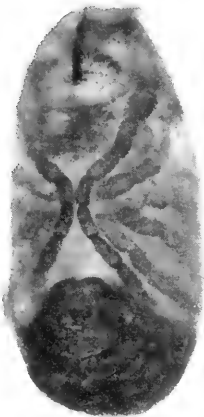
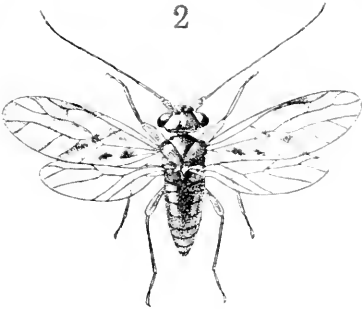
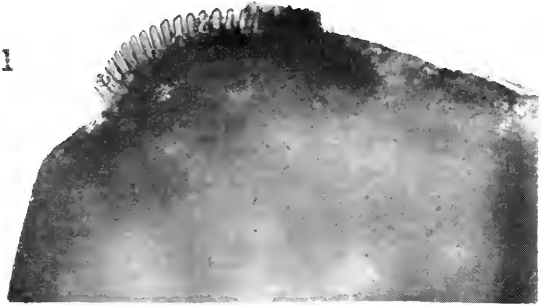
Very common on tree-trunks, palings, etc.

"Characters of the genus *Stenopsocus*.¹ Tarsi 2-jointed. Pterostigma connected (*i.e.* by a veinlet not existing in *Psocus*). Discoidal cell complete, less quadrangular than in *Psocus*, rather irregular. Four complete cellules on the apical half of the posterior margin, the last triangular and pedunculated."

My observations on the hatching of *S. cruciatus* corroborate an account given by Paul de Peyerimhoff in the *Annals of the Entomological Society of France*, vol. lxx., 1901, pp. 150-2. This paper was brought to my notice just as my own observations were going to press. Peyerimhoff's

¹ The species which forms the subject of the present paper is now usually placed in the genus *Graphopsocus* of Kolbe.—[EDS.]





paper was referred to by Dr Howard at a meeting of the Entomological Society of Washington in 1902, pointing out that the author in describing the peculiar habit of the issuing embryo of swallowing mouthful after mouthful of air in order to swell its body and assist in bursting the enveloping membrane, was anticipated by H. G. Hubbard. Peyerimhoff had been unable to find any former record of this peculiar habit with the Psocidæ, but Hubbard in 1885, in "his masterly volume" on the insects affecting the orange, described this process for *Psocus citricola*. I have not been able to obtain Hubbard's book.

I am indebted to Mr Richard Muir, Pathological Department, Edinburgh University, for the photo-micrographs of my preparations of embryos and hatching spine.

EXPLANATION OF FIGURES.

IN THE PLATE.

1. Part of the head of an embryo bearing the hatching file $\times 300$.
2. Adult insect (after M'Lachlan).
3. Embryo of *Stenopsocus cruciatus* within the egg. Ventral aspect $\times 80$.
4. Larva newly emerged from the egg, but still enveloped in the amnion skin $\times 80$.

IN THE TEXT.

5. Larva drawn from life about fifteen minutes after shedding the amnion skin.

A new British Ant.—*Myrmica schencki*, Emery, is recorded by H. Donisthorpe (*Ent. Record*, December 1915, pp. 265-266) as taken at Sully, in Glamorganshire. A full description of this interesting addition to the British List is given, with synonymy and geographical distribution. It is unfortunate that the specimens did not reach the author until too late for insertion in his recent book, a notice of which we gave in our Editorial of last month.

NOTES.

Birds and Aeroplanes.—In Mr Evans' paper on "Birds and Aeroplanes" in the *Scottish Naturalist* for February, all the references are to birds being alarmed by aeroplanes, and flying *away from* them. An interesting example of the converse phenomenon came under my observation here recently. On Wednesday, 20th October 1915, three military biplanes from an east coast station flew over Perth, leaving again in a south-easterly direction. One of them flew away over Kinnoull Hill, and as it did so I could watch it from my library window in the Museum. As it passed over the river, a flock of about a dozen gulls rose in the air and *followed* it as quickly as they could fly. They continued following it till it passed out of sight. This appeared to me to be an evident case of curiosity, the birds being attracted by a new creature flying through the air. This occurred about three o'clock in the afternoon.—HENRY COATES, Perthshire Natural History Museum.

Notes on the Gannet.—At Kilchattan Bay, Bute, in the second half of September 1915, numerous Gannets were to be seen daily, busily engaged in fishing operations. I was interested to notice that they were often molested by the larger Gulls, particularly by immature Herring Gulls. When the Gannet reappeared on the surface of the water after its dive, and just as it was about to take wing again, one or two Gulls would frequently fly towards it, with the intention, evidently, of obtaining share of the Gannet's catch. This move on the Gull's part apparently alarmed the Gannet, for, if it were still on the water, it would flounder hurriedly along the surface for a considerable distance, uttering its raucous *garra*, *garra*, ere it was able to rise in the air and get away; but if it had already got up a few feet, it escaped by taking a glancing plunge beneath the waves, and then, on coming up, behaving pretty much as in the first instance. I could not see that the Gulls gained anything by their attention. All the same they were most persistent, and the young Herring Gulls often uttered the cheeping cry which fledgling Gulls use when pestering their parents for food.

Shoals of mackerel frequently broke the surface of the water with a sound like that of hail falling on a pond, or the breaking of a slight swell on a pebbly beach. This sound was plainly audible at a distance of several hundred yards. From the high ground I could see patches of troubled water, indicating shoals of mackerel

here and there, all along the coast; yet, unless in a single instance, the Gannets passed and repassed over those shoals without making any attempt to dash down on the fish. As far as I have been able to observe, the Gannet, when fishing, performs the greater part of the descent with its wings drawn in about half-way, holding them very rigidly, for they can distinctly be seen to quiver owing to their resistance to the air. When 10 or 15 feet from the water they are retracted still further, but only to the same extent as those of a Black-headed Gull when it makes an ungainly attempt to dive. They are never really closed, that is folded along the bird's sides, till the Gannet bobs up on the surface again. In the descent a considerable rotary motion of the bird's body round its long axis is often apparent, to the extent occasionally of about half a circle by the time the water is entered. Professor Newton and Howard Saunders both state that the Gannet dashes perpendicularly with *closed* wings on its prey.

By watching Gannets from ground nearly level with their line of flight when they were on the look-out for fish, I have formed the opinion that they seldom dive from a greater height than 100 feet, but usually from a much lower elevation. I have seen an immature bird, at least one year old, dive repeatedly from 12 or 15 feet. It was in too big a hurry to mount into the air in the ordinary way, for no sooner did it get up a short distance than with a slanting plunge it was under the water once more. It seemed to draw in its wings much closer than adult birds do. According to Seebohm, the Gannet very often plunges into the sea from a height of 100 *yards* or more.—JOHN ROBERTSON, Glasgow.

[During a residence of thirty-two days in the Eddystone Lighthouse in the autumn of 1901, I had exceptional opportunities for observing the Gannet on its fishing-grounds. These birds fished close to the lighthouse in considerable numbers and with marked success. My point of observation was the gallery, 130 feet above high-water mark, and from it I was enabled to gauge the height from which these birds dived with a degree of accuracy not usually attainable. The water around was remarkably clear, and the Gannets, as a rule, descended from a considerable elevation, but out of many thousands of dives witnessed none exceeded a height of from 130 to 140 feet. It was, however, quite a common occurrence to see a Gannet newly on the wing after a successful dive detect a fish in front of it and near the surface, and in such cases the bird dived from an elevation of a few feet only, not perpendicularly but on the slant, and at as low an angle as 60°.—W. E. C.]

Notes on the Extension of Range of the Crested Tit.—

In the September number of the 1915 volume of the *Scottish Naturalist* Mr Blackwood records this species from Nairnshire, and says (page 285), "This record would seem to indicate an extension in the breeding range via the Darnaway Forest." In the December number of *British Birds*, vol. ix. (page 182), Mr W. R. Ogilvie Grant records the occurrence of this species in Ross-shire in October. In view of the above records, I think it advisable to publish the following notes which I have made on the extension of range of the Crested Tit during the last few years; my reason for not publishing them before being that I wished to see the species established in the new localities, and thought silence on my part would further this object. On 14th September 1907 I observed this species in north-east Inverness-shire; on 16th May 1910 I came upon them in the locality mentioned by Mr Blackwood, and also in another locality farther to the east. I know of them in two distinct localities in the lower reaches of the Findhorn Valley; one locality I discovered on 24th May 1910, the second locality in September 1915. In September 1911 I again observed them in north-east Inverness-shire (some miles away from the first locality of 1907), and have seen them there several times since.

In October 1910 I first discovered this species in east Ross-shire; I saw them again in this locality on 12th May 1911, and have seen them there several times since. On 5th April and 11th May 1912 I observed them in another locality in east Ross-shire, several miles distant from the first locality, and here they have certainly bred, as I have seen the young ones hardly able to fly. On 16th June 1912 I discovered this species some fifteen miles from the last locality, so I may say I know of three distinct localities where this species occurs. Presumably Mr Ogilvie Grant met with it in one of these localities. May I remind your readers that the distribution of this species previous to Mr Blackwood's and Mr Ogilvie Grant's records as given in the new B.O.U. list published in 1915 is as follows (see B.O.U. list, page 59): "Resident and common in the pine forests and birch woods of the Spey Valley of east Inverness-shire and Morayshire."—WILLIAM BERRY, Lentan, Inverness-shire.

Rough-legged Buzzard in East Fife.—On 29th October a Rough-legged Buzzard (*Archibuteo lagopus*) was brought to us which had been found, about a week before, sitting under the telephone wires by the side of the main road between Largo and Colinsburgh. It had a badly broken leg, one wing was injured, and

it had evidently struck one of the wires just above the bill. We took it home, and put it in an empty stable, where it sat rather sadly in the corner of a stall. In a few days it could perch on the log which we gave it to sit on: one or two days after that it flew up on to the barricade we had put at the end of the stall. After that it mended apace, and was soon flying strongly up and down the stable and perching on the divisions of the stalls. The leg was feeble for some time but mended most astonishingly quickly, and by the 23rd November it was quite strong, and we were able to release the bird. It was a beautiful specimen: from the plumage we thought it an immature bird. It became very tame, and would take its food from the hand. It preferred rabbits' and fowls' livers and pieces of meat, but would pluck and eat Sparrows if hungry enough. It uttered a curious, long, wild note, whew—ew—ew—ew—, very long drawn out, and, although loud, beautifully modulated and not shrill. This cry was chiefly uttered in the morning, and we thought more often on frosty days. When we first got it, its tail was rather draggled, as, owing to its broken leg it could not stand up, but as soon as it was able to perch, it preened itself carefully, and was quite beautiful when we released it. When we brought it food it used to come fluttering to meet us with its feathers puffed out, showing the chocolate brown band on the lower breast and its feathered legs very distinctly.—EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL, Largo.

Honey Buzzard in Berwickshire.—A Honey Buzzard (*Pernis apivorus*) was shot in this district about the middle of July last. This bird is rare in Berwickshire, and no other example has passed through the local bird-stuffer's hands during an experience of thirty years. The sex was not ascertained, but from the wing-measurements the bird appears to have been a female.—T. G. LAIDLAW, Duns.

Bernicle Goose in Berwickshire.—A Bernicle Goose (*Branta leucopsis*) was shot at Hule Moss, Greenlaw, on the 3rd November last. This is not a common bird on the east coast of Scotland, and it is also exceptional to find one wandering so far inland: from where the bird was shot, the sea is about twenty miles distant. The Hule Moss is a winter haunt of the Pink-footed Goose, and the Bernicle was in company with some birds of that species when it was secured.—T. G. LAIDLAW, Duns.

Landrail at St Kilda.—In *British Birds* for February, R. H. Read records that he obtained a Landrail at St Kilda on

the 9th of June 1888. This does not appear to have been previously recorded. Mr Read, however, is quite wrong in supposing that it "was on account of this specimen that Howard Saunders in his *Manual* recorded the Landrail as having been obtained on St Kilda." Saunders had already quoted St Kilda for this species in vol. iii., Part 17, of *Yarrell's British Birds* published in 1883, and was doubtless aware of Martin's record of 1697.

Little Auks in the Perth District.—I have received for the Museum a specimen of the Little Auk, which was picked up dead in a field within a mile of Tummelbridge, on Sunday, 30th January 1916. Other two specimens were found in the same district during the month of January. A fourth specimen was got at Kinmonth, near Bridge of Earn, and a fifth at Newtonmore. There was a long-continued succession of south-westerly gales during the month of January.—HENRY COATES, Perthshire Natural History Museum.

Black-tailed Godwit in Forth.—Seeing there are only half a dozen records of the occurrence of the Black-tailed Godwit (*Limosa limosa*) in the Forth area, I may mention that one was seen by me in Aberlady Bay on 7th August last (1915.) It was by itself, and seemed disinclined to mingle with the flocks of other waders.—WILLIAM EVANS, Edinburgh.

Lycæna artaxerxes and Zygæna filipendulæ in Kincardineshire.—Both these species of Lepidoptera are stated by G. E. Hartley (*Entomologist*, January 1916, p. 22) to have "literally swarmed" during the season of 1915 on the sea braes at Muchalls. A long series of *L. artaxerxes* was taken, including several aberrations.

Acronycta aceris on Birch in Aberdeenshire.—In the *Entomologist* for January (p. 22), G. E. Hartley mentions the occurrence of three larvæ of this species on birch. All the specimens duly pupated. The species is stated to be an addition to the Aberdeenshire List of Lepidoptera.

A new British Moth.—According to Edward Meyrick (*Ent. Mo. Mag.*, January 1916, p. 17), a fine example of the Tineid Moth *Depressaria hepaticella*, Zell., has been taken in Scotland by the Rev. J. W. Metcalfe. The precise locality and

date are not mentioned, but a description of the species is given. Its nearest British ally is stated to be *enicella*, and its food-plant supposed to be some Composite or Umbellifer. Abroad, it occurs from Lapland southwards to the Corinthian Alps.

Miscodera arctica, Payk., in the Forth Area.—On 4th September 1906 I found an example of this boreal beetle under a stone about 100 yards to the south of the cairn, on the summit of Ben Ledi. This would appear to be the first record of the species for the Forth drainage area.—WILLIAM EVANS, Edinburgh.

Bembidium paludosum, Panz., and Cœlambus quinque-lineatus, Zett., in the Forth Area—On 4th June 1904 the very local beetle, *Bembidium paludosum*, was common on the banks of a stream on Kilconquhar Links, Fife. The day being warm and sunny, the beetles were most active, and the few I took were not easily captured. Dr W. A. Jolly, as he kindly informed me, had met with the species "near Elie" the previous month. Though not given for Forth in Sharp's *Coleoptera of Scotland*, *Bembidium paludosum* appears in a list for the parish of Dollar, published in the *New Statistical Account of Scotland*, vol. viii. From Otterston Loch, Fife, I secured a specimen of the rare water-beetle, *Cœlambus quinque-lineatus*, on 21st October 1905. Mr Balfour Browne has confirmed the identification. The record adds, I think, another species to the Forth list.—WILLIAM EVANS, Edinburgh.

Staphylinid Beetle from Orkney.—T. Hudson Beare records (*Ent. Mo. Mag.*, January 1916, p. 16) the capture of *Philonthus varius* var. *shetlandicus*. Poppius, in moss on the mainland of Orkney in September 1910. He also records the var. *nitidicollis*, Boisd., of the same species from roots of grass at Southsea. This variety, now recognised as distinct from var. *bimaculatus*, Grav., is apparently new to the British List.

Andrena trimmerana, K., and its allies.—In the *Ent. Mo. Mag.* for January (pp. 13-15) R. C. L. Perkins gives some results of his study of the three bees, *Andrena trimmerana*, K., *spinigera*, K., and *rosæ*, Panz. In his opinion these forms are specifically distinct and not mere races. Two of them, moreover, are seasonably dimorphic, so that in all we have five distinguishable forms which should be separated in collections under distinct names. These are as follows: (1) *trimmerana*, K. (with a new variety *scotica*, stated to occur at Loch Rannoch); (2) *spinigera*, K.;

(3) *anglica*, Alf. (= *spinigera*, 2nd generation); (4) *rosæ*, Panz.; and (5) *eximia*, Sm. (= *rosæ*, 1st generation). A useful key is given for the identification of all these forms, male and female.

Simulium equinum, L., in Scotland.—In the *Entomologist's Monthly Magazine* for December 1915 (p. 331), William Evans records the capture of this new Scottish fly at East Linton, Haddingtonshire, on 21st April 1913. The specimens were identified by F. W. Edwards, British Museum.

Trichoptera (Caddis-flies) from Fair Isle, Shetland.—To the published lists of insects obtained by Mr Eagle Clarke on Fair Isle, the following Caddis-flies fall to be added:—*Limnophilus affinis*, Curt.—one specimen, taken in September 1906. *Stenophylax permistus*, M'Lach.—I have examined an example of this species taken in September 1906, and several other specimens of same date are probably also referable to it. *Halesus radiatus*, Curt.—one, autumn of 1912. It is a somewhat small male.—WILLIAM EVANS, Edinburgh.

BOOK NOTICE.

THE STRUCTURE OF THE FOWL. By O. Charnock Bradley, M.D., D.Sc., M.R.C.V.S. The Edinburgh Medical Series. A. & C. Black, London; pp. xi. + 153. Price 3s. 6d.

Among the higher creatures no class possesses organs more peculiar or more specialised than birds, and, on this account, the naturalist who would take an intelligent interest in their habits must pay some preliminary attention to their general organisation. Principal Bradley's manual, while intended primarily for the use of students of veterinary science, is an excellent guide for such a purpose. In describing a typical form it serves as an introduction to bird structure and development in general. It is clearly written, concise, and free from overloading with non-essential details. The printing is good, and the descriptions are elucidated by many instructive and original figures.

J. R.

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[APRIL

EDITORIAL.

DR SIDNEY F. HARMER, keeper of Zoology in the British Museum, has recently recorded¹ the occurrence of two specimens of Cuvier's Whale (*Ziphius cavirostris*) on the southern coast of Ireland. The only previous occurrence of this rare Cetacean in British waters is that recorded by the late Sir William Turner on the evidence of a skull obtained off Hamna Voe, Shetland, in 1870, and now in the Anatomical Museum of Edinburgh University. Dr Harmer was unable to trace the male Irish specimen referred to by Van Beneden in 1888, although he suspects that the species is not such an uncommon visitor to our shores as has hitherto been supposed. The two specimens recorded in the present paper were stranded in counties Wexford and Cork respectively, and their general appearance, skulls and teeth, are carefully described by the author. Cuvier's Whale is a native of the Northern Atlantic and Mediterranean, and has occurred on the coasts of Sweden, Denmark, and France.

In the March number of *British Birds* there are some interesting records of recoveries of marked birds. Perhaps the most worthy of note are a Linnet and a Pied Wagtail ringed in England, as nestlings, in July and August 1915,

¹ *Proc. Zool. Soc. Lond.*, December 1915, pp. 559-66.

and recovered in France in November; a Redstart ringed as a nestling in Westmorland in June and recovered in Portugal in October, and three British Lesser Black-backed Gulls all ringed in the north of England, two of which were recovered in Portugal; the third being got in France in the summer after it was marked. In addition to these there are many other returns well worth the notice of students of ornithology.

British entomologists should not overlook a paper of some importance by T. D. A. Cockerell, which, although published in America,¹ bears for its title "British Fossil Insects." This memoir is based upon the study of the Lacoe collection of fossil insects, now in the United States National Museum, and containing an important series of specimens partly from the Lias and partly from the Oligocene beds of the Isle of Wight, all collected by the Rev. P. B. Brodie. Forty-four new species and eleven new genera are described, the details of many of which are figured in the six plates which accompany the paper. A useful feature is the summary of our knowledge of British fossil insects given at the beginning of the article. From it we learn that altogether 368 species have been described, distributed in the various geological formations as follows:—Carboniferous, 27; Lias, 82; Oolite, 209; Tertiary, 42; and Post-tertiary, 8.

¹ *Proceedings U.S. National Museum* (No. 2119), 1915, pp. 469-99.

Land and Freshwater Mollusca of Jura and neighbouring islands.—In the January number of the *Journal of Conchology* (pp. 13-16) J. F. Musham publishes an account of additions made to the list of Land and Freshwater Mollusca of Jura, Colonsay, Oronsay, and Islay, which islands together form the vice-county known as "Ebudes South." A list is given of forty-eight species and varieties now known to inhabit the area, thirty-eight of which are additions made during two visits paid by the author in June 1908 and June 1913 respectively.

NOTES ON SOME SCOTTISH BIRDS
OBSERVED IN 1915.

By WILLIAM EAGLE CLARKE.

I. TREE-CREEPER IN THE ISLAND OF LEWIS.

TREE-CREEPERS have, on rare occasions, been observed in the British area in places far removed from their accustomed arboreal haunts, and quite unsuited to their habits and the peculiar manner in which they seek and obtain their food. The appearance of these wanderers in such localities, which include the Orkney and Shetland Islands, is a subject of interest to naturalists on several grounds. Thus the recent occurrence of one of these birds in the Island of Lewis is an interesting event to those who concern themselves with the fauna of the Outer Hebrides, since no Tree-creeper has ever before been known to visit any of the islands of that group; while to the student of bird migration, such a visit affords a remarkable instance of the wanderings of a species which is not accustomed to rove far beyond the limits of its native woodlands, and also one possessed of very limited powers of flight, usually only flitting from tree to tree.

There are yet other points of interest associated with these wanderers, for there remains to be solved the problem whence came these migrants. Were they emigrants from neighbouring British areas, or were they immigrant voyagers from the Continent? A few years ago it would not have been possible to give satisfactory answers to these questions, but now, thanks to our knowledge of racial forms, we are able in the case of many species, including the Tree-creeper, to do so, though the writer freely admits that they are more difficult to differentiate in this than in most groups, and that he has had to seek the aid of Dr Hartert in the present case.

Our own familiar Tree-Creeper belongs to a racial form peculiar to the British Islands, being one of the insular representatives of the Continental bird, and is known as *Certhia familiaris britannica*. The discoverer of its peculiar

characters was, strange to say, the distinguished American ornithologist, Robert Ridgway, who described it as long ago as the year 1882, but its distinctness has only recently been accepted by British ornithologists.

The latest addition to the list of these aberrant occurrences of Tree-Creepers in out-of-the-way places in our islands, and the *raison d'être* for the present remarks, was obtained under singular circumstances at Galson, in the north-west of the Island of Lewis, on 13th October last. During the terrific gale and torrential rain which prevailed on that day, one of the men at Galson Farm was engaged in making safe some stacks of hay which were in danger of being blown away, and on throwing a rope over one of them for that purpose, was much surprised to find that he had unwittingly killed an unfortunate bird-waif which had sought refuge there from the storm. The bird, being unknown, was kindly sent to me for identification by Mr John Morrison, one of our valued correspondents in the "Long Island." It proved to be of the British race, and had probably been unwillingly carried there on the wings of the gale. It may be remarked that one of the Fair Isle Tree-Creepers also sought refuge in a stack, where it was found in a dying condition. In conclusion, it may be useful to state that the Continental Tree-Creeper, *Certhia familiaris*, differs from the British form in having the brown tints in its upper plumage of a light yellowish tone, as against the pronounced rufescent brown of *Certhia familiaris britannica*.

II. CONTINENTAL BARN OWL IN SHETLAND.

In November last Dr Edmondston Saxby forwarded to me a male Barn Owl from Balta Sound, in the Island of Unst, where it had been captured in a rat trap, set in an outhouse, on the 5th of the month. Hitherto there have been no authentic records of the appearance of this bird in either the Shetland or Orkney groups, and hence its visit to the northernmost of the British Isles is to be regarded as a noteworthy occurrence.

The interest in the present record is further enhanced by the facts that the specimen belongs to the Continental dark form, *Flammea flammea guttata*, and that it is the first known instance of the visit of a bird of this race to Scotland. In England, where it is regarded as a rare immigrant, it has occurred in Kent, Sussex, Surrey, Oxon, Norfolk, Yorkshire, and Northumberland. The example recorded as having recently been obtained in Berkshire on 21st November 1915, from the description given of it, seems to be an intermediate form, and is not to be regarded as a full coloured characteristic example of the Continental dark-breasted race. The Edinburgh Museum received a similar example, which had been captured in Cornwall on 20th September 1915. Both these birds were probably visitors from the opposite side of the Channel, where the light-breasted, dark-breasted, and intermediate forms are known to occur.

The Dark-breasted Barn Owl is a native of South Sweden; Denmark; and Central Europe, west to France, and south to the Alps, Austria, and Hungary. In France it intergrades with the typical white-breasted form. The Shetland specimen has the upper parts blue-grey, finely vermiculated with greyish white; and each feather having two spots of white towards the tip, one terminal and the other subterminal, and having a dark spot between them and a smaller one above. Facial disc silvery white tinged with orange and vinous brown in the centre, and has a dark vinous spot in front of the eyes; the rim of the disc golden buff, each feather with a dusky centre streak, and its lower third brownish orange. Under-parts warm orange-buff, with clearly defined small blackish spots on the abdomen and larger double spots on the flanks. Wings and tail with broad bars of dark vermiculated grey and orange brown.

III. THE WATER-RAIL AT ST KILDA.

The Water-rail (*Rallus aquaticus*), though not previously recorded for St Kilda, has probably occurred there as a bird of passage, since it is a native and migratory species in

Iceland as well as North-western Europe. It seems, however, to have remained unnoticed as a visitor there until late last autumn, when an adult was obtained at Hirta, and was forwarded to me by an obliging correspondent.

The visits of migratory birds, especially those belonging to the land and the fresh-water groups, to the remote and insignificant islets which form the St Kilda Archipelago are of exceptional interest to naturalists for several reasons. Chief among these is the importance of such records as contributions to our knowledge of the course followed by the regular feathered voyagers when in spring *en route* for their native summer haunts, and in the autumn when returning to their winter retreats. One wishes it were possible to obtain more information regarding these movements, and of the species participating in them, from St Kilda—a station whose geographical position renders it unique among the bird observatories to be found in the North-western Atlantic. If this could be accomplished there can be no doubt, from the comparatively little we already know, that much interesting information would be forthcoming concerning the far-western movements of a number of migratory birds, as well as the remarkable wanderings of some of the rarer species.

IV. LESSER WHITETHROAT IN WEST INVERNESS-SHIRE.

On 13th June the writer and his friend, Mr Knight Horsfield, found a male *Sylvia curruca* among the trees that fringe the banks of the river just before it enters the head of Loch Trieg. Our attention was drawn to it by its song, and as it was remarkably tame, we were able to watch it for some time, during which it on several occasions came within a yard of where we stood. There was much cover near at hand which would afford suitable nesting sites, but whether the bird had a mate near by we were unable to ascertain, nor did we come across it again. It appears to be an uncommon visitor to the Western Highlands, but on 23rd May 1915 the Misses Rintoul and Baxter saw a Lesser Whitethroat among some low willows and brambles, close to the seashore, about two miles west of Arisaig. It was very

tame, and crept about among the undergrowth quite close to them, chuckling and singing its pleasing song. They returned on several occasions to the same place, but never saw the bird again. At this time there were enormous numbers of Common Whitethroats and Whinchats everywhere about Arisaig; these passed on in the next few days, and it was thought the Lesser Whitethroat must have departed with them.

This species bred in West Ross-shire in 1890, when a nest and eggs were found at Inverbroom, by the late Sir Arthur Fowler, Bart. These were submitted to the writer for his opinion.

V. NEW BIRD FOR FAIR ISLE.

Unfortunately, as the result of the war, we have lost the services of Jerome Wilson, who for several years had served us so well as the bird-watcher at Fair Isle. Wilson rightly considered it his duty to join the Naval Brigade early in February 1915. Among the birds which he recorded in his diary previous to his departure was one new to the avifauna of the island, namely, a Red-necked Grebe (*Podiceps grisegena*), a female, on 9th February. The addition of this bird brings the grand total of the species and subspecies observed at Fair Isle as the result of ten years' investigations to 226—a very remarkable record. When peace again prevails over these realms we hope to renew our work there, for its ornithological resources are by no means exhausted.

Little Gull at the mouth of the Don.—A specimen of the Little Gull (*Larus minutus*) was shot by my son, Ernest Gordon Paterson, at the mouth of the Don, on 3rd January, and is being preserved. Professor J. Arthur Thomson has seen it, and describes it as a beautiful specimen. The taxidermist to whom the bird was entrusted for preservation thinks it is a young male. The bill is black or nearly so, and there is a slight trace of brown on some of the feathers of the back. In Sim's *Vertebrate Fauna of Dee*, it is stated that a specimen was last obtained on 26th October 1888, at the mouth of the Dee.—GEORGE PATERSON, Cults, Aberdeenshire.

Slugs in the mountains of Westernness.—In 1913 Mr R. G. Carruthers, of the Geological Survey of Scotland, was kind enough to send me some Slugs from Ben Alder and Loch Ericht, which are interesting from the heights at which they were found. From the Eagle's Corrie on Ben Alder, at a height of 2500 feet, he sent (on the 25th of June) *Limax arborum* var. *rupicola*, the only one he saw. It was small, about a third of the size to which the species can attain, and was entirely brown-black in colour, with the banding obsolete, and the variety is distinctively the mountain form of the species. Along with it he sent a quarter-sized example of the type of *Arion ater*, with the trifasciation of the footsole very clearly marked. At the same date he sent various examples of *Arion ater*, the smaller of which was the type with trifasciate footsole, and the larger, an adult, was of var. *aterrima*, in which the footsole is uniformly dark in colour, nearly or even quite black. These were from the shores of Loch Ericht, at a height of 1160 feet, where the species was abundant, and it was equally common by the moorland paths up to 1500 feet. I shall be glad if other Scottish naturalists will favour me with examples of the mollusca of the mountains, with full and precise notes as to height, locality, date, habitat, frequency, etc.—W. DENISON ROEBUCK, 259 Hyde Park Road, Leeds.

BOOK NOTICE.

THE BRITISH MARINE ANNELIDS, Vol. III., Part I. (Text), and Part II. (Plates). Polychæta. Opheliidæ to Ammocharidæ. By Professor W. C. M'Intosh, F.R.S., etc. Issued to the subscribers of the Ray Society for 1914 and 1916.

The value of Professor M'Intosh's great work on British Marine Annelids is too well known to students of the Nemertine and Polychæte worms to need repetition here. The unanimous desire of all who know the monograph is to see it completed. It is therefore a genuine pleasure to record the issue of another (the third) of the series of folio volumes. The families dealt with in the present volume include the Arenicolids or Lug-worms, and others of economic interest. About ninety species in all are described. Unfortunately the War has, in the meantime at least, deprived the volume of the beautiful coloured plates one has learned to associate with the work. Having been executed abroad, it has not been possible to obtain them up to the present time. Excellent uncoloured copies of the coloured proofs by the collotype process have been substituted; and, should the six coloured plates be eventually obtained, their issue to the subscribers, and to purchasers of the volume, is provided for.

W. E.

A NOTE ON THE HIBERNATION OF FLIES.

By J. H. ASHWORTH, D.Sc.

THE notice in the Editorial of the March issue of *The Scottish Naturalist*, on the presence of swarms of flies in houses, suggests that a record of recent observations I have made on the occurrence of flies in a large detached house near the south-eastern boundary of the city of Edinburgh may be of interest.

I was asked to examine the flies in this house, and did so on 22nd February 1916. A bedroom on the second floor, with a large bay-window facing south, was first inspected. On the glass of this window, but more especially on the upper sides of the wooden cross-pieces between the panes, also on a ledge just under the window, on the wooden floor below, and on the neighbouring walls, were numerous small flies. Those on the window or in direct sunlight (though the day was cold, the sun was shining brightly during the time of my visit—1.30 to 2.30 P.M.) were crawling slowly, and only took a short flight on being disturbed; elsewhere the flies were lethargic, and either remained at rest or were creeping very slowly. Among the small flies were ten larger flies, mostly at rest, but two or three were crawling slowly over the floor. There were very few flies on the ceiling, but many were found resting behind pictures on the south wall of the room. All the large flies and a considerable number of the small ones were collected for detailed examination. A smaller bedroom and dressing-room on the second floor were inspected, and there also the small flies were found about the two windows (which look south and west respectively), though not in the same abundance as in the former room. A bedroom on the first floor and the morning room on the ground floor (each with windows to the south and east), in both of which the small flies were plentiful last autumn, were examined, but yielded no specimens.

From the large room first mentioned 244 flies were obtained, which have been identified as follows:—

Family Anthomyidæ.

Limnophora septemnotata, Zett., 234 ♀.

Family Muscidæ.

Pyrellia eriophthalma, Macq., 4 ♀, 2 ♂.

Muscina stabulans, Fallen, 2 ♀.

Calliphora (Protocalliphora) grænlandica, Zett.,¹ 1 ♀.

Pollenia rudis, Fabr., 1 ♀.

The "small flies" of the preceding account proved to be all *Limnophora septemnotata*, the "larger flies" being representatives of the four Muscids above named.

A second inspection of the large bedroom on the second floor was made on 7th March, when it was found that although so many flies had been collected there a fortnight previously, a considerable number had gathered on the window and on the floor below the window. These had probably emerged from various crevices or from behind the furniture, where they were resting unnoticed at the time of my previous visit. All these flies were females of *Limnophora septemnotata* except two—one *Muscina stabulans* ♀, and one *Calliphora grænlandica*¹ ♀. It will be noted that no specimens of the Common House-fly were present in the collections.

I have made careful inquiries regarding the occurrence of flies in this house in previous years, and find that in all the four rooms referred to above *Limnophora septemnotata* has been present in dense swarms during the past autumn, and that this fly has been troublesome to a greater or less extent in these rooms during the last sixteen years. The flies invaded the rooms in September and October, but have generally disappeared (or practically so) by the end of November; but during the last four years they have persisted in the rooms throughout the winter, and this year apparently in larger numbers than previously. Only the rooms with a southern aspect are affected, and of these the large bedroom

¹ Both these specimens are peculiarly sombre in their colouring, but Mr Grimshaw has kindly examined them, and assures me that they are examples of *C. grænlandica*. I am also indebted to Mr Grimshaw for help in regard to other specific determinations.

on the second floor seems to have been the site of the densest swarm, which at its maximum not only covered the bay-window but formed an elongate mass on the south and west ceiling, which was described to me as resembling a thick coil of black rope some three inches in thickness.

All the evidence seems to indicate that the specimens of *Limnophora septemnotata* entered the house in autumn to find quarters in which to pass the winter. It will be observed that all the specimens are female; no doubt the males died off at the end of autumn.

I have made a careful examination of the internal organs of ten specimens of *L. septemnotata* taken at random from the two batches collected. The specimens varied in length from 4 to 4.7 mm. All proved to be impregnated, their three receptacula seminis (spermothecæ) being crammed with long filamentous spermatozoa, which, when liberated by rupture of the receptacula, exhibited the characteristic lashing movements. Each ovary is a small oval mass (the shorter diameter is about .4 mm.), in which the short and very immature ovarian tubes can be distinguished. The ovary forms a striking feature of the dissection, owing to its tracheal supply being disproportionately large at this stage. The mid-gut is empty in every case, but the hind gut contains opaque granules evidently of excretory origin, as similar granules are present in the Malpighian tubes. Between the alimentary canal and the body-wall is a large fat-body.¹

Examination of the organs shows that the females are impregnated, and that, therefore, on the return of suitable conditions, those females which survive the winter could emerge from their winter quarters, feed, mature their ovaries,

¹ One female *Muscina stabulans* was dissected, and presented similar conditions, a mass of living sperms filling each receptaculum seminis. One female *Calliphora grænlandica* was also dissected, and its receptacula carefully examined, but spermatozoa were not present. Its other internal organs were in a condition similar to those of the *Limnophora* described above. Perhaps this specimen of *C. grænlandica* emerged late from the puparium, i.e. in late autumn, when males were scarce or had died out, and had thus not been impregnated. This species does not appear to be common around Edinburgh, so that there might be a considerable chance in autumn against a female being impregnated.

and produce a batch of eggs which would be fertilised by the sperms received in autumn, and maintained alive through the winter in the receptacula seminis. In this respect *Limnophora septemnotata* agrees with the Common Gnat, *Culex pipiens* (and no doubt with other Diptera which hibernate as imagos), specimens of which collected in late autumn or winter hibernating in cellars or outhouses are invariably females. I have examined during class-work, and for other purposes, some hundreds of such hibernating gnats, and have found, without exception, that their receptacula seminis contained living spermatozoa.

Plague of Flies in a Renfrewshire house.—The paragraph in the editorial of the March number of the *Scottish Naturalist* concerning the “plague of flies,” much interests me. We lived for seven years in a house at Caldwell (Renfrewshire), known as “Hall of Caldwell.” This was an old-fashioned house facing N.E. The principal rooms went from the front to the back, with a window in each wall directly opposite to each other. The drawing-room was above the kitchen. In the autumns of 1906, 1907, and 1908 we had a plague of flies there. There were a few on the kitchen window facing N.E. In the drawing-room above, however, on the corresponding window (viz. N.E.) the flies were in thousands—so black that it was difficult to see through. They covered the woodwork and roof above, and swarmed in behind the wooden shutters. There were a few Common House flies, but the multitude were of a fly about one-third smaller than the Common House-fly, and black. I got a tin of “Keating’s” and dusted it on them and on the window-sill—everywhere that Keating’s would lie. This quickly killed them off—they were then swept up—not a fly left. Next day they were as bad as ever. This usually went on for a week or ten days. It should be noted that this point applies to each year. Although there was a window in the same room facing S.W., very few even went near it. In both the apartments they kept to the windows facing N.E. No other rooms in the house were visited.—T. THORNTON MACKEITH, Kilmacolm.

THE STUDY OF DIPTERA.

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

OF recent years a great impetus has been given to the study of Diptera, or Two-winged Flies, by the discovery that many of these insects play an important part in the dissemination of disease. They may play the *rôle* of intermediate host in the life-cycle of some tiny protozoan which completes its development within the body of man, and in so doing causes a serious or fatal illness, or they may act as mere mechanical carriers of disease-producing bacteria, conveying such organisms from infected localities, and afterwards contaminating our food in such a way as to cause an outbreak of the particular disease in a new area. The list of diseases thus more or less directly due, not only in tropical climes but also within our own country, to the agency of Diptera is a long and formidable one. It is hardly necessary in this place to trouble the reader with a list of such diseases; the mere mention of malaria, yellow fever, and sleeping-sickness will be quite sufficient to convince him of the importance of the subject to travellers abroad; while within the limits of the British Isles themselves, although the more formidable diseases just mentioned are fortunately absent, yet it is now a well-established fact that epidemic outbreaks of typhoid fever, summer diarrhœa, diphtheria, smallpox, and other ailments are largely due to the agency of the common House-Fly, while certain other species are held to be more or less responsible for the transmission of diseases of lesser importance.

In another way flies are injurious to the welfare of mankind, for many species destroy his growing crops: witness the notorious Hessian Fly, devastator of wheat; while other groups, such as the Bot-Flies, attack his domestic animals, injuring their health and seriously damaging the commercial products derived from them. The annual loss due to Dipterous agencies, indeed, is reckoned in millions of pounds sterling.

Any investigations, therefore, which aid us in controlling the enormous numbers of these germ-carrying, food-destroying and herd-infesting pests, by throwing light upon the various details of their life-histories and habits, and thereby enabling us to attack them in their most vulnerable point, must be regarded as of supreme importance. That such is now realised to be the case is effectively shown by the great increase in the literature of the subject during the past twenty years or so. Especially is this so in regard to the species concerned in the spread of disease. Before the epoch-making discoveries of Major Ross, Drs Manson and Bruce, and others, the number of published memoirs dealing exclusively with Diptera was a comparatively small one, but since our attention was thus directed to the subject the percentage has increased to a notable extent. From the pages of the *Zoological Record* we may obtain some instructive statistics. For instance, in the year 1885 some 375 titles are given of papers and books devoted to insects, and of these twenty-one are devoted entirely to Diptera, *i.e.*, between 5 and 6 per cent. Ten years later the number of titles was 1251, of which 112 refer exclusively to this Order of insects, the percentage thus having risen to 9. In 1905 the titles number 1669, the papers on Diptera 186, while the percentage works out at 11.14. Lastly, in the volume for 1913, the latest accessible to me, the entomological titles amount to 2967, those referring to Diptera alone being 436—a percentage of 11.32. Thus, in spite of the heavy increase in the output of insect literature in general the percentage dealing with Two-winged Flies seems to maintain a steady increase.

From this rapid growth in the number of books and papers on Diptera there arises a considerable disadvantage to the student in one important respect. It becomes increasingly difficult to cope with the contents of this continually augmenting literature, and access to all the works written on the subject is becoming every day a more and more hopeless task. This state of things applies as much to the study of British Flies as it does to the forms inhabiting other countries. There is crying need for some work which would bring together within a reasonable compass the great

mass of facts which have accumulated regarding the classification, structure, and habits of our native species, which, by the way, number considerably over three thousand. Taking the subject from a merely systematic point of view, it may be remarked that the identification of the constituents of quite a small collection, such as, for instance, might be obtained in the field on a single sunny morning, necessitates reference to quite a number of books and scattered papers written in English, French, German, Latin, Dutch, and perhaps other languages. It is true, a few volumes have been published in recent years dealing with certain families (mainly from the systematic point of view), but I know of no general up-to-date work giving a summary of our knowledge of all groups from a biological as well as a taxonomic aspect. And yet a knowledge of our native species would serve as an admirable introduction to the study of those of the world in general, for out of a total of seventy-four existing families no fewer than sixty-four are represented in our own fauna.

Apart from the importance of Flies from an economic point of view, they are highly worthy of study on account of their great and interesting diversity in form and habit. Were they a little better known, it is certain that they would attract a host of students; no insects are more easily collected and preserved, and no group more amply repays the collector. The chance of making some interesting discovery and the likelihood of capturing species not hitherto obtained in this country are both greater than in the case of well-studied groups such as Butterflies, Moths, or Beetles. Every family of Flies has a particular interest of its own, and the majority still require careful investigation in many ways. Much still remains to be done by the systematist in differentiating the species, while those interested in their external structure will find ample scope for useful work in regard to the mouth-parts, genitalia, or that comparatively new subject known as chaetotaxy, which concerns the arrangement of the bristles on the various parts of the body. For those willing to work out life-histories there is an enormous field for research, for only the fringe of this subject has been touched; while finally, regarding the more difficult domains

of internal anatomy and embryology, the same remark applies, only with more intensity.

But, as in every other subject, one must first of all acquire a general elementary knowledge of the objects to be studied. And thus, by the formation of a typical collection, and the identification of the specimens contained therein, at least sufficiently to recognise to what families and perhaps genera they belong, the novice will gain a useful idea of the extent and variety comprised within the Order—a necessary preliminary to satisfactory work in the future. Such a procedure will also help the student to some extent in his choice of a subject for investigation, and probably assist him to realise where such work is more particularly required. My object, therefore, in penning the present article, which I hope will be shortly followed by others dealing with matters of detail, is to draw attention to the present need for more workers in a group of insects which are not only of extraordinary interest, but also likely to be, in the future, regarded as of the utmost importance.

***Andrena cetii*, Schr., in Forth and Argyll.**—In the autumn of 1902 I found several colonies of the dark variety of this little bee burrowing in sunny banks about Balquhiddy, in the upper part of the Forth area. Females were also fairly common on flowers of *Scabiosa succisa*. The specimens preserved are labelled as follows:—Kirkton of Balquhiddy, 20th and 21st August (both sexes); Loch Voil side, on Scabious, 2nd September (females); and Kingshouse, 17th September (females). The females are all dark coloured like the males. The identification was confirmed by the late Edward Saunders. Among Mr J. W. Bowhill's 1915 captures I detected a specimen of *A. cetii*, which was taken in the neighbourhood of Loch Awe, Argyllshire, in the beginning of September; it is a female with ochraceous markings on the upper side of the abdomen, the second and third segments being almost entirely of that colour. This species would appear to be very local in Scotland. It has been recorded from Arran, in the Clyde area, by A. A. Dalglish.—WILLIAM EVANS, Edinburgh.

HYDRACARINA FROM STRATHEARN.

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

WHEN in Comrie in August 1915, I made a few collections of Hydracarina in the neighbourhood. A visit to Drummond Pond yielded: *Piona longicornis imminuta* (Piersig), ♀; *Limnesia fulgida* (C. L. Koch), ♂ and ♀; *L. maculata* (O. F. Müll.), ♀; *L. undulata* (O. F. Müll.), ♂; *Brachypoda versicolor* (O. F. Müll.), ♀ and ♂; *Arrhenurus globator* (O. F. Müll.), ♀; *Frontipoda musculus* (O. F. Müll.), ♀; and *Hygrobates longipalpis* (Hermann), ♂ and ♀. A roadside pool on the way from Comrie to Glenartney yielded: *Piona carnea* C. L. Koch, ♂; *Arrhenurus cylindratus*, Piersig, ♂ and ♀; and *A. caudatus* (Geer), ♂. I had hoped to get good results from the pond close to Lawers House, but at the time of my visit the water had been temporarily drawn off. The proprietor of the estate (Rev. C. D. Robertson Williamson), however, very courteously directed me to some likely places on the estate. A hill tarn to the north of Lawers House yielded only *Diplodontus despiciens* (O. F. Müll.), of which a number of both sexes were taken as well as one nymph. A tarn near the railway, though apparently a much less likely place than the former, yielded better results. *Hygrobates longipalpis* (Hermann), ♂, ♀, and nymph; *H. nigromaculatus* Lebert, immature ♀; and *Arrhenurus cylindratus* Piersig, ♂, ♀, and nymph, were represented, as well as *Atractides anomalus* C. L. Koch, ♂. The most noteworthy capture here proved to be *Lebertia angulata* Sig Thor, not previously known to occur within the Britannic area, and supposed to be limited to Norway. The hitherto unknown nymph was also taken.

Lebertia angulata Sig Thor, without its rather pronounced antero-lateral corners and the more weakly developed postero-lateral ones, may be described as being nearly round in outline. The dorsum is somewhat flattened, so that the body is not thick. The skin is covered with fine, short, closely set, chitinous ridges, and in colour ranges from a pale yellowish brown to a dark brown,

with the Malpighian vessel showing a greenish yellow. The legs are more or less transparent. The capitulum has its lower edge deeply concave, and the processes at its extremities are sharply tapered, and, being short, do not extend beyond the pharynx. The anterior processes are as usual longer, but they do not reach back to the level of the posterior end of the pharynx. At its posterior end the pharynx is very thick and broad, but it narrows rapidly till the width is reduced to one-third. The anterior third when viewed laterally is seen to be fairly curved.

The palpi are as usual characteristic. The extensor surface of the second segment is highly arched, appearing, when viewed laterally, to be almost angular. It has two spines close together at its distal extremity, and two or three smaller ones farther back. The bristle on the flexor surface stands back from the distal margin, and is fairly long and slender. The distinctive feature of the third segment is *six* long bristles on the inner surface. Three of these are distal, one being at the flexor edge, one at the extensor edge, and the third rather closer to it than to the first. The fourth bristle is on the edge of the extensor surface, about midway between the proximal and distal extremities of the segment. The fifth lies slightly posterior to the fourth, but more in towards the centre of the inner surface. The sixth lies immediately posterior to the fifth, and about midway between it and the proximal extremity of the segment. The hair at the posterior pore on the flexor surface is very prominent, but the anterior pore hair is very indistinct. The hairs on the extensor surface are clustered distally, one being longer and more curved than the others. The second, third, and fourth segments are entirely porose, and very distinctly so.

The posterior ends of the first pair of epimera lie nearer to the genital area than to the capitulum. The posterior ends of the second pair are broad and thick. The posterior margin of the fourth pair is variable, so that the epimera are to be found with three or four edges. The lateral emargination is weak, and the inner posterior corners are blunted.

The legs are slender, with no appreciable enlargement of the sixth segment. At the distal end of the fourth and fifth segments of the third and fourth pair of legs, there will be observed a single hair—possibly a rudiment of the rows of swimming hairs to be found in other species. The claws are small, without accessory claw and lamina.

As in other nymphs, the palpi of the nymph of *L. angulata* differ considerably from that of the imago. The first segment

is without any spines, and the second segment also wants the long, characteristic bristle on the flexor surface. It has, however, midway on the extensor surface one short spine, and on the distal inner surface two moderately long bristles, one at the outer edge and the other inside and slightly in advance of it. The inner surface of the third segment has *three* long hairs, not six as in the imago. Of these three, one lies nearly proximal close to the extensor edge, the other two are distal and shorter, one being at the extensor edge and the other close to it on the inner surface. Extensor surface of fourth segment has three hairs distal, the middle one being longest. The hair pores on flexor surface agree with those of imago. At the distal extremity of same surface there is a short hair which stands well out.

The capitulum is similar to that of the imago, and lies in a recess which is relatively large.

The posterior end of the first pair of epimera is tapered, and runs well down towards the broad posterior end of the second pair. The suture between the second and third pairs is open for about one-third the width of the epimera, while the suture between the third and fourth pairs extends in from the outer edge for nearly three-fourths of the width. The fourth pair of epimera are nearly rectangular, and have their inner margins spreading out posteriorly. All margins are thick.

The genital area lies partly beyond the epimera. It has four acetabula and is surrounded by a ring. Between the genital area and the epimera there is a small sclerite.

The legs are sparingly equipped with bristles. Fourth and fifth segments of the fourth pair of legs have a short hair like the imago.

Of the earlier stages in the life-history nothing is yet known. *L. angulata* is the tenth species of *Lebertia* now known to occur within the Britannic area. Descriptions of the other nine species appear in the *Journal of the Quekett Micro Club* (Ser. 2), xii., 479-514, pls. 33 and 34.

THE COLOUR OF *HUITFELDTIA RECTIPES* SIG THOR.

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

Huitfeldtia rectipes Sig Thor, was first recorded from Norway, and afterwards from the Orkney Islands. Now it has been found in the north of England. The earlier records were from preserved material, so that no definite statement could be made as to the colours. This lack has been supplied by the English specimens. Mr C. D. Soar writes me that the colour is an orange-brown with brown markings. In the centre of the dorsum the colour is slightly lighter in tone, without any trace of the T-shaped figure indicating the Malpighian vessel, which is usually so conspicuous in the closely allied genus *Piona*.

79 Morningside Drive, Edinburgh.

Hylastes cunicularius, Er., in Peeblesshire.—On 7th October 1915, while collecting *Hylastes ater* on newly planted larch trees at Eddleston, Peeblesshire, I found, feeding side by side with them, a solitary specimen of *H. cunicularius*. I have since revisited the locality and examined numerous young conifers attacked by *Hylastes*, and also Scots pine stumps in which they were breeding, but while *H. ater* was common, I found no more *cunicularius*. So far as I am aware, the last record of *H. cunicularius* in Scotland is that of Professor Beare from Innerleithen. Three species of *Hylastes* occur in Scotland—*H. ater*, *H. cunicularius*, and *H. palliatus*. All three may, it is highly probable, occur together; certainly I have found *H. ater* in company with each of the others. *H. palliatus* is easily recognised by its smaller size and the stunted, pear-shaped prothorax. *H. ater* and *H. cunicularius*, on the other hand, closely resemble one another. The best characters for identification are the configuration of the prothorax and the breadth of the elytra. In *H. ater* the sides of the thorax are sub-parallel. In *cunicularius* the sides are obviously rounded and the punctures coarser (granulate). In *H. ater* the elytra are long and narrow, in *cunicularius* they are distinctly broader and proportionately shorter.—JAMES W. MUNRO, Edinburgh.

NOTES.

Bembidium quinquestriatum, Gyll., in the Edinburgh District.—In the January number (p. 16) of the *Entomologist's Monthly Magazine*, T. Hudson Beare records the capture on 20th February 1915 of this species of beetle in the Midcalder district, and remarks upon its scarcity in the Edinburgh district. Since 1901 he has repeatedly searched for it, but in vain, until the occasion noted. In the March number (pp. 64-65) of the same journal William Evans gives the results of his experience with the species, and gives details of his captures in the neighbourhood of the same city. In the course of the past twenty-seven years this beetle was taken by him on scarcely a dozen occasions.

Myelophilus minor (Hartig), in Forfarshire.—On 14th November 1915, while visiting a Scots pine wood on Balhall Estate, near Brechin, I picked up three fallen pine twigs that had been bored by a *Myelophilus*. I put these in my pocket and examined them on my return to Edinburgh. In two of the twigs I found *Myelophilus piniperda*, L., and in the third, *Myelophilus minor*.—JAMES W. MUNRO, Edinburgh.

Some Notes on the Eclipse Plumage of the Young Male Goldeneye.—Eclipse plumages are often difficult to obtain, and the published matter relating to the eclipse of the Goldeneye (*Bucephala clangula clangula*) is, as far as we have been able to ascertain, rather scanty. In Dresser's *Birds of Europe* there is a full description of an adult male in eclipse, translated from Dr Palmen (*Finl. Fogl.*, ii., p. 469), and Bechstein has a short description of the same stage (*Naturg. Deutschlids.*, iv., p. 990). In Millais' *British Diving Ducks* (vol. i., pp. 82 and 83) there are interesting notes on the eclipse plumage of both old and young male Goldeneye, but even he does not give a full description. We therefore think it may not come amiss to place on record the state of plumage of a young male in the collection of the Royal Scottish Museum. This bird was got on Benbecula, Outer Hebrides, on 11th November 1908; from the fact that the white on the wing-coverts is so much mixed with dark, we take it to be a young bird about sixteen months old. Head and neck greyish brown, paler on the chin and throat; some of the feathers have darker tips, and a lot of very small dark feathers are appearing on the cheeks. The white spot at the base of the bill is very indistinct, being represented by a few white feathers mixed with the brown ones, some of them

having dark tips. Feathers of the back greyish brown, becoming darker from the hind-neck downwards; the feathers have light tips with an ochreous tinge. On the entire back many new feathers are appearing which are much darker than the older ones, being blackish with a greenish gloss. A few white feathers form a very indistinct and much broken collar round the neck. Crop and sides of the neck cinereous grey, the tips being slightly ochreous; some new feathers of the same colour are making their appearance. Under-surface white, with many new feathers coming; flanks and vent ashy grey with an ochreous tinge; new feathers showing on the flanks. The tail consists of one old feather, brown and exceedingly worn; all the new tail-feathers appearing are dark, and almost wholly in quill. The primaries, secondaries, tertiaries, the primary and greater wing-coverts, are all in quill and just beginning to sprout; the wing-feathers being practically non-existent. The right wing is rather more developed than the left. The lesser wing-coverts are greyish brown with light ochreous tips, the median coverts very worn, a mixture of whitish and dusky grey, with new white feathers showing; under wing-coverts greyish brown. Scapulars brownish grey with hoary grey tips; several old feathers remain, in which one web is white, the other greyish brown with an indication of greenish gloss; a good many new scapulars seem to be coming in the same, while several darker scapulars are also appearing.

Our best thanks are due to the authorities at the Royal Scottish Museum for allowing us to examine and describe this specimen.—EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL, Largo.

Swimming of young Lapwings.—A very pretty little incident of last nesting-season may be worthy of record in your interesting pages. A pair of Lapwings had nested on an island in the Knapps Loch near here. They were undisturbed, and in due course hatched out. One evening thereafter, as some of us were sitting watching the bird-life, the mother of these four chicks flew over to the shore and at once started calling her family. Three of the young birds immediately responded by entering the water and swimming across. The fourth remained behind. The mother then returned to the island, but what she said to the little trembler will ever remain a secret. She then rejoined the three, and there repeated her call. This time she was successful, for the solitary little chap at once entered the water and swam bravely across. The distance will be about 30 to 40 yards. I never saw young Lapwings in the water before.—T. THORNTON MACKETH, Kilmacolm.

Ivory Gull on the West Coast of Scotland.—On 5th February 1916, I secured an Ivory Gull (*Pagophila eburnea*) at Mallaig. When I first noticed it, it was flying about with other gulls, near the rocks. It is a beautiful adult male, with red eyelids and black feet.—LEONARD BARNARD, Lowestoft.

Ivory Gulls in Inverness-shire.—The occurrence of Ivory Gulls (*Pagophila eburnea*) in the Beauly Firth is, I think, of sufficient interest to be worthy of record in the *Scottish Naturalist*. On the 5th of February an adult male of this species was got there, and on the 7th I saw another one at fairly close quarters. They came in ahead of a bad storm.—WILLIAM BERRY, Lentrán.

***Dryocætes autographus*, Ratz., near Harelaw, Midlothian.**—On 4th February 1916, while examining some fallen spruce trees for *Hylastes palliatus*, I found numbers of *Dryocætes autographus*, for the most part lying in their pupal chambers under the bark. Those parts of the tree-stem which were wettest and most sheltered harboured the greatest numbers. On other stems larvæ also occurred, and in fact scarcely a stem was examined which did not harbour some. *H. palliatus* occurred along with the *Dryocætes*, but on the drier, fresher parts of the stem, especially in the "crown." The first record of *D. autographus* in Britain is from Scarborough, 1869. It has since been recorded by Bagnall in Weardale, Durham. For the Scottish records I am indebted to Professor Beare, who found it in 1902 at Hawthornden, under Scots pine, and in 1903 near Midcalder, by sweeping under larches. Mr Wm. Evans has also very kindly allowed me to examine several specimens in his collection, and to give the dates of their capture and the localities. In April 1903 he obtained it near Kirknewton, Midcalder, on two occasions. On 2nd April he took one specimen, and on 14th April found a colony on a spruce stump. He again obtained it at Blair Adam on 6th June 1909. The gallery of *D. autographus* is interesting. The mother-gallery is U-shaped, one leg of the U being short. The larval galleries are confused. This confusion is due to the fact that *Dryocætes* lays its eggs in clusters. As the several larvæ hatch they may feed side by side for a time, and then strike off in a radial direction; or they may follow the first hatched member of their group for a time and then feed side by side, to scatter later. I succeeded in securing several specimens of these curious galleries, and Mr Evans kindly showed me a particularly fine one he had himself obtained.—JAMES W. MUNRO, Edinburgh.

Note on the habits of *Phloeophthorus rhododactylus*, Marsh, and *Hylastinus obscurus*, Marsh.—Both these bark-beetles inhabit whin and broom stems and branches, and in view of their small size and the close similarity of their habits, some notes on their contrasting features may be of interest. *Phloeophthorus* is the smaller beetle, and is rarely found on thick stems, the galleries usually occurring on stems or small branches half an inch in diameter, and less. I have found it on branches less than quarter of an inch thick. The mother-gallery of *P. rhododactylus* is Y-shaped, and is vertical. As a rule one arm of the Y is shorter than the other, and sometimes it may be scarcely noticeable. *Hylastinus obscurus* prefers stouter stems, an inch or more in diameter, and I have never found it on branches less than half an inch thick. The mother-galleries of *obscurus* are horizontal, and may sometimes all but girdle the stem. The type is very similar to the galleries of *Hylesinus crenatus* on ash, and as in *crenatus*, one branch of the mother-gallery may be shorter than the other.—JAMES W. MUNRO, Edinburgh.

***Sinodendron cylindricum*, L., in Peeblesshire.**—On 14th October 1915 I obtained on a dying ash stem several larvæ and two adults of *S. cylindricum*. This beetle is comparatively rare in Scotland, the last record being that of Mr Black from Peebles district. The above specimens were obtained on Darnhall Estate, Eddleston. Dr Stewart MacDougall has mentioned this occurrence, and added a note on the beetle and its larvæ in the January number of the *Arboricultural Society's Transactions*.—JAMES W. MUNRO, Edinburgh.

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[MAY

EDITORIAL.

THE *History of British Mammals*, commenced by the late G. E. H. Barrett-Hamilton, and carried on by Martin A. C. Hinton, continues to make progress, Part XVIII. having been issued quite recently. Only two species are dealt with, viz.: the Harvest Mouse (*Micromys minutus*, Pallas), to which twenty-one pages are devoted, and the Black or Ship Rat (*Epimys rattus*, Linn.), the consideration of which occupies the same amount of space, and is carried forward to the next part. It is interesting to note that the latter species is divided into three subspecies—the Black Rat proper (*E. rattus rattus*), the Alexandrine Rat (*E. rattus alexandrinus*), and *E. rattus frugivorus*, the last named of which still remains to be considered. Very complete and carefully compiled accounts are given of the distribution of these rodents in Britain. We learn that the Harvest Mouse “undoubtedly has occurred and probably still occurs in Scotland, but it must be very local, and cannot be anywhere numerous”; it appears also to be less frequently met with than formerly. The introduction of the Black Rat, which came from the East, is discussed in great detail, and an interesting account given of the extermination of this species in many parts of Britain by its larger and stronger relative, the Brown Rat. Three full-page illustrations and two text-figures accompany the letterpress.

In the pages of one of our entomological contemporaries,¹ we have read with feelings of anything but pleasure a paper by C. P. Pickett recording the capture of an excessive number of specimens of the Chalk Hill Blue Butterfly (*Agriades coridon*), in order to secure as large a number as possible of the variety known as *roystonensis*. The writer remarks that he was able to "work" it as he "had never worked it before," and, let us add the hope, *as he will never work it again*. He says that after examining some 60,000 specimens his total of the variety amounted to 66 examples. During his stay in the particular locality some 32 collectors were counted, "all more or less keen on *semi-syngrapha* . . . and as each captor stayed from one or two days to a week, roughly some 500 *semi-syngrapha* were taken." Although the species is stated to have been flying "in countless thousands," yet we cannot admit the justification of such wholesale slaughter of a butterfly and its varieties. We should much like to see some legislation put into force for the preservation of our most beautiful insects, and a "Butterfly Protection Act" would be as welcome as have been those passed in the cause of ornithology.

James W. Munro has recently published² an excellent account of the larvæ of the Furniture Beetles—Families Anobiidæ and Lyctidæ. From an economic point of view this memoir should prove extremely useful, since it aims at furnishing definite characters for the identification of the larvæ of these destructive insects. From an examination of the author's descriptions and analytical keys, together with the beautifully drawn figures which accompany the text, we can cordially congratulate him on having achieved his object. Indeed, the treatise is an admirable one in every respect, and may well serve as a model for other workers in insect morphology.

¹ *Entomologist's Record*, March 1916, pp. 59-62.

² *Proceedings of the Royal Physical Society*, vol. xix., pp. 220-36 (February 1916).

CONTINENTAL RACIAL FORMS OF SCOTTISH
BREEDING BIRDS AND THEIR OCCUR-
RENCES IN SCOTLAND.

By LEONORA JEFFREY RINTOUL, H.M.B.O.U., and
EVELYN V. BAXTER, H.M.B.O.U.

EACH year more interest is being taken in the study of geographical races of birds, their importance is becoming more generally recognised, and their value more appreciated. There are, of course, many species which do not vary in any particular throughout the whole extent of their geographical range, and with these there is no question of subspecies. On the other hand there are also many species which vary according to the localities in which the birds breed. In some cases the difference is striking and the differentiation is therefore easy; in others the differences, though constant, are small, and need careful study and comparison. These differences, if constant in birds breeding in a given area, entitle such bird to subspecific rank. The breeding quarters of the various races of a species are, therefore, always distinct, though the winter quarters of the various forms may be identical. There is a certain amount of intergrading between the races, where the ranges meet, as in the case of the Barn Owl, of which the dark-breasted and light-breasted forms intergrade in France, and this may also be observed in other cases. In this paper we shall only include those which have occurred in Scotland, and of which we have a resident race.

The identification of these racial forms is not by any means an easy matter; in many cases they differ in such small particulars that it is impossible to identify them unless the specimen be available for comparison and measurement. Field identifications are, therefore, usually of little value; the comparative thickness of bill, length of wing, shades of colour, etc., cannot be determined at a glance; in fact, until the worker is thoroughly familiar with the various races, identification should only be attempted when a large series

of skins are available for comparison. There is a good deal of divergence of opinion as to what constitutes a species or a subspecies, and no two lists, indeed hardly any two men, agree on this thorny matter. In this paper we shall, as is our wont, follow Dr Hartert, and include two forms which have not been differentiated in the new B.O.U. list. These are the Continental Goldcrest and Hedge-sparrow, which in our opinion are readily distinguishable from the British races.

We propose to give a brief account of the status, in Scotland, of the races dealt with, along with a description of the difference between them and our Scottish breeding birds, except in the case of forms which have frequently been described before. To this we shall add any field notes which we have made on the habits of these races. When there is a big rush of immigrants from the Continent on an isolated station like the Isle of May, and when Continental Thrushes, Robins, etc., have been killed at the lantern, it is fairly safe to assume that those seen on the island next day are also arrivals from overseas.

The REDPOLLS are a very puzzling group; the differences between them are small, and the difficulties are increased by transition forms. The MEALY REDPOLL (*Carduelis linaria linaria*), which breeds from the far north, south to the Baltic, is a fairly common winter visitor to Scotland. In some seasons it occurs in very large numbers, the largest immigration of recent years being in 1910. It is larger, and the brown on the back is less red than in our resident LESSER REDPOLL (*Carduelis linaria cabaret*). A doubtful and rather unsatisfactory form is *Carduelis linaria holboellii*: it nests in the Polar regions of the Old and New World, and is stated to be larger, the wing longer (74-78 mm. in the Mealy Redpoll, 75-81.5 mm. in Holboell's Redpoll), the bill stronger and usually longer than in *C. l. linaria* (8 mm. in the type, 9-11 in the other). Hartert says there are transition forms between these two Redpolls, and that they often breed in the same locality, which makes him doubtful whether Holboell's Redpoll should not be accorded specific

rank. It is an irregular visitor to Scotland, and has been recorded from Haddington, Midlothian, Linlithgow, the Isle of May, and Shetland. The GREATER REDPOLL (*Carduelis linaria rostrata*) breeds in southern Greenland. It is a very large form, with strong linnet-like bill. The upper side is very dark, and the striping on the under-side strikingly dark and heavy. It is an uncommon visitor to Scotland, and has been recorded from Lanark, the Inner Hebrides (Tiree), the Outer Hebrides, Orkney, and Shetland.

The NORTHERN BULLFINCH (*Pyrrhula pyrrhula pyrrhula*) is a larger bird than the British race, the wing measuring 93-98 mm., as against 81-88 mm. in the smaller bird. The grey on the back is lighter, and the pink on the breast generally brighter. The female, too, is lighter and cleaner in colour than the British bird. The Northern Bullfinch breeds in Northern Europe and Western Siberia, and is an irregular passage migrant in Scotland, occurring in considerable numbers in some years. It has been recorded from Berwick, Haddington, North and South Fife, and the Isle of May, Orkney, and Shetland. We have not, ourselves, been fortunate enough to see this bird alive, but several occurred on the Isle of May after we had left the island in 1910, and the inhabitants there told us what a beautiful bird it was, and how much larger and brighter it looked than the common form.

One of our most interesting birds is the SCOTTISH CROSSBILL (*Loxia curvirostra scotica*), which differs from its continental relative in having a stouter and more curved bill, the curve of the upper mandible being more round and the whole bill heavier. The typical form of CROSSBILL (*Loxia curvirostra curvirostra*) breeds in Europe generally and in Northern Asia, and visits Scotland at irregular intervals, and in some seasons in large numbers. The Crossbills which have bred irregularly in a few of the southern counties (Dumfries, Wigtown, Ayr, Linlithgow, Stirling, and possibly Kincardine), probably belonged to this race. In 1909 there was a very large immigration of this form into Scotland: the first was seen on Fair Isle on 23rd June; thereafter they arrived in numbers, as many

as 300 being seen on the island on 10th July. They were reported from almost every part of Scotland—from the Shetlands in the north to Creetown, Kirkcudbrightshire, in the south; from Fraserburgh in the east to the Outer Hebrides, Flannan Islands, and St Kilda on the west. They alighted on ships in the North Sea, and hundreds are reported by fishermen as having been found drowned. They were reduced, in our outer isles, to such makeshifts in the way of food as the yellow centres of daisies, berries, seapinks, and greenfly, all very different from their usual diet.

One example of the EASTERN SKYLARK (*Alauda arvensis cinerascens*) is known to have occurred in Scotland; it was killed on the Flannan Islands on 24th February 1906. This form is usually smaller and decidedly greyer than our bird, and breeds in parts of Western Asia.

One example of the AMERICAN WATER PIPIT (*Anthus spinoletta rubescens*) has been recorded from St Kilda in September 1910. It breeds in the Nearctic and N.E. Siberia. The distinguishing feature of this subspecies is the large amount of white on the second pair of tail feathers. The SCANDINAVIAN ROCK PIPIT (*Anthus spinoletta littoralis*) has occurred at Pentland Skerries, Orkney, and Fair Isle, Shetland. It is distinguished from our Rock Pipit by having a reddish wash on the foreneck, which is also rather less spotted. This difference is only present in spring plumage; in autumn dress it does not differ from our bird. The Scandinavian Rock Pipit has doubtless occurred elsewhere in Scotland on passage, but the above are the only definite records.

Dr Hartert regards all the Yellow Wagtails as subspecies of *Motacilla flava*. The only one which breeds in Scotland is the YELLOW WAGTAIL (*Motacilla flava rayi*). Full descriptions of the Blue-headed and Grey-headed Wagtails can be found in any book on British Birds, so we shall not give any here, merely recording their status in Scotland. The BLUE-HEADED WAGTAIL (*Motacilla flava flava*) breeds from Central Scandinavia to the Pyrenees and east to Russia. It has occurred in Lanark, Haddington, Midlothian (an old

and rather doubtful record), the Isle of May, and Aberdeen, and is an occasional passage migrant in Shetland. The only times we saw the Blue-headed Wagtail on the Isle of May were on the 13th and 14th May 1913. The picture rises before us, of the plateau on the island covered with rough grass, and with here and there pools of water, the result of the recent rain. By one of these pools a Blue-headed Wagtail was feeding, a beautiful bird with blue-grey head and very distinct white eye-stripe. We watched it through our glasses for some time, but when we attempted to approach nearer, it rose at once and flew off. SYKE'S WAGTAIL (*Motacilla flava beema*), which breeds in West Siberia, has once been procured on Fair Isle, on 13th May 1910. It differs from *Motacilla flava flava* in having a shorter tail and lighter head, the superciliary stripe is very broad, and the lower part of the ear-coverts is mixed with white. The GREY-HEADED WAGTAIL (*Motacilla flava thunbergi*) breeds in Northern Europe and Siberia, and has occurred several times on the Isle of May and in Orkney, and is an occasional passage migrant in Shetland. We have several times seen the Grey-headed Wagtail on the Isle of May in spring—the features which strike one most being the shortness of its tail and its note. This last is very loud and ringing, and quite different from that of the other Wagtails with which we are familiar. It is always very wild and unapproachable. The WHITE WAGTAIL (*Motacilla alba alba*) breeds in Europe generally, and is a regular passage migrant along our coasts, more common on the West than on the East. It reaches as far as St Kilda, where it is one of the commonest birds of passage, and has bred on several occasions in Shetland. We have often seen this bird on passage, and have noticed that the note differs very distinctly from the familiar “chizzit” of the Pied Wagtail. The differences of plumage between this form and the Pied Wagtail have long been known, and need no description here.

The NORTHERN TREE-CREEPER (*Certhia familiaris familiaris*), which breeds in Northern Europe and Siberia, differs from our resident bird in having the brown tints in the upper plumage of a light yellowish tone, as against the

pronounced rufescent brown of the British Tree-creeper (*Certhia familiaris britannica*). It is a rare visitor to Scotland, the only place from which it has been recorded being Fair Isle.

The CONTINENTAL GREAT TITMOUSE (*Parus major major*) breeds in Europe and Western Siberia. It differs from our native bird in having a slimmer, less powerful bill. Specimens of this form have been obtained on the Isle of May and in Shetland. It doubtless occurs elsewhere down our coasts, but these are the only localities from which it is authentically recorded. In the autumn of 1914 there was a regular immigration of Continental Great Tits into Shetland, where they remained all winter. The CONTINENTAL BLUE TITMOUSE (*Parus cæruleus cæruleus*) differs from our British bird in being brighter and more yellowish on the back, in being larger, and having a comparatively slimmer bill. It breeds in Europe generally, and has only once been recorded in Scotland, namely, in Peeblesshire in September 1895. Two specimens of the CONTINENTAL COAL TITMOUSE (*Parus ater ater*) are recorded in the new B.O.U. list from Morayshire. It breeds in Europe and Northern Asia, and differs from our resident race (*P. a. britannicus*) in the grey tone of the upper side (washed with yellowish olive in the British bird) and in having a somewhat longer wing.

In the new B.O.U. Hand-list the BRITISH GOLDEN-CRESTED WREN is not separated from the Continental. However, as Dr Hartert has done so, and as the Goldcrests from the Continent, as well as those obtained during the large continental immigrations, appear to us to differ from the British Goldcrest (*Regulus regulus anglorum*), we intend to include it here. The CONTINENTAL GOLDCREST (*Regulus regulus regulus*) breeds in Europe generally, east to the Caucasus and Asia Minor. It differs from our bird in being greener (less olive) on the upper side, this difference being specially noticeable on nape and rump, rather lighter and less brownish on the under side and sides of neck. Immigrations of this form occur almost every autumn in greater or lesser numbers on the Isle of May and in Orkney and

Shetland. Doubtless the immigrant Goldcrests, which sometimes occur in such numbers all down our east coast, also belong to the typical form. The status of this bird, in Scotland, is insufficiently known, and further definite records are much to be desired. A large immigration of Goldcrests is a most wonderful sight. When they arrive, which in our experience is always with an easterly or south-easterly wind, the poor little birds are often so tired as to allow themselves to be picked up in the hand. They are strongly attracted by light, and are among the most frequent visitors to the lighthouse lanterns. They are by far the tamest and most fearless of all the migrants, and will perch on the rocks and garden walls within reach of one's hand. They look strangely out of place in those barren islets, creeping about on the great rock faces and swarming on the grassy plateaux.

In Northern and Eastern Europe we find a larger, longer-winged form of the CHIFFCHAFF. The SCANDINAVIAN CHIFFCHAFF (*Phylloscopus collybita abietinus*) occurs in Scotland as a passage migrant both in spring and autumn. The wing measurement is 62-67.3 mm. in the males, 56-60 mm. in the females; in the Common Chiffchaff the wing measures from 55-60 mm., the longer being the males, the shorter the females. The Scandinavian Chiffchaff has been recorded from Orkney and Shetland, the Outer Hebrides, and the Isle of May. On migration the habits of this Chiffchaff seem in no way to differ from those of the Common Chiffchaff. Another Chiffchaff which is a regular autumn visitor to Shetland, and has also occurred in Orkney and at the Isle of May, is the SIBERIAN CHIFFCHAFF (*Phylloscopus collybita tristis*). This form breeds in the extreme east of Europe and in Siberia, and although usually occurring only on autumn passage has been found wintering in Orkney and Shetland, and has once appeared at Fair Isle in spring. It differs from the Common Chiffchaff in the absence of yellow in the plumage, in being whiter below, greyer on the back, and in having coal-black legs; the superciliary stripe is cream-coloured instead of yellow. The bend of the wing and under wing-coverts are sulphur-yellow, less greenish-yellow

than in the type. We have only once been fortunate enough to see this bird alive, when the absence of yellow in the plumage struck us very forcibly, and the black legs were much more conspicuous than we would have expected.

(*To be continued.*)

Comparison of Danish and Scottish Ornithological Movements in 1914.—As the Danish Report on Ornithology (*Fuglene ved de danske Fyr*, i., 1914) contains so much of interest to Scottish ornithologists, and many of the movements recorded therein correlate so closely with those observed in our own country, we think it well to draw attention to the more outstanding points in this interesting publication. The records from which it is compiled are derived exclusively from observations made at the lighthouses and lightships round the coast, only a very small percentage being daylight observations. Perhaps the most striking similarity between the two reports is found in the movement of Dotterel, which took place in the end of August. On the last two nights of the month the species is recorded from the lanterns of the Isle of May and Mull of Galloway; in some numbers at both places. At the Lynvig lightship a large number were seen in the rays on the night of the 29th-30th, and six were killed. Another instance hardly less interesting is found in the movements of Great Tits; these are recorded from various stations in Denmark, in considerable numbers in October, and it will be remembered that arrivals of this species took place on Fair Isle and in Shetland during the same period. There are also many interesting records of the spring and autumn migrations of Skylarks, Starlings, Red-breasts, Turdinæ, Waders, etc., and a study of the two reports will show how closely these agree with those which take place in our own country. One thing which strikes the student of the Danish records is the number of ducks which are killed at the lanterns. These birds do not appear to be much attracted by light, as a rule, but here we find Black Scoter, Scaup, Goldeneye, Mallard, and Eider, and in addition to the ducks mentioned Brent Geese, Coots, Moorhens, a Razorbill, and a Little Auk, striking the lanterns. There are also brief notes on the more uncommon birds which have occurred during the year; these include a Ruddy Sheldrake, a Bustard (*Otis tetrix*), a Bee-eater, an Oriole, a Lapland Bunting, and a Long-tailed Tit, which has been identified as *Acredula caudata rosca*.—EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL, Largo.

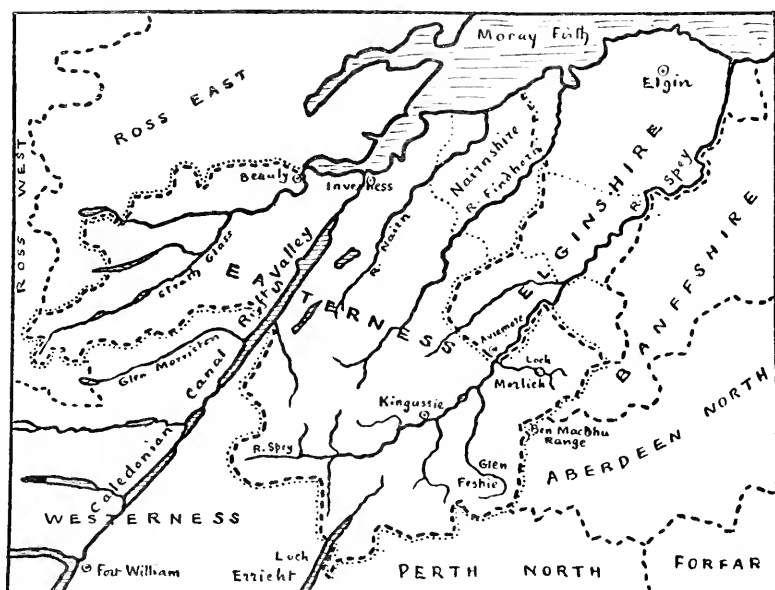
EASTERNESS: THE VICE-COUNTY AND ITS MOLLUSCAN FAUNA.

By W. DENISON ROEBUCK, M.Sc., F.L.S.

IN my capacity as Hon. Recorder of the Conchological Society of Great Britain and Ireland, I am endeavouring to complete the census of distribution as based upon examples authenticated by the Society's referees. I wish to call attention to the vice-county of Easternness as one which has been very little worked, and yet which is of high importance from the point of view of distribution. Its situation in the British Islands places it at about the point where the study of the northern limitations of range offers problems worthy of investigation; and the remarkable rift valley along which the Caledonian Canal runs constitutes an important feature of the physical geography of the vice-county, and one likely to have presented a formidable barrier to the northward progress of various species. In altitude the vice-county ranges from sea-level on the Moray Firth to over 4000 feet on the Cairngorm and Braeriach range, and it includes the vast forest of Rothiemurchus, the scene of the re-discovery of the long-lost species, *Limax tenellus*. It is important, therefore, that a much closer survey of its land and freshwater mollusca should be made than has hitherto been done.

The sketch-map given here shows the boundaries of the vice-county. It may be defined as that portion of Inverness-shire which lies east of the line of watershed between the East and West of Scotland, to which is added Nairnshire, and from which is subtracted a district which is included in the vice-county called Elginshire, which is not quite the same as the civil or political county of Elgin. It is needful to explain that when Mr H. Cottrell Watson defined his vice-counties, the civil county of Elgin consisted of two detached portions, between which intervened a detached

portion of Inverness-shire, the three taken together constituting his vice-county 95, Elginshire. In 1870 an Act of Parliament transferred the detached portion of Inverness-shire to Elginshire in exchange for the southernmost detached portion of Elginshire. The vice-county for botanical and conchological work remains, however, as Watson defined it, the difficulty now being to state in words the southern boundary of vice-county 95. We shall



Boundaries of Easternness.

Boundaries of other Vice-Counties.

Subsidiary Boundaries.

SKETCH-MAP OF EASTERNNESS AND ELGINSHIRE VICE-COUNTIES.

have to content ourselves with knowing that it includes the Dulnan Valley up as far as Elie, and that it includes Aviemore in its south-east corner, and on the east the Dorback Burn Valley with Nethy Bridge at its foot.

All the work that has been done in Easternness has been done by very few observers, viz.:—Alex. Somerville in 1886 and 1888; Rev. J. E. Somerville in 1887; William Evans in 1889, 1891, 1892, 1893; Rev. R. Godfrey in 1904; Thomas Scott before 1891; Charles Oldham in 1911, and

J. E. Black in 1913—all of them visitors, and none resident observers.

The authenticated list is as follows:—

Limax cinereo-niger (Wolf).

Loch-an-Eilean near Aviemore, one, May 1893 (W. Evans); the Doune, Rothiemurchus, one, 12th June 1893 (*id.*); var. *maura* in Rothiemurchus pine forest, one nearly adult and one small, with next species, 29th August 1904 (Rev. R. Godfrey).

Limax tenellus (Müll.).

Abundant in the pine forest of Rothiemurchus, where it was discovered by Rev. R. Godfrey on 29th August 1904. This is the original locality in which the species was rediscovered as British, after having been lost sight of for no less than fifty-six years, and the history of its rediscovery may be considered one of the few romances of modern natural history. Mr Godfrey had previously collected the species in Switzerland, and on working the Rothiemurchus forest was struck by the similarity of the slugs which he found so abundant among the pine needles to the Swiss specimens. He described it as being emphatically the common slug of the habitat, where its chief haunts were on old pine branches lying half-smothered in the masses of blaeberrries, whortle-berries, and heather—the branches being covered with decayed pine needles and other rotten vegetation, amongst which these slugs concealed themselves, although several were found under stones. Its ordinary companion was *L. arborum*. This discovery of the nature of the habitat at once threw a flood of light upon the occurrence of the species, and showed that the reason of its having so long escaped notice was the fact that, its habitat being aboriginal pine forests, conchologists had never thought of searching, from a belief that pine was inimical to molluscan life. The hint was at once taken, and it fell to my lot to organise immediate search in similar localities elsewhere. This was the end of August, and on the 15th of October I left England for a long tour at the Antipodes. During these six weeks it was found in three more Scottish and two English counties, making six in all, viz.:—Easterness, Kincardine, Perth Mid, Perth South with Clackmannan, York North-west, and Essex South. On my return in 1906 from my Antipodean travel, I organised fresh work, and the species turned up in 1907 in Northumberland South; in 1908 in Worcestershire,

Buckinghamshire, and the Island of Jura (Ebudes South); in 1909 in Hertfordshire, Oxfordshire, and Staffordshire; in 1910 in Perth North; in 1912 in Surrey; and in 1915 in Shropshire; and it has also been found in Northamptonshire—altogether six Scottish and eleven English counties, five of these forming a ring encircling London. The secret of its occurrence is its preference for aboriginal forest, pine in Scotland and the north of England, beech in the south; and it does not occur in modern plantations, so would seem doomed to ultimate extinction as a component of the British fauna, when and as the old forest tracts fall under the axe of the woodman.

Var. *cerea* is the common and prevalent form at Rothiemurchus, and elsewhere. Of var. *fulva*, a few with type at Rothiemurchus, 29th August 1904 (R. Godfrey). Of var. *cincta*, one was found at Moy, 29th September 1911, by Mr Charles Oldham, to whom we are indebted for the actual discovery of the species in most of its English localities.

Limax arborum (B.-Ch.).

Kincraig, by Kingussie, August 1889 (W. Evans).

Var. *alpestris* occurred in Rothiemurchus forest, with *L. tenellus*, 29th August 1904 (Rev. R. Godfrey).

Agriolimax agrestis (L.).

Nairn, type and var. *reticulata*, 15th January 1887 (Rev. J. E. Somerville); var. *reticulata* at Glenurquhart, 21st January 1887 (*id.*); Kincraig by Kingussie, 22nd August 1889 (William Evans); Glen Feshie, before 1890 (*id.*); Dalwhinnie, 16th June 1892 (*id.*).

Agriolimax lœvis (Müll.).

Nairn, 13th January 1887, one obtained during frost (J. E. Somerville); Kincraig by Kingussie, 22nd August 1889 (W. Evans).

Arion ater (L.).

Inverness, one adult, 1st June 1888 (Alex. Somerville); Kincraig by Kingussie, common, 22nd August 1889 (W. Evans); Dalwhinnie, small, 16th June 1892 (*id.*); Rothiemurchus Forest, one, with *L. tenellus*, 29th August 1904 (R. Godfrey).

Arion subfuscus (Dp.).

Dalwhinnie, 16th June 1892 (W. Evans); var. *rufofusca*, Rothiemurchus pine forest, 30th August 1904 (R. Godfrey); vars. *rufofusca* and *fuliginea*, a few of each, nearly grown, on the western bank of the Caledonian Canal near Inverness (Charles Oldham).

Arion hortensis Fér.

Nairn, one, 13th January 1887 (J. E. Somerville); Glen Feshie, alt. 1250 feet, September 1889 (W. Evans); Dalwhinnie, 16th June 1892 (*id.*); Coylum Bridge near Aviemore, one adult, very dark brown, 27th August 1904 (R. Godfrey).

Arion circumscriptus Johnst.

Nairn, one juvenile, 13th January 1887 (J. E. Somerville); Glenurquhart, 21st January 1887, on gneiss (*id.*); Inverness, several, 1st June 1888 (A. Somerville); Kincaig by Kingussie, 22nd August 1889 (W. Evans); Glen Feshie, September 1889 (*id.*); Dalwhinnie, 16th June 1892 (*id.*); Moy, two adults, 29th September 1911 (Charles Oldham).

Arion intermedius (Norm.).

Dalwhinnie, 1200 feet alt., 16th June 1892 (W. Evans); Rothiemurchus pine forest, 30th August 1904 (R. Godfrey).

Vitrina pellucida (Müll.).

Upper part of Glen Feshie, 2nd September 1889 (W. Evans); Nairn, 15th January 1887 (J. E. Somerville); Nairn, a few, 12th September 1891 (W. Evans).

Hyalinia cellaria (Müll.).

Glen Feshie (W. Evans).

Hyalinia alliaria (Miller).

Glenurquhart, January 1887 (J. E. Somerville); Strathglass, January 1887 (*id.*); Nairn, 15th January 1887 (*id.*); Kincaig by Kingussie, 1889 (W. Evans); Upper Glen Feshie, under stones at "The Huts," alt. 1250 feet, September 1889 (*id.*); Castle Roy by Nethy Bridge, August 1891 (*id.*); Nairn, several, 12th September 1891 (*id.*); Dalwhinnie, alt. 1200 feet, 16th June 1892 (*id.*).

Hyalinia pura (Alder).

Var. *nitidosa*, Glenurquhart, January 1887 (J. E. Somerville); var. *margaritacea*, Strathglass, January 1887 (*id.*).

Hyalinia radiatula (Alder).

Kincaig by Kingussie, 1889 (W. Evans); Dalwhinnie, 16th June 1892 (*id.*); shore of Loch Cuaich near Dalwhinnie, one, 30th June 1913 (J. E. Black).

Hyalinia crystallina (Müll.).

Strathglass, January 1887 (J. E. Somerville); var. *contracta*, under stones at "The Huts," Upper Glen Feshie, alt. 1250 feet, September 1889 (W. Evans).

Hyalinia fulva (Müll.).

Dalwhinnie, at 1200 feet alt., 16th June 1892 (W. Evans).

Zonitoides nitidus (Müll.).

Kincraig by Kingussie, a few, 22nd August 1889 (W. Evans).

Helix hortensis (Müll.).

Glenurquhart, January 1887, one juvenile var. *lutea* 00345 (J. E. Somerville); Rothiemurchus, type = var. *lutea* 12345 (W. Evans).

Vallonia pulchella (Müll.).

Nairn, 15th January 1887 (J. E. Somerville).

Zua lubrica (Müll.).

Kincraig by Kingussie, several, 22nd August 1889 (W. Evans); upper part of Glen Feshie at 1250 feet alt., under stones, etc., at "The Huts" (ruined cottages) above the shooting-lodge (*id.*); Dalwhinnie, very young examples, 16th June 1892 (*id.*); var. *lubricoides*, one in rabbit burrow on Speyside near Newtonmore, 12th July 1913 (J. E. Black).

Limnæa peregra (Müll.).

Nairnshire, locality not stated, a few, also juvenile, August 1886 (Alex. Somerville); Loch Morlich, a few, young, July 1887 (J. E. Somerville); dub by roadside between Kincraig and Kingussie, 5th September 1889 (W. Evans); in the River Spey, Kincraig, one, small, 25th September 1889 (*id.*); monst. *decollatum* abundant with type in the dub between Kincraig and Kingussie, 5th September 1889 (*id.*).

Planorbis crista (L.).

Pond near Inverness (Thomas Scott, before 1890).

Planorbis contortus (L.).

Loch Morlich, July 1887 (J. E. Somerville).

Pisidium fontinale Drap.

Loch Pityoulish (*cf.* Ordnance Map, Loch Phitiulais of Baddeley's Guide), May 1893 (W. Evans).

Pisidium pusillum (Gmel.)

Nairn, one, August 1886 (Alex. Somerville); Loch Pityoulish or Phitiulais, May 1893 (W. Evans); Loch Ness, collected at a depth of 700 feet by Mr James Murray of the Lake Survey in 1903; the bulk are of this species, probably all, although they were referred to *P. milium* and *P. nitidum* by persons who have seen them (W. Evans).

Pisidium milium Held.

Loch Morlich, July 1887 (J. E. Somerville); pond near Inverness (Thomas Scott, before 1890).

There are various species of practically universal range in Britain which have not yet been reported to us for Easter-

ness, such as *Limax maximus*, *Hyalinia nitidula*, *Punctum pygmaeum*, *Pyramidula rotundata*, *Helicigona arbustorum*, *Hygromia fusca*, *H. granulata*, *Pupa cylindracea*, *Sphyradium edentulum*, *Balea perversa*, *Clausilia bidentata*, and *Carychium minimum*, among the land shells.

Only six freshwater molluscs have been reported, but we ought certainly to see *Unio margaritifer* (the Pearl mussel), *Ancylus fluviatilis*, *Limnaea truncatula*, and other *Pisidia*, besides other species. It would be of interest to ascertain if such species as *Helix nemoralis*, *Helix aspersa* (so far only known to have crossed the line of the great rift valley at one point, Ardtornish Castle on the Sound of Mull, in Westernness), and *Hygromia hispida*, have attained so far north, these three being species whose northern limits require tracing out.

I wish to make a direct appeal for further research in this vice-county. If any specimens exist in collections, either public or private, we should like to see them. If any residents in the vice-county will collect what specimens they can, their assistance will be valued—and in doing so it is by no means needful that they be conversant with our mollusca. Any observant lover of nature, if he takes care to include the small species, and the common and therefore dominant and variable forms, can further the quest, and naturalists and others visiting the area can render equally good service. The slugs are particularly desired, as they must always be seen in a living state.

In the mountainous regions the observation of altitudinal range is of importance and interest, and in all cases the furnishing of as full data as possible, locality, habitat, altitude, date, etc., adds immeasurably to the value of an observation.

I shall be glad to hear from any one willing to co-operate, at 259 Hyde Park Road, Leeds.

Barn Owl in the Glasgow District.—I found a dead Barn Owl here on 27th February. The only other occasions on which I have seen a Barn Owl here were in October 1912. In Mr John Paterson's paper in *The Glasgow Naturalist*, on "The Birds of the Glasgow District," he said, "I have only heard of the Barn Owl at Cathcart and Milngavie in recent years. I have never seen it myself." A keen observer of bird life who lives a few miles from here tells me he has only seen it once in that district.—JAMES BARTHOLOMEW, Torrance, near Glasgow.

Flies in a Perthshire House.—As bearing upon the subject of the hibernation of flies in houses, it may be interesting to record that Mr J. M'L. Marshall, of Bleaton Hallet, Perthshire, noticed this spring a large number of flies lying in a torpid condition near the windows of several rooms in his house. At my request he very kindly procured an average sample from each room, and submitted them to me for inspection. Out of a total of 236 specimens examined, I found sixty-seven of *Limnophora septemnotata*, Ztt., all females; thirty-five males and forty-four females of *Pollenia rudis*, Fab.; forty-eight males and twenty females of *Pyrellia eriophthalma*, Mcq.; one male and two females of *Calliphora erythrocephala*, Mg.; one male and two females of *Calliphora grœnlandica*, Ztt.; one female of *Musca domestica*, L.; four specimens of *Æcothea fenestralis*, Flin.; two females of *Aphiochæta rufipes*, Mg.; and two Mycetophilids (each of a different species), undetermined. The other insects included half-a-dozen Chalcids and one example of the Coccinellid beetle, *Adalia oblitterata*, L. From the number of insects in each room there is no evidence of a marked preference for any particular aspect.—PERCY H. GRIMSHAW, Edinburgh.

Tipula vittata, Mg., in Perthshire.—I have seen no notice of the capture of this handsome species in recent years. As a Scottish insect, it is recorded by the late G. W. Ord in *Trans. Nat. Hist. Soc. of Glasgow*, 1897-98, p. 195, from Linn of Baldernock (Clyde), and by R. Henderson in his Tipulidæ of the west of Scotland (*Ent. Mo. Mag.*, 1901, p. 115). I found the species once or twice at Blairgowrie on marshy ground. It is rather a difficult insect to catch, as it rises from the grass, etc., before the net is within striking distance, flies on ahead, and suddenly disappears, only to rise again as one moves forward. I have two males taken in June 1910, and a female in July 1913. I have not seen the species elsewhere.—A. E. J. CARTER, Monifieth.

DIPTERA SCOTICA: VI.—THE WESTERN ISLES.

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

(Continued from 1915, page 281.)

HOLOMETOPA.

SCATOMYZIDÆ.

276. *Amaurosoma fasciatum*, Mg.—1 ♀, Dunvegan, Skye, June 1905 (Waterston).
277. *Scatophaga litorea*, Flin.—1 ♂, Jura, Sept. 1907 (Waterston); 1 ♂, Iona, June 1906 (Waterston); 1 ♂, Uig, Skye, June 1906 (Waterston); 1 ♀, S. Uist, 13th June 1906 (Kinneare); 1 ♂ and 2 ♀, S. Uist, June 1910 (Grimshaw); 1 ♂ and 1 ♀, Benbecula, 7th June 1906 (Kinneare); 3 ♂ and 1 ♀, Balelone, N. Uist, June 1905 (Waterston); 3 ♂, Garrynahine, Lewis, 4th July 1906 (Kinneare); Lewis, July 1914 (Lamb).
278. *S. lutaria*, Fab.—1 ♀, Uig, Skye, June 1906 (Waterston).
279. *S. maculipes*, Ztt.—1 ♂ and 1 ♀, Dunvegan, Skye, June 1905 (Waterston).
280. *S. ordinata*, Beck.—1 ♀, Loch Ba, Mull, Oct. 1907 (Annan-dale).
281. *S. squalida*, Mg.—1 ♂ and 3 ♀, Jura, Sept. 1907 (Waterston); 1 ♂, Uig, Skye, June 1906 (Waterston); 1 ♂, Barra, June 1910 (Misses Baxter and Rintoul); 1 ♂ and 2 ♀, S. Uist, June 1910 (Grimshaw); 1 ♂ and 1 ♀, Benbecula, June 1906 (Kinneare); 1 ♂ and 2 ♀, Balelone, N. Uist, June 1905 (Waterston); 5 ♀, Garrynahine, Lewis, 4th July 1906 (Kinneare).
282. *S. stercoraria*, L.—1 ♂, Machrie, Islay, 30th Aug. 1904 (Miss Evans); 2 ♂, Jura, Sept. 1907 (Waterston); 1 ♂, Barra, 3rd June 1910 (Misses Baxter and Rintoul); 2 ♀, S. Uist, 13th June 1906 (Kinneare); 15 ♂ and 19 ♀, S. Uist, June 1910 (Grimshaw); 1 ♀, Balelone, N. Uist, June 1905 (Waterston); 2 ♂ and 2 ♀, Garrynahine, Lewis, 4th July 1906 (Kinneare); 1 ♀, Stornoway, 8th July 1906 (Kinneare); 2 ♀, Butt of Lewis, Sept. 1914 (Eagle Clarke); Lewis, July 1914 (Lamb).
283. *S. suilla*, Fab.—2 ♂ and 2 ♀, Jura, Sept. 1907 (Waterston).

284. *Scatophaga villipes*, Ztt.—1 ♂ and 2 ♀, Jura, Sept. 1907 (Waterston); 3 ♀, S. Uist, June 1910 (Grimshaw); 1 ♂ and 2 ♀, Garrynahine, Lewis, 4th July 1906 (Kinnear); Lewis, July 1914 (Lamb).
285. *Ceratinostoma ostiorum*, Hal.—1 ♂, Benbecula, 7th June 1906 (Kinnear).
286. *Norellia spinimana*, Fln.—2 ♂, Balelone, N. Uist, June 1905 (Waterston).
287. *Acanthocnema nigrimanum*, Ztt.—Lewis, July 1914 (Lamb).
288. *Gimnomera tarsea*, Fln.—7 ♂ and 11 ♀, Garrynahine, Lewis, 4th July 1906 (Kinnear).

PHYCOTROMIDÆ.

289. *Malacomysia sciomyzina*, Hal.—1 ♂ and 1 ♀, Jura, Sept. 1907 (Waterston).
290. *Ædoparca buccata*, Fln.—1 ♂ and 1 ♀, Jura, Sept. 1907 (Waterston); 1 ♂ and 4 ♀, S. Uist, June 1910 (Grimshaw); Lewis, July 1914 (Lamb).
291. *Fucomysia frigida*, Fln.—1 ♂ and 3 ♀, Jura, Sept. 1907 (Waterston); 6 ♂ and 8 ♀, S. Uist, 13th June 1906 (Kinnear); 1 ♂ and 1 ♀, Skipport, S. Uist, June 1906 (Waterston); 2 ♂ and 3 ♀, Lochboisdale, S. Uist, June 1906 (Waterston); 37 ♂ and 81 ♀, S. Uist, June 1910 (Grimshaw); 1 ♂ and 1 ♀, Garrynahine, Lewis, 4th July 1906 (Kinnear); 3 ♀, Butt of Lewis, Sept. 1914 (Eagle Clarke); Lewis, July 1914 (Lamb).
292. *Orygma luctuosa*, Mg.—1 ♂, Benbecula, 7th June 1906 (Kinnear); Lewis, July 1914 (Lamb).

BOREBORIDÆ.

293. *Borborus equinus*, Fln.—6 ♂ and 3 ♀, Jura, Sept. 1907 (Waterston); 2 ♂ and 1 ♀, Dunvegan, Skye, June 1905 (Waterston); 3 ♂ and 7 ♀, S. Uist, June 1910 (Grimshaw); 5 ♂ and 3 ♀, Balelone, N. Uist, June 1905 (Waterston); Lewis, July 1914 (Lamb).
294. *B. nitidus*, Mg.—1 ♀, Balelone, N. Uist, June 1905 (Waterston).
295. *Olina geniculata*, Mcq.—1 ♂ and 3 ♀, Jura, Sept. 1907 (Waterston); 4 ♂ and 2 ♀, S. Uist, June 1910 (Grimshaw); 2 ♂, Balelone, N. Uist, June 1905 (Waterston).
296. *Sphærocera subsultans*, Fab.—1 ♀, Balelone, N. Uist, June 1905 (Waterston).
297. *Limosina crassimana*, Hal.—1, Jura, Sept. 1907 (Waterston).

298. *Limosina fontinalis*, Fln.—1, Balelone, N. Uist, June 1905 (Waterston).
 299. *L. limosa*, Fln.—5, S. Uist, June 1910 (Grimshaw); 1, Garrynahine, Lewis, 4th July 1906 (Kinnear).
 300. *L. lutosa*, Stenh.—Lewis, July 1914 (Lamb).
 301. *L. sylvatica*, Mg.—1 ♀, S. Uist, June 1910 (Grimshaw); 1 ♀, Balelone, N. Uist, June 1905 (Waterston).

DRYOMYZIDÆ.

302. *Dryomyza decrepita*, Ztt.—3 ♂, Jura, Sept. 1907 (Waterston).
 303. *D. flaveola*, Fab.—1 ♀, Jura, Sept. 1907 (Waterston).
 304. *Neuroctena anilis*, Fln.—1 ♂ and 1 ♀, Jura, Sept. 1907 (Waterston).
 305. *Actora aestuum*, Mg.—5 ♂ and 1 ♀, S. Uist, June 1910 (Grimshaw); Lewis, July 1914 (Lamb).

HELOMYZIDÆ.

306. *Helomyza bicolor*, Ztt.—1 ♂, Jura, Sept. 1907 (Waterston).
 307. *H. hilaris*, Ztt.—1 ♂, Jura, Sept. 1907 (Waterston).
 308. *H. inornata*, Lw.—1 ♀, Jura, Sept. 1907 (Waterston).
 309. *H. similis*, Mg.—1 ♀, Jura, Sept. 1907 (Waterston).
 310. *Allophyla atricornis*, Mg.—1 ♀, Jura, Sept. 1907 (Waterston).
 311. *Leria modesta*, Mg.—1 ♂ and 1 ♀, Garrynahine, Lewis, 4th July 1906 (Kinnear).
 312. *Heteromyza commixta*, Collin—12 ♂, Jura, Sept. 1907 (Waterston).

SCIOMYZIDÆ.

313. *Sciomyza albocostata*, Fln.—1 ♀, Jura, Sept. 1907 (Waterston).
 314. *Ditania cinerella*, Fln.—Lewis, July 1914 (Lamb).
 315. *D. griseus*, Mg.—Lewis, July 1914 (Lamb).
 316. *Tetanocera hyalipennis*, v. Ros. (*levifrons*, Lw.).—1 ♀, Uig, Skye, June 1906 (Waterston); 1 ♀, Garrynahine, Lewis, 4th July 1906 (Kinnear); Lewis, July 1914 (Lamb).
 317. *T. robusta*, Lw.—3 ♂ and 2 ♀, S. Uist, 13th June 1906 (Kinnear); 4 ♂ and 2 ♀, S. Uist, June 1910 (Grimshaw).
 318. *Monochætophora umbrarum*, L.—Harris, 29th July 1883, C. W. Dale, *Ent. Mo. Mag.*, xx., p. 256 (1883-84).
 319. *Pherbina coryleti*, Scop.—1 ♀, S. Uist, June 1910 (Grimshaw).
 320. *Elgiva albiseta*, Scop.—1 ♂, Lochboisdale, S. Uist, June 1906 (Waterston); 3 ♂ and 1 ♀, S. Uist, June 1910 (Grimshaw); 1 ♂, Garrynahine, Lewis, 4th July 1906 (Kinnear); Lewis, July 1914 (Lamb).

321. *Elgiva lineata*, Fln.—2 ♀, S. Uist, June 1910 (Grimshaw);
1 ♂, Garynahine, Lewis, 4th July 1906 (Kinnear).
322. *Hydromyia dorsalis*, Fab.—4 ♂ and 1 ♀, S. Uist, 13th June
1906 (Kinnear); 6 ♂ and 1 ♀, Balelone, N. Uist, June
1905 (Waterston); Lewis, July 1914 (Lamb).

SAPROMYZIDÆ.

323. *Sapromyza pallidiventris*, Fln.—1, Jura, Sept. 1907 (Waterston); 1, Stornoway, Lewis, 8th July 1906 (Kinnear).
324. *S. rorida*, Fln.—3, Jura, Sept. 1907 (Waterston); 1, Uig, Skye, June 1906 (Waterston); 1, Stornoway, 8th July 1906 (Kinnear).
325. *Minettia trispina*, Rnd.—3, S. Uist, June 1910 (Grimshaw).
326. *Lauxania ænea*, Fln.—1, Uig, Skye, June 1906 (Waterston); Lewis, July 1914 (Lamb).

LONCHÆIDÆ.

327. *Palloptera trimacula*, Mg.—1, Jura, Sept. 1907 (Waterston).

ORTALIDÆ.

328. *Herina frondescentiæ*, L.—6, Garynahine, Lewis, 4th July 1906 (Kinnear).

TRYPETIDÆ.

329. *Oxya absinthii*, Fab.—Lewis, July 1914 (Lamb).
330. *Tephritis conjuncta*, Lw.—1, Jura, Sept. 1907 (Waterston).
331. *T. vespertina*, Lw.—1, Jura, Sept. 1907 (Waterston).
332. *Urellia stellata*, Fuessly—Lewis, July 1914 (Lamb).

SEPSIDÆ.

333. *Sepsis cynipsea*, L.—2 ♂, Dunvegan, Skye, June 1905 (Waterston); 1 ♂ and 5 ♀, S. Uist, June 1910 (Grimshaw); 1 ♂ and 2 ♀, Benbecula, 7th June 1906 (Kinnear); 1 ♀, Balelone, N. Uist, June 1905 (Waterston); 1 ♂, Garynahine, Lewis, 4th July 1906 (Kinnear).
334. *Themira minor*, Hal.—1 ♀, S. Uist, 13th June 1906 (Kinnear).
335. *Nemopoda cylindrica*, Fab.—2 ♂, Jura, Sept. 1907 (Waterston); 2 ♀, Balelone, N. Uist, June 1905 (Waterston); 2 ♂ and 2 ♀, Stornoway, Lewis, 8th July 1906 (Kinnear); Lewis, July 1914 (Lamb).
336. *Piophilila nigrimana*, Mg.—1, S. Uist, June 1910 (Grimshaw).

337. *Piophilila vulgaris*, Fln.—1, S. Uist, June 1910 (Grimshaw); 1, Butt of Lewis, Sept. 1914 (Eagle Clarke); Lewis, July 1914 (Lamb).

PSILIDÆ.

338. *Psila nigra*, Fln.—9, Balelone, N. Uist, June 1905 (Waterston); 1, Garynahine, Lewis, 4th July 1906 (Kinneare); 1, Stornoway, Lewis, 8th July 1906 (Kinneare); Lewis, July 1914 (Lamb).
339. *P. rosæ*, Fab.—1, S. Uist, 13th June 1906 (Kinneare).
340. *Loxocera aristata*, Panz.—6, S. Uist, June 1910 (Grimshaw); 3, Garynahine, Lewis, 4th July 1906 (Kinneare); Lewis, July 1914 (Lamb).

CHLOROPIDÆ.

341. *Melanum laterale*, Hal.—2, Jura, Sept. 1907 (Waterston).
342. *Meromyza pratorum*, Mg.—Lewis, July 1914 (Lamb).
343. *Chlorops tæniopa*, Mg.—2, Uig, Skye, June 1906 (Waterston).

(To be continued.)

Empis concolor, Verr., in Midlothian.—There does not seem to have been any record of this species since Verrall described it in 1872. He captured three males and a female at Aberlady on 30th June 1870. This record is referred to in Mr Grimshaw's "Diptera Scotica," iii. (*Ann. Scot. Nat. Hist.*, 1903, p. 164). It is interesting, therefore, to know that the species occurs at Musselburgh, where I took two males and three females at flowers of an Umbellifer growing at the side of the Esk on 24th July 1906. The species must be rare, as these are the only specimens I have seen.—A. E. J. CARTER, Monifieth.

Leria flavotestacea, Zett., in Midlothian and Perthshire.—While collecting at Polton (Midlothian) on 6th August 1906, I swept up a male of this rare species. I have also a male taken at Blairgowrie, 12th June 1913. This fly was added to the British List by Mr J. E. Collin (*Ent. Mo. Mag.*, 1910, p. 126) on specimens from Forres, The Mound (Sutherland), and two Welsh localities. It has since been recorded (*Scot. Nat.*, 1913, p. 137) from Lochinver by Col. Yerbury. The present records show that it is widely distributed in Scotland.—A. E. J. CARTER, Monifieth,

The Woodlice of Scotland.—For some years past I have been engaged upon a Monograph of the Woodlice of the British Isles, and had it not been for the present European War, the first part would have been published ere now. One of the features of the work will be an exhaustive record of the distribution of the various species, which has now become fairly complete for England and Ireland, but still remains very incomplete for Scotland. Robertson in 1888 recorded the species occurring in the Clyde district, and Dr Thomas Scott in 1891 and 1906 those of the Edinburgh district, the only previous record being, I believe, that of Thomas Edwards for Banff. Patience in 1908 also revised the records of the Clyde district. Apart from these the actual records are extremely few.

I feel sure that there are many Scotch naturalists who would be willing to help to increase these records, if they knew that such were desired. May I invite such assistance, which will be very cordially welcomed and gratefully acknowledged. Specimens should be placed on collecting in small glass tubes or bottles containing a little 75 per cent. alcohol. A small piece of tissue paper should be placed in the tubes or bottles in order to prevent the specimens becoming damaged in transit.—W. E. COLLINGE, 3 Queen's Terrace, St Andrews.

Læmobothrium tinnunculi (L.), from a Kestrel in the Forth Area.—Among a number of Mallophaga taken in the Forth district since the publication of my list in *Proc. Roy. Phys. Society*, 1912 (vol. xviii., p. 265), there is a species of *Læmobothrium*, a genus remarkable in this order for the large size of its members. My specimens—one adult and three immature—were sent me by Lance-Corpl. W. M. Ingles, who took them off a Kestrel which was found dead at Dysart, Fife, on 15th January 1916. The adult specimen (♀) is quite 8 mm. in length. Two closely allied species are stated to occur on the Kestrel, namely, *L. giganteum*, N. (? = *tinnunculi*, L.), and *L. titan*, Piaget. According to Mjöberg's figures of the heads of these, the Fife specimens do not exactly correspond with either form, but occupy a somewhat intermediate position, nearer, however, to the former than to the latter. Denny's *L. laticolle*, from a Hobby in England, was evidently a very similar insect to mine, which is probably the *Pediculus tinnunculi* of Linnæus.—WILLIAM EVANS, Edinburgh.

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[JUNE

EDITORIAL.

WE have pleasure in announcing that Mr W. Denison Roebuck, Hon. Recorder of the Conchological Society, proposes to publish in our pages a series of articles on the various areas of Scotland in which it is desirable that further molluscan investigation should be undertaken. The first of these, dealing with Easternness, appeared in our last number, and the succeeding papers will treat the subject on precisely the same lines. In order to make the various lists more complete, he is anxious to have the opportunity of examining any material either existing in private collections or obtained during the coming collecting season. We trust, therefore, that such of our readers as have specimens in their possession from any part of Scotland, or who have the opportunity of collecting, will assist in this useful work. The area next to be dealt with is East Ross, *i.e.* that portion of the county which lies within the eastern watershed, and specimens from this vice-county are desired *without delay*. They should be addressed direct to Mr Roebuck at 259 Hyde Park Road, Leeds.

The feeding habits of the Purple-tipped Sea-Urchin form the subject of an interesting article by H. N. Milligan.¹

¹ *Zoologist*, March 1916, pp. 81-99.

The observations are based on notes made upon the behaviour in an aquarium of about sixty examples, and are detailed under the following headings: (1) Animal matter as food; (2) vegetable matter as food; (3) inorganic matter as food; (4) the search for food; (5) the positions and postures adopted in feeding; and (6) the time spent in feeding. In the first section it is surprising to find how varied is the diet of these lowly creatures. Several species of fish serve as victims, but usually only the softer parts are devoured, although an exception to this rule is recorded. Various species of crabs and smaller crustaceans are attacked, and even their exoskeleton and fæces eaten, as are also the soft parts and even shells of molluscs. Other echinoderms, polyzoa, and worms, also cœlenterates and sponges, form part of the *menu*, and even sand, gravel, and chalk. A number of objects eaten by the Urchins are illustrated in a figure, which shows clearly the amount gnawed away by their teeth. It is pointed out, however, that seaweed constitutes by far the greater portion of the food of these animals, and this accords with our previous ideas on the subject. The section on the "search for food" shows how slowly yet surely the Urchins discover the presence of a meal, even though the desired object be placed from one to two feet away from the animal. Whether the Urchin possesses a sense of smell and discovers the tit-bit by this faculty is not stated, but it is interesting to note that "the first sign given by a Sea-Urchin that it has detected food is the extension and eager waving in the water of those tube-feet which are on the area of the animal nearest to the food." The time spent in feeding is curiously long—four large individuals remained in a mass of seaweed for a fortnight, in the course of this period reducing the heap entirely to faecal pellets. Three other examples remained fixed to a dead Hermit Crab for three whole days; while one Urchin, with a predilection for common blackboard chalk, appeared to be occupied with this peculiar diet for nineteen hours.

CONTINENTAL RACIAL FORMS OF SCOTTISH
BREEDING BIRDS AND THEIR OCCUR-
RENCES IN SCOTLAND.

By LEONORA JEFFREY RINTOUL, H.M.B.O.U., and
EVELYN V. BAXTER, H.M.B.O.U.

(Concluded from page 106.)

THE NORTHERN WILLOW-WARBLER (*Phylloscopus trochilus eversmanni*) is probably a regular passage migrant along our coasts, but is difficult to distinguish from our common breeding bird, and is consequently much overlooked. In Scotland specimens have been obtained in Haddington and Kirkcudbright, on the Isle of May, and in Shetland. This form is also recorded as having been seen at the Mull of Galloway in May 1913. This Willow-warbler, which breeds in N.E. Russia and Siberia, differs from our breeding bird in having a longer wing—68-72 mm. in the males, 64-66 mm. in the females, the type usually 66-70 mm. The first quill is usually longer or broader than in *P. t. trochilus*, and often measures 18-18.5 mm. Dr Hartert says that in spring and summer the colouring is greyer and less greenish than in our birds, and in autumn the difference of colour seems to be very trifling. This colour distinction, however, is not, in our experience, one which can be relied upon, as many of the Willow-warblers killed at the Isle of May lantern, in spring, were totally devoid of any greenish shade in their plumage, and yet had remarkably short wings. We were greatly interested in these curious little grey-brown Willow-warblers, and showed them to Dr Hartert, who agrees with us in referring them to the typical form, *P. t. trochilus*.

The typical SONG-THRUSH (*Turdus philomelos philomelos*) breeds in Europe generally and in Western Siberia. It occurs on the east coast of Scotland in very large numbers during the autumn migration period, and also in Orkney and Shetland. This race has been taken at the Mull of Galloway and Little Ross lanterns, and Mr Eagle Clarke records it as a winter visitor to the Outer Hebrides. It is probably a winter visitor to other parts of Scotland, but

proof of this is still lacking. The Continental Song-thrush differs from the British race (*Turdus philomelos clarkii*) in having less of the rufous shade on the upper side, which is more olivaceous in hue, and much more greenish-grey on the rump. The spotting on the breast is on the whole less heavy, the rusty yellow on the crop is less extensive, and the flanks, too, have less of the rusty colouring. In the field this Thrush looks smaller and duller than our common breeding bird; we have seen enormous rushes on the Isle of May, and have found it comparatively easy to distinguish the two races at sight. It is a slimmer bird, not so puffed out and self-satisfied looking as our familiar friend, and one misses the ruddy tint which is characteristic of our British Thrush.

The GREATER WHEATEAR (*Enanthe ananthe leucorrhoa*) occurs as a passage migrant on all our coasts in spring and autumn. The wing is from 5-12 mm. longer than in the COMMON WHEATEAR (*Enanthe ananthe ananthe*) (about 98-111 mm.), the metatarsus is 2 mm. longer, and the under side, particularly the throat, crop, and breast, is very vivid rust colour in autumn dress. Even in the breeding season they do not become as light as in the type. In the field the Greater Wheatear generally looks brighter in colour, and seems to hold itself more erect than the common bird, while it is usually wild and unapproachable. In spring we have seen the males displaying and singing, standing on the rocks on the May. They very often come to the lantern there, and we have caught and ringed a good many, but, sad to say, had no returns. We notice this form is much more inclined to perch on trees and chimney pots and other prominent objects in the landscape, than our own bird.

There is only one Scottish record of the INDIAN STONECHAT (*Saxicola torquata indica*), namely, one on the Isle of May in October 1913. This specimen, a young male, differs from our Stonechat of the same age, in having a much lighter, more sandy brown upper side; the dark shaft stripes are very indistinct except on the crown, where they form rather well-marked striations. The rump and upper tail coverts are sandy cream instead of the reddish-brown of our

bird; the light edgings to the tail feathers are much lighter, more sandy than in *P. t. hibernans*. Underneath it is much paler and more sandy, the black on the throat is much less extensive and is heavily obscured by cream-coloured tips to the feathers. The white patch on the wing is very indistinct, and inclines to cream, and there are sandy edgings to all the wing feathers. Truth to tell, at first sight the Indian Stonechat looks more like a Whinchat than a Stonechat.

The CONTINENTAL REDBREAST (*Erithacus rubecula rubecula*) breeds in Europe generally, and West Siberia to West Turkestan. It is a passage migrant along the east coast of Scotland, has occurred at the Mull of Galloway, and is a winter visitor to Shetland, and doubtless also in other parts of Scotland, but definite records are wanted. It differs from our common British bird in being lighter, more greyish green on the upper side, the red of the throat is much paler, less rust-coloured, the rusty brown on the sides of body is lighter and less extensive, and there is more white on the under side. The under wing-coverts are brownish cream or whitish (those of *E. r. melophilus* are rusty yellow spotted at the edge with rusty red), under tail-coverts brownish white (pale rust in *E. r. melophilus*). The bill is thinner and lighter in the Continental bird. We have seen large numbers of the Continental Redbreast on the Isle of May, and have always been struck by its extreme wildness. When one of our native Robins visits the island it frequents the gardens and is a tame and friendly visitor; the typical form, on the other hand, keeps away from the houses, and is generally among the rocks and rough grass on the island, taking covert in holes, cracks of rocks, etc., etc. We have known them to arrive so tired that they died from sheer exhaustion and starvation.

But few specimens of the HEDGE SPARROW have been examined, so records of the type, in Scotland, are meagre. The typical Hedge Sparrow (*Prunella modularis modularis*) breeds in Europe generally, and is known to occur on passage at the Isle of May, in Orkney and Shetland, and the Outer Hebrides, and doubtless does so elsewhere on our coasts. In the type the second primary is always noticeably

longer than the seventh; in the British bird the second primary is very little, only one to two millimetres, longer than the seventh. The type is also somewhat lighter underneath, but this distinction is not as constant as the difference in wing formula. We well remember one afternoon sitting by the harbour on the Isle of May, watching what proved to be the beginning of a most interesting arrival from overseas; suddenly we heard a curious bird note behind us, and looked round expecting to see a stranger. What was our amazement when we saw a Hedge Sparrow sitting on the monastery wall and calling loudly. We found out later that the Hedge Sparrows which came in then belonged to the typical form, and this curious penetrating call was doubtless a migration note.

The only Scottish record of the BLACK-BELLIED DIPPER (*Cinclus cinclus cinclus*) is one from Spiggie, Shetland. This form breeds in Northern Europe, apparently to East Prussia, and differs from our resident Dipper (*Cinclus cinclus britannicus*) in having none of the cinnamon-red on the front part of the under side. In this form the throat and fore-breast are white, the rest of the under side chocolate-brown. The sides and under tail-coverts are slate-grey, the latter in fresh plumage have fine rusty yellow tips. The front part of the under side immediately behind the white inclines to reddish.

The status of the NORTHERN GREAT SPOTTED WOODPECKER (*Dryobates major major*) in Scotland is very difficult to determine with certainty. Doubtless many more of the records are attributable to this form, but the only authentic instances of its occurrence are from Berwick, Isle of May, East Lothian (specimen in Royal Scottish Museum), Forfar, Perth, Aberdeen, East Ross, Orkney, Shetland, and the Outer Hebrides. It breeds in Northern Europe and Siberia, and is an irregular visitor to this country in autumn and winter. In some years it occurs in considerable numbers, the last immigration being in 1909, when Great Spotted Woodpeckers were recorded from many parts of Scotland. This Woodpecker differs from our breeding bird in having a stouter bill, longer wing, 138-143 mm. (*D. m. anglicus*,

125-128 mm.); it is also lighter on the under side and sides of the head. In the 1909 immigration several of these birds were seen on Fair Isle, and according to Mr Eagle Clarke "seemed very ill-pleased with their lot, since they frequently gave voice to a peevish cry, usually as they ascended the flagstaff or equally disappointing posts of the wire fences." One visited the Isle of May the same year, but it spent a happy and profitable time among the ant-hills which abound on the island.

The dark-breasted form of the BARN OWL (*Tyto alba guttata*) has only once occurred in Scotland, viz., in Shetland in November 1915. It breeds in South Sweden and Denmark, Central Europe, west to France and south to the Alps, Austria, and Hungary. It differs from our breeding bird in having the ground colour of the under side warm orange-buff instead of white, the upper side blue-grey, finely vermiculated with bluish white, instead of rusty yellow vermiculated towards the tip or for the larger part of the feather with ash-grey, and whitish. The ground colour of wings and tail much darker than in our bird, the facial disk also darker.

The LEVANTINE SHEARWATER (*Puffinus puffinus yelkouan*), which breeds in the Mediterranean, has been recorded from the Firth of Forth. It differs from the Manx Shearwater (*Puffinus puffinus puffinus*), which breeds in the Scottish islands, in being browner on the upper side, having brown under tail-coverts and flanks. This brown shade sometimes extends over the whole under surface. The axillaries are also brown, or ashy brown with white bases, occasionally white mottled with brown.

The only Scottish records of the SCANDINAVIAN LESSER BLACK-BACKED GULL (*Larus fuscus fuscus*) are from Shetland and Stirlingshire. This form, which breeds in Scandinavia and Russia, differs from the Lesser Black-backed Gull (*Larus fuscus britannicus*), which nests with us, in having a dark slaty black mantle, our own bird being clear slaty grey in colour. The Scandinavian Lesser Black-backed Gull will probably be found to occur much more frequently than appears from the above records.

In this paper we have given the Scottish status, as it is known at present, of the various races of which we have treated. As will be seen, there is much work yet to be done before their real status in this country is determined. There are, of course, birds of which more than one race has occurred in Scotland without there being a resident race in our islands: to these we have not alluded, but a good look out should be kept for them, as well as for other forms of our breeding birds which have not yet occurred.

BOOK NOTICE.

THE BRITISH FRESHWATER RHIZOPODA AND HELIOZOA. By (the late) James Cash and George Herbert Wailes, F.L.S., assisted by John Hopkinson, F.L.S., etc. Vol. III. London: The Ray Society, 1915.

Works dealing fully, both as regards text and illustrations, with the Protozoa, the true microscopic life, of these islands, can scarcely be said to exist. It therefore affords us no little satisfaction to be able to chronicle, with continued approval, the issue of a further instalment—the third and as now arranged the last but one—of the Ray Society Monograph of the British Freshwater Rhizopods. Notices of the first and second volumes were given in the *Ann. Scot. Nat. Hist.* for 1906 and 1910. In the continuation of the work the Society has been fortunate in securing the services of Mr Wailes, who is well-known as a contributor, at first hand, to the literature of the group. The volume now before us begins with a sketch of the life of James Cash, by whom the first two were chiefly written. The systematic part of the work is then continued and occupies 152 pages, beginning with the Euglyphina and ending with the Amphistomina. The number of species described is fifty-three, all of which are figured in the twenty-five fine plates (eight coloured) and numerous illustrations in the text.

LEPIDOPTERA AND OTHER INSECTS AT SCOTTISH LIGHTHOUSES IN 1915.

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

THE year 1915 has been a lean one as regards entomological data from Scottish lighthouses. This was, of course, inevitable under the circumstances. Owing to the war, many of the lighthouse lanterns, especially those on the east coast, have only been lighted occasionally and for the briefest of intervals. Consequently at the majority of stations few opportunities for obtaining moths or other insects have presented themselves.

From the Isle of May lighthouse, formerly so productive, a single consignment sent by Mr Baigrie in August is all that I have received. Of the seven other light-stations, which in my first Report¹ are referred to as the Forth group, the Bell Rock, whence Mr M'Cormick sent a few specimens in July, alone falls to be mentioned on the present occasion.

On the west coast, with more opportunities, better results were forthcoming. From Killantringan, Wigtownshire coast, Mr D. A. Mowat has forwarded several lots of specimens, including among other additions to the list for this station an example of *Xylophasia lithoxylea*, a moth I have not previously seen from any of the lighthouses. On 24th August Mr Mowat wrote as follows:—"I am sending a few moths I have got. They are very scarce this season, but they may come yet." Nothing in the nature of a "rush" would appear, however, to have taken place. In September Mr W. Begg, formerly stationed at Inchkeith, kindly sent about forty moths (representing twelve species) and a beetle from Little Ross lighthouse, on the coast of Kirkcudbrightshire. These were especially welcome, seeing they came from a station not previously on the contributing list.

¹ *Scottish Naturalist*, 1914 and 1915.

As already recorded (*Scot. Nat.*, 1915, p. 335), Mr R. Wilson¹ captured a Death's-head Hawk-moth (*Acherontia atropos*) at Skerryvore, on the 18th of September—a notable occurrence. It is a male, and made its appearance with a south-easterly wind. From Mr Clyne, a box containing a couple of dozen moths taken at the Butt of Lewis lantern was received in October; as in the two previous years, *Dasypolia templi* was among them, being this time represented by nine males and three females.

In the third week of August Mr M'Eachern sent me a number of moths and three caddis-flies taken on various dates at the North Unst (Muckle Flugga) lighthouse and shore establishment; these comprise about a dozen additions to the list previously given from this remote station. Two of them, *Aphelia osseana* and *Plutella annulatella*, are, moreover, additions to the general list.

Referring to the published records of occurrences of moths at lighthouses on the coasts of Great Britain and Ireland, cited in the second section of my original Report, attention should also be called to the following sentences in Mr W. F. de V. Kane's account of the Lepidoptera collected on Clare Island in the west of Ireland. "Further disappointment," he writes, "was caused by the almost complete failure of the lighthouse lantern to attract night-flying moths, which was attributed by the lighthouse keeper (who was familiar with this method) to the constant high winds which sweep the lofty cliffs on which the buildings stand. *Dicranura vinula*, *Saturnia pavonia*, *Arctia caja*, and a few common Noctuæ were the only captures at the lamp" (*Clare Island Survey*, part 26, p. 2, 1912).

In thanking, as I now do, those light-keepers who have sent specimens during the past year, I venture to ask that they will not forget us in 1916 should opportunities occur, and to express the hope that the time may not be far off when a return to more normal conditions will bring us not

¹ Mr Wilson, I regret to say, died in the beginning of February 1916. His cordial and enthusiastic assistance in this investigation while he was stationed on the Isle of May, I have already acknowledged, and shall always bear in grateful remembrance.

only an increase in the number of specimens, but also in the number of contributing stations.

The lists of species received from the seven above-mentioned lighthouses during 1915 are given below. An examination of the specimens of *Plusia gamma* brings out the fact that the paler, more silvery ones are all males. In Barrett's *Lepidoptera of the British Isles*, the species is described as "variable . . . in the ground colour and general tone of colour of the fore wings, from silvery whitish-grey to deep slate-grey, brown-grey, and purple-grey"; but there is no suggestion that the question of sex has anything to do with this.

ISLE OF MAY LIGHTHOUSE.

Captured prior to 11th August.

One butterfly, *Vanessa urticae*, ♀; and the following moths:—*Xylophasia polyodon*, 12 ♂ and 9 ♀; *Agrotis lucernea*, 2 ♂ and 1 ♀; *Triphena pronuba*, 1 ♀. Also a Caddis-fly, *Stenophylax permistus*, ♀; and a beetle, *Serica brunnea*, ♀. All are already on the list of species obtained at this lighthouse.

BELL ROCK LIGHTHOUSE.

Xylophasia polyodon, ♂, taken 12th July, wind N.E.

Caradrina quadripunctata, ♂, 10th July, wind E.

Vespa norvegica, ♀ (queen wasp), 16th June, wind S.E. All were at the lantern.

LITTLE ROSS LIGHTHOUSE.

Taken during the summer, prior to 15th September:—*Leucania pallens*, 1 ♂ and 1 ♀; *Xylophasia polyodon*, 4 ♂ and 9 ♀; *Chorax graminis*, 2 ♂; *Agrotis strigula*, 1 ♂; *Noctua xanthographa*, 1 ♀; *Triphena pronuba*, 7; *Amphipyra tragopogonis*, 1 ♂; *Xanthia flavago* (*silago*), 1 ♂; *Cirrhædia xerampelina*, 1 ♀; *Calymnia trapezina*, 1 ♂; *Plusia gamma*, 9. Along with these moths there was a specimen of one of the Dung-beetles, *Aphodius rufipes*.

KILLANTRINGAN LIGHTHOUSE.

From this station six parcels were received.

1. Contained the following moths (nine species), a beetle, and an earwig, taken at the lantern, between May and July:—*Spilosoma*

menthastris, 1 ♂ ; *Dicranura vinula*, 1 ♂ ; *Notodonta dictæa*, 1 ♂ ; *Phalera bucephala*, 1 ♂ ; **Demas coryli*, 1 ♂ ; *Xylophasia polyodon*, L., 3 ♂ and 1 ♀ ; *Agrotis lucerneæ*, 2 ♂ ; *Crambus tristellus*, 2 ; *Ecophora pseudospretella*, 2 ; *Aphodius rufipes*, 4 ; **Forficula auricularia*, 1.

2. Eleven species, captured 9th to 12th August:—*Notodonta dictæa*, 1 ♂ ; **Xylophasia lithoxylea*, Fb., 1 ♂ ; *X. polyodon*, L., 2 ♂ ; *Apamea didyma*, 1 ♂ ; **Noctua rubi*, 1 ♀ ; *N. xanthographa*, 1 ♂ ; *Triphæna pronuba*, 3 ♂ ; **Hadena oleracea*, 1 ♂ ; *Crambus perlellus*, 1 ; *C. tristellus*, 1 ; and *Aphodius rufipes*, 2.

3. Nine species, captured 9th to 12th September:—*Luperina cespitis*, 2 ♂ ; *Triphæna pronuba*, 5 ♂ ; *Amphipyra tragopogonis*, 1 ♂ ; *Anthocelis lunosa*, 6 ♂ ; *Epunda nigra*, 1 ♂ ; **Calocampa exoleta*, 1 ♂ ; *Plusia gamma*, 10 ♂ and 8 ♀ ; **Aphodius rufescens*, 1 ; *A. rufipes*, 2.

4. Twelve species, taken in September and October, prior to 5th:—*Agrotis suffusa*, 2 ♂ ; *Triphæna pronuba*, 1 ♀ ; *Anthocelis lunosa*, 3 ♂ and 1 ♀ ; *Phlogophora meticulosa*, 1 ♂ ; **Calocampa exoleta*, 1 ♀ ; *Plusia gamma*, 12 ♂ and 9 ♀ ; *Scoparia* sp. inc., 1 ; *Depressaria arenella*, 3. Also, *Tipula confusa*, 2 ♀ ; *T. oleracea*, 1 ♂ ; **Ophion luteus*, 1 ♂ and 1 ♀ ; *Aphodius rufipes*, 1.

5. Three species, taken in October:—*Agrotis suffusa*, 2 ; *Phlogophora meticulosa*, 6 ; *Plusia gamma*, 2.

6. Four species, taken on night of 10th November:—**Pecilocampa populi*, 1 ♂ ; *Phlogophora meticulosa*, 6 ♂ and 2 ♀ ; *Himera pennaria*, 3 ♂ ; **Cidaria miata*, 1 ♀.

Additions to the Killantringan list published in the first Report are marked with an asterisk.

SKERRYVORE LIGHTHOUSE.

Death's-head Hawk-moth (*Acherontia atropos*), 1 ♂, 18th September; was found in forenoon clinging to the outside wall beside the entrance door to the tower; wind S.E., a strong breeze (vide *Scot. Nat.*, 1915, p. 335).

BUTT OF LEWIS LIGHTHOUSE.

A parcel received from this lighthouse in October contained the following moths; most of them were got on 9th, 10th, and 11th September, then a few on 4th-5th and 8th-9th October. All are already on the Butt List:—*Hepialus humuli*, 1 ♀ (taken in the summer, no doubt); *Xylophasia polyodon*, L., 1 ♂ ; *Agrotis lucerneæ*,

1 ♂ ; *Dasyfolia templi*, 9 ♂ and 3 ♀ ; *Plusia gamma*, 2 ♂ ; *Plutella dalella*, 6.

NORTH UNST LIGHTHOUSE.

From this station the following were received on 23rd August, most of them being additions to its list:—

1. Taken at Shore Station on 4th, 15th, and 16th July:—*Hepialus humuli* v. *hethlandica*, 1 ♂ and 1 ♀ ; *H. lupulinus*, 1 ; *Agrotis strigula*, 2 ; *Hadena dentina*, 1 ♂ ; *Melanippe fluctuata*, 3 ; *Cidaria cæsiata*, 1 ; *Aphelia osseana*, Scop. (*pratana*, Hb.), 1 ; *Plutella cruciferarum*, 1 ; and the Caddis-fly, *Halesus radiatus*, 1 ♂ .

2. Caught at lighthouse lantern, on 7th and 8th August:—*Characas graminis*, 1 ♀ ; *Noctua festiva*, dark var., 2 ♂ and 1 ♀ ; *Cidaria cæsiata*, 1 ; *Sciaphila penziana* v. *colquhouniana*, 6 ; *Plutella annulatella*, 1 ; also *Stenophylax permistus*, 1 ♂ .

3. Taken at Shore Station, 9th to 11th August:—*Hepialus humuli* v. *hethlandica*, 1 ♂ ; *H. velleda*, 1 ♂ ; *Mamestra brassicae*, 1 ; *Agrotis strigula*, 1 ♂ and 1 ♀ ; *Noctua glaucosa*, 1 ♂ ; *N. festiva*, dark var., 9 ; *Hadena adusta*, 1 ♀ ; *Cidaria cæsiata*, 5 ; and *Stenophylax permistus*, 1 ♂ .

The specimens of *Noctua festiva* all belong to the dark form from Shetland figured as var. *borealis* in Barrett's "British Lepidoptera."

Neuroptera (in the Linnæan sense) from Inverness-shire.—Under this title Kenneth J. Morton records (*Ent. Mo. Mag.*, May 1916, pp. 114-116) the following species taken in the Lochaber district (between the rivers Treig and Spean), during the month of July last:—*Eschna cerulea*, *Æ. juncea*, *Somatochlora arctica*, *Cordulegaster annulatus*, *Leucorrhinia dubia*, *Libellula quadrimaculata*, *Enallagma cyathigerum*, *Pyrrhosoma nymphula*, *Perla maxima*, *P. cephalotes*, *Chloroperla grammatica*, *Isopteryx torrentium*, *Nemoura variegata*, *N. cinerea*, *N. cambrica*, *N. inconspicua*, *Leuctra klapaleki*, *L. albida*, *L. inermis*, *Panorpa germanica*, *Hemerobius mortoni*, *H. stigma*, *H. pini*, *H. atrifrons*, *H. orotypus*, *H. lutescens*, *H. marginata*, *H. concinnus*, *H. quadri-fasciatus*, *Chrysopa vittata*, *C. alba*, *Sialis lutaria*, *Phryganea obsoleta*, *Limnophilus luridus*, *L. auricula*, *L. centralis*, *L. vittatus*, *L. griseus*, *L. sparsus*, *Stenophylax stellatus*, *Lepidostoma hirtum*, *Crunecia irrorata*, *Sericostoma personatum*, *Odontocerum albicorne*, *Leptocerus aterrimus*, *Æcetis ochracea*, *Mystacides azurea*, *Hydropsyche instabilis*, *H. pellucidula*, *Polycentropus flavomaculatus*, *Philopotamus montanus*, *Tinodes wæneri*, and *Hydrotilla femoralis*.

DIPTERA SCOTICA: VI.—THE WESTERN ISLES.

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

(Concluded from page 119.)

EPHYDRIDÆ.

344. *Notiphila cinerea*, Fln.—3, S. Uist, 13th June 1906 (Kinnear); 32, S. Uist, June 1910 (Grimshaw); 2, Balelone, N. Uist, June 1905 (Waterston); Lewis, July 1914 (Lamb).
345. *N. nigricornis*, Stenh.—1, S. Uist, June 1910 (Grimshaw).
346. *N. uliginosa*, Hal.—9, S. Uist, June 1910 (Grimshaw).
347. *Hydrellia albiceps*, Mg.—5, S. Uist, June 1910 (Grimshaw).
348. *H. griseola*, Fln.—4, Jura, Sept. 1907 (Waterston); 1, Loch Ba, Mull, Oct. 1907 (Annandale); 3, Dunvegan, Skye, June 1905 (Waterston); 3, Uig, Skye, June 1906 (Waterston), and one from same locality with white face; 2, Lochboisdale, S. Uist, June 1906 (Waterston); 38, S. Uist, June 1910 (Grimshaw); 36, Balelone, N. Uist, June 1905 (Waterston); 4, Stornoway, 8th July 1906 (Kinnear); Lewis, July 1914 (Lamb).
349. *H. ranunculi*, Hal.—1, Iona, June 1906 (Waterston); 1, Lochboisdale, S. Uist, June 1906 (Waterston); 3, S. Uist, June 1910 (Grimshaw).
350. *Philygria punctatonervosa*, Fln.—2, S. Uist, June 1910 (Grimshaw); Lewis, July 1914 (Lamb).
351. *Pelina ænescens*, Stenh.—Lewis, July 1914 (Lamb).
352. *Parydra quadripunctata*, Mg.—Lewis, July 1914 (Lamb).
353. *Scatella æstuanis*, Hal.—Lewis, July 1914 (Lamb).
354. *S. sibilans*, Hal.—3, S. Uist, June 1910 (Grimshaw); 1, Balelone, N. Uist, June 1905 (Waterston).
355. *S. stagnalis*, Fln.—2, Jura, Sept. 1907 (Waterston); 3, S. Uist, June 1910 (Grimshaw); Lewis, July 1914 (Lamb).
356. *Cænia fumosa*, Stnh.—1 ♀, Jura, Sept. 1907 (Waterston). The only other British record of this fine and probably rare species known to me is that of Walker's in *Ins. Brit. Diptera*, vol. ii., p. 265, where he says: "Rare; found in August at Loch Fad, Isle of Bute."

DROSOPHILIDÆ.

357. *Scaptomyza flaveola*, Mg.—Lewis, July 1914 (Lamb).

358. *Scaptomyza graminum*, Fln.—6, Jura, Sept. 1907 (Waterston); 1, Iona, June 1906 (Waterston); 4, Balclona, N. Uist, June 1905 (Waterston).

GEOMYZIDÆ.

359. *Opomyza germinationis*, L.—1, Machrie, Islay, 30th Aug. 1904 (Miss Evans); 2, Jura, Sept. 1907 (Waterston); 1, Dunvegan, Skye, June 1905 (Waterston); 2, Lochboisdale, S. Uist, June 1906 (Waterston); 5, S. Uist, June 1910 (Grimshaw); 3, Garrynahine, Lewis, 4th July 1906 (Kinnear); 1, Stornoway, Lewis, 8th July 1906 (Kinnear); Lewis, July 1914 (Lamb).
360. *Baliptera venusta*, Mg.—1, Lochboisdale, S. Uist, June 1906 (Waterston); Lewis, July 1914 (Lamb).

OCHTHIPHILIDÆ.

361. *Ochthiphila flavipalpis*, Hal.—Lewis, July 1914 (Lamb).
362. *O. geniculata*, Hal.—Lewis, July 1914 (Lamb).
363. *O. polystigma*, Mg.—Lewis, July 1914 (Lamb).

MILICHIDÆ.

364. *Phyllomyza securicornis*, Fln.—1 ♂, Skipport, S. Uist, June 1906 (Waterston); 1 ♀, Stornoway, 8th July 1906 (Kinnear).

AGROMYZIDÆ.

365. *Cerodonta denticornis*, Panz.—1, Iona, June 1906 (Waterston); 5, S. Uist, June 1910 (Grimshaw); 1, Balclona, N. Uist, June 1905 (Waterston).

PHYTOMYZIDÆ.

366. *Phytomyza flava*, Fln.—1, Jura, Sept. 1907 (Waterston).
367. *P. varipes*, Mcq.—Lewis, July 1914 (Lamb). If this is correctly identified it is an addition to the British list. I have not seen the specimen.
368. *Napomyza lateralis*, Fln.—1, S. Uist, June 1910 (Grimshaw); 3, Balclona, N. Uist, June 1905 (Waterston).

PUPIPARA.

HIPPOBOSCIDÆ.

369. *Ornithomyia avicularia*, L.—2, Butt of Lewis, Sept. 1914 (Eagle Clarke).
370. *Lipoptena cervi*, L.—2, Loch Ba, Mull, Oct. 1907 (Annandale).

ADDITIONAL SPECIES.

DOLICHOPODIDÆ.

371. *Dolichopus griseipennis*, Stann.—Lewis, July 1914 (Lamb).
 372. *D. longicornis*, Stann.—Lewis, July 1914 (Lamb).
 373. *Hydrophorus præcox*, Lehm.—Lewis, July 1914 (Lamb).
 374. *Campsicnemus scambus*, Flin.—Lewis, July 1914 (Lamb).
 375. *Micromorphus albipes*, Ztt.—Lewis, July 1914 (Lamb).

SYRPHIDÆ.

376. *Pipizella flavitarsis*, Mg.—Lewis, July 1914 (Lamb).
 377. *Neoascia podagrica*, Fab.—Lewis, July 1914 (Lamb).
 378. *Sericomomyia lappona*, L.—Lewis, July 1914 (Lamb).

TACHINIDÆ.

379. *Sarcophaga melanura*, Mg.—1 ♂, Butt of Lewis, Sept. 1914 (Eagle Clarke).

ANTHOMYIDÆ.

380. *Fucellia maritima*, Hal.—1 ♂, S. Uist, 13th June 1906 (Kinnear); 17 ♂ and 10 ♀, S. Uist, June 1910 (Grimshaw).

ADDITIONAL LOCALITIES.

[Of the additional records obtained since the compilation of the earlier portion of this paper, only such are included in the following list as extend the distribution to a different island.]

48. *Simulium reptans*, L.—Lewis, July 1914 (Lamb).
 82. *Tipula oleracea*, L.—1 ♂, Butt of Lewis, Sept. 1914 (Eagle Clarke).
 86. *Chloromyia formosa*, Scop.—Lewis, July 1914 (Lamb).
 93. *Leptis scolopacea*, L.—Lewis, July 1914 (Lamb).
 95. *Thereva nobilitata*, Fab.—Lewis, July 1914 (Lamb).
 108. *Empis tessellata*, Fab.—3 ♀, Butt of Lewis, Sept. 1914 (Eagle Clarke).
 133. *Dolichopus brevipennis*, Mg.—Lewis, July 1914 (Lamb).
 139. *D. unguulatus*, L.—Lewis, July 1914 (Lamb).
 155. *Ectomus alpinus*, Hal.—Lewis, July 1914 (Lamb).
 159. *Liogaster metallina*, Fab.—Lewis, July 1914 (Lamb).
 164. *Platychirus manicatus*, Mg.—1 ♀, Butt of Lewis, Sept. 1914 (Eagle Clarke); Lewis, July 1914 (Lamb).
 176. *Rhingia campestris*, Mg.—Lewis, July 1914 (Lamb).

178. *Eristalis horticola*, Deg.—1 ♂ and 1 ♀, Butt of Lewis, Sept. 1914 (Eagle Clarke); Lewis, July 1914 (Lamb).
 182. *E. tenax*, L.—2 ♀, Butt of Lewis, Sept. 1914 (Eagle Clarke).
 184. *Helophilus pendulus*, L.—8 ♂ and 5 ♀, Butt of Lewis, Sept. 1914 (Eagle Clarke); Lewis, July 1914 (Lamb).
 187. *Sericomyia borealis*, Fln.—1 ♀, Butt of Lewis, Sept. 1914 (Eagle Clarke).
 194. *Bucentes geniculata*, Deg.—1 ♂ and 1 ♀, Butt of Lewis, Sept. 1914 (Eagle Clarke).
 203. *Cynomyia mortuorum*, L.—4 ♂, Butt of Lewis, Sept. 1914 (Eagle Clarke).
 208. *Pseudopyrellia cornicina*, Fab.—4 ♀, Butt of Lewis, Sept. 1914 (Eagle Clarke).
 274. *Schænomyza litorella*, Fln.—4 ♂ and 4 ♀, Jura, Sept. 1907 (Waterston); 5 ♀, S. Uist, June 1910 (Grimshaw); 2 ♂ and 3 ♀, Balone, N. Uist, June 1905 (Waterston).
 275. *Fucellia fucorum*, Fln.—7 ♂ and 15 ♀, S. Uist, June 1910 (Grimshaw).

From the preceding list it may be noted that, as regards the number of species collected in each island, Jura heads the list with 166; then follow Lewis with 150, South Uist with 148, North Uist with 90, and Skye with 78. Of the smaller islands we have Benbecula with 27 species and Iona with 22. The lists for the other islands are so small as to be negligible.

I have endeavoured, by tabulating the results in various ways, to ascertain whether any trustworthy conclusions can be drawn from the distribution of the various species, but have failed to obtain anything of a satisfactory nature. It is obviously unsafe to found any deductions upon collections formed by various individuals whose methods of collecting no doubt varied in detail, who visited the islands in different months, and who experienced different weather conditions. Until the islands are thoroughly and systematically investigated on a uniform plan, our lists must remain unreliable for statistical purposes, and the only value one can attach to the foregoing list is that of actually placing on record the existence of the species on the islands concerned, and of extending in a great many cases their known distribution in a northward and westward direction.

Since the earlier portion of my paper appeared, I have been favoured with a large number of specimens and records from Lewis, through the kindness of Mr C. G. Lamb, of Cambridge, and also with a number collected by Mr W. Eagle Clarke at the Butt of Lewis. To both these gentlemen I here express my sincere thanks.

It is necessary to expunge the remarks I made in the last paragraph of the introduction regarding Meigen's 1900 paper, as I have entirely (and I hope finally) changed my views as to the validity of the generic names contained therein. On consulting an actual copy of this rare pamphlet in the library of the British Museum, I found that, although it was certainly *published* and the genera briefly described, yet no species are actually referred by name to these genera, and that therefore, on this ground alone, we are justified in consigning them to oblivion.

Miscodera arctica in Forth area.—With reference to the record of this beetle from Ben Ledi by Mr William Evans in the March number of the *Scottish Naturalist*, I would like to mention that I got a specimen on the hills at Strathyre. It was found under a stone on 3rd January 1912. I showed this beetle to Mr Evans, and he kindly identified it for me.—D. HAMILTON, Edinburgh.

Quedionuchus lævigatus, Gyll., in Forth.—From underneath the bark of a decayed oak in Castle Campbell Glen, Dollar, I was fortunate enough to secure, on 1st May (1916), a specimen (male) of this Staphylinid. It would appear to be an addition to the list of Forth beetles. In Fowler's *British Coleoptera*, Vol. II., p. 246, its distribution is given as Tay, Argyle, Dee, and Moray, where it occurs "under bark of decaying Scotch fir." In Durham, Mr Bagnall has taken it under the bark of a beech.—WILLIAM EVANS, Edinburgh.

THE HIBERNATION OF FLIES IN A FIFESHIRE HOUSE.

By Major T. K. GASKELL.

HAVING read Dr Ashworth's paper in the April number of the *Scottish Naturalist*, I think perhaps the following few notes on flies may be of interest. In February last year I was staying at Lahill, Largo, and on several occasions noticed small flies coming out from a small crack behind the mantelpiece in my bedroom (which faces west), no doubt attracted by the heat of the fire. They crawled about on the mantelpiece and windows, in a sleepy and sluggish fashion; altogether I killed about ninety of them. This year in March I was staying in the same room, and large numbers of what seems to be the same kind of fly appeared. They behaved in the same way, and were found in small numbers congregated behind the shutters. There were a few large flies among them.

I killed about six hundred of the small flies, and Mr Grimshaw has kindly identified them as *Limnophora septemnotata* (thirty-one specimens, all females). There were small numbers in other rooms, but in no room were there so many.

Some of the other specimens collected in a south room in the same house were identified by Mr Grimshaw as follow:— 1 ♂ and 1 ♀ *Pollenia rudis*, six specimens of *Aphiochaeta rufipes*, 14 ♂ and 8 ♀ *Pyrellia eriophthalma*, 1 ♀ *Muscina stabulans*, 2 ♀ *Phaonia signata*, 2 *Leria serrata*, 10 *Simulium*, sp. Also several Chalcids, which are dealt with by Mr Waterston in the article which follows.

ON THE OCCURRENCE OF *STENOMALUS MUSCARUM* (LINN.) IN COMPANY WITH HIBERNATING FLIES.

By JAMES WATERSTON, B.D., B.Sc., Imperial Bureau of Entomology, London.

IN December 1915 the late Mr G. Meade-Waldo handed me a few living Chalcids which he had just taken "from windows" at Hever, Kent. These specimens, evidently *Pteromalini*, were staged and put aside to be worked out later. More recently—January-February of this year (1916)—through the kindness of Dr C. J. Gahan, Keeper in the Department of Entomology, British Museum, South Kensington, London, who was at the time conducting an inquiry into the composition of the swarms of flies occasionally found hibernating in houses, two additional lots of Chalcids from English localities were submitted to me.¹ After considering these and the Kentish material I came to the conclusion that all belonged to the species named by Walker, *Pteromalus thessalus*, a synonym of the older *Ichneumon muscarum*, Linn., for which Thomson erected *Stenomalus* in 1878.

On seeing Mr Grimshaw's note on p. 114 of the May number of this magazine, it occurred to me that the Chalcids incidentally mentioned there might be worth examining. Although Mr Grimshaw could not, unfortunately, supply any of the specimens mentioned in his note, he was able to send some Chalcids from a similar assemblage of flies found at Largo, in Fife, which form the subject of the preceding article. These also proved to be *Stenomalus muscarum* (Linn.). A few notes on the above occurrences may be given.

1. *S. muscarum* (Linn.) appears to be a more or less constant member of the mainly Dipterous association of insects found wintering in houses.

¹ The following details have been received regarding one of these consignments: "On shutter, Swindon, Gloucestershire, January 1916 (coll. Rev. E. D. Goddard)." The accompanying flies were *Pollenia rudis* and *Limnophora septemnotata*.

2. The species is reported to have been bred from the puparia of *Musca*, and the female is said to lay its eggs on *Muscid* larvæ.

3. All the hibernating examples which I have personally examined prove to be females.

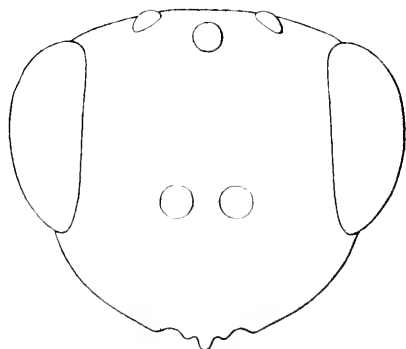
4. Is the occurrence of this Chalcid with the Diptera a fortuitous association to be explained simply on the ground that different species have selected the same winter quarters, or have we here an adaptation of habit on the part of the Chalcid enabling the parasite to oviposit most advantageously in the spring? There is evidently room for an interesting piece of œcological research. To draw attention to this, indeed, is one of the purposes of the present note. The chief points to be ascertained are how the Chalcid comes to its winter quarters, and what it does after leaving them.

5. The Chalcid parasites of household insects are numerous. Of the single family Pteromalidæ, within which *Stenomalus* falls, there are seven or eight or possibly more genera with such hosts. Some, like *Spalangia*, Latr. (on *Musca*) and *Cerocephala*, Westw. (on *Calandra*), are easily recognised; but others, like *Arthrolytus*, Thoms (*Sitodrepa*, etc.), *Dibrachys*, Först (various hosts), *Pteromalus*, Swed. (Lepidoptera, etc.), are somewhat difficult to separate from *Stenomalus*, Thoms.

In the last-named genus the right mandible has four and the left three teeth, the uppermost being broad; the occipital foramen is not margined; the antennæ are inserted above the base line of the eyes in circular scrobes; the genæ are narrowed and very distinctly convergent towards the mouth, while the clypeus bears a median tooth in addition to the usual lateral lobes (see figure). The normal fore femora, elongate thorax and abdomen, anteromedianly ridged pronotum narrowed in the middle and expanded on the slightly concave sides, and the medianly carinate propodeon, which, though long, develops no definite "nucha," further characterise the genus *Stenomalus*. In *S. muscarum* (Linn.) the legs are pale, yellowish, or straw-coloured, only the last tarsal joints being dark. In the male the fore and mid coxæ are concolorous with the femora, etc., only the hind coxæ being dark and metallic. In the female all the coxæ are dark, and the femora are occasionally a little smoky.

Other specific characters are to be found in the antennæ, the chaetotaxy of the radius and the shape of the abdominal tergites.

In the British Museum the type of *Pteromalus thessalus*, Walker—a male—is still extant in the British collection, while in the General Collection there are two more males under the



HEAD OF *Stenomalus muscarum*, Linn., ♀, seen from in front.

same name. With Walker's type there is also a correctly determined female from the Marshall collection labelled *P. muscarum*. Some additional specimens under the same name from the Cooke collection are incorrectly determined. The species occurs all over Europe, and is doubtless common, but I shall be glad to examine examples of this or any Chalcid either bred from Muscids or found in association with the adult flies themselves, from any part of Britain.

BRITISH MUSEUM (NATURAL HISTORY),
SOUTH KENSINGTON, S.W.

ON THE SPECIFIC IDENTITY OF THE WOOD-LOUSE, *ONISCUS FOSSOR*, KOCH.

By WALTER E. COLLINGE, M.Sc., F.L.S., Research Fellow of the University of St Andrews.

THE terrestrial Isopod termed *Oniscus fossor* was described by Koch¹ in 1838, and with a few exceptions has been regarded by the majority of workers as a synonym of *O. asellus*, Linn.; but in the light of our more recent knowledge of the terrestrial Isopoda it seems worth while re-examining the subject.

Kinahan,² in 1857, first recorded *O. fossor* as a British species from Dublin, Epping Forest, and Chisselhurst, stating that the body is "oval, covered with numerous rough granulations, which give it a powdered appearance; head convex; lateral lobes moderate, rounded; frontal line produced into a triangular lobe which belongs to the head, not to antennal ring." Whole animal much smaller than *O. asellus*.

G. O. Sars³ remarks, "The *Oniscus fossor* of Koch is scarcely different from this species [*Oniscus asellus*], the characters assigned to this form being such as pretty well apply to younger specimens of *Oniscus asellus*, which are generally of a duller appearance, with the dorsal face more roughly granulated than in adult animals."

Budde-Lund⁴ gives it as a doubtful species.

Scharff⁵ states that he "submitted specimens of Prof. Kinahan's *Oniscus fossor* to Prof. Budde-Lund, who failed to recognise any specific distinction between it and *O. asellus*."

In April 1913, Mr P. A. Aubin very kindly forwarded to me a number of small Oniscoids from St Helier, Jersey, which agreed in every particular with Kinahan's description. Similar specimens have been received from Miss M. Grace Giles (February, 1914) from Bonchurch, Isle of Wight;

¹ *Deutschland Crust.*, 1838, Heft 22, pl. xxii.

² *Nat. Hist. Rev.*, 1857, vol. iv., p. 21 (reprint).

³ *Crustacea of Norway*, 1898, vol. ii., p. 172.

⁴ *Crust. Isop. Terr.*, 1885, p. 205.

⁵ *Irish Nat.*, 1894, vol. iii., p. 28.

from Mr W. G. Banfield, Tenbury, Gloucester (June, 1914); Mr Jno. Ellis, Walsall (July, 1914); Mr G. A. Clout, Maidstone (December, 1914); Mr H. Overton, Sutton Coldfield, Warwickshire (February, 1915); and I have also collected specimens in Cheshire, Warwickshire, Staffordshire, Oxfordshire, Fife, and Perthshire.

All the above specimens I have referred to *O. asellus*, Linn., believing them to be immature forms of that species.

In January last Mr R. Standen, of the Manchester Museum, sent me numerous examples of a small form of *O. asellus* from Arnside Knott, Westmoreland, collected by him in March 1914. All these specimens are richly tuberculated, oval in form, with the frontal margin of the cephalon produced into a triangular lobe, and of a *brownish red colour* (in alcohol).

Excepting in colour, these specimens agree very closely with the immature specimens of *O. asellus* received from the Channel Isles, Isle of Wight, Gloucester, Warwick, etc.

The external skeleton, including the oral appendages, has been subjected to a very careful examination; and, compared with the corresponding parts of a large and typical example of *O. asellus*, and excepting for the larger size of the tubercles on the mesosomatic segments, I fail to find the slightest difference from the type. Further, I have similarly examined some of the light coloured forms, from the above-mentioned localities, with like results.

So far as I am aware, young forms of *O. asellus* are always more or less tuberculated. I have carefully examined hundreds of specimens, but have failed to find a single smooth example. The frontal margin of the cephalon is always produced into a triangular lobe, the apex of which becomes slightly more obtuse in older specimens.

I am of opinion, therefore, that the form described by Koch is, as already surmised by Prof. G. O. Sars, nothing more than an immature example of *O. asellus*, Linn., and has no claim to specific rank.

REPORT ON SCOTTISH ORNITHOLOGY IN 1915

INCLUDING MIGRATION

BY

EVELYN V. BAXTER AND LEONORA JEFFREY RINTOUL

Hon. Members British Ornithologists' Union, etc.

"The Scottish Naturalist," Nos. 55 and 56, *July-August* 1916

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REPORT ON SCOTTISH ORNITHOLOGY IN 1915, INCLUDING MIGRATION.

INTRODUCTORY REMARKS.

ONCE again this Report comes out under the shadow of War; the year 1915 has come and gone, and finds our nation still involved in a life-and-death struggle. More of our recorders have joined the colours, and, in addition to those actually serving with the forces, others have undertaken various forms of war work, and have therefore less time at their disposal for ornithological observations. In spite, however, of these and kindred disabilities the number and quality of the notes sent are splendidly maintained. The lantern returns have suffered through the extinction of some of the lights, but the lightkeepers, by their daylight observations, have nobly striven to fill the blanks. No expeditions have been possible, and in many cases unavoidable military restrictions have handicapped our mainland observers. We have, however, received a large and representative series of notes, and any merit which lies in this Report is due to the faithful work done by our recorders. We wish to thank them all specially heartily for the excellent work done in 1915, and to ask each and all to help us to carry on the Report till the dawn of better and happier times. We have to deplore the loss of an excellent recorder in Mr Robert Wilson, assistant lightkeeper, Skerryvore, who died after a short illness. He

sent us most interesting notes from that isolated station, and we shall miss his help with the Report. Our best thanks are due, in the Northern group of localities, to—William Crowe and Claude MacEachern, North Unst; the Lightkeepers, Whalsay Skerries; John S. Tulloch, Lerwick; Samuel Bruce, Lerwick, and Island of Noss; Jerome Wilson, Lerwick; the Lightkeepers, Sule Skerry; John Gilmour, Hellyar Holm; T. S. Peace, Kirkwall; M. Spence, Deerness; John Bain, Hoy High and Swona; John G. Thomson, Pentland Skerries; and the Students of the Sutherland Technical School, Golspie. In the Eastern group, to—Thomas Allan, Tarbatness; A. C. Jackson, East Ross; W. Berry, Lentrane; M. Sanderson, Rattray Head; D. Hamilton, Braemar; John B. Henderson, Bell Rock; Henry Boase, Dundee; George Cuthill, Alyth; the Keeper at Nevay Park, Meigle; Professor W. M'Intosh, St Andrews; The Hon. Gladys Graham Murray, Dunkeld; W. Berry, North Fife; M. A. Fell, Tayport; A. Munro, E. Fife; N. Miller Johnson, Kirkcaldy and Dysart; William Eagle Clarke, Edinburgh; William Evans, Edinburgh; R. Page, Edinburgh; John Pagan, Bathgate; J. A. Harvie-Brown, Dunipace; Sim Baigrie, Isle of May; Thomas Rodger, Bass Rock; William F. Little, Crosswood; Fred. S. Beveridge, Penicuik. In the Western group, to—Robert Clyne, Butt of Lewis; James F. Combe, Tiumpanhead; John Morrison, Galson; William Mouat, Barrahead; F. W. Collie, Flannan Islands; D. Macdonald, Kyleakin; the late Robert Wilson, Skerryvore; B. S. Macmichael, Craignish; Stewart Wilson, Rhinns of Islay; William Wards, Holy Island; John Paterson, Glasgow; John Robertson, Glasgow; T. Thornton Mackeith, Glasgow; D. Macdonald, Glasgow; C. W. Marriott, Glasgow; J. M'Corrisken, Glasgow; W. Jamieson, Glasgow; George W. Stout, Glasgow; Mr Ballantyne, Glasgow; T. W. Wilson, Glasgow; W. L. Walker, Glasgow; R. W. S. and H. W. Wilson, Glasgow; T. Mallock, Johnstone, Renfrew; Nicol Hopkins, Darvel; John Craig, Beith; James Bartholomew, Glenorchard. In the Southern group, to—The Rev. W. MacConachie, Lauder; Andrew Anderson, Megget Knowes; T. G. Laidlaw, Duns; G. P.

Brown, Longcroft, Oxton; A. C. Gairns, Broughton; Gilbert D. Davidson, Melrose; John Murray, Thornhill; J. B. Hough, New Galloway; David A. Mowat, Killantringan; William Begg and G. Mackie, Little Ross; and J. G. Gordon, Corsemalzie.

The under-mentioned have joined His Majesty's Forces in 1915—Samuel Bruce, R.N.R.; Robert W. S. Wilson, R.A.; Jerome Wilson, Watcher on Fair Isle, R.N.V.R.; George W. Stout, R.A.M.C.; Lieut. W. T. Blackwood, Inns of Court O.T.C.

We are indebted to the Weather Report of the Meteorological Office for meteorological data. Owing to the war, these data are drawn from a much more circumscribed area than usual, and it is therefore more than usually difficult to correlate the weather conditions with the movements of birds.

The following abbreviations will be used in this Report :—

1 = *The Scottish Naturalist*.

2 = *The Glasgow Naturalist*.

3 = *British Birds* (magazine).

(L.) = Lantern.

(O.H.) = Outer Hebrides.

There is only one addition, in 1915, to the list of Scottish birds, namely, the Dark-breasted Barn Owl—an interesting, but not unexpected, occurrence. There is a goodly list of uncommon visitors, which reflects favourably on the keenness of Scottish observers. Important extensions of Scottish breeding ranges are noted in the case of the Crested Tit and Gannet, both being species whose breeding places in these islands may be described as limited, and no extension of either has previously been recorded for many years. In the case of the Crested Tit, the spread was first noticed several years ago, but the records have only now been published.

Migration in 1915 followed a uniform course; the only rush took place in October, when a spell of east wind brought the usual big influx of migrants. In spring, some species arrived unusually early, while others were inclined

to be late in putting in an appearance. It was a cold, late spring, and winter visitors in some numbers remained unusually late. No large immigration of any species is recorded during the year, but the irruption of Little Auks, which began in December 1914, continued into January 1915, and the Continental Great Tits lingered in Shetland well into the New Year.

SPECIES NEW TO SCOTLAND.

The only addition made to the Scottish Avifauna in 1915 was the Dark-breasted Barn Owl (*Tyto alba guttata*), of which a fine specimen was caught in a rat-trap in a shed at Baltasound, on 5th November (I. 1916, 76). This Owl breeds in "South Sweden, Denmark, Germany to East France (where and even on the Rhine the ranges of this form and *T. alba alba* overlap) south to Alps, Austria and Hungary." It has been recorded as an irregular visitor to England, but this is the first time it has been known to occur in Scotland.

BIRDS NEW TO FAUNAL AREAS, AND UNCOMMON VISITORS.

Notwithstanding the absence of many of our observers and the unavoidable curtailment of our lantern records, there are quite a lot of interesting occurrences to be included under this heading. A female Northern Bullfinch (*Pyrrhula pyrrhula pyrrhula*) was shot at Shurrery, parish of Reay, Caithness, in early January (I. 1915, 68), the first record for the faunal area of Sutherland. Ortolan Buntings (*Emberiza hortulana*) visited Fair Isle on 6th and 16th October and 1st November, while a Little Bunting (*Emberiza pusilla*) is recorded from Pentland Skerries on 12th October (J. Thomson). Three Wood-larks (*Lullula arborea arborea*) are recorded from Fair Isle on 5th and one on 8th January, a male Shore-lark (*Eremophila alpestris flava*) at Hoy High on 25th March (John Bain), and two females at Swona on 16th October (I. 1916, 24).

Wagtails, either Blue or Grey-headed, occurred at Fair Isle on 16th, 18th, and 26th October, and a British Tree-creeper (*Certhia familiaris brittanica*) was killed while sitting on a haystack at Galson (O.H.) on 13th October (I. 1916, 75); this is the first record of a Tree-creeper for the Outer Hebrides. Continental Great Tits (*Parus major major*) wintered in Shetland; two are reported from Fair Isle up to 23rd January (I. 1915, 103). A Red-breasted Flycatcher (*Muscicapa parva parva*) visited Swona on 7th October (I. 1916, 24), and Yellow-browed Warblers (*Phylloscopus superciliosus superciliosus*) are recorded from Swona on 6th October (I. 1916, 23), Pentland Skerries on 8th and 9th October (I. 1916, 24), and Lerwick on 18th October (I. 1916, 24). There are few mainland records of Lesser Whitethroats (*Sylvia curruca curruca*) on the west side of Scotland; we shall therefore include one at Arisaig on 23rd May (I. 1916, 78), and another at Loch Treig on 13th June (I. 1916, 78), these being the first records for the faunal area of Argyll. Black Redstarts (*Phoenicurus ochrurus gibraltariensis*) are recorded in spring from Little Ross (W. Begg), Isle of May (S. Baigrie), not far from Glasgow (George Stout), and Pentland Skerries (J. Thomson), and in autumn from Tarbatness (T. Allan) and Pentland Skerries (J. Thomson); while a Bluethroat visited Fair Isle on 8th October. An Alpine Swift (*Apus melba melba*) is recorded as having been seen at Whithorn, Wigtownshire, on 30th July (I. 1915, 308); the first time the bird has been noted in Solway, the only previous Scottish records being of two seen in Clyde; and a Bee-eater (*Merops apiaster*) frequented the neighbourhood of Lerwick from 4th to 11th July (I. 1916, 24). A Hoopoe (*Upupa epops epops*) arrived on Pentland Skerries on 19th May (J. Thomson), and a beautiful white Snowy Owl (*Nyctea nyctea*) was observed at Little Ross on 24th February (W. Begg). The first record for Tay of Tengmalm's Owl (*Aegolius funereus funereus*) is of an adult male got at Craighall, near Blairgowrie, in February (I. 1915, 116); and a male Hen-harrier (*Circus cyaneus*) is reported from Kirkcudbrightshire on 9th October (I. 1915, 356). A Honey-buzzard (*Pernis apivorus*) was

got near Duns (I. 1916, 69), in July, and there are two separate records of Ospreys (*Pandion haliaëtus haliaëtus*), one in summer and one in autumn. On or about 20th April a Bittern (*Botaurus stellaris stellaris*) was killed at Loch Maddy (J. A. Harvie-Brown); and three Smews (*Mergus albellus*) are recorded from Loch Ewe (W. Ross) on 10th January (W. Berry). Sooty Shearwaters (*Puffinus griseus*), one bird in each case, are noted at the Butt of Lewis on 19th and 25th July (R. Clyne). The first record for Fair Isle of the Red-necked Grebe (*Colymbus griseigena griseigena*) is of a female procured there on 9th February (I. 1916, 79). In 1915, Green Sandpipers (*Tringa ochropus*) are recorded from Luce Sands (J. G. Gordon), Fair Isle, Swona (J. Bain), Balgray (I. 1915, 357), and Bardowie, Stirlingshire (J. Bartholomew). A Black-tailed Godwit (*Limosa limosa*) was seen in Aberlady Bay on 7th August (I. 1916, 70), and a Little Gull (*Larus minutus*) was found dead at Girdsta, Shetland, on 21st September (J. Tulloch). Last on the list is a Water-rail (*Rallus aquaticus aquaticus*) procured on Hirta in autumn, and new to the St Kildan avifauna (I. 1916, 77).

EXTENSION OF BREEDING RANGE.

A further spread in the breeding range of the Hawfinch took place in 1915, a young bird of this species being picked up on 18th July, "on the road which runs over the shoulder of the Dunion into the valley of the Teviot. The presence of the fledgling—it could not have been very long flown, judging from the condition of its plumage—at this season of the year, is pretty conclusive evidence that the nest in which it was reared was in the neighbourhood of Jedburgh" (W. W. M. in *Scotsman*).

Some interesting observations have been published this year on the extension of the breeding range of the Crested Tit. Mr G. G. Blackwood records one in Nairnshire in May 1915, which, from its actions, he believed had a nest (I. 1915, 285); Mr Ogilvie Grant reports the species in Ross-shire in October (3. ix. 182); and

following on these notes, a most interesting series of records made by Mr Berry (Lentran) appeared in the *Scottish Naturalist*, 1916, 68. Although these do not all belong to the year under review, we think it well for the sake of completeness, and because of their ornithological importance, to include them here. Mr Berry mentions having seen Crested Tits in north-east Inverness in September 1907; in May 1910 he came upon them in the locality mentioned by Mr Blackwood, and also in "another locality further to the east." He knows of them in two distinct localities in the lower reaches of the Findhorn Valley. In 1911 he found them in a new part of north-east Inverness, where he has seen them several times since. They were first noted by him in east Ross-shire in 1910, and he records their spread in that county.

The most interesting and important extension of breeding range which has taken place for many years is that of the Gannets, which nested on the Noup of Noss, Bressay, Shetland, this season. They were first seen on the 7th of May when they began nesting operations, four nests being built (1. 1915, 251). As no new sites have been colonised by the Gannet for a great many years, and all the known nesting places in our islands, with the exception of the Bass Rock, are on the west coast, this may indeed be regarded as a "remarkable occurrence." One of our correspondents in Shetland tells us that he was told by some fishermen that they had seen Gannets on several occasions this summer sitting on a stack, called the Burra Stack, about one and a half miles from the lighthouse on Bressay, but they do not think they were breeding. Is it possible however that, like the Fulmars, they like to prospect for a year or two before nesting?

SUMMER AND NESTING.

There are not quite so many nesting notes as usual in 1915, but the shortage is accounted for by the fact that many of our usual correspondents are away on active service. The notes sent are, however, sufficient to show

that nesting was early this season, a fact which is commented on by several recorders.

From Duns we have records of an increase in the number of Linnets; there, too, Bullfinches, Wood-warblers, and Tree-sparrows are also common in summer, although the last mentioned is said not to have been seen in winter this year. There were unusual numbers of Willow-warblers at Duns, and Blackcaps were "exceptionally plentiful in Duns Castle woods—usually there are only a pair or two, this year there are quite a dozen pairs." A Stonechat's nest and young was found at Beith, and our correspondent there adds that it is eleven years since he saw a nest of this species (2. viii. 22). A good increase of Tufted Duck, Goosander, and Great Crested Grebes was observed in Tay. At North Unst the Kittiwakes have started a new colony, and have made about twenty nests on a cliff facing north-east. Little Ross, too, records a new Kittiwake colony, and at North Unst, we are told, Guillemots were even more numerous this year than last. Fulmars were noticed at the Butt of Lewis during the breeding season, but they were "not definitely ascertained" to be nesting.

Turning now to the records sent of the decrease of species in certain places, we find that there were no Hawfinches at Duns, Garden-warblers were scarcer there than usual, Whitethroats and Reed-buntings were "thinly scattered," Sedge-warblers were quite scarce in the district, and only one pair of Corn-buntings was noted there. There were fewer Pied Wagtails than usual at Dunkeld this year, the Peregrine was not seen at the Burnmouth eyrie, and no Corncrakes were heard at Nevay Park, Meigle. Only seven or eight pairs of Coots bred on Loch Stiapavat (O.H.) this year, and neither Moorhens nor Little Grebes were observed there.

Three pairs of Hawfinches were found nesting in East Lothian this year (1. 1915, 284). A Chaffinch at Beith reared two broods in the same nest (2. viii. 23), and at the same place a Garden-warbler's nest was found with five eggs, which resembled those of the Common White-throat, and were smaller than those of any Garden-warbler

our correspondent there has ever seen. The young left the nest three weeks after the last egg was laid (2. viii. 22). A Swallow's nest with five eggs was found at the same place—of these, two were taken, two hatched, and the other egg was left in the nest; a second clutch was laid in the same nest, but in this case there were only two eggs (2. viii. 23). When repairing a broken nest for a second clutch, a House-martin at Beith "left an open space round the top of the nest instead of the usual hole at the side" (2. viii. 23). Four broods of the same species were reared in two nests under the eaves of a house at Duns. Great Spotted Woodpeckers were frequently heard at Duns, but only one nest seen; most of the young are said to fall victims to the Sparrow-hawk. A bird of this species was shot, and another seen on 10th May in Inverness-shire. Shags nested in the same place on the Isle of May, as they have done for several years. Single Fulmars were seen at Fowlsheugh this season, and to the north of St Abb's on 13th June (1. 1915, 310), but no evidence of nesting is forthcoming as yet.

The only notes of nesting in February are of Ravens and Falcons (Peregrine) "busy nesting" at Little Ross, and Rooks were seen carrying sticks for their nests near Markinch, Fife. In March we have the usual records of Dippers, Song-thrushes, Blackbirds, Lapwings, etc., all nesting, the only ones requiring special notice being a Wood-pigeon sitting on two eggs on 27th March, and a Hedge-sparrow which had five eggs on 28th March, both records coming from Corsemalzie. From the Butt of Lewis we hear that Herring-gulls began to clean their nests on 7th March, by which time Starlings and House-sparrows had returned to the rocks there. At the same station a Shag had a nest nearly built on the 22nd; this was, however, totally destroyed, and another built, the eggs being laid by 5th May. After the first brood left the nest it was replenished, and a clutch of three eggs was laid; these hatched about 5th September, and two young Shags were still in the nest on 24th October; on 31st October one left the nest, on 3rd November the other was still in the

nest, but the old bird was seen pulling the remains of the nest off the ledge; by 6th November all had left. Cormorants at the Butt of Lewis were noticed on 3rd April making their nests of "oily paraffin waste." April brings yet more records of the nesting of our earlier breeding birds. A Stockdove's nest and two eggs was found on the Lammermuirs on 4th April, a Snipe at Corsemalzie had four eggs, and was sitting on the 9th, next day a Long-tailed Tit in East Lothian had a nest and egg, on the 11th a Redshank at Craignish had two eggs, and on the 15th a Carrion Crow at Penninghame had six eggs in an advanced state of incubation. From Hoy High comes a note of a Rock Pipit with two eggs on 16th April, and by the 19th Rooks and Herons had hatched in East Ross. On the 26th, records come of four Curlews' nests, three with four and one with three eggs, on the moor at Corsemalzie. By May there are reports of the nesting of our summer visitors, and of later breeding species generally. On 3rd May Eiders' nests with five, six, and three eggs were found at Craignish, where also lots of Gulls had eggs. On the 5th, at Mochrum Castle Loch, there were a good many Herring-gulls' nests with three eggs, also three Greater Black-backed Gulls' nests with three eggs each, while six Cormorants' nests, each containing five eggs, were also found. A Goldcrest nesting in a spruce tree on an island in the same loch had nine eggs nearly ready to hatch on the same date. By 18th May a pair of Stonechats, with young "flying well," were seen on the shore at Luce Bay, a very early date. On the 12th Fulmars began to sit at North Unst, the first young left the nest on 4th September; this species is also reported from Doune Tower, on the east side of the Lewis on 26th May, to which part it only spread in 1913. On 14th May a Swallow's nest was found built in a horse collar hung up in a stable at Soulseat, and on the same day two nests of the Grey-lag Goose with four and five eggs were found at Galson (O.H.), and the first Guillemot's egg was laid on the Bass. Nesting there began early in 1915, the first Puffin's egg being seen on 4th May, the first Herring-

gull on the 8th, and the first Razorbill on the 10th, while the first Kittiwake's egg was laid on the 23rd. Young Grouse were found at Oxton, Berwickshire, on 15th May, and two Wood-warblers' nests with eggs were found in East Lothian on 26th May. On 29th May at Corsemalzie a Common Sandpiper with four three-quarter-grown young was seen by the burn, a very early date for this species to have well-grown young. On the same date, a Spotted Flycatcher had a nest and five eggs in the ivy on the house at Corsemalzie; it had a second brood, and by 6th August was feeding a second family of four. On 1st June a Little Grebe in Arisaig Forest had two stripy young, and this species is also recorded as nesting at Kirkmichael during the month. A Hedge-sparrow at Arisaig had a nest and young on the 4th; this was the only nest of the species found in the district, and was built in some ivy at the station. A Redstart's nest and eggs was found at Craignish on the 2nd June; while by the 8th Great Spotted Woodpeckers were seen feeding young at Gask, and on the 12th Willow Tits were similarly employed on Bathgate Hills. The Arctic Terns at Whalsay Skerries had "nests and eggs in every direction" on 12th June; they left the island later, and under date of 14th July our correspondent there writes, "most of the Terns have left, their young have apparently died of starvation." From Pentland Skerries, too, come sad tales of great mortality among the young Terns; on 18th July hundreds are reported dead or dying, this being attributed to the heavy rainfall on the 16th. But under 26th to 31st we find the note, "hundreds of young birds dying, and the Terns daily decreasing in numbers." On 19th June the Terns on Tentsmuir all seemed to be hatching, and enormous numbers were seen; "breeding more thickly than ever" is the note made on this date. A Woodcock's nest and four eggs was found near Duns on 22nd June, a very late date. On 4th July a Great Spotted Woodpecker boring was seen in a wood on the Cardross estate, Lake of Menteith, and on the 16th two newly-fledged Little Terns were seen in Largo Bay, having evidently been bred near by, as they

could hardly fly. A pair of Grey Wagtails were nesting at Braemar on 13th July. Our correspondent writes, "I never saw such a wonderful example of a bird choosing a nesting site of the same colour as itself, for just for a few yards where the nest was, the face of the rock looked as though sulphur had been thrown down and remained on the ledges (really a yellow lichen); the face of the rock was grey, with marks of soft brown—all the colours exactly those of the Grey Wagtail."

By the 30th July many young birds on the Isle of May were on the wing and leaving the cliffs; thereafter there are no further notes referring to this heading, with the exception of reports of Kittiwakes leaving their nesting ledges at the Butt of Lewis and Sule Skerry in August, Lesser Redpolls and Sedge-warblers with young at Darvel in mid-August. A family of newly-hatched Goldcrests was seen near Invergowrie on 6th September, and Wood-pigeons with young a few days old at Darvel.

WINTER.

The winter of 1914-15 was notable for the fact that for the first time on record Continental Great Tits wintered in Shetland. It is generally supposed that several of the Continental races of our own breeding birds do winter in this country, but definite records are few and valuable. Gannets are recorded more often and in greater numbers this winter than is usual. Whimbrel are reported in January from Galson (O.H.) (shot), Fairlie (Ayr), and Musselburgh, and a Greenshank was seen at the Cromarty Firth. Hawfinches are reported from Lauder all through the winter, as many as ten birds being seen at one time. In the winter of 1914-15 Goldcrests were very numerous at Corsemalzie, Blackbirds wintered at Pentland Skerries, and were very numerous at Holy Island (Arran), where they are said usually to be very scarce in winter. Wrens, too, are described as numerous on the Bass, where about twelve Snow-buntings also spent the winter. Eider were very scarce about the shores of East Fife and the Isle of May in

January and February. A lot of Little Auks are recorded in January—these were, as was to be expected, most numerous on the east coast and in the Northern Isles, but there are also a good many notes of individuals driven inshore, and of others on the west coast. These are all probably the remains of the wreck which occurred in the end of 1914. Otherwise the winter seems to have been a normal one, and there is nothing else reported worthy of notice here.

For the last six weeks of 1915 there is little to record; the usual winter visitors were present, but they do not seem to have been in unusual numbers with the exception of Redwings. These are reported in very large numbers from East Fife and East Renfrew; at the latter place they were seen feeding on haws, and after the heavy snowfall in November were so tame that they sat on the thorn bushes till they could almost be poked off with a stick. Pied Wagtails were more numerous than usual in Dundee, and flocks of as many as two hundred Goldfinches were seen in Wigtownshire in November and December. At the Butt of Lewis a small flock of Corn-buntings remained throughout the winter, and a few Skylarks were there in November and December, and Gannets were seen nearly up to the end of the year (i. 1916, 58). There were no Coots on the loch at the Butt of Lewis although they were not "frozen out," Starlings and Golden Plover were scarce, Curlew, on the other hand, were numerous, and a good many Wigeon were seen occasionally. Duck were few on Lindores and Kilconquhar Lochs after the hard weather in November and very few were seen at Crosswood, while Eider were very scarce at the Isle of May. Large flocks of Wood-pigeons were present in East Fife and Wigtownshire this winter, and at the latter place Stockdoves, too, were unusually plentiful. The only records of Little Auks in numbers come from Pentland Skerries.

RINGING.

There are some very interesting records to come under this heading in 1915, and we once more congratulate Mr Witherby on the excellent work done by the "British

Birds Ringing Scheme." In this Report we can only deal with those notes which are directly connected with Scottish Ornithology, but we recommend everyone who is interested in migration to study all the returns.

A Starling, marked at the Mull of Galloway on 26th February 1914, was recovered at Gretna on 26th November 1915 (3. ix. 266), and a Swallow marked near Glasgow on 29th June 1914 was recovered near Skipton, Yorks, on 23rd May 1915 (3. ix. 268). There are a good many returns of Mallard marked at Stranraer as adults; one marked on 27th February 1915 was recovered at Ardmaal, Sweden, on 1st August 1915 (3. ix. 269), while three others marked on 17th and 27th February 1915 were got at the place of ringing on 22nd August, 18th September, and 4th October 1915 (3. ix. 269). Four others marked on 28th February 1914 were recovered at the same place in January and February 1915 (3. ix. 43); while three others marked on 9th and 10th October 1915 were recovered at the place of ringing in November (3. ix. 269). A Wigeon, also ringed at Stranraer, 31st January 1914, as an adult, was recovered there on 23rd January 1915 (3. ix. 43); and of two Teal marked there, both being adult and both ringed on 17th February 1915, one was recovered in Montgomeryshire on 24th September, and the other was retaken at Stranraer in November (3. ix. 269). A Cormorant ringed in Sutherland on 16th June 1914, was recovered at Stornoway (O.H.), in February 1915 (3. ix. 43), and another bird of the same species, marked on the Farne Islands in August 1913, was recovered in Haddingtonshire in November 1915 (3. ix. 269). The migrations of Lapwings and Woodcock to Ireland, in winter, with which we are now so familiar, are again much in evidence. Lapwings marked in Moray and Sutherland in June were recovered in Cork and Co. Limerick in January and February (3. ix. 44 and 270); while Woodcock ringed in Stirlingshire, Dumfriesshire, and Kirkcudbrightshire, were recovered in Ireland in January, February, November, and December (3. ix. 45, 46, and 270), in two cases, both Dumfriesshire birds, three years after ringing. In addition

to these there are records of birds being recovered at, or near, the place where they were ringed, in some cases as much as three or four years, in one case five years, after ringing. Thus a Chaffinch marked at Torrance, Stirlingshire, as an adult on 30th March 1912, was recovered there in December 1915 (3. ix. 266). A British Song Thrush marked at Torrance as a nestling on 6th June 1911 was recovered at Cadder on 16th January 1915 (3. ix. 22). Another, marked at the same place in June 1914, was found there in July 1915 (3. ix. 266), while two nestlings marked in Ayrshire on 12th and 25th May 1913 were recovered at the same place in June and November 1915 (3. ix. 267). There are also records of a Blackbird recovered at the place of ringing three years later (3. ix. 267), a House-martin retaken two years after ringing (3. ix. 268), a Lapwing five years after (3. ix. 45), another four years after (3. ix. 270), and lastly a Woodcock recovered within a mile of the place it was marked three years before (3. ix. 270).

PLUMAGE.

A Rook with some white feathers in its wings is recorded from Beith, and a "Crow" with a lot of white on its wings was seen on Fair Isle all summer. Our observer there says, "I think it was brought out on the cliffs"; the only Crow which breeds on Fair Isle is the Grey Crow, so it probably belonged to this species. At Pentland Skerries, a buff or cream-coloured Starling, which had been bred on the island, was still there on 17th July; and during November "an almost white Starling" was several times observed at Darvel, while an albino Twite was seen among a large flock at North Unst on 5th November. A female Chaffinch with a white head was seen near Largo on 8th February, and a pure white Sparrow at Penninghame on 20th November, while from Darvel, on 7th January, we have a record of a melanic variety of a male Sparrow. Blackbirds having some white feathers in their plumage are recorded from Beith, Pentland Skerries, Melrose and Largo, and white or almost white birds of this species occurred at Craignish,

Corsemalzie, and Whithorn. "An almost pure white Whinchat" frequented the neighbourhood of Darvel during August, and an all-black specimen of the Black Guillemot was at the Butt of Lewis on 28th June. On 11th August a Moorhen was caught at the Cromarty Firth, which "had every one of the remiges in quill." An adult male Black Grouse with white speckled neck and head was shot at Mindock on 28th September, and a male Red Grouse with an almost white wing was seen at Mallochglass, Mochrum, on 16th September, and on 23rd October two pied male Pheasants were shot at Barnbarroch.

Golden Plover, Dunlin, Black-headed Gulls, and Guillemots are recorded in spring plumage from various localities in January and February.

HABITS, FOOD, ETC.

Under this heading we have a larger series of notes than usual; these deal with a considerable number of different species. We have also included here notes made on the behaviour of birds in the vicinity of aeroplanes, as well as the observations on oil-clogged birds, along our coasts.

Twenty-one Redpolls at Corsemalzie determinedly chased a Pied Wagtail over the garden; there, too, flocks of Greenfinches and Chaffinches were feeding on elm seeds in July, and the last-mentioned species was seen on the Beaully Firth, pecking and eating a kind of glasswort growing on the mud during a spell of frost. Our correspondent at Swona (Orkney) says, "In the autumn of 1915, all the birds I have seen leaving the island—Snow-buntings, Skylarks, Twites, Starlings, and Thrushes—leave from the most northerly point and fly in a north-easterly direction." A partly moulted Meadow-pipit caught at the Butt of Lewis lantern on 4/5th October had three small snails' shells (living) attached to its underparts (I. 1915, 336). At Corsemalzie, on 17th July, a Whitethroat was seen greedily eating fallen red currants, and at the same place on 31st July three Swallows chased a Missel-thrush over the garden, "pecking viciously at it," and hundreds of Blackbirds there were eating goose-

berries on 2nd August. A young Hedge-sparrow was seen at Braemar trying to fly across the Clunie Water—it dropped into the stream about two feet from the shore; “it seemed, however, to be quite able to swim to the rock, and scrambled up it, looking very much pleased with itself.” Our observer at the Bass Rock records, under 15th May, two immature Gannets seen salaaming and rubbing beaks and behaving like a mature pair. Some immature male Goldeneye were displaying in the sea near Portmahomack on 27th April. Our correspondent at Melrose tells us that he noticed in the winter that Wild Ducks, when flushed off the river, nearly always make for a quiet bay or backwater. Whereas Goosander, when flushed, fly, as a rule, upstream and alight on the water in the centre of a strong stream. He has never seen them alight on the water on a quiet smooth stretch; “certainly their plumage harmonises with the foam and waves of the rough stream, and they are difficult to see after alighting. I wonder if it is a way of concealing themselves.” The same observer writes:—“During the frost, in November, I often used to see Wild Duck under the beech trees near the Tweed, presumably feeding on the beech-mast.” A female Merganser in Largo Bay was attacked by an immature Greater Black-backed Gull, which stooped at her when she came up from a dive. The first time it happened she dived again, but on being again attacked opened her bill, elevated her crest, and drove the Gull away.

A Wood-pigeon at Corsemalzie was seen eating cherries on 24th July, and in late autumn several birds of this species were found dead or dying, covered all over with warty excrescences and in a very emaciated condition. Notes of Golden Plover and Black-headed Gulls being attracted by lighted tents appeared in the *Scottish Naturalist*, 1916, 23, and young Lapwings were seen to swim thirty or forty yards across parts of Knapps Loch, Kilmacolm (i. 1916, 94). On 19th June Black-headed Gulls were seen in Renfrewshire, about 9 P.M., flying over a hayfield after Ghost Swift Moths (*Hepialus humuli*), and this species was courting on the Cromarty Firth on 23rd April; “one of them regurgitated some food which it put on the sand; the other, which was

the smaller of the two, presumably the female, picked it up and swallowed it, and afterwards put up her beak, open, and the male fed her with food which he regurgitated." There, too, an immature Common Gull, with a small fish, hovered some six feet over the water and dropped the fish, swooped down again and seized it; it did this about half a dozen times, then, other Gulls appearing, swallowed its prey. A Herring-gull at Corsemalzie was mobbed by a flock of Lapwings on 16th March. From Hoy High, under date of 12th April, our correspondent reports considerable numbers of Glaucous and Iceland Gulls; these, he says, follow the plough with the other Gulls. "The Glaucous does not eat worms, but goes for the grubs in the seaweed manure; the Iceland, on the other hand, eats worms like the other Gulls." In winter, at Corsemalzie, the Pheasants not only ate off the turnip tops in the garden, but devoured cabbages, brussels-sprouts, beetroot, parsnips, parsley, and carnations wholesale, unless wired over. Interesting observations on birds killed by oil on the sea in Forth and Tay appeared in the *Scottish Naturalist*, 1915, 282: from these it will be seen that many birds lost their lives from their feathers becoming so clogged with oil that they were unable to dive or fly, and therefore starved. The principal victims were Guillemots, but a good many Eider, Razorbills and Puffins were also found dead or dying. Notes have also been published on the behaviour of birds with aeroplanes; in every case cited, with one exception, the birds showed fear and flew away from the aeroplane—in the exceptional case they rose up and pursued it (I. 1916, 39 and 66). In autumn 1915 a passing aircraft caused the great flocks of Wood-pigeons frequenting Barnbarroch, Wigtownshire, and feeding on the beech-mast, to fly off in all directions; they did not return for several days.

MIGRATION.

SUMMARY OF MOVEMENTS.

January.

The weather in January was very unsettled, strong winds prevailed, chiefly from some westerly quarter. No severe or prolonged frost is recorded in Scotland.

A good deal of migration is noted in January, the movements being constant throughout the month. In the first half there were movements of Rooks, Starlings, Lapwings, and Golden Plover. The movements of Starlings and Golden Plover were more pronounced in the second half of the month, and in addition there were distinct movements of Snow-buntings, Skylarks, and Blackbirds. Guillemots and Fulmars are reported as visiting their nesting places.

February.

The weather in February was very unsettled, the wind mainly south-westerly or south-easterly till the 13th, when it changed to some northerly quarter, the temperature fell, and snow and sleet were recorded from many stations. The movements during the month were of a very normal character. Throughout the month partial migrants were returning to their Scottish breeding places; during the first week Curlew, Golden Plovers, and Gannets arrived at their nesting quarters, as did Herring-gulls in the second week. A big Skylark movement took place from the 9th to the 11th, and the migrations of this species continued till the end of the month. During the third week many arrivals of Lapwings and Thrushes are recorded; Oystercatchers were on the move, and Rooks were emigrating. The last week brings arrivals of Pied Wagtails.

March.

The weather in the first week of March was cyclonic in character, and the wind was chiefly from some westerly quarter. During this period little movement is recorded, and this is mostly confined to Starlings and Turdinæ. Wader were returning to their breeding places in our inland districts or Northern Isles. An anticyclone was the dominating influence in our area during the second week of March, and the winds were light and chiefly westerly. Much migration is recorded, the period of maximum movement being from the 9th to the 13th, when large numbers of Starlings, Skylarks, Turdinæ, and Wader are recorded. There was also a good deal of Duck and Goose movement, and sea-birds were seeking their nesting haunts. Thereafter to the end of the month the conditions were cyclonic, and the wind was chiefly westerly. The movements continued, becoming intensified in the last week, in which time we have a good many notes of the arrival of Wheatears. Partial and passage migrants still predominated, but there are also records of the departure of some of our winter visitors. The migration throughout the month seems to have been of a very normal character.

April.

In April there was a slow and steady flow of migration, which did not develop into a rush but became more pronounced as the month progressed. Up to the 25th the weather was variable, and the wind was chiefly north-west; from that time to the end of the month an anticyclone prevailed over the area. The temperature was low all the month. Very little movement is recorded during the first week, though there are spasmodic and unexpectedly early arrivals of summer visitors, though they were, on the whole, late in arriving in 1915. The same type of migration continued throughout the month, the stream of arrivals becoming greater towards the end. As was to be expected,

the number of summer visitors recorded increased as the month advanced, and as there are few notes from the Northern Isles during this period, it is probable that these were arrivals of our own breeding birds. There are also a good many records of winter visitors and passage migrants.

May.

May was a calm month, cold up to the 20th, after which it became somewhat warmer. Variable light airs characterised the first week, and a great rush of summer visitors poured into the country; a certain amount of passage migration is also recorded, and an unusual number of winter visitors were still with us. Up to the 20th the weather was cold, and the wind almost entirely from some northerly quarter; from the 20th to the 24th the winds were south and south-east, after this they were chiefly north and light to the end of the month. The arrivals continued, becoming less as the month advanced, until by the end it was apparent that our summer visitors had reached their nesting places. Less passage migration than usual was recorded, this assuming the character of a steady trickle, there being no sign of the rush which often comes at this season. An unusual number of winter visitors are recorded as remaining with us throughout the month, these naturally becoming fewer towards the end of the period.

June.

Up to the 12th of June the winds were chiefly westerly and southerly, and light; after this till the end of the month they were from north-east to north-west, and light or moderate in force. A little passage migration is recorded in the first week, and arrivals of Terns at their northern breeding places are also reported. In the second week there was a little passage of Hirundinæ and Swifts, and a late Fieldfare is noted. To the end of the month there was little migration; birds began to flock after nesting, and movements of small numbers of Wader were noted. Large

numbers of Black-headed Gulls returned to the shore after breeding.

July.

The first week of July was warm and the winds chiefly southerly ; thereafter there was a great prevalence of northerly winds, and the weather was therefore cold for the time of year. In the first week the only movements recorded are departures of adult Cuckoos and a little Wader movement. The second week showed little more migration : besides the Wader a few passage migrants are noted ; a noticeable decrease of Terns is reported from Sule Skerry on the 13th, and of Puffins there on the 17th. In the last week of the month the movement became more pronounced ; departures of Swifts and Tree-pipits are noted, and from the 27th onward a considerable overseas arrival of Wader took place, and a good deal of Duck movement is also recorded.

August.

Up to 8th August the wind was between north-east and north-west, and light, and the movements recorded principally refer to departures of our summer visitors, and arrivals of Wader from overseas. From the 9th to the 14th the wind was chiefly south-east, and a rather stronger movement of the same character is recorded. Thereafter to the end of the month the wind was almost entirely between north-west and south-west, and moderate in force. The movements continued the same, small but constant, with nothing approaching a rush. Few passage migrants are recorded, with the exception of White Wagtails, which are noted in some numbers.

September.

The wind during September was almost entirely from some quarter between west and north-east, except from the 9th to the 13th and the 19th to the 23rd, when it was south-east and south.

Uniform and normal migration was the feature of

September; the movement comprised departures of our summer visitors, arrival of winter visitors and some passage migration, rather more Pied Flycatchers than usual being recorded. The movement was slightly increased from the 9th to the 13th, coinciding with a brief spell of south-east and south wind, and there was a good deal of Wader movement from the 24th to the end of the month, but at no time was there anything approaching a rush.

October.

Up to the 8th October the wind was from some westerly quarter, and there was steady normal migration, chiefly arrivals of winter visitors. From the 8th to the 24th the wind was in the south-east, with the exception of an interval from the 14th to the 19th, when it was westerly. During this time a big rush took place, slackening somewhat from the 14th to the 19th, thereby corresponding to the change of wind. The species affected were chiefly winter visitors, but there was also a good deal of passage migration, and some uncommon visitors are recorded. Thereafter to the end of the month the wind was variable, and there were practically no fresh arrivals, the birds recorded being mostly those lingering after the big rush.

November.

Up to the 17th November the wind was almost entirely between north-east and north-west; thereafter to the end of the month it was very variable, and frost is recorded from the 14th onwards. Constant small arrivals of winter visitors are recorded up to the 14th; after this, and up to the end of the month, the frost caused movements to our shores and island stations. The species affected were chiefly Jackdaws, Turdinæ, Robins, Curlew, Jack Snipe, Lapwings, and Golden Plover, the last two being recorded in large numbers from our south-western lanterns on the night of the 29th.

December.

The first week of December was pretty cold, with winds chiefly between north-west and north-east. During this period some movement is recorded from the Killantringan and Little Ross lanterns. The rest of the month was stormy, and the wind frequently rose to the force of a gale, the heaviest winds being from the south-east. Hardly any movement is reported; there are one or two records from various stations of small numbers of Starlings, Skylarks, Turdinæ, and Wader, and many Little Auks were seen at sea off Pentland Skerries.

NOTES ON THE MOVEMENTS OF BIRDS IN 1915.

ARRANGED UNDER SPECIES.

THE HOODED CROW, *Corvus cornix cornix*.—A single bird visited the Isle of May on 15th February, thirteen arrived at Pentland Skerries on 31st March, and three at Sule Skerry on 3rd April. On 5th April eleven were seen at Pentland Skerries flying north; last observed in Largo Bay on 12th April, and a northward passage of seventy to eighty at the former station at 7.15 A.M. on the 23rd, and thirteen on the island on 26th April. Two are recorded from the Mull of Galloway on 24th May, and on that date, the next day, and 2nd June, single birds visited the Isle of May.

Large assemblies of one to two hundred Hoodies were seen daily at Tiumpanhead (O.H.) from 1st to 20th July, single birds at Corsemalzie on 17th August and 29th September, two at Pentland Skerries on 9th October, and small arrivals are recorded from the Isle of May, Largo Bay, and Pentland Skerries between 18th October and 7th November.

THE CARRION CROW, *Corvus corone corone*.—A Carrion Crow is noted at the Isle of May on 11th March, and two there on 22nd March, four at Hoy High on 28th March, while on the 31st of the same month two were watched coming in over the sea from the east at Balcomie (E. Fife). Three were at the Isle of May on 13th April and two at Hoy High on 3rd May, while on 17th September two are recorded from Keppoch, Arisaig.

THE ROOK, *Corvus frugilegus frugilegus*.—Single birds are noted at Fair Isle on 7th, 11th, and 18th January, two there on 15th February, and about twenty at Lerwick on 20th February. Small

numbers are recorded from stations in Orkney and Shetland frequently from 5th to 10th March and from 21st March to 28th April, these being evidently Continental breeding birds on the way to their nesting places; the only other records of movement during this period being from Little Ross and Tarbatness on 26th March. Single birds appeared at Fair Isle on 8th and Pentland Skerries on 10th May, and two at the latter station on 24th May.

Arrivals in small numbers are reported from Fair Isle, Pentland Skerries, and the Isle of May between 13th and 25th October; single birds visited the first-named station on 3rd and 6th November, and on 17th November several flocks were seen passing Little Ross, probably a weather movement, caused by the snow and frost prevailing at that time.

THE JACKDAW, *Colæus monedula*.—Two are recorded from Pentland Skerries on 22nd March, and on 17th November several flocks were observed at Little Ross, and parties kept arriving in Largo Bay, all coming from the south-east.

THE STARLING, *Sturnus vulgaris vulgaris*.—On 7th January numbers of Starlings were at the Little Ross lantern at 11 P.M., and from 13th January to 19th February there are numerous notes of this species from lanterns and lighthouse stations in Southern Scotland, the only records of arrivals in the northern part of our country being from Pentland Skerries and Tiumpanhead on 24th January and Hoy High on 16th February. From 4th March to the end of April large and constant movements of Starlings are reported; the periods of maximum movement seem to have been from 7th to 12th March, 20th March, 11th and 15th April. The records come from the length and breadth of Scotland, from N. Unst to Little Ross and from Skerryvore and the Outer Hebrides to the Bell Rock and Pentland Skerries. Some of these were doubtless our winter visitors leaving us; others probably refer to the arrival of our breeding birds and to passage migrants *en route* for further north. The May notes are—flocks of twenty or thirty at Crail on the 5th, four at the Bell at 6 P.M. next day, and one there on the 13th; two at the Killantringan lantern at 3 A.M. on the 11th, and one at the Little Ross lantern at 12.30 A.M. on the 20th May. Flocking had begun at Largo by 16th June, and is noted in many localities after 12th July. On 2nd August four are noted at Sule Skerry and one at the lantern there on 13th August, while on the mornings of 3rd and 16th September one or two appeared at the Killantringan lantern. Throughout October large arrivals are noted in our Northern Isles and at the Isle of May, doubtless

immigrants from overseas, while from 8th October to 4th November there are frequent records of small numbers from the lanterns at Killantringan and Little Ross, and on 30th October four visited the Bell Rock. Small numbers of Starlings were at the Killantringan lantern early on the 3rd, 6th, and 14th December, at the Little Ross lantern on 5th, 9th, 10th, 15th, and 16th, three on the Bell on the 10th, and an increase at the Isle of May on the 24th December.

THE HAWFINCH, *Coccothraustes coccothraustes coccothraustes*.—During January, Hawfinches are several times reported from Lauder (1. 1915, 45), as many as ten birds having been seen on one occasion. A bird of this species is noted from the mainland opposite Little Ross (Kirkcudbright) on 23rd July.

THE GREENFINCH, *Chloris chloris chloris*.—From 1st to 12th January Greenfinches are noted at Fair Isle and Galson (O.H.), and several at the Isle of May on 7th January. Seven visited Lerwick on 30th January, and single birds are recorded from Hoy High on 1st February and the Isle of May on 6th April. On 22nd October an enormous flock was seen at Castle Kennedy, a female at Swona and one on the Bell on 23rd October, and a lot at Little Ross on 30th November.

THE GOLDFINCH, *Carduelis carduelis britannica*.—One bird of this species was seen near Largo on 4th May, about six in East Inverness-shire on 25th October, and several near Beith on 13th November (2. viii. 23). These birds probably belonged to the British form.

THE SISKIN, *Carduelis spinus*.—There are no spring records of Siskins this year.

On 5th October a young bird was killed at the Flannans lantern and eleven were seen at Mochrum Park, on the 8th two arrived at Fair Isle, a female at Swona next day, while on the night of the 9/10th October a male was at the lantern of the Butt of Lewis. From this time to the end of the month there are constant records of small numbers from Fair Isle, Lerwick, Swona, Pentland Skerries and the Isle of May; one is reported from the first-named station on 12th November, and seventeen from Carseriggan (Wigtownshire) on 25th November.

THE TWITE, *Carduelis flavirostris flavirostris*.—On 24th January arrivals are recorded from Pentland Skerries and Tiumpanhead, and from Hoy High on 28th March; about twelve

at the Butt of Lewis on 2nd May, increasing at Fair Isle on the 4th, and two at the Isle of May on 14th May.

In autumn, arrivals are noted at Fair Isle on 15th September, a very large flock at the Butt of Lewis on 3rd October, and increases at Pentland Skerries on 5th and Swona on 6th and 7th October. By mid-October Twites were decreasing at Pentland Skerries, and all had left by 29th October, but a flock of over thirty reappeared there on 3rd November.

THE MEALY REDPOLL, *Carduelis linaria linaria*.—The only records of Mealy Redpolls in 1915 are—single birds at Lerwick on 3rd October and Pentland Skerries on 28th October, and about eight at Williamwood, Clyde, on 12th December.

THE LINNET, *Carduelis cannabina cannabina*.—On 14th January a Linnet is reported from Fair Isle, many at Little Ross on 18th March in snow, varying numbers at Hoy High up to the end of April, and four there on 17th May. A flock is noted at Kyleakin on 1st and 11th October, a few on Swona from 7th October to 16th November, two at Pentland Skerries on 24th October, and a few at Hellyar Holm on 9th December.

THE NORTHERN BULLFINCH, *Pyrrhula pyrrhula pyrrhula*.—A female of this large Bullfinch was shot early in January at Shurrery, parish of Reay, Caithness (I. 1915, 68). See p. 150.

THE CHAFFINCH, *Fringilla coelebs coelebs*.—Small numbers of Chaffinches are recorded during January from Fair Isle and Pentland Skerries, one at the Butt of Lewis on 5th February, and fourteen at Lerwick on 21st February. A female appeared on Pentland Skerries on 11th March, one on the Isle of May on 17th March, and next day numbers were on the island at Little Ross, a weather movement caused by the snowstorm. A lot, chiefly females, are noted at the same station on 4th April, and northward passage is recorded from stations in Orkney and Shetland, and from the Isle of May from 8th April to 1st May; at the last station single birds appeared on 8th and 11th May.

The Butt of Lewis reports two Chaffinches on 27th September, and a strong arrival is recorded from 9th to 27th October; the stations recording this movement are Lerwick, Fair Isle, Swona, Pentland Skerries, the Isle of May, and (after the 22nd) Little Ross. On 17th November a weather movement caused by snow is noted at this last station, and Chaffinches were again plentiful there on 30th November.

THE BRAMBLING, *Fringilla montifringilla*.—On 12th March four Bramblings appeared at Lerwick, last seen at Melrose on 16th April, a few on the Isle of May on 19th, 26th. and 30th April, and on Fair Isle on 7th May. A very interesting record is that of three birds of this species on the Island of Noss on 4th July.

The first of the autumn immigrants is reported from Fair Isle on 25th September, and from 1st to 30th October steady arrivals are recorded from our stations in the Northern Isles and the Outer Hebrides, the Isle of May and Tarbatness, while on 10th October great numbers were seen near Duns. Large flocks are noted at various localities during the second half of November, and a Brambling at the Butt of Lewis on 19th December.

THE TREE-SPARROW, *Passer montanus montanus*.—A flock of sixteen to twenty are noted near Inverness on 8th October, and two at Pentland Skerries on 16th October.

THE CORN-BUNTING, *Emberiza calandra calandra*.—From 7th to 22nd February we have some records of arrivals of Corn-buntings from stations in Shetland and the Outer Hebrides and Tarbatness. The Butt of Lewis records "none of the usual arrivals of Corn-buntings in April and May"; on 20th April "a good few" were seen near Garlieston, Wigtownshire, a flock of twenty-three at North Unst, and one bird at Pentland Skerries on 30th April.

On 4th July one of these Buntings visited Pentland Skerries, and some movement is noted at Fair Isle, Swona, and the Butt of Lewis from 2nd to 13th October. A flock of thirty was seen at Barnbarroch on 15th November.

THE YELLOW BUNTING, *Emberiza citrinella citrinella*.—A few Yellow Buntings are recorded from Fair Isle during January, on 11th February, from 24th to 29th March, and on 8th, 12th, 17th, and 26th April, one at this station on 8th May, and one at the Bell Rock on 11th May.

The autumn records are, one at Fair Isle on 27th October, two at Lerwick on 31st October, one at Fair Isle on 5th November, a few at the Isle of May on 23rd November, and one at Barra Head on 31st December.

THE ORTOLAN BUNTING, *Emberiza hortulana*.—Single birds are reported from Fair Isle on 6th and 16th October and 1st November. See p. 150.

THE LITTLE BUNTING, *Emberiza pusilla*.—A bird of this species is noted at Pentland Skerries on 12th October. See p. 150.

THE REED-BUNTING, *Emberiza schornichus schornichus*.—From 8th October to 3rd November arrivals of Reed-buntings, doubtless immigrants from overseas, are recorded from Fair Isle, Swona, and Pentland Skerries.

THE SNOW-BUNTING, *Plectrophenax nivalis*.—During January and February movements of small numbers of Snow-buntings are reported from stations in our Northern Isles and Outer Hebrides. The northward movement was very pronounced throughout March and April, there being constant notes of emigrants from our northern stations during this period, the greatest numbers noted being on 24th, 25th, and 28th March, and 2nd and 28th April; the last mainland record is from Lundin Links on 10th April. In May two were seen on the 1st and one on the 3rd and 8th, all at Pentland Skerries.

The first autumn records come from Pentland Skerries on 13th September, Fair Isle next day, Hellyar Holm on the 15th, North Unst on the 21st, and Swona on the 24th September; the first mainland note comes from Tarbatness on 25th September. Steady immigration is recorded after this up to 18th November from our Outer Hebridean and Northern Island stations, and to a lesser degree from Rattray Head, the Bell, Isle of May, Longcroft, and Corsemalzie. The numbers noted are usually small, with the exception of 26th September, when numbers visited North Unst, and 20th October and 5th November, when a large flock appeared at the Butt of Lewis. During December small numbers frequented Fair Isle and Pentland Skerries.

THE WOOD-LARK, *Lullula arborea arborea*.—Three birds of this species are recorded on 5th and one on 8th January from Fair Isle. See p. 150.

THE SKYLARK, *Alauda arvensis arvensis*.—On 17th January a Skylark is noted at Lerwick, one at the Bell on 20th January, and during this month and up to 14th February there are many notes of Skylarks in some numbers from stations in the Outer Hebrides. From 24th February to 1st March flocks are noted at Galson (O.H.), and a flock at the Butt of Lewis on 8th March. Between the 6/7th February and 3rd April constant movement is recorded from our southern lanterns and stations—Little Ross (and L.), Killantringan (L.), Isle of May, Skerryvore (L.), and Bell Rock. The periods of maximum movement were on 11th February, 9th, 10th, 18th, 20th, and 24th March; the earlier arrivals were doubtless our breeding birds returning, but it seems probable that some, at any rate, of the

later records refer to passage migrants on their way to breed further north. To this latter category belong, we think, the Skylarks at the Muckle Flugga lantern on 11th April, at Sule Skerry on 28th April, the Isle of May on 27th April, 7th and 22nd May, and the Bell Rock on 13th May. Three stragglers are reported from this last station on 14th June.

From 16th September up to 2nd November much movement is recorded from our southern stations, chiefly from the Little Ross and Killantringan lanterns, the largest numbers reported being on 1st and 2nd October at the former light. Records during this period are scarce in our northern area: on 20th September small parties were flying south over the sea parallel with the coast at Tarbatness, a few were at the Muckle Flugga lantern on 9 10th October, Skylarks were leaving Swona in parties of six to twelve from 8 A.M. to noon on 19th October, and about fifty were on that island next day. A weather movement in snow is noted from Beith and Little Ross on 16th and 17th November. The December records are, some at the Little Ross lantern at 9 P.M. on the 1st, 9th, 11th, 15th, and 16th, one at the Killantringan lantern on the 3rd and 14th, one at the Bell on the 11th, at Lerwick on the 12th, and a few at the Isle of May on the 24th, 25th, and 30th, and at the Rhinns of Islay lantern on the 28th December.

THE SHORE-LARK, *Eremophila alpestris flava*.—A male occurred at Hoy High on 25th March, and two females at Swona on 16th October (1. 1916, 24). See p. 150.

THE TREE-PIBIT, *Anthus trivialis trivialis*.—The first recorded for the season is at Inchlonaig, Loch Lomond, on 25th April; the species is noted at Duns next day, at Darvel on the 27th, Strathyre 29th, and Melrose on 30th April. After this arrivals are reported up to 10th May, by which time our Tree-pipits seem to have been very generally distributed.

From 27th to 30th July movement is noted at Kirkmichael, from 8th to 28th August there are several records from Balgay near Dundee, one was seen in Largo Bay on 24th August, and the last for the season at Balgay on 25th September.

THE MEADOW-PIBIT, *Anthus pratensis*.—On 3rd January there were one or two Meadow-pipits in Largo Bay, one at Whalsay Skerries on the 12th, and a flock of twenty-seven on the moor at Corsemalzie on 29th January. "Quite a dozen" were at Balcomie (E. Fife) on 11th February, one at Fair Isle on 9th March, and five at Pentland Skerries on 22nd March. From 24th March to 12th

April there are many notes from our southern stations of the arrival of Meadow-pipits, probably our own birds returning to breed with us. Stations in our Northern Isles record arrivals from 8th April steadily up to 15th May, on which latter date many are also recorded at the Butt of Lewis. These doubtless refer to the passage of the more northern breeding birds on their way overseas, and the notes from the Isle of May during this period probably also belong to this category.

The autumn movement is first noted on 27th July, and our southern stations record movement, doubtless our breeding birds leaving us, up to 11th September. The first record of movement from our Northern Isles is on 17th August at Swona, and there are spasmodic notes of arrivals in the northern archipelago and the Outer Hebrides up to 14th September. A strong movement, without doubt an overseas arrival, took place in the above localities from 30th September to 21st October, after which the only records are, one in Largo Bay on 17th December, and several on the moors at Corsemalzie on 28th December.

THE ROCK-PIBIT, *Anthus spinoletta petrosus*.—Arrivals of Rock-pipits are reported from the Isle of May on 12th March, and Hoy High on 2nd April, and one was killed at the Little Ross lantern on 11th April at 11.30 P.M.

A few appeared on Skerryvore on 31st July, numbers are noted at North Unst on 4th September and the Butt of Lewis on 9th October, a flock of thirty at Swona on 15th October, and a party of nine flying to the south-east out at sea off Craignarget, Luce Bay, on 22nd October. Some of the above records may refer to *A. s. littoralis*.

THE BLUE-HEADED WAGTAIL, *Motacilla flava flava*.—Birds of either this or the Grey-headed form (*M. f. thunbergi*) occurred at Fair Isle on 16th, 18th, and 26th October. See p. 151.

THE YELLOW WAGTAIL, *Motacilla flava rayi*.—This Wagtail is first recorded from Beith on 18th April, Summerston on 1st, and Darvel on 2nd May. After this arrivals are noted up to 6th May, and on 21st May one is reported from the Island of Noss. On 18th August a male Yellow Wagtail is noted at Corsemalzie, one at Beith on 16th September, and one at the Isle of May on 28th September.

THE GREY WAGTAIL, *Motacilla cinerea cinerea*.—A party of eight Grey Wagtails was seen in the Lahill burn on 8th February.

Returns to breeding haunts are recorded between 13th March and 10th April, and this species visited North Unst on 6th and 9th May, and Galson (O.H.) on 7th, 12th, 13th, and 16th May. On 21st July five (old and young) were seen at Alticig (Luce Bay), one in Largo Bay on 10th August, and local movements are recorded from various mainland stations up to 23rd October. North Unst was visited on 17th and 23rd August, the Isle of May on 8th September, and Whalsay Skerries two days later. There are several records from Killantringan and Little Ross between 15th October and 18th November.

THE WHITE WAGTAIL, *Motacilla alba alba*.—Is first recorded from Little Ross on 22nd March, Hoy High on the 24th, Alticig shore (Luce Bay) on the 27th, and Pentland Skerries on the 29th and 30th March. From 10th April to 15th May, constant passage up the west coast is reported; there are two very interesting lantern records, the birds being sent in, in each case, viz., a good many at Killantringan lantern, two being killed at 11 P.M. on 30th April, and a male and female killed at the Little Ross lantern at 4 A.M. on 11th May. Passage up the east coast is noted between 23rd April and 6th May, and constant passage from our Northern Isles from 10th April to 12th May, the last two records being from Pentland Skerries on 17th and Island of Noss on 19th May.

On 22nd July a White Wagtail appeared on Swona, and from 18th August to 8th September there are constant notes of immigrants from stations in Orkney and Shetland. Passage down the west coast is recorded, chiefly from the Outer Hebrides, between 23rd August and 14th September, and small numbers about Lahill and Largo on 28th and 31st August. On 24th September there were a few on Fair Isle, one at Lerwick on 26th September, and one or two on Fair Isle and Pentland Skerries constantly between 2nd and 10th October.

THE PIED WAGTAIL, *Motacilla alba lugubris*.—On 8th January from fifty to sixty Pied Wagtails were seen in the Kay Park, Kilmarnock, and returns to breeding places are recorded from 24th February to the end of March from many parts of the country. Single birds are recorded from Lerwick on 9th March, Hoy High on 30th March, Deerness on 1st April, and Pentland Skerries on 13th April and (two) 7th May, while there was one at Fair Isle on 14th May.

On 2nd July one was on the Island of Noss, and one on

Pentland Skerries on 5th July. There are many records of movement in Southern Scotland during September; last seen Pentland Skerries on 6th October, sixty to seventy on the Barrack Square, and "the whole place dotted with Pied Wagtails" at Glencorse on 8th October (1. 1916, 23); last seen Largo Bay on 19th November, the Tweed at Melrose on 4th December, Barnbarroch (Kirkinner) on 6th, and Longcroft (Oxton) on 7th December.

THE BRITISH TREE-CREEPER, *Certhia familiaris britannica*.—On 13th October a Tree-creeper belonging to this form was accidentally killed at Galson, Outer Hebrides (1. 1916, 75). See p. 151.

THE CONTINENTAL GREAT TITMOUSE, *Parus major major*.—It will be remembered that there was an immigration of these Tits into Shetland in the autumn of 1914. Some spent the winter there, and two are recorded steadily from Fair Isle up to 23rd January 1915 (1. 1915, 103). See p. 150-151.

THE BLUE TITMOUSE, *Parus coruleus*, subsp.?—A Blue Tit is recorded from Little Ross on 28th October.

THE GOLDCREST, *Regulus regulus*.—There are very few spring records of Goldcrests this year; one was at the Holy Island lantern at 2 A.M. on 9th February, and two there at 1 A.M. on 11th February. Numerous at Melrose on 25th February, and one was killed at the Killantringan lantern on 14th April. From 11th September to 18th October there are very frequent records of small numbers of Goldcrests at the Killantringan and Little Ross lanterns. Our excellent recorders at these stations several times sent us specimens which had struck the lantern and killed themselves, and in each case they belonged to the British form, *R. r. anglorum*. This movement, then, would appear to be a southward migration of our Scottish breeding birds. Between 18th and 23rd October there are records of immigrant Goldcrests, doubtless the Continental *R. r. regulus*, from Fair Isle, Pentland Skerries, and Swona; records from the Isle of May during this period probably also belong to this race. On 1st and 3rd November one is reported from Swona.

THE GREAT GREY SHRIKE, *Lanius excubitor excubitor*.—Single birds are reported from Pitlochry at the beginning of February (1. 1915, 68), New Galloway on 3rd March, Cruden Bay about 25th March (1. 1915, 127), Pentland Skerries on 9th October, Capenoch, Dumfriesshire, on 16th November (1. 1916, 24), and Beith on 4th and 18th (another) December (2. viii. 23).

THE RED-BACKED SHRIKE, *Lanius collurio collurio*.—One appeared on the Island of Noss on 21st May.

THE SPOTTED FLYCATCHER, *Muscicapa striata striata*.—Is first recorded from Broughton on 6th May, Rouken Glen next day, East Linton on 8th, Darvel and Invergowrie on the 9th, and Duns on 10th May. After this there are many notes of arrival, till by 21st May the tale of our breeding birds seems to have been pretty well complete. On 16th May one, and on 20th May several, were at the Little Ross lantern. One on the Island of Noss on 21st May, and one on the Isle of May on 23rd May were doubtless passage migrants, as were four on the Island of Noss on 6th June.

Much departure is recorded from our southern stations between 24th August and 5th September; last seen Corsemalzie on 12th September, Beith on 20th, and Balgay on 26th September. A passage migrant arrived on Pentland Skerries on 12th October.

THE PIED FLYCATCHER, *Muscicapa hypoleuca hypoleuca*.—A male arrived at the usual haunt near Duns on 8th May, but disappeared a few days later; no female has been seen there for the last two years. On 11th and 12th May one or two were on the Isle of May, and one at Thornhill (Dumfries) on 19th May. Passage migrants, one hen in each case, were observed on the Island of Noss on 21st and 24th May. During the second week of July a pair of Pied Flycatchers were seen several times about three miles from Stonehaven (i. 1915, 284).

A good deal of passage migration is noted in autumn: on 10th September one is recorded from Helmsdale, several at the Isle of May from 11th to 13th September, one at the Muckle Flugga lantern at 10 P.M. on 15th September, one at the Flannans on the 17th, and a young male at the Butt of Lewis lantern at 3 A.M. on 20th September. A Pied Flycatcher seen in the Findhorn Valley on 17th September should perhaps come under this category; two were on the Isle of May on 7th October, and one at the Butt of Lewis lantern at 3 A.M. on 10th October.

THE RED-BREASTED FLYCATCHER, *Muscicapa parva parva*.—A bird of this species appeared on Swona on 7th October (i. 1916, 24). See p. 151.

THE CHIFFCHAFF, *Phylloscopus collybita collybita*.—Is first recorded from Corsemalzie on 17th April, and one was killed at the Little Ross lantern that night and sent to us; Rouken Glen on

20th April, several at the Little Ross lantern at 10 P.M. on 30th April, and Darvel on 1st May. These are late dates for the arrival of this little Warbler with us. Last seen Corsemalzie on 8th September, and two at the Killantringan lantern at 11 P.M. on 12th September.

THE NORTHERN CHIFFCHAFF, *Phylloscopus collybita abietinus*.—The following records doubtless all refer to this form of Chiffchaff: one Island of Noss on 21st May, single birds at North Unst on 12th August and 4th September, a fair number at Lerwick between 10th and 24th October, and one at Swona on 31st October and 1st November.

THE WILLOW-WARBLER, *Phylloscopus trochilus trochilus*.—This species was rather late in arriving in 1915, the first records being from Corsemalzie on the 19th April, New Galloway and Balerno on the 22nd, Darvel and East Linton on the 23rd, Melrose, Beith, Kilmacoll, Carbeth, and Murtle on 24th April. After this the spread over Scotland was rapid, and the immigration continued steadily up to 9th May. On 11th May Willow-warblers were at the Killantringan lantern at 3 A.M., on 16th and 20th May at the Little Ross lantern at 11 P.M. and 12.30 A.M. respectively. There were enormous numbers of this Warbler about Arisaig on 23rd and 24th May, after which they mostly passed on and comparatively few remained to breed. Passage migrants are recorded from Lerwick on 6th and the Island of Noss on 24th May, and from the latter station on 5th June.

Throughout August and September there are many notes of movement: our home-bred birds left us in a steady stream, this being recorded from our southern lanterns and mainland stations alike. The only rush noted is one at the Little Ross lantern on 10th August, otherwise the notes of departure, though constant, refer to small numbers only. Last seen Balgay on 19th September, Corsemalzie on 27th September, Little Ross on 4th October, and Derrie (Mochrum) on 9th October. The first undoubted passage migrants recorded are from Pentland Skerries on 2nd, 3rd, 10th and 14th September, and from 20th September to 18th October there are constant notes of the arrival of small numbers of Willow-warblers at Fair Isle, Butt of Lewis, North Unst, Lerwick, and Pentland Skerries, and the records from the Isle of May during this period may well be also those of passage. The last record for the year comes from Fair Isle on 20th October.

THE WOOD-WARBLER, *Phylloscopus sibilatrix sibilatrix*.—Is first recorded from Rouken Glen on 30th April, Melrose on 2nd

May, East Linton on 4th, Darvel on the 5th and Duns on 7th May. After this there are a good many notes of arrival up to 24th May, when an increase was noticed at Arisaig. The only autumn note is from the Isle of May on 8th August.

THE YELLOW-BROWED WARBLER, *Phylloscopus superciliosus superciliosus*.—A bird of this species appeared at Swona on 6th October (I. 1916, 23), one at Pentland Skerries on 8th October, and two there next day (I. 1916, 24). On 18th October one is reported from Lerwick (I. 1916, 24). See p. 151.

THE GRASSHOPPER-WARBLER, *Locustella naevia naevia*.—Is reported from Kilmacolm on 7th May, Inchmoan on 9th, and Darvel on 18th May.

THE SEDGE-WARBLER, *Acrocephalus schænobænus*.—Is recorded from Glenling (Mochrum) on 3rd May, Beith on 4th, and Darvel on 5th May. Summerston and Kilmacolm report it on the 7th May, Melrose, Loch Lomondside, and Duns next day. After this there are further notes of arrival up to 11th May. At 1 A.M. on 1st August a Sedge-warbler was killed at the Little Ross lantern; last seen Beith on 10th August, Souleseat (Inch) on 2nd September, and Loch Chesney (Corsemalzie) next day.

THE GARDEN-WARBLER, *Sylvia borin*.—The return of the Garden-warbler is recorded from Duns on 26th April, from the Isle of May on 2nd May, the Little Ross lantern and near Rouken Glen on 5th, and Melrose, Inchtavannach, and near Dalserf (Clyde) on 8th May. After this there are a good many notes of arrival; one was at the Little Ross lantern at 11 P.M. on 13th May, and many there late on 16th May. Two passage migrants are noted at Pentland Skerries on 24th May.

On 9th September a Garden-warbler struck the Little Ross lantern at 11 P.M., and a passage migrant was on Pentland Skerries on 10th October.

THE BLACKCAP, *Sylvia atricapilla atricapilla*.—Arrivals are reported at Duns on 1st May, Bridge of Allan and East Lothian next day, and Darvel on 11th May.

On 22nd September a female, probably a passage migrant, was observed at Swordale (E. Ross); on 9th October two were at Fair Isle, one at the Butt of Lewis from 11th to 15th October, and one or two at Lerwick on 13th, 21st, 28th, and 31st October, these being certainly all passage migrants.

THE WHITETHROAT, *Sylvia communis communis*.—This species is first recorded from Loch Elrig (Mochrum) on 23rd April, the Isle of May on 29th April, Melrose and Busby (Clyde) on 2nd May, and Thornhill (Dumfriesshire) next day. After this the spread was steady, and arrivals at breeding places are noted up to 23rd May. On 23rd and 24th May Whitethroats were very numerous indeed at Arisaig, then they began to decrease till by 30th May only the breeding birds were left. Passage migrants, single birds in each case, are reported from Fair Isle on 22nd and 28th May, and the Island of Noss on 4th June.

On 8th August several Whitethroats were at the Little Ross lantern at 1 A.M., and from this time up to 18th September there are constant notes of departure from our mainland and southern lighthouse stations. Last seen Corsemalzie on 6th September, East Fife on 8th and Evanton on 9th September, and one at Kilchattan Bay, Bute, on 18th September. Passage migrants, single birds in each case, are recorded from Pentland Skerries on 2nd September, Fair Isle on 13th and 15th October, and Swona on 22nd October.

THE LESSER WHITETHROAT, *Sylvia curruca curruca*.—One is reported a little west of Arisaig on 23rd May (1. 1916, 78), and one at Loch Treig on 13th June (1. 1916, 78), see p. 151. On 9th October a Lesser Whitethroat appeared on Pentland Skerries.

THE FIELDFARE, *Turdus pilaris*.—On 10th January a Fieldfare is reported at Lerwick, five at Pentland Skerries next day, and fifteen at Holy Island on 17th January. Throughout February and up to 9th March there are constant notes of movements of small numbers from stations in the Outer Hebrides, Orkney and Shetland, and from Skerryvore, a few from the Isle of May, and one at the Killantringan lantern at 8 P.M. on 4th March. For the rest of March there are notes of large flocks from various mainland stations. From 10th April to 7th May we have constant notes from our southern and mainland stations of the passage of large numbers of Fieldfares, on 11th and 14th April there were great rushes to the Little Ross lantern, before midnight in each case, and many large flocks are reported from various localities, all going north: probably the majority of these were passage migrants. It is not a little remarkable that during this period there are only a few notes of single birds at our stations in Orkney and Shetland. The absence of lantern records no doubt is responsible for this in some degree, but it would seem probable that in many cases another

route was taken—possibly the North Sea was crossed further south than these islands, or possibly, delayed by the cold northerly winds which prevailed, the birds lingered longer on the mainland of Scotland than is their wont, and so had to hurry on when the weather became more propitious. Be that as it may, the fact remains that no large movements are noted from our Northern Isles. On 9th May six are reported from Darvel, and Fieldfares at Kinnelhead on 15th May. The Isle of May had several there from 21st to 23rd May, a few at Fair Isle on 21st and 22nd May, and records for the former date come from the Bass, Little Ross, and the Island of Noss. Single birds visited Pentland Skerries on 5th June, and the Isle of May next day; while on 10th June a female was shot at Cairnsmore (Kirkcudbrightshire), which contained three eggs, one with the shell forming and due to be laid in about four days, the others without shells (1. 1915, 263 and 356).

On 5th October eleven Fieldfares are reported from Mochrum Park (Wigtownshire); the species is recorded from Bathgate and Duns on 7th October, Swona next day, the Butt of Lewis lantern and Tarbatness on 10th, and Pentland Skerries on 12th October. The main arrival took place between 20th October and 11th November: during this time there are many notes of considerable numbers 'from island and mainland stations alike. The largest influxes seem to have been on 22nd and 23rd October, on 29th October, and on 11th November. Many appeared on Fair Isle on 18th November, evidently a weather movement due to frost; and from this time to the end of the year there are constant notes of movement of small numbers of Fieldfares from stations in our Northern Isles and Outer Hebrides, and from the Isle of May.

THE MISSEL-THRUSH, *Turdus viscivorus viscivorus*.—One to three Missel-thrushes are recorded on Pentland Skerries between 5th and 9th March, two at Barra Head on 14th April, and one at the Isle of May on 29th April. Flocking is recorded from Glenling (Mochrum) as early as 15th June, and after this there are a good many notes of flocks from various localities. Little Ross records visits from this species on 10th and 24th July, 5th, 8th, 12th, and 13th September; and one appeared on the Isle of May on 29th September. From 9th to 16th October small numbers occurred at Pentland Skerries and Swona, and Little Ross again notes arrivals on 28th October, and 2nd and 19th November.

THE THRUSH, *Turdus philomelos*.—During January there are many records of small numbers of Thrushes from stations in

our Northern Isles, probably wintering birds of the Continental *T. ph. philomelus*. From the night of 4/5th February till 24th March there are many notes from our southern lanterns and lighthouse stations of Thrushes sometimes in considerable numbers, and from mainland stations of the return of the breeding birds. These records probably all refer to our British Thrush, *T. ph. clarki*, though there may have been passage migrants of the Continental form along with them. The largest arrivals reported are on 6/7th and 18th February, 6th, 9th, 10th, 18th, 20th, and 24th March. During the first ten days of March there are notes of emigrants in very small numbers at Pentland Skerries, these being doubtless *T. ph. philomelus* on its northward journey; but there is the same absence of notes of spring emigration from our Northern Isles as in the case of the Fieldfare: possibly the reasons suggested there may also be applicable to this case. On 30th March we have this note from the Butt of Lewis: "A Thrush that remained all winter has now gone"; while on 30th April several arrived on the Isle of May, and one was seen there on 3rd July, and one at Pentland Skerries next day.

On 9th September a Thrush appeared on the Isle of May, and from that time to 4th October there are a good many notes from our southern lighthouses and lanterns of small numbers on the move: these were doubtless emigrant British Song-thrushes. A Thrush is reported from North Unst on 15th September, and from 4th October to 2nd November many arrivals are recorded from stations in Orkney and Shetland, this being evidently the autumn immigration of the Continental *T. ph. philomelus*: records from the Isle of May during this period may also refer to this form. During October there are a good many records of Thrushes at the lanterns of Little Ross and Killantringan; and as birds sent in belonged to the British form, a southward emigration of this race would appear to have been in progress at the same time as the immigration of the Continental birds took place. It is impossible to say to which form the following notes refer. A few Thrushes at the Rhinns of Islay lantern on 7th and 11th November, some at the Skerryvore lantern all night on 8th November, and several at the Butt of Lewis on 28th November—this last and Thrushes at the Isle of May and Little Ross on 17th November being evidently a weather movement. During December there are frequent notes of one to three at Pentland Skerries: a number visited the Isle of May on the 12th, and a Thrush of the British race was killed at the Killantringan lantern on the 14th December, and Thrushes visited the Little Ross lantern on 5th, 28th, and 30th December.

THE REDWING, *Turdus musicus*.—On 18th February numbers of Redwings were at the Little Ross lantern from 12 to 4 A.M., and one is noted at Lerwick. Throughout March and up to 18th April there are constant notes of movements of Redwings from all parts of Scotland; passage migrants would appear to be included in these movements as well as our winter visitors, as our southern lanterns and stations report immigration, and the movements reach all the way up to Shetland. After 18th April the notes refer almost entirely to emigration from our Northern Isles and Outer Hebrides, the only exceptions being a flock of twenty-seven at Alticig on 28th April and one at the Isle of May on 1st May. After this, the only notes are of single birds at Fair Isle on 11th, 17th, and 22nd May. The earliest record in autumn is from Corsemalzie on 22nd September, a flock of about three hundred being seen flying south. On 29th September Redwings are reported from the Isle of May and next day from Pentland Skerries and Longcroft, while on 1st October there were several on Fair Isle and numbers at the Little Ross lantern at midnight. From 2nd October to 19th November a steady stream of Redwings is recorded; up to 24th October this comprised immense numbers of birds, and it is recorded from stations all over Scotland, though chiefly from our Northern Isles. After 24th October the numbers recorded are smaller, though the arrivals continued very constantly. Up to 10th December a few are recorded fairly frequently from Pentland Skerries and Fair Isle, and a Redwing was killed at the Killantringan lantern on 14th December.

THE RING-OUZEL, *Turdus torquatus torquatus*.—Is first recorded from Braidshawrigg on 10th April, Longcroft on 15th, and Kinnelhead on 20th April. One or two Ring-ouzelts are noted at the Isle of May on 30th April, 1st May, and 6th to 9th May, probably passage migrants, while a female on the Island of Noss on 18th May doubtless belonged to this category. On 4th October at 3 A.M. and on 9th October at 10 P.M. single birds were at the Killantringan lantern and at the Isle of May on 9th and 10th October. Passage migrants are noted at Swona on 11th and 14th and from 20th to 26th October, at Sule Skerry on 16th October, at the Butt of Lewis lantern early on 19th October, and at Pentland Skerries on 22nd October.

THE BLACKBIRD, *Turdus merula merula*.—On 18th January four Blackbirds arrived on Sule Skerry, and many were killed at the Little Ross lantern and one at the Killantringan lantern on 6/7th February. From 11th February to 27th March there are numbers

of notes of movements in Southern Scotland from lanterns and also from daylight observations. The greatest numbers recorded are from the Little Ross lantern, where there were rushes on 5th and 6th, 9th, 10th, and 20th March. From 22nd March to the end of April there are constant notes of emigrating Blackbirds from our Northern Isles. Killantringan and Little Ross lanterns record small movements on 11/12th and 14/15th April, and a male was at the latter light at 11.15 P.M. on 10th May. Arrivals at the Isle of May are reported on 6th May, one at Pentland Skerries on 6th and 8th May, two at Fair Isle on 11th May, and one there on 10th June, and two at the Bell on 20th June.

On 14th July several appeared at Little Ross, a female at Pentland Skerries on 27th July, and one at Sule Skerry on 25th August. During the first half of September there were one or two about Pentland Skerries, and one at the Rhinns of Islay lantern on 16th September at 10 P.M. From 26th September to 11th November a steady stream of immigrants is reported from stations in Orkney, Shetland, and the Outer Hebrides. There are also a good many notes during this period of the arrival of Blackbirds from the Isle of May, Rhinns of Islay (L.), Tarbatness (L.), Bell and Skerryvore (L.). Between 10th October and 4th November there are a good many records of small numbers from the lanterns of Little Ross and Killantringan.

THE WHEATEAR, *Ænanthe ðnanthe ðnanthe*.—Is first recorded this year from Little Ross lantern at 11 P.M., Nevay Park and Fair Isle, all on 23rd March, while from 1 to 3 next morning the "rush of Wheatears was very great" at the above-mentioned light. On 27th March it is reported from Darvel, West Kilbride (Clyde), Glen Afton and Port William (Solway), on 28th March from Broughton (Peeblesshire), and on 30th March from Kinnelhead and Tarbatness. After this and up to 24th April we have many notes of the return of breeding birds to their nesting places all over Scotland. From 20th April to 13th May there are constant records of movements of Wheatears from our Northern Isles. The largest passages seem to have been on 23rd and 24th April, 28th and 30th April, and 4th and 6th May. During this period and up to 2nd June there are a good many notes of Wheatears, probably passage migrants, from the Isle of May, Butt of Lewis, Tarbatness, Bell Rock, Galson and Skerryvore (L.); the Little Ross lantern records them on 17th and 20th May, and one or two are reported from Pentland Skerries up to 16th June.

On 6th July a Wheatear arrived on the Isle of May, several at

Little Ross on 14th July, while on 19th July we have this note from the Butt of Lewis, "many on the move locally for the last week." Two visited Sule Skerry on the 20th, and from the 23rd to the end of July southward movement was observed at Bathgate. Throughout August and September there are many notes of migrating Wheatears from all over Scotland, the periods of maximum movement being from 3rd to 5th and from 11th to 13th September, when great numbers are recorded from various stations. Up to 18th October a few frequented the Butt, Pentland Skerries records up to 24th, and Fair Isle to 27th October. On 6th, 9th, and 10th October Wheatears were at the Little Ross lantern, two at Derrie (Mochrum), and numbers at Sule Skerry on 9th October, and a few at Skerryvore lantern that night; some at Killantringan lantern on the 15th, single birds at Tarbatness and the Isle of May on the 19th, and one in Luce Bay on 22nd October. In November two were at the Butt of Lewis and a female at Craignarget (Luce Bay) on the 2nd, and one at Swona, and a few at Skerryvore lantern on the 8th. Some of these records, specially among the late birds, may refer to the following form.

THE GREATER WHEATEAR, *Ænanthe ðnanthe leucorrhœa*.—Appeared at Pentland Skerries on 19th April, and is recorded thence on 20th and 25th April. From 6th to 16th May steady passage is recorded, chiefly from Pentland Skerries, Hoy High, and the Isle of May, but this form was also killed at the Killantringan lantern on 6th May and Little Ross lantern on 11th May.

From 7th to 30th September a few were on passage at Swona, at Lerwick and Butt of Lewis on 12th September, and Girdsta (Shetland) on 24th September. Steady passage is reported from stations in Orkney and Shetland from 7th to 24th October, several were at the Isle of May on 6th October, and one at Portmahomack (E. Ross) on 21st October.

THE WHINCHAT, *Saxicola rubetra rubetra*.—Was rather late in arriving in 1915, the first records being from Corsemalzie on 26th April, Largo Bay on 29th April, and New Galloway on 1st May. On 2nd May many arrivals are reported, and up to 17th May the return of our breeding birds is strongly evident. Two were at the Isle of May on 20th May and one on 26th, while on 23rd and 24th May Whinchats were swarming at Arisaig; they decreased rapidly after this, till by 30th May only a few breeding pairs were left.

From 16th July to 23rd August notes come from mainland

stations in both Eastern and Western Scotland of movements of Whinchats. Last seen in W. Renfrew on 11th September, Kilchattan Bay, Bute, on 16th September, Corsemalzie on 23rd and Darvel on 25th September. A passage migrant is reported from Lerwick on 11th September and a Whinchat was on the Isle of May that same day.

THE STONECHAT, *Saxicola torquata*.—On 5th April a Stonechat visited Pentland Skerries, early on 14th April a few were at the Little Ross and Killantringan lanterns, and next day at 1 A.M. at the latter light; two at Galson (O.H.) on 3rd May, one on Pentland Skerries next day, and a male on the Island of Noss on 20th May. From 4th to 6th September five frequented Galson, a pair near the Butt of Lewis on 3rd October, and one on Pentland Skerries on 24th October.

THE REDSTART, *Phœnicurus phœnicurus phœnicurus*.—The first records of this species are late this year. On 25th April Redstarts were seen at Inchtavannach, on 27th at Broughton (Peeblesshire), and on 30th April at the Isle of May, the Little Ross lantern at 10 P.M., and in south-west Perthshire. Arrivals at nesting places are recorded from the Scottish mainland right up to 28th May. A female, evidently on passage further north, is reported from the Butt of Lewis on 15th May, and Redstarts at the Isle of May on 19th, 20th, 26th, and 27th May may also have been passage migrants.

From the end of July till 19th September there are many records of movements of Redstarts from stations in Southern Scotland; the numbers noted are all small and the movement was evidently the departure of our summer visitors. Passage migration is reported steadily from stations in the Northern Isles and Outer Hebrides from 20th to 27th September and 5th to 22nd October. Records from the Isle of May and Bell Rock during this period probably refer also to passage migrants; in all cases the numbers observed were small. The last Redstart of the season is reported from Pentland Skerries on 7th November.

THE BLACK REDSTART, *Phœnicurus ochrurus gibraltariensis*.—On 4th March the remains of a Black Redstart were found at Little Ross, and single birds are recorded from the Isle of May on 30th April, Pentland Skerries on 26th April and 4th May, and near Glasgow on 9th May. Two were at Tarbatness on 26th September, and at Pentland Skerries small numbers are noted on 8th, 9th, 12th, 13th, 16th, 23rd and 24th October. See p. 151.

THE NORWEGIAN BLUETHROAT, *Luscinia svecica gaetkei*.—A Bluethroat, probably of this race, visited Fair Isle on 8th October. See p. 151.

THE REDBREAST, *Erithacus rubecula*. Redbreasts, doubtless the typical *E. r. rubecula*, wintered in Shetland; last seen at Lerwick on 29th March, and single birds were on Pentland Skerries on 11th and 13th April: there are no notes of large passage movements in our Northern Isles this spring. The southern records this year are: one at the Killantringan lantern at 3 A.M. on 16th February, one at the Isle of May on 21st March and at the Little Ross lantern at 3 A.M. on 24th March, two at the Killantringan lantern at 9 P.M. on 11th April, one at the Isle of May on 19th and several there on 30th April. It is difficult to know to which race to assign these notes; probably some of the later were passage migrants.

On 16th August several Redbreasts were at the Little Ross lantern at 2 A.M., and Little Ross (L.), Killantringan (L.), Rhinns of Islay (L.), and the Isle of May record movement fairly frequently between 11th and 17th September and on 1st and 4th October. Birds sent proved to be *E. r. melophilus*, so this was evidently a southward movement of our home-bred birds. A very large Continental immigration is recorded from many stations in our Northern Isles between 8th October and 6th November: the height of the movement was from 20th to 23rd October; at this time Robins were unusually numerous on the Isle of May and at Tarbatness, probably also immigrants of the typical *E. r. rubecula*. Single birds are noted at the Killantringan lantern on 13th and 16th October and 2nd and 3rd November, and many at Little Ross on 21st October, but in the absence of specimens it is impossible to say to which race they belonged. Large numbers visited Killantringan on 18th November in frost, one was on the Bell on 29th November, and a few are noted from our Northern Isles up to the end of the year.

THE HEDGE-SPARROW, *Prunella modularis*.—A Hedge-sparrow visited the Isle of May on 21st February, and single birds, probably passage migrants, are noted from Pentland Skerries on 10th and 12th April.

A good deal of movement is reported from the Isle of May from 10th October to 23rd November, and several at Little Ross on 27th October; we cannot say to which race these migrants belonged.

THE WREN, *Troglodytes troglodytes troglodytes*.—A good deal of movement of Wrens in ones and twos is recorded from our Orcadian stations up to 16th April; they were at the Killantringan lantern on 11th and 14th April, and one was killed at the Skerryvore lantern on 4th May.

On 25th July and 10th August, and from 1st to 10th September, a Wren visited Pentland Skerries, and on 4th (one) and 9th (two) August the species is reported from the Muckle Flugga lantern (*T. t. zetlandicus*?). From 22nd September to 18th November small numbers on the move are noted from stations in Orkney, the Butt of Lewis, Kyleakin, the Isle of May, Tarbatness, and Little Ross. On 5th December one was on Pentland Skerries, and two there on 18th December, while on 10th December a few were on the Isle of May.

THE SWALLOW, *Chelidon rustica rustica*.—The first record is early, and is from Bardowie (Clyde) on 5th April; the next are Beith on 13th April, the Blackadder on 15th, Duddingston on 16th, and Darvel, Johnstone, and Troon on 17th April. Notes of arrival come steadily after this up to 15th May, by which time our summer visitors seem mostly to have settled down. The first island record is from the Butt of Lewis on 3rd May, and from 5th May to the end of June there are constant records of Swallows, probably mainly passage migrants from stations in our Northern Isles and Outer Hebrides.

A few were about Fair Isle from 6th to 9th July and from 8th August, when "few left" is recorded from Dunkeld, up to the end of September departures are reported constantly; the height of the movement seems to have been from 20th to 27th September. On 12th September one, probably a passage migrant, was seen at North Unst. Last seen Beith on 2nd October, Largo and Melrose on 5th, Meggatknowes, Yarrow, on 7th, West Renfrew on 8th, Darvel on 15th, Bathgate on 16th, and Alticig shore (Luce Bay) on 27th October.

THE HOUSE-MARTIN, *Hirundo urbica urbica*.—Is first noted at Holy Island (two) on 12th April, and Kilconquhar Loch (E. Fife) (one) on 20th April. The general arrivals were late this year and did not take place till the first week of May; during this time many notes come from all over Scotland of the return of breeding birds. By 16th May the tale of nesting birds seems to have been pretty well complete. On 18th May House-martins are recorded from Fair Isle and the Island of Noss, and up to 15th June

there are notes of small numbers, probably passage migrants, from these two stations, Pentland Skerries and Hoy High.

A few were about Fair Isle on 6th July, and Lerwick on 11th July, and two at Skerryvore on 1st August. From 26th August to the end of September there are many notes of departure. Last seen Dundee on 19th September, Beith on 24th, and Largo on 28th September, Dunkeld on 4th October, and Invergowrie on 31st October.

THE SAND-MARTIN, *Riparia riparia riparia*.—Was very late in appearing in 1915. It is recorded at Duns on 13th April, Souleseat (Inch) next day, Duddingston on 16th April, New Galloway on 18th, and Beith on 20th April. After this, arrivals are recorded constantly up to 4th May, by which time our breeding birds were well distributed. A Sand-martin visited Fair Isle on 9th June. Last seen Largo on 18th August, Souleseat on 3rd September, and Invergowrie on 19th September.

THE ALPINE SWIFT, *Apus melba melba*.—A bird of this species is recorded as having been seen at Whithorn, Wigtownshire, on 30th July (i. 1915, 308). See p. 151.

THE SWIFT, *Apus apus apus*.—Was rather late in appearing in 1915. On 1st May it is recorded from Invergowrie and Summerston (Clyde), and next day from Melrose, Williamwood, Allander Toll, Bardowie, Johnstone, and Dundee. After this and up to 14th May many returns to summer haunts are noted. On 21st May several were at the Butt of Lewis, and a "great flight" at Little Ross on 7th June; "Swifts were very numerous and remained five or six hours." On 8th, 9th, and 15th June there were a good many at the Butt of Lewis, and two at the Isle of May on 18th and 19th June. By 25th July the last of the local breeding birds had left Johnstone; "they have stayed less than three months," and during August there are constant notes of departure from our mainland stations. Last seen Largo on 12th August, Loch Elrig (Mochrum) on 16th, Beith on 20th, and Dundee on 29th August. Notes of Swifts, probably passage migrants, come from Swona and Sule Skerry on 20th July, Fair Isle on 28th July and 3rd and 9th August, Pentland Skerries on 10th August, and the Butt of Lewis on 10th and 11th August, while the last for the season is reported from Hellyar Holm on 22nd September.

THE NIGHTJAR, *Caprimulgus europæus europæus*.—Is recorded from Thornhill on 10th May, Souleseat (Inch) on 14th, and Holy

Island on 17th May. On 1st September two young birds were observed at Corsemalzie, and one at Barnbarroch, Kirkinner, on 10th September.

THE BEE-EATER, *Merops apiaster*.—A bird of this species, apparently a female, frequented the neighbourhood of Lerwick from 4th to 11th July (1. 1916, 24). See p. 151.

THE HOOPOE, *Upupa epops epops*.—A Hoopoe arrived on Pentland Skerries on 19th May. See p. 151.

THE CUCKOO, *Cuculus canorus canorus*.—Is first reported from Craignish (Argyllshire) on 15th April, Beith and Longformacus on 24th April, Corsemalzie next day, and Darvel on 28th April. After this and up to 14th May there are many notes of arrival from all parts of the Scottish mainland. On 12th May a Cuckoo is recorded at Lerwick, one at Pentland Skerries on 19th May, two on the Island of Noss on 6th June, and one at Fair Isle on 15th June. Last adult seen at Beith on 2nd July, and at Corsemalzie on 6th July, and from 19th July to 20th August a good deal of movement of young Cuckoos is reported. Last young bird seen at Mochrum on 28th August, Beith on 14th September, and Corsemalzie next day.

THE SNOWY OWL, *Nyctea nyctea*.—A beautiful specimen was observed at Little Ross on 24th February. See p. 151.

TENGMALM'S OWL, *Egolius funereus funereus*.—An adult male was got at Craighall near Blairgowrie in February 1915 (1. 1915, 116). See p. 151.

THE LONG-EARED OWL, *Asio otus otus*.—A single bird is recorded at Lerwick up to 29th March; it had been there since November 1914. Two at this place on 26th March and three on 28th March.

Single birds are reported from the Isle of May on 26th July, 30th September, and 25th October, from Pentland Skerries on 21st October, Swona and the Bell on 23rd October, and the last-named station on 30th October.

THE SHORT-EARED OWL, *Asio flammeus flammeus*.—Single birds are noted from Pentland Skerries on 10th February, Lerwick on 1st April, Sule Skerry on 6th May, and Fair Isle on 25th and 28th May. On 17th July one visited Fair Isle, Sule Skerry on 11th August, and the Butt of Lewis on 27th August. An immigration

took place between 9th October and 7th November, and is recorded from stations in our Northern Isles, the Isle of May, and mainland stations alike.

THE WHITE-BREASTED BARN OWL, *Tyto alba alba*.—One is recorded from Kinnelhead on 17th November (1. 1916, 38). A Barn Owl is reported from Galson (O.H.) on 5th March, but it is unknown whether it belonged to this or the following race.

THE DARK-BREASTED BARN OWL, *Tyto alba guttata*.—One was got at Baltasound, North Unst, on 5th November (1. 1916, 76). See pp. 149 and 150.

THE MERLIN, *Falco columbarius aesalon*.—Small numbers are recorded constantly from stations in our Northern Isles up to 30th April. On 15th July a Merlin visited Pentland Skerries, and from 5th September to 24th October a good deal of movement is noted from stations in Orkney and Shetland.

THE KESTREL, *Falco tinnunculus tinnunculus*.—Between 27th March and 12th April some movement is reported from our Northern Isles, and a Kestrel was on the Isle of May on 8th and 9th May and 26th July. From 4th September to 2nd November constant small movements are noted, chiefly from Orkney and Shetland, but also from the Isle of May, Rattray Head, and Little Ross. On 20th November one visited Fair Isle, and a Kestrel frequented Pentland Skerries from 11th to 21st December.

THE ROUGH-LEGGED BUZZARD, *Buteo lagopus lagopus*.—In the winter of 1914-15 two lived on a hillside near Binscarth, Orkney. Single birds are recorded from North Unst on 8th April, Dumbarnie (between Largo and Colinsburgh) about 22nd October (1. 1916, 68), on a moor two miles west of New Galloway on 29th October, and near Stromness on 10th November.

THE BUZZARD, *Buteo buteo buteo*.—Single birds are reported from Longformacus on 9th February, Longcroft (Oxton) on 15th April, Tarbatness on 24th August, near Newton-Stewart on 6th September, and at Mindock, Kirkcowan, on 5th November.

THE HEN-HARRIER, *Circus cyaneus*.—A male is noted between Southwick and Auchanskeoch, Kirkcudbrightshire, on 9th October (1. 1915, 356). See p. 151.

THE HONEY-BUZZARD, *Pernis apivorus*.—In mid-July a Honey-buzzard was got in the Duns district, where it is a "scarce bird":

one got 1913 and the present are the only notes I have in six years" (1. 1916, 69). See p. 151.

THE OSPREY, *Pandion haliaetus haliaetus*.—On 14th June an Osprey arrived at one of our Scottish lochs, and stayed there fishing for six days. On 4th September one was seen at close quarters on the Corsemalzie moors; it "circled for some time, then, rising to a height, flew away south-west." See p. 152.

THE BITTERN, *Botaurus stellaris stellaris*.—On or about 20th April one was killed at Loch Maddy, near Languas. See p. 152.

THE WHOOPER SWAN, *Cygnus cygnus*.—On 17th and 18th January two Swans, probably this species, are reported from Fair Isle, and two Whoopers from Galson (O.H.) on 26th and 28th January. Between 28th March and 26th April there are records of the northward passage of this species from Galson (O.H.), Lerwick, and North Unst. On 26th October a Whooper is reported from Lerwick, two from the loch at Bragar, Lewis, on 4th November, four immature birds from Soulseat Loch on 2nd December, and six to sixteen from Galson from 20th to 28th December.

BEWICK'S SWAN, *Cygnus bewickii bewickii*.—Three are reported from Bishop Loch (Clyde) on 2nd April.

THE GREY-LAG GOOSE, *Anser anser*.—From 11th March to 10th May a good deal of northward movement of Grey-lags is recorded. On 22nd October three appeared at Little Ross, one at Pentland Skerries on 29th October, while on 30th November hundreds were in Wigtown Bay. Four shot there weighed $8\frac{1}{4}$ to $9\frac{1}{2}$ lbs. each. There are a good many records of the arrival of "Geese" or "Grey Geese" from 27th October to 19th November; the direction of flight, when noted, was usually south-west, but occasionally south-east.

THE WHITE-FRONTED GOOSE, *Anser albifrons*.—One is noted at Galson (O.H.) on 27th January, twelve at Dalgowan on 18th February, and two at the former station on 30th April. On 30th November eleven were observed in Wigtown Bay and a small flock frequented the meadows at the head of Loch Ken for about a fortnight in December.

THE BEAN GOOSE, *Anser fabalis fabalis*.—Six were at Darsnag Flow, Wigtownshire, on 9th January.

THE PINK-FOOTED GOOSE, *Anser brachyrhynchus*.—On 12th February two of these Geese were on the Castle Loch, Wigtownshire, and five on the Beaully Firth on 18th April.

THE BARNACLE GOOSE, *Branta leucopsis*.—A male is recorded at Fair Isle on 9th February, and several at Dalgowan on 18th February, and Luce Sands on 23rd February. Barnacle Geese had all left Barra Head by the end of April, and two visited Hoy High on 3rd, 5th, and 9th May. About 18th September a few reappeared at Barra Head, one was shot inland at Hule Moss, Greenlaw, on 3rd November (1. 1916, 69), and one was on Pentland Skerries on 29th October.

THE BRENT GOOSE, *Branta bernicla*.—One is reported from Fair Isle on 12th February, eighteen from Little Ross on 27th November, and two large flocks from Deerness on 4th December.

THE SHELDRAKE, *Tadorna tadorna*.—Great numbers were seen in Wigtown Bay on 24th February, and small arrivals are recorded from Tarbatness on 2nd March, Pentland Skerries and Lerwick on 9th April, and Holy Island on 12th and 13th April: a male on Soulseat Loch, Inch, on 12th May. On 24th September one was on Morton Loch (N. Fife), "a late date," and forty to fifty on the Dornoch Firth on 27th October: "we do not usually see so many so late as this."

THE MALLARD, *Anas platyrhynchos*.—Up to 14th May there are notes of small numbers of Mallard from stations in our Northern Isles and Outer Hebrides. By 11th March the numbers in Largo Bay had greatly decreased, and the "dispersal of local flocks" is noted from the Tay Estuary from 14th March to 25th April.

A female is noted from Pentland Skerries on 8th June and 2nd July; two had returned to Largo Bay by 16th July, and much movement is reported from Orkney and Shetland from 10th September to 11th November. Flocks were arriving in the Tay Estuary on 16th October, and in the Firth of Forth on 25th and 27th October.

THE GADWALL, *Anas strepera*.—Two drakes were shot, fighting at Dunbog (N. Fife), on 16th January, "one in fairly full plumage, the other not much differentiated from female plumage." Several were on Morton Loch (N. Fife) on 24th September, and two on Soulseat Loch, Inch, on 2nd December.

THE TEAL, *Anas crecca crecca*.—A Teal visited the Isle of May on 4th April, two were at Fair Isle on 28th April, and four next day, while a female was observed on the Island of Noss on 23rd May. On 7th September a bird of this species was shot at Megget Knowes during a grouse shoot, and one was on Pentland Skerries on 9th September. A good deal of movement of small numbers of Teal is reported from our Northern Isles and the Isle of May between 4th October and 9th November, and on 11th November one was killed at the Rhinns of Islay lantern.

THE WIGEON, *Anas penelope*.—From 9th March to the end of April departures of Wigeon are recorded; four, two ducks and two drakes, from Lerwick on 1st May, one off Dundee on 9th May, five off Luce Sands on 15th May, and one, possibly a pricked bird, off Port William on 21st May. On 1st August a female is reported at Lerwick, seventeen at Luce Sands on 11th August, forty to fifty on the Beaully Firth on 18th August, and four or five on Morton Loch (N. Fife) on 28th August. From 12th September to 25th October a good deal of movement is noted from many stations; the period of maximum movement seems to have been from 19th to 27th September.

THE PINTAIL, *Anas acuta*.—On 24th February about fifty of these handsome duck were seen in Wigtown Bay, a male and female on the Clyde, near Langbank, on 13th March, and about sixty in the Beaully Firth on 15th April.

On 7th September two Pintail were observed in Largo Bay, a male on Morton Loch (N. Fife) on 10th September, and some there on 24th September, twenty to thirty in the Beaully Firth on 27th September, and a flock of thirty-two in Wigtown Bay on 30th November.

THE SHOVELLER, *Spatula clypeata*.—On 6th March a Shoveller Drake is recorded from Glenorchard, a pair at Torrs Sandhills (Wigtownshire) on 7th May, and a drake on Souleseat Loch on 12th May. On 16th October ten arrived on the Castle Lake, Duns; "males still in partial eclipse, stayed till driven off by the November frost."

THE POCHARD, *Myroca ferina ferina*.—Thirty-five Pochard are reported from Lerwick on 4th March, and by 11th March they had increased to fifty-nine; many on Kilconquhar Loch on 20th April. One is noted at Lerwick on 1st August, and fifty to sixty on Mochrum Loch, and twenty on Castle Lake, Duns, on 11th September.

THE TUFTED DUCK, *Nyroca fuligula*.—One is reported from Lerwick on 6th and 7th February, and 11th March; last seen Tay Estuary on 20th March, many on Kilconquhar Loch on 20th April, and a great many pairs on Mochrum and Castle Lochs (Wigtownshire) on 6th May. On 3rd October six, one being a male, are recorded from Lerwick, and on 29th November this species was seen on the Tweed at Melrose.

THE SCAUP, *Nyroca marila marila*.—A flock of fifty were observed at the mouth of the River Luce on 22nd January, and a female at Lerwick on 13th March. On 21st August one returned to Lerwick, several Scaup were seen in the Tay Estuary on 7th November, thirty to forty in Largo Bay on 19th November, and two pairs on Souleseat Loch, Inch, on 2nd December.

THE GOLDENEYE, *Bucephala clangula clangula*.—From 25th March to the end of April a good deal of movement is recorded. Seven Goldeneye were observed at Lerwick on 1st May, twenty-six, mostly immature, but including an adult male, on Castle Loch (Wigtownshire) on 6th May, a male on Souleseat Loch in the same county on 15th May, one at Galson (O.H.) on 20th May, and a male and female at Lerwick on 3rd June. Another interesting series of summer notes comes from Wigtownshire—on 4th June a fine pair of adults were seen on Souleseat Loch, an immature male on Castle Loch on 12th June, an adult male and three females, or immature males, on Souleseat Loch on 16th June and 2nd July, the adult male being by this time in eclipse. On 18th August one reappeared on the Beaully Firth, and thirty to forty were seen there on 8th October. A female Goldeneye at Lerwick on 26th September, two at Sule Skerry on 10th October, and hundreds in the Dornoch Firth on 27th October; and up to the end of the month arrivals are recorded in some numbers. On 4th December four struck the Whalsay Skerries lantern with great force, and were killed instantaneously.

THE LONG-TAILED DUCK, *Clangula hyemalis*.—Is recorded pretty regularly up to 22nd April; six to eight were seen at Tarbatness on 27th April, last seen Hoy High on 13th May, and six, two males and four females, at the Island of Noss on 25th May. A female reappeared in the Dornoch Firth on 30th September, and next day two females were observed at Lerwick. Many arrivals are recorded from 27th October to 16th November, and from 17th December to the end of the year Long-tailed Ducks were much more plentiful than usual in Largo Bay.

THE EIDER, *Somateria mollissima mollissima*.—This species was unusually scarce about the shores of East Fife and the Isle of May during January and February, and gradually increased in numbers during March, till by the end of that month it was present in its accustomed abundance (1. 1915, 116). On 8th May two males and four females were seen flying south-east past Burrow Head (Wigtownshire), and a flock of about twenty-five were in Largo Bay on 27th June.

None was to be seen about the Isle of May on 1st August; in September a few are noted at this station, but on 8th October we have this record, "the Eider have disappeared," and the only other note from the Isle of May for this year is of a flock of fourteen on 19th December. On 3rd October a flock of about a hundred and eighty is reported from the Butt of Lewis, and on 20th October "large numbers, mostly young males, arrived for the winter at Rattray Head."

THE BLACK SCOTER, *Oidemia nigra nigra*.—This duck is reported fairly regularly up to 29th April, and "enormous flocks" were observed in St Andrews Bay on 7th May. On 6th July a flock of eighteen were seen in Largo Bay, hundreds in the Dornoch Firth on 29th July, and another flock in Largo Bay on 31st August.

THE VELVET SCOTER, *Oidemia fusca fusca*.—On 6th May an adult male was found dead on Luce Sands, and some were in St Andrews Bay next day. On 31st July two were observed in Largo Bay, some in the Dornoch Firth on 30th August, and three at Little Ross on 31st October.

THE GOOSANDER, *Mergus merganser merganser*.—Last seen in the Tay Estuary on 28th March and reappeared there on 17th October, while an adult pair were seen on Souleseat Loch on 2nd December.

THE MERGANSER, *Mergus serrator*.—Some movement is reported during March and April. A male on Mochrum Loch (Wigtownshire) on 6th May, a female at St Andrews next day, six on Luce Sands on 15th May, and one at Deerness, Orkney, on 7th June. In autumn a good deal of movement is noted between 5th September and 28th October.

THE SMEW, *Mergus albellus*.—An adult male and two females are reported from Loch Ewe (W. Ross) on 10th January. See p. 152.

THE GANNET, *Sula bassana*.—A Gannet is recorded from Whalsay Skerries on 4th January, on the 8th the Butt of Lewis has "Gannets passing earlier and more numerous than in previous years," and on 14th January records come from Lerwick and the Isle of May. On 22nd and 23rd January many were seen at sea off Fair Isle, and hundreds near the Bass by the end of January. They landed on the rock at this last station on 8th February, and on 15th February the first immature bird was observed there, those seen previously having all been adults. There are many notes of Gannets after this from our coasts and islands, and on 1st May an adult was found, dead but quite fresh, on the moor at Corsemalzie, 7 miles inland. Gannets are recorded steadily up to mid-October; on 10th October some were seen in Lerwick Harbour, which our correspondent notes as "a very unusual occurrence." On 27th October an adult is reported from Largo Bay, a good many at the Butt of Lewis at the end of November, and several there up to the end of the year. Mr Clyne records fully the local movements of Gannets at the Butt of Lewis in 1915 in a most interesting paper (1. 1916, 55); we shall not attempt to go into the matter in the space at our disposal, but refer our readers to the original article.

THE STORM PETREL, *Hydrobates pelagicus*.—Birds of this species are reported from the Muckle Flugga lantern on 4/5th August, Tiumpanhead lantern at 1 A.M. on 9th August, Sule Skerry lantern at 11 P.M. on 13th August, and Whalsay Skerries lantern at 1 A.M. on 18th August.

THE SOOTY SHEARWATER, *Puffinus griseus*.—Single birds are noted at the Butt of Lewis on 19th and 25th July. See p. 152.

THE FULMAR, *Fulmarus glacialis glacialis*.—Many Fulmars are noted at Fair Isle on 12th and 18th January, two at Lerwick on 14th January, several at Whalsay Skerries from 14th February, and about the Butt of Lewis from 8th April. On 13th June one was seen at St Abbs (1. 1915, 310), and single birds were found dead at Tayport on 19th August, and the Dornoch Firth on 30th September. On 5th November they "returned to the cliffs" at North Unst.

THE GREAT CRESTED GREBE, *Colymbus cristatus cristatus*.—A Great Crested Grebe was on the sea in Luce Bay on 23rd January, two or three off Baleomie (E. Fife) on 11th February, three on the Castle Loch (Wigtownshire) on 25th February, one on Kilconquhar Loch on 20th April, and two pairs above the Tay Bridge from 25th

April to 9th May. An immature bird is reported on 10th October from the Tay Estuary, and two there on 17th October.

THE SLAVONIAN GREBE, *Colymbus auritus*.—Is recorded from Largo Bay up to 11th March, and from Hoy High up to 19th April, and two in breeding dress were seen in the Dornoch Firth on 13th April. Single birds were observed at Lerwick on 25th September and Largo Bay on 17th and 19th November.

THE RED-NECKED GREBE, *Colymbus griseigena griseigena*.—A female was obtained at Fair Isle on 9th February (1. 1916, 79). See p. 152.

THE GREAT NORTHERN DIVER, *Gavia immer*.—There are many records of this species up to 7th May, and single birds are noted at Hoy High on 12th May, Holy Island on 20th May, Luce Bay on 21st May, Mull of Galloway on 24th May, and Galson (O.H.) on 28th May. Is first noticed in autumn in Largo Bay, where two birds were seen on 24th September, Rattray Head on 9th October, and the Dornoch Firth on 27th October.

THE BLACK-THROATED DIVER, *Gavia arctica*.—Single birds are recorded from Luce Sands on 26th February, and Largo Bay on 24th September and 17th December.

THE RED-THROATED DIVER, *Gavia stellata*.—Is recorded commonly up to the end of April; "quite a lot" were at Balcomie (E. Fife) on 5th May, and two at Hoy High on 12th, 16th, and 17th May. Six Red-throated Divers appeared off Rattray Head on 19th September, and there were a good many in Largo Bay on 27th October.

THE WOOD-PIGEON, *Columba palumbus palumbus*.—A Wood-pigeon is reported from Fair Isle on 5th and 6th January, and about mid-January the species was unusually plentiful about Gask (Perthshire) and Glenorchard. One or two are recorded frequently from Fair Isle between 10th April and 9th June, and single birds at the Isle of May on 23rd April, 11th and 17th May, and at Lerwick on 8th June. On 24th May a flock of fifty was seen in a cabbage patch at the Mull of Galloway far from any wood. On 9th, 11th, and 12th October a Wood-pigeon visited Pentland Skerries, the Isle of May records one on 19th October, and great flocks arrived in East Fife in the latter half of November.

THE STOCK-DOVE, *Columba oenas*.—Was very numerous at Glenorchard on 22nd January. Two had returned to Dumbarnie Links (E. Fife) on 10th April, and two are noted at Balcomie that same day. On 30th October two immature Stock-doves were shot near Kirkinner, and one was seen in Largo Bay on 17th November.

THE TURTLE-DOVE, *Streptopelia turtur turtur*.—Single birds are recorded from the Isle of May on 21st May and 6th June, from Galson (O.H.) on 30th June, Lerwick on 11th July, the Island of Sanday (an immature bird) on 14th September, and Bragar on the west side of the Lewis in September.

THE OYSTERCATCHER, *Hematopus ostralegus ostralegus*.—Returns to stations in our Northern Isles and Outer Hebrides are recorded from 17th February to 30th March, and arrivals at inland nesting sites are noted during the first half of March. Passage north at night is recorded from Largo on 26th and 27th March, and West Renfrew on 17th April, and on 1st May Oystercatchers "arrived to breed" at Barra Head. A flock of thirty-seven on 15th May, and one of twenty-nine on 16th June, were seen on Luce Sands, and they were passing over Largo at 11 P.M. on 27th June.

On 7th July six Oystercatchers arrived at Crosswood "but did not stay," and movement to the south or south-west at night is noted from W. Renfrew on 22nd July, and Largo on 25th and 30th July, in each case about 11.30 P.M. One was killed at the Little Ross lantern at 10 P.M. on 29th November, in December the species was unusually plentiful in the Outer Hebrides, and an Oystercatcher was killed at the Rhinns of Islay lantern at 9 P.M. on 28th December.

THE DOTTEREL, *Charadrius morinellus*.—Seven Dotterel are reported from a field near Tentsmuir (N. Fife) on 3rd May, and as late as 30th May four were still there.

THE RINGED PLOVER, *Charadrius hiaticula*.—A Ringed Plover is recorded from Lerwick on 17th January, one at Fair Isle on 27th January, and two there next day. From 20th February to 2nd April there are many notes of movement from stations in our Northern Isles and Outer Hebrides; these may refer to the return of our breeding *C. h. major*, or to passage of the Continental form; in the absence of specimens it is impossible to say to which race they should be referred. On 1st May ten are noted at North Unst and one at Pentland Skerries on 6th May; the late dates are suggestive of passage migration. Inland passage is reported from

Balgray on 21st and 29th August and 12th September (i. 1915, 357); noted at Pentland Skerries up to 8th October, Whalsay Skerries to 17th October, Lerwick to 1st November, and Swona to 11th November. Numbers appeared at Little Ross on 17th November, snow lying thickly on the mainland.

THE GOLDEN PLOVER, *Charadrius apricarius*.—On 7th January numbers of Golden Plover were at the Little Ross lantern at 11 P.M., and single birds at Fair Isle on 11th, 12th, and 18th January. During February there are many notes of arrivals at inland breeding places, and during this month and up to 10th March there are many records of large arrivals from our southern stations and lanterns, and notes also of arrival in our Northern Isles: these probably all referring to the return of our breeding birds. From 24th March to 22nd May there are many records of movement from stations in the Outer Hebrides and Northern Isles, the only notes from Southern Scotland during this period being from the Little Ross lantern on 11th April and 20th May, and a flock of twenty-one near Mochrum (Wigtownshire) on 4th May. It would seem probable that most, if not all of these, were passage migrants on their way to breed overseas. Galson (O.H.) reports flocks of Golden Plover throughout the year.

Returns to the shores after breeding are recorded from 9th July to 17th August, and throughout September and October a good deal of movement is reported from stations in Orkney and Shetland. Several were at the Little Ross lantern at 9.30 P.M. on 14th September, one was killed at the Rhinns of Islay lantern at 9 P.M. on 18th September, and one at the Little Ross lantern on 10th October at 9 P.M. Thirty-seven were seen at Swona on 15th November, and one at Pentland Skerries next day. A strong weather movement caused by frost is recorded from the Beaully Firth on 20th November, and from the Little Ross and Killantringan lanterns from 17th November to 6th December, "thousands" were seen in the rays, and many killed. These birds were probably on their way to the milder shores of Ireland.

THE GREY PLOVER, *Squatarola squatarola*.—Six Grey Plover are recorded from the Dornoch Firth on 7th and 21st January, and again on 13th April, and one from Largo Bay on 29th March. The first autumn record is from Galson (O.H.) on 11th and 12th September, two at Fairlie (Ayr) on 13th, and eight there on 15th September. Quite an arrival took place between 24th and 30th September, small parties are noted from the Cromarty Firth,

Largo Bay, the Beaully Firth and Balgray (1. 1915, 357), and "a great many" at the Dornoch Firth. They were seen about Largo Bay up to 16th October, and two there on 26th December.

THE LAPWING, *Vanellus vanellus*.—Three Lapwings visited Fair Isle on 6th January, numbers were at the Little Ross lantern at 11 P.M. on the 7th, two at Hoy High on 10th January, two at Holy Island on 13th January, and two at the Isle of May next day. From 6th February to 10th March there are constant records of Lapwings from the Little Ross and Killantringan lanterns, and from 15th February to 10th March there are many notes of arrival at inland nesting grounds. These observations evidently refer to the return of our breeding birds, and the small arrivals in our Northern Isles during February and up to 5th March were probably also summer visitors. From 5th March, when about seventy Lapwings were seen to go north in small parties over Pentland Skerries, and right on to 22nd May, there are many notes of movements of Lapwings from stations in our Northern Isles, probably passage migrants going overseas to breed. Single birds are noted from the Isle of May on 27th April and 2nd and 25th May, and one or two birds are reported constantly from Fair Isle up to 25th June. A flock of twenty was seen at the Mull of Galloway on 24th May, one of seventeen at Souleseat on 4th June, and one of thirty at Loch Elrig, Mochrum, on 18th June.

One or two Lapwings are noted frequently at Fair Isle and Pentland Skerries in July, and from 12th July to 13th August flocking after nesting and movements to the shores are recorded from many quarters. From 9th September to 25th October much movement is reported from Orkney, Shetland, and the Outer Hebrides; three were at the Little Ross lantern on 8/9th October and two next night. Six were at the Killantringan lantern at 2 A.M. on 4th November, and twelve at the Rhinns of Islay lantern at 8 P.M. on 11th November. A strong weather movement in frost and snow is reported from 15th November to 9th December. It is recorded from Little Ross (and L.), Killantringan (and L.), Beith, the Isle of May, Fair Isle, Pentland Skerries, and Butt of Lewis; the greatest numbers recorded are from our south-western stations, where "thousands" are noted at the lanterns, these being doubtless emigrants *en route* for Ireland. On 28th December several were at the Rhinns of Islay lantern at 9 P.M.

THE TURNSTONE, *Arenaria interpres interpres*.—This species is recorded steadily and in numbers up to mid-May; on 16th May

there were five or six on the Isle of May, two on the Island of Noss on 18th May and ten there on 25th May, six at North Unst on 23rd May, and one on Pentland Skerries on 7th June. Throughout June and July a few Turnstones in fine plumage were to be seen in Luce Bay. On 2nd July ten arrived on Pentland Skerries, one in faded summer plumage was seen in Largo Bay on 12th July, and from 22nd July to 17th September there are many records of arrivals, the period of maximum movement falling between 27th July and 4th August. The only record from inland localities is of two young birds at Balgray on 12th September (1. 1915, 357).

THE RUFF, *Machetes pugnax*.—Single birds are reported from the Beaully Firth on 18th August, Balgray on 27th August and 5th and 12th September (1. 1915, 357); six at Kilburnie Loch on 16th and one on 24th September (2. viii. 24), and Morton Loch (N. Fife) on the last-named date.

THE KNOT, *Canutus canutus*.—Is reported commonly up to the end of March; on 11th and 14th April Knots were numerous at the Little Ross lantern, fourteen were at Whalsay Skerries on 25th April, six in Largo Bay on 29th April and 3rd May, and four in winter plumage there on 10th May, and a flock of two hundred and fifty on Luce Sands on 15th May. On 29th July a Knot in summer plumage was seen on the Dornoch Firth, one or two "losing summer plumage" on Luce Sands next day, and five at Fairlie (Ayr) on 2nd August. Large arrivals took place between 14th August and 29th September and are recorded from many stations, while on 5th December several were at the Little Ross lantern.

THE SANDERLING, *Calidris alba*.—About a dozen in winter dress were observed in the Dornoch Firth on 13th April; about forty, "some in very white winter plumage, others in full breeding dress," at St Andrews on 7th May, on which date, and again on 15th May, flocks of ten to thirty were seen in Luce Bay.

On 29th July about thirty birds of the year are noted at the Dornoch Firth, nine Sanderling on Luce Sands next day, seven adults at the Dornoch Firth on 14th August, one at Lerwick on 12th September, and one at Invergowrie on 9th October.

THE DUNLIN, *Erolia alpina alpina*.—A good deal of movement is recorded from our Northern Isles from 8th May to 7th June, and fifteen are reported from Pentland Skerries on 16th June, while a "good many flocks" were seen on Luce Sands on 4th June. By

7th July two had returned to Fair Isle, a good many on the Isle of May on 22nd July, and great numbers on Luce Sands on 30th July. Throughout August and September constant small movements are noted; a Dunlin was shot at Teasses (Fife) about 500 feet above sea-level and five miles inland on 2nd October, and on the nights of 8th, 9th, and 10th October a few were at the Little Ross lantern.

THE CURLEW SANDPIPER, *Erolia ferruginea*.—A bird of this species is reported from Monifieth on 7th September, Balgray on 12th September (1. 1915, 357), and three or four at Kilchattan Bay, Bute, on 18th September. From 23rd September to 31st October there are a number of records of small numbers of Curlew Sandpiper; more than half of these come from freshwater haunts inland, such as Balgray or Morton Loch (N. Fife).

THE LITTLE STINT, *Erolia minuta minuta*.—On 10th September a Little Stint is recorded from Morton Loch (N. Fife), two from Balgray on 12th September, and three there on 30th September (1. 1915, 357), seven or eight at Morton Loch on 24th September, and one at Hogganfield Loch on 3rd October (2. 1915, 119).

THE PURPLE SANDPIPER, *Erolia maritima maritima*.—Is recorded steadily up to 15th April, after which the notes thereon are as follows:—About twenty Portmahomack on 27th April, one at Fair Isle on 1st May, three at Hoy High on 3rd May, twenty to thirty at Balcomie on 5th May, one at Little Ross on 12th May and one at Hoy High next day, and four at Fair Isle on 18th May.

On 7th July two reappeared at Pentland Skerries, a large flock at Swona on 4th August, and several on the Isle of May on 10th September. After this many arrivals are noted up to 23rd October.

THE COMMON SANDPIPER, *Tringa hypoleuca*.—The first arrivals recorded are from Braidshawrigg and New Galloway on 7th April. Then a prolonged pause ensues, the next notes being from Melrose and Blackhill on Kelvin (Clyde) on 17th April, the River Cart and Longcroft next day, and the Whitadder on 19th April. After this many notes come of arrival at breeding haunts up to 1st May, by which time our summer visitors seem to have been well distributed. On 6th May two and on 9th May a good many are recorded from Galson (O.H.).

Three Common Sandpipers appeared on Pentland Skerries on 2nd July; on 12th July two had returned to Largo Bay after

breeding, and returns to our coasts are frequently noted during July. Many departures took place in August; last seen Luce Bay on 2nd September, Balgray Dam on 5th and Bell Rock on 10th September, Invergowrie on 18th and Beith on 24th September.

THE GREEN SANDPIPER, *Tringa ochropus*.—Two are recorded from the mouth of the Piltantan, Luce Sands, on 30th July; single birds at Fair Isle on 2nd August, and Swona on 3rd and 4th August, two there on 9th August, one at Balgray on 5th September (i. 1915, 357), and one at Bardowie (Stirlingshire) in mid-October. See p. 152.

THE REDSHANK, *Tringa totanus*.—From 26th February and throughout March returns of Redshanks to their breeding places inland are noted. On 4th June a flock of twenty-two were seen on Luce Sands, while from 10th July onwards returns to the shore after nesting are reported. A few were passing the Muckle Flugga on 6/7th September, and one visited the Bell on 8th September.

THE GREENSHANK, *Tringa nebularia*.—A Greenshank is noted on the Cromarty Firth on 2nd January. On 29th July four had returned to the Dornoch Firth, and next day some were on Luce Sands. A young one in Tayport Bay on 7th August, one at Aberlady Bay on 8th, and Greenshanks at Morton Loch (N. Fife) on 7th, 14th, and 28th August, one at Duns Castle Lake on 11th September, and one at Swona on 12th October.

THE BAR-TAILED GODWIT, *Limosa lapponica lapponica*.—This species is recorded regularly up to 5th April from many stations. On 7th May a flock of seventeen were on Luce Sands, and three "in fine plumage" there on 15th May. On 25th July some were in Aberlady Bay, and on 29th July about a dozen were seen on the Dornoch Firth, and about forty-five, "mostly going out of summer plumage," on Luce Sands next day, while during August many arrivals are reported.

THE BLACK-TAILED GODWIT, *Limosa limosa*.—A bird of this species was seen in Aberlady Bay on 7th August (i. 1916, 70). See p. 152.

THE CURLEW, *Numenius arquata arquata*.—Two Curlew were at the Killantringan lantern at 4 A.M. on 13th January, and from 22nd January to 12th March returns to inland breeding grounds are

recorded, and during this period there are many notes from the Little Ross and Killantringan lanterns, sometimes of large numbers, as on 10/11th March, when there was a great rush all night. The big snowstorm in the end of March drove the Curlew from the Fife uplands, where they had arrived to nest, back to the shores. Throughout April there are many notes of movement from stations in our Northern Isles and Outer Hebrides, and on 11th, 14th, and 15th April Curlew were again at the Little Ross lantern, while on 24th May a flock of nineteen were seen at the Mull of Galloway, and one of fourteen at Souleseat on 2nd July.

"Hundreds" returned to Galson (O.H.) on 10th July, and after this many returns to the shores after nesting are noted. During August and September and up to 19th October there are many notes of the movement of Curlew from our Northern and Western Isles, and some from the Isle of May and our mainland stations; the only lantern records are from Little Ross on 15th and 16th August and 6th September. A distinct weather movement in frost and snow is noted from Killantringan, Little Ross, and some of our island stations from 18th November to 6th December.

THE WHIMBREL, *Numenius phaeopus phaeopus*.—On New Year's Day a Whimbrel was seen at Fairlie, Ayr; one was shot at Galson (O.H.) on 9th January, and five are recorded from Musselburgh on 25th January (1. 1915, 94). Arrivals are reported from the Butt of Lewis on 26th April, Luce Bay two days later, Hoy High and Galson on 29th April, Loch Elrig on 3rd May, and Pentland Skerries next day. Much movement is noted throughout May from our Northern and Western Isles, and from Wigtownshire, Fife, and East Ross, while at 12.30 A.M. on 20th May Whimbrel were numerous at the Little Ross lantern, and one was seen at Arisaig on 30th May, and three at Mochrum on 4th June. Throughout June and July Whimbrel remained at Fair Isle and Galson; they were numerous at Little Ross on 12th July, appeared at Swona on 18th July, Portmahomack on 27th, Dornoch Firth on 29th, and Luce Sands on 30th July. Much movement is recorded throughout August; last seen Tarbatness on 30th August, Galson on 16th September, and Pentland Skerries on 27th September.

THE SNIPE, *Gallinago gallinago gallinago*.—A few Snipe are reported pretty regularly from Fair Isle up to 27th May, about fifty on Pentland Skerries on 31st January, one or two at frequent intervals from this station and Hoy High up to 19th May, and one

at Pentland Skerries on 5th June. During August and September there are constant notes of very small numbers of Snipe from stations in our Northern Isles; the movement strengthened and became more general during October and the first half of November. Little Ross and Tiumpanhead lanterns record Snipe during this period, and there were "swarms" on the shores of the Beaully Firth on 8th November. A weather movement took place in the first week of December, and is recorded from some of our island stations and from south-western Scotland.

THE JACK SNIPE, *Limnocryptes gallinula*.—A Jack Snipe is noted at the Butt of Lewis from 12th to 15th February, one at Pentland Skerries on 28th February, two at Corsemalzie on 1st March, and one at Fair Isle next day.

The first autumn arrivals recorded were at North Unst on 21st September, the Butt of Lewis on 23rd, Morton Loch (N. Fife) on 24th, Pentland Skerries on 27th, and Corsemalzie on 29th September. During October and November there are a good many notes of small numbers from Fair Isle and Pentland Skerries.

THE WOODCOCK, *Scolopax rusticola*.—Hardly any Woodcock are recorded on spring passage; during January and February there are one or two isolated records from our island stations, and single birds are noted on Fair Isle on 23rd April and 19th May and the Isle of May on 29th June.

A considerable overseas arrival began on 8th October and lasted for a month; it is recorded from many stations in Orkney, Shetland, and the Outer Hebrides, and from the Isle of May. There were many Woodcock in the Corsemalzie woods on 7th November, but "almost all had gone by 10th, after a big northerly gale." On 19th November one visited Little Ross, one or two at Pentland Skerries on 27th November, 8th and 12th December, one on the Isle of May on the 24th and Galson (O.H.) on 25th December.

THE SANDWICH TERN, *Sterna sandvicensis sandvicensis*.—Is first reported from Rattray Head on 9th April, Garlieston Bay on 20th April, Nairn on 25th April, and Portmahomack on 27th April. Last seen Luce Sands on 3rd September, Cromarty Firth on 24th September, between Port Seton and Longniddry on 2nd October, and Largo Bay on 5th October.

THE COMMON TERN, *Sterna hirundo*.—"Terns" probably of this species were seen at Tarbatness on 29th April and near Dysart on

2nd May. Common Terns were first observed in Largo Bay on 3rd May, Crail on 5th, Bell Rock on 6th, and Luce Sands on 7th May. A fresh influx took place in Largo Bay on 10th May, and they are recorded at Loch Thom, Clyde, on 13th May. After this there are many records of the species. Numbers of Common Terns were at the Little Ross lantern at 12.30 A.M. on 6th August, and single birds visited Crosswood Reservoir on 26th June and 12th August. Most had left Largo Bay by 5th September: they were numerous at the Little Ross lantern at 9.30 P.M. on 6th September; last seen Monifieth on 27th September, a lot between Port Seton and Longniddry on 2nd October, and Largo Bay on 5th October, "three old and three young birds."

THE ARCTIC TERN, *Sterna paradisæa*.—Is first recorded from Lerwick on 3rd May, Hoy High on 8th May, and Pentland Skerries on 10th May. After this many arrivals at breeding places are recorded up to 22nd May. Some Arctic Terns were at the Muckle Flugga lantern at 11 P.M. on 1st August, decreasing at Pentland Skerries by 8th August, and the last young left their nesting colony at Swona on 9th August. "Terns" passing Lerwick on the nights of 7th and 16th September and at the Whalsay Skerries lantern on 12th September were probably of this species; last seen Hellyar Holm on 13th October and Rattray Head next day.

THE LITTLE TERN, *Sterna albifrons albifrons*.—Is recorded from St Andrews on 7th May and Largo Bay on 10th May. One or two at the Isle of May on 1st August, two at Maidens (Ayrshire) on 11th September, last seen at Rattray Head on 26th September.

THE LITTLE GULL, *Larus minutus*.—One was found dead at Girdsta, Shetland, on 21st September. See p. 152.

THE BLACK-HEADED GULL, *Larus ridibundus*.—An influx is noted in Largo Bay on 17th January, three or four pairs returned to the Butt of Lewis on 30th January, and Black-headed Gulls were plentiful near Melrose on 19th March. Arrivals are reported from Lerwick on 7th April and 1st May, Fair Isle on 12th April, and North Unst on 27th April. Many returned to the neighbourhood of Largo on 23rd June, after nesting, and on 30th a flock of about four hundred was seen to the south of Edinburgh flying in a north-easterly direction. A few were at Fair Isle from 13th to 27th July, about a hundred visited Pentland Skerries on 15th July, and the last left the Butt of Lewis on 19th September.

THE LESSER BLACK-BACKED GULL, *Larus fuscus*.—A Lesser Black-backed Gull is recorded from Corsemalzie on 17th February, two from Luce Sands on 23rd February, one from the Butt of Lewis on 12th March, and four from Corsemalzie on 16th March. On 2nd April one was seen at Bishop Loch, and numbers in Wemyss Bay (Clyde) next day, and after this there are many records of the return of our breeding *L. f. britannicus*. In autumn the species is noted with some regularity up to 25th August, when it was last seen at Galson; last seen Lerwick on 25th September.

THE GLAUCOUS GULL, *Larus glaucus*.—Is recorded steadily from our coasts and islands during January and February, and from 10th January to 4th February one was at the Kilmarnock Waterworks, fourteen miles from the sea, and another in the same neighbourhood on 5th February (3. viii. 243). Three were at Pentland Skerries on 12th March, and single birds at Hoy High on 3rd, 10th, and 11th April. Glaucous Gulls are first noted at North Unst on 4th September and Lerwick on 6th November. After this small numbers are recorded constantly up to the end of the year.

THE ICELAND GULL, *Larus leucopterus*.—Is recorded commonly in small numbers from our Northern Isles and coasts up to 10th April. Two at Hoy High on 29th April, one there on 1st May and one at North Unst on 24th May. On 27th August an "immature male approaching the white phase of plumage" was procured on Lochfyne (1. 1915, 358), an Iceland Gull was at Whalsay Skerries on 22nd September and three there on 15th November, after which and to the end of the year there are again notes of small numbers of these Gulls.

THE KITTIWAKE, *Rissa tridactyla tridactyla*.—On 30th January Kittiwakes were numerous at the lochs at the Butt of Lewis but not about the shores. Arrivals at breeding stations are recorded between 9th March and 5th April, on 13th May scores were passing north all afternoon at Whalsay Skerries, on 4th June a flock of forty were flying, calling, over Souleseat Loch, and on 29th June thousands of Kittiwakes were passing the Butt of Lewis at 7 A.M., going east. Large flocks were again passing this station going east all day on 28th October, "far more numerous than our local birds." On 7th October an immature Kittiwake visited Melrose.

THE GREAT SKUA, *Stercorarius skua skua*.—Is recorded from North Unst on 8th April, Island of Noss on 13th May, and Whalsay Skerries two days later. Last seen North Unst on 21st September and Lerwick on 11th October.

THE ARCTIC SKUA, *Stercorarius parasiticus*.—Is first noted at North Unst on 4th May. Early in August an Arctic Skua was obtained inland at Lesmahagow, Lanarkshire (1. 1915, 358); seen at Rattray Head up to 23rd September, and Lerwick up to 17th October.

THE RAZORBILL, *Alca torda*.—Many Razorbills were in Largo Bay on 31st January, and returns to breeding cliffs are noted in March and the first half of April. Many were in Loch nan Uamh on 28th May and at the Bell Rock on 2nd June, and on 22nd July hundreds were flying east all day in flocks of ten to forty at Pentland Skerries.

THE GUILLEMOT, *Uria troille troille*.—On 20th and 21st January a number visited the Isle of May in the morning, and during March and up to 6th April many returns to nesting cliffs are recorded. On 14th April a "great many were going ashore and dying on the beach" at Rattray Head, and great numbers were going north past this station on 22nd April. Many were about the Bell Rock on 2nd June, and immense numbers passed Rattray Head going north on 13th and 14th July. On 15th October many were going south past the Isle of May, and there were large numbers in Largo Bay on 27th October.

THE BLACK GUILLEMOT, *Uria grylle grylle*.—Arrivals at breeding sites are recorded during March, and departures therefrom during the latter half of August.

THE LITTLE AUK, *Alle alle*.—The movement of Little Auks which bulked so large in the December records for 1914 continued into 1915. On 1st January one was found dead at Crieff (1. 1915, 95), next day hundreds were seen by fishermen off the Island of Copinsay, six were found dead about Deerness and one at Dunipace. On 3rd and 4th January records come from Largo Bay, from North Unst on the 6th, Bell Rock on the 7th, and Dunipace on 10th January. A Little Auk was found dead at Galson (O.H.) on 16th January, and one alive in the River Broom on 18th January (1. 1915, 144); while "many at sea" are noted from Fair Isle on 18th, 22nd, and 23rd January, and one at Lerwick on 25th January; three at the Bell Rock on 10th February, last seen Pentland Skerries on 17th February, and five at Rattray Head on 5th March.

The only autumn records are from Pentland Skerries, where one is noted on 5th December and hundreds flying west on 9th and 13th December.

THE PUFFIN, *Fratercula arctica arctica*.—Many arrivals at breeding stations are noted during April; by 17th July a noticeable decrease is recorded at Sule Skerry, young birds were at the Muckle Flugga lantern on 9/10th August, and by mid-September the breeding sites were deserted. On 20th October a young Puffin was found dead at the Butt of Lewis.

THE CORNCRAKE, *Crex crex*.—Was rather late in appearing in 1915. The earliest records are from New Galloway on 24th April, Beith on 28th, Bardowie on 29th, and Bridge of Weir on 30th April. After this, arrivals are reported up to 23rd May, by which time the birds had reached their high inland haunts. Corncrakes were first heard in the Outer Hebrides at Barra Head on 12th May, and single birds are noted on Fair Isle on 22nd and 24th May and 7th June, and on Pentland Skerries on 20th and 22nd June.

Last heard West Renfrew on 23rd July, Beith on 6th August, one killed at Little Ross lantern at 1 A.M. on 15th August. Last seen Alticig, Luce Bay, on 9th September, one killed at the Rhinns of Islay lantern at 8 P.M. on 18th September, one at the Butt of Lewis on 4th October, Pentland Skerries on 8th October, Dalmeny on 12th, and the last for the season at the Butt of Lewis on 18th October.

THE WATER-RAIL, *Rallus aquaticus aquaticus*.—Single birds are recorded at Glenorchard on 3rd January, Corsemalzie on 6th January, Galson (O.H.) on 9th January and 24th February, Fair Isle on 30th January, and Craignish on 22nd February.

In autumn a Water-rail was got on Hirta and sent to the Royal Scottish Museum (1. 1916, 77). See p. 152.

One was killed at the Rhinns of Islay lantern at 3 A.M. on 10th October, one at Lerwick on 14th November, and one at Pentland Skerries on 30th November.

THE MOORHEN, *Gallinula chloropus chloropus*.—A Moorhen was killed at the Rhinns of Islay lantern at 10 P.M. on 16th September.

THE COOT, *Fulica atra atra*.—Arrivals are noted at Loch Stiapavat (O.H.) on 14th February and at Lerwick on 25th March, while on 20th May one appeared on Fair Isle. On 19th September only six remained on Loch Stiapavat, and one, the last, at Lerwick on 1st November.

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Yrs sincerely
J A Hawick Brown

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[SEPTEMBER

In Memoriam

JOHN ALEXANDER HARVIE-BROWN.

Born 27th August 1844; died 26th July 1916.

By the death of Dr Harvie-Brown, which occurred unexpectedly on the 26th of July at his residence, Dunipace House, Stirlingshire, a notable Scottish naturalist has passed away, and a wide circle mourn the loss of a singularly genial and valued friend.

The record of his work in furtherance of our knowledge concerning the vertebrate fauna of Scotland is a remarkable one, as is testified to by the long series of papers and notes contributed to serial literature, and the fine series of volumes devoted to accounts of the faunas of the various drainage areas of Northern Britain. In the production of most of the volumes of the "Vertebrate Fauna" series he had as an associate and coadjutor the late T. E. Buckley, but it is generally recognised that the laird of Dunipace was the originator and mainstay of the great undertaking. At one time it was his custom to spend some weeks each summer cruising in his yacht among the Scottish islands, and in this way he was enabled to visit the remotest isles in the Hebrides and the Orkney and Shetland groups. Not only were these faunal volumes (there are ten of them) of great value in themselves for the amount of information they contained, but also on account of the impulse they gave to the investigation of the animal life of the various areas; they were the means of inducing those who possessed additional information

to publish their records, and they have inspired further research.

In addition to the Scottish work alluded to, Harvie-Brown was a member of the British Association Committee appointed to make investigations on the phenomena of bird-migration as observed at lighthouses and light-vessels, those on the Scottish coasts falling to his charge. Indeed, he shares with Cordeaux the credit of initiating the inquiry. His name is also intimately associated with the *Annals of Scottish Natural History*, which he founded, owned, and jointly edited, and he lent his services to the present series of the *Scottish Naturalist*.

His activities as a naturalist were not confined to the study of the animals of his native country, for he visited, in the "seventies," much of Northern Europe for the purpose of collecting both information and specimens, his most important work being accomplished in the lower reaches of the great rivers Petchora and Dwina, in company with Seeböhm in the former region and E. R. Alston in the latter. Along with Mr Danford he visited Transylvania on a similar quest. The ornithological results of these expeditions were duly recorded in the pages of *The Ibis*. The loss by fire in January 1897 of the irreplaceable collection of eggs and birds' skins formed by him and Col. Fielden, was a great blow which he bore with characteristic cheerfulness.

Such is a slight sketch of the labours of our late friend in the interests of Scottish Natural History and the avifauna of some of the little visited portions of the Continent. For an enumeration of his published writings reference may be made to the Royal Society's list of scientific papers. In recognition of his services to the cause of Natural History, especially in its Scottish aspect, the University of Aberdeen, in 1912, conferred on him its honorary degree of LL.D.

We understand that his great and extremely valuable collection of books and papers relating to natural history and to the topography of Scotland, have been bequeathed to the Royal Scottish Museum, where also the remnants of such natural history specimens as escaped the fire, and others more recently acquired, will find their final resting-place.

NOTES ON TWO COLLECTIONS OF MICE FROM LEWIS, OUTER HEBRIDES

By MARTIN A. C. HINTON and G. BATHURST HONY, B.A.

THIS paper deals with two collections of Field Mice and House Mice from Lewis, Outer Hebrides. One of these was made in September 1914, at the extreme north of the island—the Butt of Lewis—by Dr Eagle Clarke, who most kindly lent his specimens to us for description; the other was made by Mr Hony in July 1914 at Barvas in north-western Lewis.

I. APODEMUS HEBRIDENSIS, de Winton.

(The Hebridean Field Mouse.)

A. BUTT OF LEWIS.—Dr Eagle Clarke obtained ten specimens, of which three are in an adult, and seven in a juvenile pelage. The following are the dimensions in millimetres taken in the flesh by the collector:—

No.	Date.	Head and body.	Tail (without hair).	Hind-foot (without claws).	Ear.	Condylor-basal length of skull.
MALES:—						
14	29th September 1914 .	94·5	85·5	23·75	14·75	23·4
16	Do. do. .	89·5	83	24	14·6	22·6
9	Do. do.* .	80	74	23·75	14	..
FEMALE:—						
1	17th September 1914 .	99·5	83·5	22·5	15	23

* Juvenile.

Besides these, six young Field Mice were taken on the 29th September; the collector recorded no measurements of these specimens, but the length of the hind-foot, taken on the skins, appears to vary between 21·3 and 22 mm.

The three adults in this series are really quite young animals, their teeth being but slightly worn; they are probably in the first adult coat, and agree closely with some of the specimens taken by Mr Anderson at Stornoway, in

March 1913.¹ The dorsal tints appear to be somewhat colder, or less rufous, than in older specimens. The bellies are silvery and show no trace of a buff suffusion: in the two males there is no trace of a pectoral spot, but a minute pectoral spot of buff is present in the female. The feet are white, and the tails distinctly bicoloured.

The young are dusky, House Mice-like creatures, distinguishable from the House Mice in this collection by their larger, almost dead white feet and bicoloured tails. No sexual differences of coloration are visible in this series of young.

B. BARVAS, LEWIS. — Mr Hony collected twenty-one Field Mice at this place; of these sixteen are adult, one is changing into the adult coat, and four are immature. The following are the dimensions taken in the flesh by the collector:—

No.	Date.	Head and body.	Tail (without hair).	Hind-foot (without claws).	Ear.	Condyl-basal length of skull.	Teeth. State of wear.
MALES:—							
6	6th July 1914	98	97	24	16	25	much.
10	5th do.	99	91	23	15	..	half worn.
11	8th do.	103	89	23	15	24·2	much.
12	8th do.	101	97	24	15	23·8	moderately.
13	9th do.	94	89	24	16	23·4	slightly.
14	9th do.	103	100	23·5	16	24·6	much.
20	13th do.	96	82	23	14	22·1	moderately.
22	14th do.	98	104	24	16	..	..
23	15th do.	103	99	23	16	..	..
24	15th do.	102	94	22	16	..	..
26	16th do.	102	94	23	16	24·7	half worn.
FEMALES:—							
2	5th July 1914	92	92	24	15	23·9	moderately.
5	5th do.	94	95	24	16	24 (<i>circa</i>)	much.
7	6th do.	95	101	23·5	17	23·8	much.
16	11th do.	98	91	23	15	24	much.
18	12th do.	103	90	22	15·2	23·2	much.
Av. of 16 adults		99	94	23·3	15·6	..	
Young male changing into adult coat:—							
8	6th July 1914 In juvenile pelage:—	87·5	88	23	15	22·6	very slightly.
MALE:—							
17	11th July 1914	67	65	21	13	..	unworn.
FEMALES:—							
15	10th July 1914	80	64	21	14	20·4	very slightly.
19	12th do.	81	71	21	13·5	..	very slightly.

¹ Hinton, *Ann. and Mag. Nat. Hist.*, ser. 8, vol. xiv., p. 124, July 1914; Barrett-Hamilton and Hinton, *British Mammals*, ii., p. 532.

On arranging these specimens in order of individual age, as judged by the degree of wear shown by the teeth, it seems clear that the earlier adult coats are characterised by colder, less rufous dorsal tints than are the later phases. The three young adults from the Butt of Lewis, described above, have backs which match that of No. 13 from Barvas closely. Nos. 2 and 12 (Barvas) show much black on their backs. The specimens with much worn teeth have bright red backs, and form a very uniform series. The reddening of the back appears to be a gradual process transpiring between adolescence and old age. As regards the ventral coloration, there appears to be a corresponding gradual change with advancing age. Thus the young adults have silvery bellies with the buff suffusion absent, or else represented merely by a small throat spot: the suffusion becomes conspicuous only in the aged specimens, and in these it varies from a more or less well-developed median stripe along the chest and belly to a more or less general wash over all the underparts.

We are not able to discover any sexual differences of coloration in this collection. It would appear, however, that the aged female skull is distinctly smaller than the aged male skull: the condylo-basal length in such females varies between 23.2 and 24 mm., and in such males between 24.2 and 25 mm.; the range found by one of us on a former occasion was 22.7 to 24.2 for five females, as against 23.5 to 24.7 for five males from Lewis.

The young specimens resemble those from the Butt of Lewis, and call for no further comment.

In an earlier paper¹ it was pointed out that skulls from eastern Lewis (Stornoway) are slightly smaller than those of typical *A. h. hebridensis* from Uig and neighbouring portions of western Lewis, and that apart from size some differences of proportion exist between the two series. In order to have any value, comparisons of this kind must be based upon skulls of equal age. Unfortunately, none of the specimens from the Butt of Lewis is old enough to be used in this way. Seven of those from Barvas are of use, and

¹ Hinton, *op. cit.*, 125; and *British Mammals*, ii., 533 and 539.

these have been carefully measured by Mr Hinton, so that the figures given below are strictly comparable with the earlier data.

MEASUREMENTS OF SKULLS OF *Apodemus hebridensis*.

Dimension No.	PART I.							Dimension No.	PART II.		
	BARVAS, LEWIS.								BARVAS. STORNOWAY. WEST LEWIS.		
	Skull No. :—								No. of Skulls :—		
	18♀	7♀	16♀	11♂	14♂	6♂	26♂		(7)	(7)	(3)
1	23·2	23·8	24	24·2	24·6	25	24·7	1	23·2 to 25	22·7 to 24·1	23·5 to 24·7
2	25·9	26·5	26·5	26·7	27	27·6	27·1		24·2	23·64	24·13
3	13·4	13·9	13·8	13·8	13·9	14·2	13·7				
4	4·2	4·4	4·4	4·4	4·3	4·4	4·5	1 =	100	100	100
5	12	12	12	11·9	11·9	12·1	11·9	2 =	110 to 112	109 to 111	110 to 110·5
6	8·3	8·6	8·5	8·7	8·6	9	8·8		110·6	110·5	110·33
7	10·6	10·8	11	11	11·3	11·5	11·4	3 =	55·5 to 58·3	55·1 to 58	54·9 to 55·3
8	6·2	6·4	6·4	6·5	6·4	6·8	6·5		57·1	56·6	55·16
9	9·9	9·5	9·6	10·1	10	10·1	10·4	4 =	17·5 to 18·5	17·6 to 18·5	17·4 to 17·8
10	2·7	2·7	2·8	3	2·9	2·9	2·8		18·05	17·96	17·53
11	12·6	13·1	13	13	13·4	13·5	13·5	5 =	48·2 to 51·7	49·3 to 51·5	48·5 to 49·5
12	6·8	7·3	7·1	7·2	7·2	7·3	7·3		49·4	50·04	48·83
13	5·7	6	6·1	5·9	6	6	6	6 =	35 to 36·1	34·3 to 36·5	34·4 to 35·5
14	1·8	1·8	1·8	1·8	1·8	1·9	1·8		35·7	35·23	34·93
15	4·4	4·6	4·7	4·9	4·9	4·4	4·8	7 =	45·3 to 46·2	45·3 to 46·4	45·4 to 45·7
16	2·3	2·7	2·5	2·5	2·5	2·5	2·5		45·8	45·97	45·53
17	3·8	4	4	3·7	4	4	4	8 =	26·1 to 27·2	26·3 to 27·2	25·5 to 28·1
									26·7	26·77	26·53
								9 =	39·9 to 42·7	39 to 43	40·4 to 41·3
									41·1	41·5	40·86
								10 =	11·3 to 12·4	10·9 to 12·1	10·3 to 10·6
									11·7	11·65	10·46
								11 =	53·8 to 55	53·5 to 54·8	53·6 to 54·6
									54·4	54·11	54·23
								12 =	20·2 to 30·6	28·6 to 30·5	29·5 to 30·1
									29·6	29·51	29·8
								13 =	24 to 25·4	23 to 24·3	23·8 to 24·8
									24·6	23·71	24·13
								14 =	7·3 to 7·8	7·5 to 8·05	7·25 to 7·7
									7·5	7·73	7·46
								15 =	17·6 to 20·3	18·9 to 20·5	18·3 to 19·4
									19·3	19·64	18·76
								16 =	9·9 to 11·3	10·4 to 10·6	10·2 to 10·9
									10·3	10·51	10·46
								17 =	15·3 to 16·8	15·8 to 16·7	15·7 to 16·2
									16·2	16·31	16·03

In the upper half of Part I. of the above table, 17 dimensions of each of the skulls from Barvas are recorded: these dimensions are numbered as follows:—(1) condylo-basal length; (2) occipito-nasal length; (3) zygomatic breadth; (4) interorbital constriction; (5) cranial width; (6) cranial depth (median); (7) post-molar length, *i.e.* from condyle to m^3 ; (8) condyle to anterior surface of bulla; (9) length of nasals; (10) width of nasals in front; (11) palatal length, from spine of premaxilla to posterior edge of palate;

(12) length of diastema; (13) length of incisive foramina; (14) width of incisive foramina; (15) width of rostrum; (16) least width (at base) of the anterior root of the zygoma ("masseteric plate"); (17) length of cheek-teeth (on crowns). In the lower half of Part I. these dimensions are reduced to percentages of the condylo-basal length; the reductions were made with a slide-rule.

In Part II. of the table the skulls from Barvas are compared with those from Stornoway and with those from the neighbourhood of Uig, western Lewis—the latter being typical *A. h. hebridensis*. At the top the range of the condylo-basal length found in skulls with well- or much-worn teeth is given, and the average length for each series is printed in heavy numerals. The remainder of this part of the table compares similarly the percentages of the condylo-basal length formed by each of the 17 dimensions—the range of the values in each series of skulls being printed in ordinary, the average values being in heavy numerals.

It will be seen from Part II. of the table that, as regards absolute size, the Barvas skulls, like those from western Lewis, are larger than those from Stornoway. As regards proportions, however, the Barvas skulls agree very closely indeed, in most respects, with the Stornoway series, and offer similar rather well-marked distinctions from the skulls of typical *A. h. hebridensis*. The possibility of the existence of two races of *hebridensis* upon Lewis has been discussed not only in the works above cited but in the earlier papers of de Winton and Barrett-Hamilton. The Barvas collection is of interest in proving that the range of the Stornoway or eastern race extends across the island to the north-western coast, where, although the skull attains the slightly larger size of typical *hebridensis*, the cranial proportions remain essentially as in specimens from north-eastern Lewis. Before we can come to any decision as to the true status of the Field Mice of Stornoway and Barvas, we need a good series of specimens from the hilly country to the south of the small east and west stream, which cuts off Barvas from the Uig district or type locality of *A. h. hebridensis*.

2. MUS MUSCULUS, Linnæus.

(The House Mouse.)

A. BUTT OF LEWIS.—Nine House Mice were collected at this place by Dr Eagle Clarke; these mice were leading a wild outdoor life at some considerable distance from any houses. The following are the dimensions:—

No.	Date.	Head and body.	Tail (without hair).	Hind-foot (without claws).	Ear.	Condyllo-basal length of skull.	Teeth. State of wear.
MALES:—							
3	17th Sept. 1914	98	85	18·75	12·75	..	slightly.
4	17th do.	..	..	18	..	juv.	hardly.
6	24th do.	..	..	18	..	..	..
13	27th do.	..	..	18	..	19·5	hardly.
7	30th do.	..	..	18	..	..	..
FEMALES:—							
2	17th Sept. 1914	84·5	75	17	13·75	22·5	much worn.
5	19th do.	103	86	21·5	14·5	23	moderately.
8	21st do.	101·75	82·75	18·5	14·5	22·2	much worn.
12	27th do.	85	82	19·5	15	20·3	half worn.

The external measurements given above are as made by the collector: as regards the females Nos. 5 and 12 we think the hind-foot without claws cannot have measured more than 20 and 18·5 mm. respectively. Twelve more or less complete skulls have been sent with this collection, but some slight confusion on the part of the preparer appears to have been made in numbering them, so that we are not quite certain as to the association of the individual skins and skulls. Nine skulls are complete, viz., "No. 3, Butt of Lewis 1914," condyllo-basal length 19·4, teeth very slightly worn; "No. 4," c-b. l. 19·2, teeth hardly worn; "No. 5," c-b. l. 23, teeth moderately worn; "No. 2," c-b. l. 22·5, teeth much worn; "No. 7," c-b. l. 21·1, teeth half worn; "No. 8," c-b. l. 22·2, teeth much worn; "No. 9," c-b. l. 21·9, teeth much worn; "No. 12" (? No. 13), c-b. l. 19·5, teeth hardly worn; "No. 13" (? No. 12), c-b. l. 20·3, teeth half worn.

In colour these mice are quite like ordinary *musculus* in out-door pelage, their bellies being dusky instead of light coloured as in *M. muralis* and *spicilegus*. The flesh measurements are large but do not exceed the known maximum for

musculus. The adult skulls, with teeth half worn or more, range in condylo-basal length between 20.3 and 23 mm.; they are thus distinctly larger than in ordinary House Mice, and agree closely in size with those of *M. muralis* from St Kilda; we have carefully examined their proportions and structure, but can find no tangible difference, other than the unusually large size, from the skull of *M. musculus*. The mesopterygoid space is quite as in the latter species.

B. BARVAS.—Four House Mice were collected here by Mr Hony: of these Nos. 1, 3, and 4 were taken "in a kitchen garden near manse," while No. 21 was obtained on a grassy bank at some distance from houses. The dimensions taken in the flesh are:—

No.	Date.	Head and body.	Tail (without hair).	Hind-foot (without claws).	Ear.	Condylo-basal length of skull.	Teeth. State of wear.
4	MALE:— 5th July 1914	88	90	18	13.5	..	
1	FEMALES:— 4th July 1914	74	78.2	17	13.8	20	half worn.
3	4th do.	76	76	17.2	12.4	19.7	moderately.
21	13th do.	79	76	17	13	19.9	moderately.

These specimens differ in no way from ordinary *M. musculus*.

Cetacea stranded on the Scottish Coasts.—A Report on Cetacea stranded on the British Coasts during 1915, by S. F. Harmer, published under the auspices of the British Museum (Natural History), was issued in February last. Owing to the abnormal conditions of wartime, only twenty-eight specimens were reported, but among them appear three Scottish records, namely, a Bottle-nosed Whale (*Hyperoodon rostratus*) at Thurso on 14th March, a Porpoise (presumably the common species) at Arbroath on 7th July, and a Sowerby's Whale (*Mesoplodon bidens*) at Inverness on 13th August.

Reoccurrence of *Pityophagus (Ips) ferrugineus* in the Forth Area.—On 2nd May I obtained two specimens of this beetle on Scots Pine roots near Balerno. The first was found in the gallery of *Hylastes ater*, and the second crawling on roots which I took home for breeding purposes. *P. ferrugineus* is not mentioned for Forth in Sharp's list, and I am indebted to Mr Wm. Evans for the following old records. James Hardy records it from Pease Bridge neighbourhood in *Hist. Berw. Nat. Club*, vol. i., p. 229, 1840; R. K. Greville records it from near Edinburgh in the *Zoologist*, 1843, p. 340.

Apparently the fact that *Pityophagus* is a root-dweller, or at least more so than its near neighbours *Ips* (proper) and *Rhizophagus*, accounts for its having been overlooked.—J. W. MUNRO, Edinburgh.

Tree-sparrow near Glasgow.—I caught a female Tree-sparrow here on 10th July. The state of its plumage seemed to me to indicate that it had nested this season. I have never seen a Tree-sparrow here before, and Mr John Paterson did not include it in his paper in the *Glasgow Naturalist* (February 1910) on "The Birds of the Glasgow District." Since then there is a record for the Glasgow district of two birds seen at Clarkston by Mr Hugh Wilson, as mentioned in the paper on "The Birds of Renfrewshire" in the *Scottish Naturalist* (August 1915) by Messrs John Robertson and T. Thornton Mackeith.—JAMES BARTHOLOMEW, Torrance, Glasgow.

House-sparrows utilising Nest of Blackbird.—A week ago (20th June 1916) I saw the brood leave a Blackbird's nest. The nest was situated about 12 feet from the ground in a rhododendron shrub. Yesterday (26th June) I was surprised to find a pair of House-sparrows had erected a dome of dry grass over this nest and converted it into one for themselves.—D. J. BALFOUR KIRKE, Burntisland.

Two Queen Wasps apparently constructing the same Nest.—While capturing Queen Wasps a fortnight ago (13th June 1916), I saw one go into a small bush of boxwood and remain for three or four minutes. On its coming out I missed catching it, and on looking into the bush saw that it was attending to its nest. I waited for its return, allowed it to go into its nest, and captured it coming out. I then removed the nest, and while doing so a Queen Wasp arrived and flew all round where the nest had been, and settled where it had been attached to the bush, and kept flying round the bush. This one I also captured. The two Queens seem to have been constructing the same nest.—D. J. BALFOUR KIRKE, Burntisland.

MAIN ARGYLL AND ITS INLAND MOLLUSCAN FAUNA

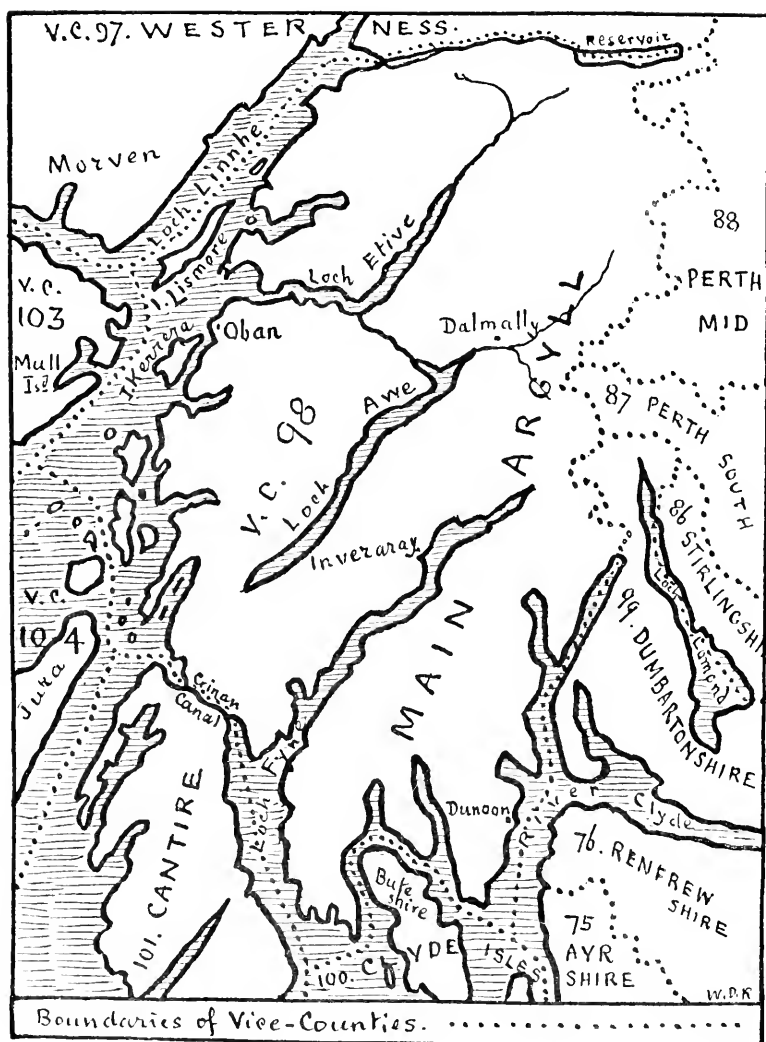
By W. DENISON ROEBUCK, M.Sc., F.L.S.

THIS is the second of a series of papers on the vice-counties of Scotland, based on the records of the Conchological Society of Great Britain and Ireland, of which the writer is Hon. Recorder, no records being included beyond those which have been seen by the Society's official referees.

Argyllshire is divided, under the Watsonian vice-county scheme, into no less than five vice-counties or parts of vice-counties. Of these, two are island-groups. Vice-county 103, Ebudes Mid, includes Mull, Iona, Tiree, and Coll. Vice-county 104, Ebudes South, includes Islay, Jura, Colonsay, Oronsay, Scarba, Lunga, and the small Isles of the Sea. Vice-county 101, Cantire or Kintyre, including Gigha and other small islets, is separated from Main Argyll by the line of the Crinan Canal. All that part of the mainland portion of Argyllshire which lies north of Loch Linnhe—the southern prolongation of the great rift of the Caledonian Canal—is joined to Western Inverness-shire to constitute vice-county 97, Westerness. What remains after the separation of these areas constitutes vice-county 98, Main Argyll. A few small islets closely adjacent are included. The boundary in Loch Linnhe is drawn so as to include Isle Lismore in this vice-county. The channel which divides it from Ebudes South passes up Scarba Sound, so as to include the Isles of Seil, Luing, and Shuna, and the tiny islets off Craignish Point.

In physical configuration it is a mountain country intersected by the deep sea-lochs or fiords so characteristic of western Scotland; and in the Naturalist's Map of Scotland published by my late dear friend John A. Harvie-Brown, to whom Scottish natural history owes so much, it is a region predominantly of moorland, hill-pastures, and other uncultivated tracts, with scarcely any cultivated tracts or woodlands.

The conchologists who have contributed material for



the area are few in number. Various examples from Oban were seen by Mr J. W. Taylor in the British Museum in September 1886, and others collected by Captain Bedford in the Rev. A. Merle Norman's collection in 1884. The writer visited Dunoon in August 1886. In the same year, collection was done by Mr Alex. Somerville and his brother Rev. J. E. Somerville, by the brothers M. E. and G. W. Mellors, and by Mr Andrew Scott. In 1885 Mr B. Sturges Dodd collected, in 1887 Mr W. Turner, and in 1889 Mr Alex. Shaw. In 1893 Messrs Robert Standen and J. Ray Hardy collected numerous species about Oban—some of which are here included. Collections were made in 1894 by Mr W. Evans, in 1900 by Mr W. H. Heathcote, and in 1901 by Mr A. M. Rodger. In addition to these we have undated records by Mr F. G. Binnie, Mrs Janet Carphin and the Rev. G. A. Frank Knight. The Kelvingrove Museum of Glasgow possesses examples found by the late David Robertson; the Perth Museum, some found by the late A. M. Rodger; and the Royal Scottish Museum at Edinburgh, one by the late Rev. John M'Murtrie. Since 1901 no specimens from this vice-county have been submitted for authentication.

Limax maximus.

Dunoon, under stones; vars. *cinerea* and *fasciata* both common, one fine adult of latter, 25th August 1886 (W. D. R.).

Limax arborum.

Oban, type, one juvenile, 5th October 1910 (Charles Oldham); Dunoon, two fine typical adults and one var. *nemorosa*, under stone in road, 25th August 1886 (W. D. R.).

Agriolimax agrestis.

Dunoon, Glen Morag, Ardenadam, Hunter's Quay, type and var. *reticulata* abundant, 25th August 1886 (W. D. R.). Var. *reticulata*, a few at Beregonium, ancient capital, vitrified fort of Dalriad Scots, Benderloch, between Lochs Etive and Creran, in hard frost, 16th December 1886 (J. E. Somerville); Crinan, several var. *reticulata* on very cold day, 22nd December 1886 (*id.*).

Agriolimax leviss.

Coast south of Dunoon, one, 25th August 1886 (W. D. R.); var. *pallida* in one of the back streets of Dunoon, 25th August 1886 (*id.*).

Arion ater.

Lochgailhead, two typical adults, 20th August 1886 (M. E. and G. W. Mellors); type, adults and juvenile, abundant at Hunter's Quay, Ardenadam, and Dunoon, 25th August 1886 (W. D. R.).

Arion subfuscus.

Ardenadam, one; coast south of Dunoon, three; common under stones on roadsides about Dunoon—all var. *rufofusca*—25th August 1886 (W. D. R.).

Arion hortensis.

Hunter's Quay, two, 25th August 1886 (W. D. R.); Crinan (J. E. Somerville, 1886).

Arion circumscriptus.

Hunter's Quay, one, and coast south of Dunoon, a few, 25th August 1886 (W. D. R.).

Arion intermedius.

Dunoon, one, 25th August 1886 (W. D. R.); Crinan, two, very pale, 22nd December 1886, weather very cold (Alex. Somerville); Hunter's Quay, 25th August 1886 (W. D. R.).

Vitrina pellucida.

Oban, a few (Alex. Somerville, January 1886); Glen Morag, Dunoon, two juveniles, 25th August 1886 (W. D. R.); at foot of old red sandstone conglomerate rocks, in a wood chiefly oak, larch, and spruce, along Kerrera Sound, Oban, one, 14th December 1886 (J. E. Somerville); Crinan, two, 22nd December 1886 (*id.*); Lismore, on limestone, one (Alex. Somerville, 29th July 1889).

Hyalinia cellaria.

Loch Awe, a few (Alex. Somerville, January 1886); Dunstaffnage Castle, Oban, a few (*id.*); Glen Morag, Dunoon, one; Hunter's Quay, a few; both 25th August 1886 (W. D. R.); Lismore, 14th December 1886 (J. E. Somerville); Oban, several, August 1893 (R. Standen and J. Ray Hardy); var. *albinos*, Airdbairn Crags, Oban (W. H. Heathcote, 1901).

Hyalinia alliaria.

Along Kerrera Sound, Oban, type and var. *viridula*, at foot of old red sandstone conglomerate rocks, in a wood chiefly oak, larch, and spruce, 14th December 1886 (J. E. Somerville); Isle Lismore, September 1889 (*id.*).

Hyalinia helvetica.

Isle Lismore, several, August 1893 (R. Standen and J. Ray Hardy).

Hyalinia nitidula.

Dunstaffnage Castle, Oban, numerous (Alex. Somerville, January 1886); Dunoon; Hunter's Quay, one; Ardenadam, one; near Glen Morag, Dunoon, two—all 25th August 1886 (W. D. R.); Isle Lismore, one, August 1893 (R. Standen and J. Ray Hardy); islands on Loch Awe (William Evans); var. *nitens*, Oban, M[urtrie] (Royal Scottish Museum, Edinburgh, May 1913).

Hyalinia pura.

Along Kerrera Sound, Oban, at foot of old red sandstone conglomerate rocks, in wood chiefly oak, larch, and spruce, with var. *margaritacea*, 14th December 1886 (J. E. Somerville); Glen Shira, Inveraray (F. G. Binnie, before 1891); var. *margaritacea*, Oban (British Museum, September 1886).

Hyalinia radiatula.

Dalmally (Alex. Shaw, 12th June 1889); Oban (Janet Carphin, before 1891).

Hyalinia crystallina.

Oban (British Museum, September 1886); at foot of old red sandstone conglomerate rocks, in a wood chiefly oak, larch, and spruce, along Kerrera Sound, Oban, 14th December 1886 (J. E. Somerville); var. *contracta*, Isle Lismore, September 1889 (*id.*).

Hyalinia fulva.

Oban (British Museum, September 1886).

Zonitoides excavatus.

Lochan Dubh, near Oban, a few, August 1893 (R. Standen and J. Ray Hardy).

Pyramidula rotundata.

Oban, numerous (Alex. Somerville, January 1886); Loch Awe, a few (*id.*); Dunoon, a few; Glen Morag, a few; Ardenadam, a few; Hunter's Quay, one—all 25th August 1886 (W. D. R.); at foot of old red sandstone conglomerate rocks, in wood chiefly oak, larch, and spruce, along Kerrera Sound, Oban, 14th December 1886 (J. E. Somerville).

Pyramidula rupestris.

Ardbairn Crag, Oban (W. H. Heathcote, 1901).

So far this marks the northern range of the species on the western coast except as regards the Durness (Sutherland West) Observation, which is not as yet authenticated.

Acanthinula aculeata.

Oban (British Museum, September 1886); at foot of old red

sandstone conglomerate rocks, in a wood chiefly oak, larch, and spruce, along Kerrera Sound, Oban, 14th December 1886 (J. E. Somerville).

Acanthinula lamellata.

Inveraray (B. Sturges Dodd, 5th February 1885).

Helix aspersa.

Dunoon, numerous; Hunter's Quay, one; both 25th August 1886 (W. D. R.).

Helix nemoralis.

Hunter's Quay, by the shore, one, var. *libellula* 123(45), one adult, var. *libellula* 12345, and var. *rubella* 00000, all 25th August 1886 (W. D. R.); Island of Kerrera, Oban, one var. *libellula* 003(45) *roscolabiata* (A. Somerville, January 1886); Lismore, one juvenile, var. *libellula* 12345, 14th December 1886 (*id.*); Innellan (*id.*, December 1886); Lismore, on limestone, var. *rubella* 00000, and two var. *libellula* 12345 (one of these (12)345 at mouth) (*id.*).

Helix hortensis.

Oban, April 1894, var. *lutea* 12345 (William Evans).

Helicigona arbustorum.

Innellan, a few (Alex. Somerville, January 1886); Dunoon, one, 25th August 1886 (W. D. R.); Lismore Island, juvenile, 12th December 1886 (J. E. Somerville); Oban, April 1894 (William Evans); var. *cincta*, one on limestone, Isle Lismore (Alex. Somerville, 29th July 1889); Ben Lui at about 1500 to 2000 feet up, 6th July 1901, six type, rather thin and nearly all immature, one immature var. *flavescens*, and one small var. *marmorata*, all collected by A. M. Rodger (Perth Museum).

Helicella itala.

Isle of Lismore, on limestone (A. Somerville, 29th September 1889).

Helicella caperata.

Isle Lismore, type and var. *ornata* numerous, August 1893 (R. Standen and J. Ray Hardy).

Hygromia striolata (rufescens).

Kilchurn Castle, Loch Awe (Alex. Somerville, January 1886); Hunter's Quay, a few each of type and var. *rubens*, and one of var. *albida*, 25th August 1886 (W. D. R.); Inveraray, on a garden wall, three, immature (W. Turner, 6th October 1887); Oban, one, April 1894 (William Evans).

This marks the northern range of this species on the western slope of Scotland.

Hygromia hispida.

Isle of Lismore, 14th December 1886 (J. E. Somerville); Ardenadam, Hunter's Quay, Dunoon, var. *hispidosa*, common, associated in the last place with numerous var. *concinna* and one var. *albida*, all 25th August 1886 (W. D. R.); var. *subrufa*, near Glen Morag, one, 25th August 1886 (*id.*).

This marks the northern limit of the species on the western side of Scotland. It is found also in the adjoining vice-counties, Dumbarton, Clyde Isles, Cantire, and Ebudes South.

Hygromia granulata.

Kilchurn Castle, Loch Awe, two (Alex. Somerville, January 1886).

This marks the northern limit so far as yet known on the western side of the Scottish mainland, but it has also been verified for Ebudes South, Ebudes Mid, Ebudes North, as well as Cantire and the Clyde Isles.

Pupa cylindracea.

Oban, a few (Alex. Somerville, January 1886); Innishail Island, Loch Awe, plentiful (*id.*); at foot of old red sandstone conglomerate rocks, in wood chiefly oak, larch, and spruce, along Kerrera Sound, Oban, adult and juvenile, 14th December 1886 (J. E. Somerville); Dunoon, a few, 25th August 1886 (W. D. R.); Dunoon, several, 1886, Alex. Shaw (in coll. R. Standen).

Pupa muscorum.

Isle Lismore, several, August 1893 (R. Standen and J. Ray Hardy).

Vertigo antivertigo.

Bog near Pulpit Rock and Loch Oich, 1900 (W. H. Heathcote).

Vertigo substriata.

Dunollie, Oban, a few (R. Standen, 1912).

Vertigo pygmaea.

Dunollie, Oban, several (Robert Standen, September 1912).

Sphyradium edentulum.

At foot of old red sandstone conglomerate rocks, in wood chiefly oak, larch, and spruce, along Kerrera Sound, Oban, 14th December 1886 (J. E. Somerville); Ardbairn Crag, Oban, with var. *columella* (W. H. Heathcote, 1901).

Balea perversa.

Kilmun, quite common in crevices on maple trunks, but nowhere else, 12th June 1886 (Andrew Scott); Inveraray (F. G. Binnie, before 1890).

Clausilia bidentata.

Oban (in coll. R. D. Darbishire, September 1885); Dun-

staffnage, Oban, numerous (Alex. Somerville, January 1886); Loch Awe, numerous, including some var. *tumidula* (*id.*); at foot of old red sandstone conglomerate rocks, in wood chiefly oak, larch, and spruce, along Kerrera Sound, Oban, 14th December 1886 (J. E. Somerville); Inveraray, April 1887 (*id.*); Dunoon and Glen Morag, in great profusion, 25th August 1886 (W. D. R.).

Cochlicopa lubrica.

Oban, a few (Alex. Somerville, January 1886); near Glen Morag, Dunoon, a few, juvenile, 25th August 1886 (W. D. R.); Isle of Lismore, 14th December 1886 (Alex. Somerville); var. *viridula*, Dunoon, one, 25th August 1886 (W. D. R.).

Carychium minimum.

Oban (British Museum, September 1886).

Succinea putris.

Isle Lismore, numerous, August 1893 (R. Standen and J. Ray Hardy).

Limnaea peregra.

Pool near Loch Awe, Captain Bedford (in coll. A. Merle Norman, 21st November 1884); var. *ovata*, small form, Dalmally (Alex. Shaw, 12th June 1889); var. *labiosa*, pond near Loch Creran (coll. A. M. Norman, 21st November 1884); var. *picta*, Oban, Captain Bedford (*id.*).

Physa fontinalis.

Lochan Dubh, near Oban, a few, August 1893 (R. Standen and J. Ray Hardy).

This locality is the farthest north at which the species has so far been verified for the western side of Scotland

Planorbis albus.

Lochan Dubh, near Oban, numerous, August 1893 (R. Standen and J. Ray Hardy).

This locality is the farthest north for which the species has been authenticated from the western side of Scotland.

Planorbis contortus.

Loch Gilp, abundant in a pond near the shore, David Robertson (Kelvingrove Museum, Glasgow, May 1913).

Ancylus fluviatilis.

Near Glen Morag, Dunoon, several, 25th August 1886 (W. D. R.).

Valvata piscinalis.

Lochan Dubh, two, August 1893 (R. Standen and J. Ray Hardy).

This locality, and Ebudes Mid vice-county, are the farthest

northern localities for which the species has been authenticated for the western slope of Scotland.

Paludetrina stagnalis.

Loch Gilp, in a pond near the shore, one, David Robertson (Kelvingrove Museum, Glasgow, 12th May 1913).

Unio margaritifer.

River Orchy, near where it flows into Loch Awe, two (Alex. Somerville, January 1886): Loch Awe, one (G. A. Frank Knight).

Pisidium pusillum.

Loch Gilp, a few in a pond near the shore, probably collected by David Robertson (Kelvingrove Museum, Glasgow, May 1913).

Pisidium obtusale.

Loch Gilp, a few in pond near the shore (Kelvingrove Museum, Glasgow, May 1913, probably collected by David Robertson).

Not much has been published in respect of the area now dealt with or any part of it, but there is one paper of capital importance, by R. Standen and J. Ray Hardy, on "The Land and Freshwater Mollusca of Oban and the Island of Lismore" (*Journal of Conchology*, Oct. 1893, vol. 7, pp. 266-274), which includes a couple of pages of most informing introductory matter concerning the district and its physical characteristics. This list includes records of 7 slugs, 36 land and 10 freshwater shells—altogether 53—curiously enough the same total number as is contained in the present paper. The species recorded by Messrs Standen and Hardy which have not so far been authenticated for the Conchological Society's record-scheme, and not therefore includible in this paper, are ten in number, as follows:—

Hyalinia draparnaldi.

Zonitoides nitidus.

Punctum pygmaeum.

Vallonia pulchella.

Vallonia costata

Pupa anglica.

Planorbis crista.

Planorbis spirorbis.

Limnea truncatula.

Pisidium fontinale.

Besides these, I have seen mention of *Hygromia fusca* and *Planorbis glaber* having occurred in the vice-county, which

have not so far been duly authenticated for the Society, while such other species as *Limax cinereo-niger* and *Succinea elegans* may fairly be expected to occur; and it would even be within the bounds of possibility to hope for the discovery of *Helicella acuta*, which occurs in the neighbouring vice-counties of Cantire, Clyde Isles, Ebudes South, Mid, and North.

I shall always be pleased to enlist assistance, and to have—in my capacity as Hon. Recorder of the Conchological Society—specimens sent with detailed data as to locality, date, habitat, frequency, etc., for record, either from this or any other Scottish area. Consignments may be addressed to me at 259 Hyde Park Road, Leeds.

Addendum.

Since the above was printed, I find that there are records of eight species additional to the list, viz. :—

<i>Zonitoides nitidus</i> , several,	} found at Oban in April 1894 (Wm. Evans).
<i>Punctum pygmaeum</i> , one,	
<i>Hygromia fusca</i> , two,	
<i>Pupa anglica</i> ,	
<i>Succinea elegans</i> , one,	
<i>Limnaea truncatula</i> , a few,	
<i>Planorbis glaber</i> , several small,	
<i>Pisidium fontinale</i> , one,	

Making a total list of 61 species.

Along with these, Mr Evans also submitted several small *Limax arborum*, one each of *Agriolimax agrestis* and *A. lavis*, a few *Arion hortensis*, many *A. circumscriptus*, a few *A. intermedius*, a few *Vitrina pellucida*, several *Hyalinia cellaria* (with one var. *albinos*), several *H. nitidula*, one *H. pura*, several *H. crystallina*, one *H. fulva*, a few *Zonitoides excavatus*, one *Pyramidula rotundata*, one juv. *Helix aspersa*, one immature *Helicigona arbustorum*, one small *Hygromia hispida* var. *hispidosa*, a few *H. granulata*, a few *Pupa cylindracea*, one *Vertigo pygmaea*, several *Sphyradium edentulum*, many *Clausilia bidentata*, a few *Zua lubrica* (including one var. *lubricoides*), a few *Carychium minimum*, several *Succinea*

putris, one *Limnea peregra*, a few *Ancylus fluviatilis*, and a few *Pisidium pusillum*, all from the same locality, together with several immature *Hygromia striolata* from Dunstaffnage Castle.

In the same year, Mr G. A. Frank Knight submitted *Hyalinia cellaria*, *Pyramidula rotundata*, and *Pupa cylindracea*, from islands in Loch Ridden; several *Limnea peregra* var. *ovata*, and one *Helix aspersa*, from Auchenlochan; several *L. peregra* var. *ovata*, from Loch Meldalloch, near Tighnabruaich; *Vitrina pellucida* and *Pyramidula rotundata*, from Strachur, Loch Fyne; one *Ancylus fluviatilis* and several *L. peregra*, from the Pass of Brander, Loch Awe; one each of *Hyalinia alliaria* and *H. nitidula*, from islands in Loch Awe; and an example of *Helicigona arbustorum* taken at 700 feet alt., on Ben Chrois, near Arrochar.

All these were recorded by myself in the *Annals of Scottish Natural History* for July 1895, pp. 152, 153, 154.

[We hope to publish in our October issue a further article by Mr Roebuck, dealing with the county of Wigtown. Readers who are in possession of any Mollusca from this area may materially assist by forwarding, without delay, specimens to the address given above.—EDS.]

Wryneck in Aberdeenshire.—I am informed that a male Wryneck was sent to the University of Aberdeen from the Fraserburgh district in the second week of May 1916. Beyond the statement that it had been brought alive to the sender a few days previously, no details could be obtained, but the bird had presumably been captured locally about that time. The species is seldom recorded from this area.—A. LANDSBOROUGH THOMSON, Argyll and Sutherland Highlanders.

Goldcrest's unusual Nesting-place.—I have just inspected the nest and eggs of a Goldcrest, which exhibit a departure from the normal in several respects. The nest was built in a privet hedge, and consequently is not of the almost spherical form commonly found in trees: this one is almost barrel-shaped. A small cavity at the top contains the eggs, which are only four in number, so that the bird appears to have deserted before the clutch was complete.

There is no lining of feathers, but the interior is warmly felted with wool. Curiously enough, the last egg laid, although similar in shape and markings, is considerably larger than the others.—T. M'GREGOR TAIT, Berwick-upon-Tweed.

Little Gull near Glasgow.—On 16th, 18th, 19th, 20th, and 21st May 1916, an immature Little Gull (*Larus minutus*) was seen by my friend, Mr D. Macdonald, on a small marsh on the right bank of the Kelvin, near Summerston: and, in his company, I had the pleasure of observing it on the last two of these dates. Its flight was desultory, as Seebohm has remarked. Occasionally it dipped down to the water, and, while its wings were raised nearly vertically, picked something from the surface: but usually it caught its prey in the air, apparently sharing the same fare as the Swallows and Sand-martins, which were always present in varying numbers. In its pursuit the Little Gull was almost as tireless as the Hirundines. I did not see it rest at all, although Mr Macdonald noticed it settle once or twice on a grassy spit. So far as I know, there are only three previous records of the Little Gull for "Clyde." The present one applies to Lanarkshire as well as to Dumbartonshire; the river Kelvin forming the county boundary, which our bird, in its circuit, crossed and recrossed.—JOHN ROBERTSON, Cathcart, Glasgow.

Goldfinches in Mid-Lothian.—On the 22nd April (1916) I, in company with Messrs Hugh Cleland and William Scott, Edinburgh, had the pleasure of observing a pair of Goldfinches (*Carduelis elegans*) near Rosebery, Mid-Lothian. I first of all noticed one bird sitting on a beech tree at the roadside. After I had viewed it through my field-glasses for a time, it flew away and was joined by its mate, which had evidently been sitting close at hand unobserved.—BRUCE CAMPBELL, Edinburgh.

Early Appearance of Swift.—The first Swift (*Cypselus apus*) arrived at Duddingston this year on 24th April; I watched it for a little time careering round the Kirk tower: the following day there were two, and immediately thereafter a few more have come. In my notes dating back to 1881, I have only one other record for the Swift in April. I saw *Hirundo rustica* for the first time on the 27th April. The Willow-warbler was in song in my garden on the 17th April. I had seen one previously this year near Beaulieu, Hampshire, on the 4th April.—WILLIAM SERLE, Duddingston.

The Silver-striped Hawk-moth (*Chœrocampa celerio*, L.) in Edinburgh.—Through the kindness of my neighbour, Mr J. H. Young, I am the proud possessor of a specimen of this fine Sphingid which he captured in his back garden at 45 Morningside Park, Edinburgh, on 30th September last year (1915). It was at rest on a chrysanthemum late in the afternoon, and was easily taken. It is a female, and, though a little "worn," is a wonderfully good specimen considering that no special care was bestowed on it. By means of a stout pin it had been stuck on the inside wall of the tool-house, where it remained till I saw and identified it a couple of months ago.

Chœrocampa celerio occurs not unfrequently, as an immigrant, in England, more especially in the southern counties, but it is a great rarity in Scotland, where, however, it has been taken as far north as Aberdeen, Banff, and Ross, and as far west as Mull. In the Lothians I know of no previous records of its capture except the two given by J. C. Howden in the *Zoologist* for 1849 (p. 2401), namely, one got at Hopetoun House, West Lothian, in September 1848, and one taken prior to that year at West Barns, near Dunbar, East Lothian, by Dr Charles Nelson, in whose collection (now in the Royal Scottish Museum) I first saw it about fifty-five years ago. The only other Forth records seem to be from Alloa, 21st September 1864, and Culross, 19th September 1864, which Tutt (*Brit. Lepid.*, iv., p. 131) thought probably refer to the same specimen. The two Lothians records, it may be remarked, appear to have escaped Tutt's notice.—WILLIAM EVANS, 38 Morningside Park, Edinburgh.

The Water-rail at St Kilda.—In the *Scottish Naturalist* for last April Mr Eagle Clarke reports the occurrence of a Water-rail (*Rallus aquaticus*) at St Kilda, obtained last autumn, which he states has not been previously recorded for that island. The first known occurrence of the Water-rail at St Kilda was a bird sent me by my correspondent there, which was captured there on 3rd November 1903, the year after my visit to the island. This bird is still in my possession. Mr Eagle Clarke has obviously forgotten the fact that I supplied him with this record, and that he has himself published it in his work, *Studies in Bird Migration*, vol. ii., p. 229, 1912. It is interesting to note that this second example, which has recently come into Mr Clarke's hands, also occurred in the autumn.—J. WIGLESWORTH, Winscombe, Somerset.

***Acanthocinus ædilis*, L., at Lauder.**—A strange beetle was noticed in Lauder—5th July—on the splash-board of a motor car which had stopped for repairs on its way north. The creature was

sent to myself, and proved to be one of the Longicorns—*Acanthocinus edilis*, L., the Timberman Beetle. The antennæ were fully three times the length of the body and in perfect condition, so that it was evidently a male.—WM. M'CONACHIE, Lauder.

[Two examples, doubtless imported with pit-props, taken at Granton, near Edinburgh, on 16th and 19th August, have been sent to us.—EDS.]

BOOK NOTICE.

MEDICAL AND VETERINARY ENTOMOLOGY. By William B. Herms. New York: The Macmillan Company, 1915. 8vo, 393 pp. Price 17s. net.

Of late years the study of economic entomology has taken its place as an essential part of the training of the medical officer, the veterinary surgeon, and the public health official. It is not surprising, therefore, that many volumes have recently appeared, with the object of affording the student the means of acquiring an adequate knowledge of the various groups of insects which have some influence, noxious or otherwise, on the welfare of mankind. These works also endeavour to impart to their readers information of a practical nature, designed for the control of the various pests which attack man himself, his domestic animals, and his cultivated plants. On many occasions we have had the opportunity of noticing works of this nature in our pages, and that now open before us will compare favourably with any that we have seen. After a general discussion on the control of insect-borne diseases, the origin and effects of parasitism, and the general features of insect anatomy and classification, the various groups are treated systematically and in full detail. Thus one chapter is devoted to cockroaches, beetles, and thrips; the next to the various groups of lice; another to bedbugs and their allies; three to mosquitoes and their control; one to "buffalo gnats" (*Simulium*) and "horseflies" (Tabanidæ); two to the house-fly and its control; one to the various blood-sucking Muscidæ (tsetse flies, stable flies, etc.); one to the various forms of myiasis and the insects concerned therein; one each to fleas, ticks, and mites; and finally one treating of venomous insects and arachnids. A useful feature of the text, which is excellent throughout, is the employment of a heading in heavy type for each paragraph or section, enabling the student to find readily the exact kind of information required. The book is well printed, the type clear, and the illustrations (numbering well over two hundred) adequate and well-chosen. The weight of the volume (3 lb.) is its only objectionable feature, but this is a common fault of works published in America.

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[OCTOBER

EDITORIAL.

It is possible to derive a certain amount of amusement from the efforts of our strict priority-mongers. In a communication by Oldfield Thomas on the generic names *Rattus* and *Phyllomys*,¹ the author confesses his disappointment at the discovery that the name *Rattus* was used earlier than he anticipated for the ordinary Rats, and, therefore, has priority over *Epinys*, which he hoped could be accepted. As a consequence, his "attempted use of *Rattus* for Azara's Spiny-rat fails, and this animal will have to bear in future the burden of *Euryzygomatomys* as its generic name." Poor creature!

A paper entitled "Some Dental and Cranial Variations in the Scotch Wild Cat (*Felis sylvestris*)" by R. I. Pocock² will interest the student of our native mammals, although of a highly technical nature. The varying characters referred to, are the presence of extra premolar teeth in both upper and lower jaws, the interlocking of the carnassial teeth, and the junction between the frontal and squamosal bones of the skull.

The British Fishes of the Subfamily Clupeinæ form the subject of a recent paper by C. Tate Regan.³ The first section of this paper is systematic, describing in detail six species of *Clupea* (Herring, Sprat, etc.), five of *Alosa* (Shad),

¹ *Ann. and Mag. Nat. Hist.*, August 1916, p. 240.

² *Ann. and Mag. Nat. Hist.*, Sept. 1916, pp. 272-277.

³ *Ann. and Mag. Nat. Hist.*, July 1916, pp. 1-19, plates i-iii.

and three of *Sardina* (Pilchard or Sardine). Synoptical tables are given, and certain new species and subspecies described. General accounts of the geographical distribution, biology and economics of these important food-fishes conclude the article, which should be useful and authoritative. One of the plates is in the shape of a map showing the distribution of the various forms of *Sardina*.

In his "Notes from the Gatty Marine Laboratory, St Andrews—No. xxxix."¹ Professor M'Intosh deals with (1) the coloration of *Cæsicirrus neglectus*, Arwidsson; (2) *Cirratulus (bioculatus) incertus*, M'I.; (3) the British Serpulidæ; and (4) a *Placostegus*, from the "Porcupine" Expedition of 1870. In the 3rd of these sections, which occupies some thirty-four pages, an interesting summary is given of the Serpulids obtained by exploring ships and by zoologists in various waters in order to indicate the proportional abundance of the British species. This summary is followed by a detailed description of all the British species, fifteen of which are admitted by the author, and one of them, *Spirorbis caulleryi*, described as new. Professor M'Intosh's careful investigations cannot fail to be of the utmost service to students of our native marine worms.

The volume of Proceedings of the South London Entomological and Natural History Society for 1915-16 contains several papers well worthy of perusal. Alfred Sich contributes (pp. 15-20) a "Life Cycle of *Tortrix viridana* L.," in which all the stages of this common little moth are fully described, with details as to the time occupied by each. An interesting statement at the conclusion of the paper indicates the relative abundance of the species, for of sixty-two cocoons gathered at random off oaks nearly 89 per cent. yielded *T. viridana*. Pages 25 to 28 contain a well-written account, by a Belgian author, Constant Sano, of the metamorphoses of the Common Dor Beetle (*Geotrupes stercorarius*), accompanied by an excellent photographic plate depicting the egg, larva and pupa of this well-known insect. Then follow two useful articles by W. J. Lucas, one of the most active members of the Society. The first of these is on

¹ *Ann. and Mag. Nat. Hist.*, August 1916, pp. 161-199, plate vii.

"British Cockroaches," in which we find a capital summary of the distinguishing characters, habits and distribution of the native species, and such as have repeatedly occurred as introductions in Britain, together with an enumeration of such as have only been found casually. To simplify the identification of the former, eight in number, an artificial key is given; while of the latter some fourteen are mentioned. This paper cannot fail to be of much service to students of our Orthoptera, while the same remark applies to the later article (pp. 50-54) on "British Crickets" by the same author. This is treated in precisely the same style, four species being noted as truly British and six as purely casuals.

The microscope is ever throwing more and more light upon those tiny organisms which lie at the bottom of the scale of creation, and recent investigations tend to show how dependent we are for our livelihood upon a proper control of creatures of whose very existence man has been for long ages totally ignorant. The lowest class of animals, the protozoa, are a vast assemblage of creatures almost unlimited in variety of form, and armed with a subtle potentiality of disease and destruction terrible to contemplate. One of the latest results of research among these tiny atoms, with their gigantic possibilities, has been to prove that there are certain forms present in our soils which are inimical to the welfare of those bacteria whose activity enables a normal soil to attain its full fertility. In this connection, Dr T. Goodey's recently published "Observations on the Cytology of Flagellates and Amœbæ obtained from old Stored Soil"¹ is of considerable interest and importance. Five different species were investigated, three Flagellates and two Rhizopods, both the latter and one of the former group being described as new. A full account of the structure, methods of reproduction and systematic position of each of these minute organisms is given, while the beautifully executed plates convey a very clear impression of their appearance in different stages when stained and viewed under a high magnification. One of the most interesting features of the investigation lies in the fact that the soil in which these protozoa were found had been

¹ *Proc. Zool. Soc.*, 1916, pp. 309-332, plates i-iv.

bottled in the years 1865 to 1870, thus proving that their vitality was not impaired after a close confinement of half a century!

THE BIRDS OF BRITAIN. By A. H. Evans, M.A., F.Z.S., M.B.O.U.
Cambridge University Press. Price 4s. net.

This little book is primarily intended for the use of schools and we think that as an introduction to the birds of Britain, it will prove most useful to a large circle of readers. Each of the commoner species is briefly but clearly described, and the range of the bird indicated, while at the end we have a list of the occasional and rare visitors. The introduction "On the Class Aves, or Birds in General" is the work of a master hand. In it, the author deals concisely with many interesting branches of the subject, such as moult, flight, migration and distribution; only long and profound study could enable anyone to treat this vast subject so briefly and yet so clearly. The summaries, introducing the families, are models of their kind. The book is illustrated by photographs chiefly taken from nature; most of these are excellent and some are quite charming, others, however, as is almost inevitable, are disappointing. That labelled "Spotted Flycatcher" on page 65 is upside down and appears to us to represent the Pied Flycatcher. A very useful illustration is that on page 4 showing the nomenclature of the external parts of a Falcon.

The author's method of dealing with the sub-species is unfortunate and in some cases very misleading. He frequently fails to make clear the difference between the distribution of the species and that of the sub-species, for instance, when dealing with the "Common or Song Thrush (*T. musicus clarkii*)," he states that "its foreign range is not very dissimilar to that of the last species" (Missel Thrush), qualifying, however, this statement by adding, "but the Continental form is distinguishable from the British in coloration." Had Mr Evans been treating of the species as a whole, this distribution would have been correct, as, however, he is dealing with our British bird under a trinomial it is decidedly confusing. Several other birds are treated in the same confused manner, while others, such as *P. ater britannicus* are quite clearly put and it seems a pity that one clear method had not been followed in every case. It would be interesting to know on what grounds Mr Evans founds his statement that the increase of Great Spotted Woodpeckers breeding in Scotland is attributable to the autumn immigrants from the Continent. As far as we know all the Scottish breeding birds which have been critically examined, belong to the same race as those which breed in England, viz. *Dryobates major anglicus*. Apart from the above criticisms, and a few slips such as, "Loch Leven in Fifeshire," which should of course be Kinross-shire, the book is one of much merit, and the perusal of these scholarly pages will, we feel sure, give pleasure not only to the tyro, but also to the veteran ornithologist.

THE NEW "BIBLIOGRAPHY OF BRITISH ORNITHOLOGY"¹

THE first two parts of this welcome publication have now appeared, and it is with feelings of admiration, not to say amazement, that the reader will peruse these, the first 240, pages of what will certainly prove to be the standard work on the subject. In a prospectus the authors claimed that their aim had been "to give a biographical account of each author or co-author of a separately published work, followed by a complete bibliography of published works or contributions to works, and of papers contributed to journals (where such exceed one page in extent), bearing on British Ornithology, and published before 1912. Collations are given in all possible instances, together with verbatim spaced titles of separate works published before 1850, and shorter titles of those published since that date. Critical notes on many of the books are also included. Works containing birds, extra-British as well as British, are included and marked with an asterisk (*)." It will be seen from the above that Mr W. H. Mullens and Mr H. Kirke Swann set themselves an enormous task, and this they have performed with the erudition and care which was to have been expected of two such eminent authorities. Although the preliminary first two parts only cover from A to G, it may be observed that no less than 286 different authors are here dealt with, to whom close on 1385 publications or papers are accredited. As regards the printing, paper, and general get-up of the work, this is worthy of the traditions of the house of Messrs Macmillan & Co.

A note, printed in red and inserted at the commencement of Part I., intimates that the authors would be very grateful

¹ A Bibliography / of / British Ornithology / from the Earliest Times / to the End of 1912 / By / W. H. Mullens, M.A., LL.M., F.L.S., M.B.O.U. / and / H. Kirke Swann / Macmillan & Co., Limited / St Martin's Street, London / 1916 // (Parts I. and II., price 6s. net per part.)

for any notes of errors or omissions. We suggest that any such might be printed later in a supplement *on one side of the page only*, so that the owner of the complete work may be able, if he so wishes, to cut up these supplementary pages and insert the slips in their proper places. The errors and omissions which we have noticed are so few and unimportant that it would not be just to disparage the whole work by detailing them in this review. In accordance with the authors' printed request we have, however, brought a few mistakes to their private notice, so that they can subsequently make use of our information as they may see fit.

We understand that "by way of Supplement a Geographical Bibliography, in which the books and articles, as well as the ornithological matter in topographical books, will be arranged under their separate counties, thus affording an index to the work accomplished in the various districts." This "county index, in which will be included not only short titles of the books, but all articles and notes in periodicals by every writer, provided they are of a faunistic nature," should prove as invaluable to the student as the labour of its compilation must have proved gigantic to the authors.

In the first two parts, now to hand, we have sufficient evidence to show how thoroughly the Authors have ransacked every possible source of information; we may therefore confidently state that when the work is completed it will be one which will be indispensable to every public library and to every individual who is a student of local Ornithology or Bibliography. It may certainly be said that any author with but the slightest claim for inclusion as a writer on ornithology has been mentioned in this work, and that, from a strictly utilitarian point of view, the book might have been curtailed to about one-half without omitting any publication of real ornithological value; so far from thinking this a fault, we consider it additional testimony to the indefatigable research of Messrs Mullens and Kirke Swann.

H. S. G.

THE FIRTH OF FORTH RECORD OF THE LEVANTINE SHEARWATER.

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

IN several recent publications one meets with the bare statement that the Levantine Shearwater (*Puffinus puffinus yelkouan*) has been recorded for Scotland, namely, from the "Firth of Forth."¹ As the authority for the record, and the details of the occurrence do not appear to be generally known, it seems desirable to give publicity to the facts of the case in the pages of the *Scottish Naturalist*. Shortly they are as follows:—The specimen was shot by the late E. T. Booth, on 19th August 1874, at the mouth of the Firth of Forth (without doubt, as I shall presently show, somewhere between the Bass Rock and the Isle of May), and is preserved in the Booth Museum, Brighton. Booth regarded it as an immature example of our Manx Shearwater (*P. p. puffinus* = *P. anglorum*), and it was left to Howard Saunders to recognise it as belonging to the Levantine subspecies. This identification appeared in the supplement to the third edition of the *Catalogue of the Booth Museum*, and thence was gleaned into *British Birds* (magazine) for February 1910 (vol. iii., p. 295).

First-hand information regarding the occurrence is to be found in Booth's important work, *Rough Notes on the Birds observed during Twenty Years' Shooting in the British Islands*, part xii., 1886. Under the heading "Manx Shearwater," we there learn that on 14th August 1874, during a gale from the north-east, the author saw parties of Shearwaters from the May till within about a couple of miles of the Bass (on one or two occasions only had he ever seen any between the Rock and the shore). They were seen also on the 15th beyond the Bass. On the 19th, when the weather was fine, he was out again, clearly in the same waters, and met with small parties of from two or three to a dozen. On this occasion he "procured two or three with perfectly white

¹ See, for instance, *A Handbook of British Birds*, 1912, and the new edition of the B.O.U. List.

breasts, and one on which the plumage of the throat, breast, and belly was of a uniform dusky grey." With the latter specimen in his mind he makes the following remarks:—"No opportunity of examining the young having fallen to my share, I am unable to state the colouring of their first feathers; it is probable, however, that these dark-tinted birds were immature." In October 1887, I visited Booth's Museum at Brighton, and noted, among other interesting birds procured in the Forth Area, the case containing these Shearwaters, two white-breasted specimens and the dusky one. In the index to the *Catalogue* (1876, p. 7) they are entered as "male, female, and immature."

The presence of large numbers of Manx Shearwaters in the Firth of Forth during the summer half of the year has long been known, and has been a matter of peculiar interest to me (see notes in *Ann. Scot. Nat. Hist.*, 1903, p. 26, and *British Birds*, ii., p. 421). Where are the breeding haunts of these parties—at times they amount to flocks—that visit the Forth in summer? That they do not breed in this area,¹ or, indeed, anywhere on the east of the mainland of Great Britain, is practically certain. Are they birds belonging to a Shetland or other northern (or even western) colony, or are they from some southern nesting-grounds down in the Atlantic—the Madeira group of islands, for instance, which is understood to be a great stronghold of this Shearwater? That those present in the Forth in mid-summer, wherever they come from, are non-breeding birds—chiefly birds, let us say, but one year old—seems highly probable, when we consider that the breeding-season is at its height in May and June at Madeira,² as well as in the British habitats.

¹ In an article on the Birds of the Bass, etc., by the Hon. Walter (now Lord) Rothschild, which appeared in the *Nineteenth Century Magazine* for October 1898, it is stated that the Manx Shearwater breeds on the Bass Rock. The author subsequently informed me (*in lit.* 3.12.98) that his grounds for the statement were that he had seen old and young in the neighbourhood of the Rock, and that fourteen or fifteen years previously the late Mr Robert Chambers told him they bred there. Did they really breed on the Bass, we may be sure proof of the fact would have been forthcoming ere this.

² See Bannerman, *Ibis*, 1914, p. 473.

In August and September it may be that they are joined by adults and young. The presence along with the typical race of the Levantine bird, and also of the Sooty Shearwater (*P. griseus*), lends some countenance to the southern aspect of the case; but the question cannot be answered with any degree of confidence on the basis of our present all too imperfect knowledge.

The points in which *P. p. yelkouan* differs from the typical race, or Manx Shearwater, are alluded to in a paper by Misses Rintoul and Baxter in this magazine for June last, and no distinction is drawn between adult and immature plumages. Saunders, in the second edition of his *Manual*, says that, in the Manx Shearwater, "The young bird resembles the adult and has white under-parts." The Levantine Shearwater he describes as "browner in tint than our Manx Shearwater, and not only are the under tail-coverts and flanks dusky-brown, but the immature bird is dusky on the belly; it is moreover a larger species throughout." With reference to the last clause, it may be mentioned that, according to Salvin (*Brit. Mus. Cat.*), the total length and wing are equal in both forms, slightly longer tarsi and toes being, however, assigned to *yelkouan*. This author does not differentiate between adult and immature birds. In search of further light on these points I wrote to Mr Ogilvie Grant of the British Museum, where there is a fair series of specimens for comparison, and he has kindly favoured me with the following valuable notes.

"*Puffinus anglorum*.—The young Manx resembles the adult and has white underparts and under tail-coverts, or the latter more or less mottled with dusky on the outer webs.

"*P. yelkouan*.—Has the longer under tail-coverts mostly or entirely dusky (smoky brown), and often the sides, flanks, and belly similarly coloured. These characters are *variable*, and I agree with Godman (and Sharpe)—*Monogr. Petrels*—that the more dusky birds are *not* necessarily immature. Our material is, however, not sufficient to be certain on this point.

"The *most reliable* distinguishing character is to be found in the axillaries.

"*P. anglorum*.—Axillaries white, sharply tipped with dark smoky brown, or even uniform white.

"*P. yelkouan*.—Axillaries dusky, smoky brown."

Any of our readers who may possess specimens of *P. puffinus* from the Forth or elsewhere off the east coast of Scotland, would do well to have them carefully examined in case there should happen to be a *yelkouan* among them. The Levantine Shearwater roams from the Mediterranean into the Atlantic and North Sea, and has been reported, even in numbers, off the coast of Yorkshire.

Bird Notes from Lauderdale.—Within the past few years the Woodcock has largely increased as a nesting species in Lauderdale. In connection with this increase the following fact may be of interest. I have it on the authority of Mr Cossar, head keeper here. In a letter he writes:—"A most extraordinary thing was observed on this estate this season. One of the woodmen drew his mate's attention to a Woodcock on its nest. 'There are two of them,' he answered. And so there were two birds, sitting practically touching one another. Unfortunately, on the felling of a tree beside them, they forsook the nests, one with four, the other with three eggs."

Mr Cossar also, in a letter of 27th June, mentions the presence of two pairs of Quail on a farm close to his house. "During the last ten days," he says, "I have been hearing Quail calling in two different places near here, and have reason to believe there will be a pair in each case, and that they may be nesting. One was calling quite a long time before and after five o'clock. I hear them, however, most about daybreak, and through the night they fly round and round, uttering their call in the same way we have noticed the Waterhen do." In a letter of 19th July, Mr Cossar adds an interesting fact as to his experiences of the ventriloquial powers of the Quail. He remarks of one that a bird followed himself and a friend with a retriever for some distance through a grass field, calling all the time. Their efforts to find the Quail with the dog were without any result; the bird never showed, but began calling again as soon as they left off searching over a limited extent of the grass field. There seems no question of their nesting.—WM. M'CONACHIE, Lauder.

WIGTOWNSHIRE AND ITS INLAND MOLLUSCAN FAUNA.

By W. DENISON ROEBUCK, M.Sc., F.L.S.

THE County of Wigtown or Shire of Galloway, with its characteristic hammer-head outline facing the north-east coast of Ireland across $21\frac{1}{2}$ miles of sea, and exposed to the influence of the warmth of the Gulf Stream, has for its distinctive feature its deeply indented and extensive coast line, more than 130 miles in extent, so that no part of the county is more than 13 miles from the nearest sea, and only a small portion is anything like so far. Physically, the county is divisible into three areas:—(1) The Moors, which cover a large tract of the north; (2) the Machars, comprising the low-lying cultivated lands of the south; and (3) the Rhinns, which contain all the peninsular tract lying west of Loch Ryan and Luce Bay, or west of the isthmus between Stranraer and Glenluce. The county does not attain to an elevation of more than 1000 feet, on the Ayrshire border, the hills of Benbrake and Craigairie. There are numerous freshwater lochs, none of great size, and the chief rivers are the Cree, Bladenoch, Luce, and Tarf. The area of the county is 311,984 acres, of which in 1912 115,727 were mountain and heath land used for grazing, 42,709 permanent grass, 113,171 arable land, and 8526 woods and plantations. The geological structure is very simple, consisting entirely of silurian rock, almost the earliest of the stratified rocks, with small outcrops of trap or granite here and there; the only variation of any consequence being a narrow belt of new red sandstone running along the western shore of Loch Ryan. As regards faunistic habitats, there are the mudflats and merse lands of Wigtown Bay, the far-reaching sands of Luce with the considerable stretches of sandhills known as the Torrs, the hilly moorlands and wet flats known as "flows," the numerous lochs and pools, the arable lands and rough pastures, the woods, and the cliffs and pebbly beaches—all tending to form a region which, if properly

worked out, should furnish a goodly list of land and freshwater mollusca.

The material upon which the following list has been based is the result of the labours of about nine observers. Taken chronologically, the earliest in point of date are a few anonymous examples from Lochnaw and Larbrax in the Royal Scottish Museum at Edinburgh; and Port Logan examples, collected by Dr David Robertson, preserved in the Kelvingrove Museum at Glasgow. Specimens collected in 1890, about Portpatrick, by Mr Richard Rimmer, are in the Royal Scottish Museum; and my very good friend Mr William Evans, F.R.S.E., collected during the same year about Stranraer, and also at Ardwell, Knockglass, and Port Logan. Before or about this date Mr P. Adair collected one species at Chippermere, near Port William.

In the year 1909 collecting was systematically carried on by three observers. My friend and ever-faithful companion, Mr John F. Musham, F.E.S., of Selby, who is always ready to undertake special investigation in neglected areas, went at my special request and collected in the neighbourhoods of Portpatrick and Stranraer. During the same month (August) another friend, Miss Marie V. Lebour, M.Sc., of the Zoological Department of the University of Leeds, was working the vicinity of the Isle of Whithorn; and, unknown to us until very lately, the district of Corsemalzie, its burn and its local lochs, was being diligently investigated about the same time by the very able resident naturalist, Mr Jack G. Gordon of Corsemalzie, whose researches also took him to the adjacent shores of Luce Bay. His work has been continued down to the present year, and to him I am indebted for the information embodied in the opening paragraph of this paper. In 1912, my friend Mr Edward Collier, of Manchester, collected mollusca at Garlieston and the Isle of Whithorn. Finally, during the months of July and August of the present year (1916), Mr Alexander Ross, of Glasgow, collected a considerable amount of material about the Isle of Whithorn.

The literature of the subject is but scanty. In the *Proceedings of the Natural History Society of Glasgow*, 1869,

i. 36, the Rev. A. Urquhart published a list of species collected about Portpatrick.

In the *Journal of Conchology* for January 1915, xiv. 266, is a note by Mr John N. Kennedy on "Fluviatile Mollusca from Port Patrick," in which seven species are cited; and in the same journal for July 1915, xiv. 346, is a note by Mr John F. Musham, F.E.S., on his "Additions to the Land and Freshwater Mollusca of Wigtownshire," noting eighteen species and varieties, a number of which had, however, already been recorded from the county by myself in my "Census of Scottish Land and Freshwater Mollusca," published in the *Proceedings of the Royal Physical Society of Edinburgh*, 1890, x. 437-503.

Limax maximus.

Springbank, near Stranraer, one var. *fasciata*, about a third grown, 15th September 1890 (W. Evans); Portpatrick, The Battery, one var. *fasciata*, nearly adult, 16th August 1909 (John F. Musham); small woodland plantation above the harbour, Isle of Whithorn, one young, var. *fasciata*, 1st August 1916 (Alex. Ross).

Limax arborum.

Corsemalzie, abundant, adult and young, typical, under moss, etc., on tree-trunks in a wood, 1st September 1916 (Jack G. Gordon).

Agriolimax agrestis.

Springbank, near Stranraer, one var. *reticulata*, half-grown, 14th September 1890; two immature var. *reticulata*, and two young characteristic var. *nigra*, 15th September 1890 (W. Evans); Stranraer, type, common, 14th August 1909 (J. F. Musham); road-plantation between Isle of Whithorn and Port William, one very young var. *reticulata*, 1st August 1916 (Alex. Ross); small woodland plantation above the harbour, Isle of Whithorn, a few, type, 1st August 1916 (*id.*); Isle of Whithorn, one very young, under stone near shore, 1st August 1916 (*id.*).

Milax gagates.

Portpatrick, The Battery, a few, var. *rava*, 16th August 1909 (J. F. Musham).

Arion ater.

Springbank, near Stranraer, one adult and one young, 14th September 1890 (W. Evans); Stranraer, 14th August 1909,

one adult, var. *atra*, and one young, var. *castanea* (J. F. Musham).

Arion subfuscus.

Stranraer, two, 14th August 1909 (J. F. Musham).

Arion hortensis.

Springbank, near Stranraer, four young, 15th September 1890 (W. Evans); road-plantation between Isle of Whithorn and Port William, one very young, 1st August 1916 (Alex. Ross).

Arion circumscriptus.

Springbank, near Stranraer, three very young, 14th and 15th September 1890 (W. Evans).

Arion intermedius.

Stranraer, one, type, 14th August 1909, and one adult, var. *grisea*, 15th August 1909 (J. F. Musham); Portpatrick, The Battery, one var. *grisea*, 16th August 1909 (J. F. Musham).

Vitrina pellucida.

Springbank, near Stranraer, September 1890 (W. Evans); Corsemalzie, numerous under stones in gardens, 23rd May 1909 (Jack G. Gordon); Portpatrick, The Battery, one, 16th August 1909; Isle of Whithorn, one very young, under stone near shore, 1st August 1916 (Alex. Ross).

Hyalinia cellaria.

Port Logan, September 1890 (W. Evans); Springbank, near Stranraer, September 1890 (*id.*); Corsemalzie, a few, 25th May 1909 (Jack G. Gordon); Isle of Whithorn, one, August 1909 (Marie V. Lebour); Stranraer, a few, 15th August 1909 (J. F. Musham); road-plantation between Isle of Whithorn and Port William, several, 1st August 1916 (Alex. Ross).

Hyalinia alliaria.

Springbank, near Stranraer, September 1890 (W. Evans); Corsemalzie, two young, in garden, 25th May 1909 (Jack G. Gordon); Isle of Whithorn, one young, August 1909 (Marie V. Lebour); Portpatrick, The Battery, one, 16th August 1909 (J. F. Musham); Dunskey Wood, near Portpatrick, a few, 18th August 1909 (J. F. Musham); road-plantation between Isle of Whithorn and Port William, several, 1st August 1916 (Alex. Ross); small woodland plantation above the harbour, Isle of Whithorn, several, 1st August 1916 (*id.*).

(To be continued.)

COLEOPTERA FROM FAIR ISLE.

By Professor T. HUDSON BEARE, B.Sc., F.E.S.

IN Vol. XLII. of *The Entomologists' Monthly Magazine* (1906), p. 77,¹ I gave a list of Coleoptera which had been collected on Fair Isle by Mr Eagle Clarke in September and October 1905. Thirty-five species were included in the list. The majority of these were species which are common and widely-distributed throughout Great Britain. I have recently had an opportunity of examining another collection, made by Mr Eagle Clarke on Fair Isle in September 1907, and I give below a complete list of all the species in the collection, with the number of specimens found in each case. Species which were not in the first collection made in 1906 are indicated by an asterisk. It will be observed that there are ten new species, bringing the total number of species from this island recorded up to the present date to forty-five.

Of the new species two are typically northern species, viz., *Nebria glyllenhali*, Sch., and *Barynotus schönherri*, Zett.; the remainder are fairly widely-distributed species.

It is interesting to note that two species of *Harpalus* occurred in the recent collection, but only a single specimen of each; the genus *Harpalus* is poorly represented in Scotland.

In view of the exposed position of this small island, it is certainly somewhat unexpected to find two species of *Geotrupes*, but the powerful wings of the species of this genus no doubt enable them to cross a fairly wide stretch of water when favourable winds blow; the probability is, therefore, that these two species are merely casual visitors to the island, though the conditions are favourable enough for the species to establish themselves should the immigrants reach the island during the breeding season.

¹ See also *Ann. Scot. Nat. Hist.*, 1906, pp. 81-83.

LIST OF SPECIES.

<i>Carabus catenulatus</i> , Scop.,	(4)	<i>Notiophilus biguttatus</i> , F.,	(1)
<i>Pterostichus niger</i> , Schal.,	(16)	<i>Ocypus olens</i> , Müll.,	(5)
„ <i>nigrita</i> , F.,	(1)	<i>Quedius molochinus</i> , Gr.,	(1)
* „ <i>strenuus</i> , Pz.,	(1)	<i>Tachinus rufipes</i> , De G.,	(5)
<i>Calathus melanocéphalus</i> , L.,		* <i>Agabus chalconotus</i> , Pz.,	(4)
	(15)	„ <i>bipustulatus</i> , L.,	(11)
„ <i>cisteloides</i> , Pz.,	(4)	<i>Chrysomela staphylea</i> , L.,	(7)
<i>Loricera pilicornis</i> , F.,	(9)	* <i>Cryptohypnus riparius</i> , F.,	
<i>Nebria brevicollis</i> , F.,	(3)		(23)
* „ <i>gyllenhali</i> , Sch.,	(2)	* <i>Geotrupes spiniger</i> , Marsh,	(2)
<i>Amara spinipes</i> , Brit. Cat.,	(9)	<i>Otiorhynchus blandus</i> , Gyll.,	
„ <i>apricaria</i> , Pk.,	(9)		(16)
* <i>Harpalus latus</i> , L.,	(1)	* <i>Barynotus schönherri</i> , Zett.,	
* „ <i>ceneus</i> , F.,	(1)		(14)
<i>Bembidium littorale</i> , Ol.,	(1)	<i>Silpha opaca</i> , L.,	(2)
* „ <i>atroceruleum</i> , Steph.,		* <i>Dolopius marginatus</i> , L.,	(1)
	(1)		

NOTES ON COLEOPTERA FROM ST KILDA.

By Professor T. HUDSON BEARE, B.Sc., F.E.S.

IN the *Annals of Scottish Natural History* for 1908, p. 30, I published a note on the species of Coleoptera taken on the island of St Kilda by Mr J. Waterston and Mr C. Gordon Hewitt in 1905 and 1906; the list of captures enumerated sixty-six species. The only previous records from the island I could discover contained the names of ten other species, making the total number of species recorded seventy-six.

In the same issue of the *Annals*, p. 34, Dr N. H. Joy gave a list of forty-nine species mostly found in sea-birds' nests sent to him from St Kilda, and thirty-five of these species were additions to the list I gave, making one hundred and eleven as the total number of species recorded from the island up to that date.

In the *Entomologists' Monthly Magazine* for 1909, p. 3, Dr Joy gave a further list of species found in a sack of turf

sent to him from St Kilda in September 1908; in this list the following species were additions to the lists in the *Annals* for 1908:—*Loricera pilicornis*, F.; *Homalota atricolor*, Sharp; *Conosoma lividum*, Er.; *Atomaria atricapilla*, Steph.; bringing the total recorded species up to one hundred and fifteen.

I have recently had the opportunity of identifying the extensive collection of Coleoptera made by Mr W. Eagle Clarke on St Kilda in the autumns of 1910 and 1911—there were many hundreds of specimens; the great majority of these specimens belonged to five or six dominant species, namely, *Pterostichus niger*, Schal; *Calathus cisteloides*, Pz.; *Nebria brevicollis*, F.; *Ocytus olens*, Müll.; *Quedius umbrinus*, Er.; and *Tachinus rufipes*, De G.—all species widely distributed and usually common throughout the whole of Great Britain.

Mr Eagle Clarke informed me that the majority of the specimens in the collection had been captured by children, who were induced by gifts of sweets to search diligently all over the island for possible specimens; from the species which form the major part of the collection, I am inclined to think that the children chiefly confined their attention to searching under stones, and in the droppings of the sheep and cattle.

As the fauna of this remote island is of great interest in connection with the problem of the geographical distribution of our insect fauna, I give a complete list of the species in Mr Eagle Clarke's collection, and of the number of specimens of each species. Those marked with an asterisk are additions to the previous lists; it will be seen that there are ten of these species, bringing the total record to date up to one hundred and twenty-five. All these ten species are fairly widely distributed and common throughout the kingdom; they are, indeed, what Mr W. E. Sharp (*Ent. Record*, 1913, p. 19, "The Coleopterist in Tiree") calls dominant forms. The only species from St Kilda so far recorded, which belong to the Northern group, are:—*Nebria gyllenhali*, Sch.; *Elaphrus lapponicus*, Gyll.; *Morychus ænens*, F.; *Otiorhynchus blandus*, Gyll.; and *Barynotus schönherri*, Zett., although some of the other species occur more abundantly in the north than in the south.

It is somewhat noteworthy that only one of the eight species of the 1842 record, all of them conspicuous and striking insects, and not, therefore, likely to be passed over, has been found by later workers, namely, *Carabus catenulatus*, Scop., which Mr Eagle Clarke tells me is a scarce insect on the island; there were two specimens in Mr Waterston's collection of 1905, and five in the collection now dealt with.

While the presence on St Kilda of many of the recorded species can be explained by wind action, still there are certain species which it is impossible to imagine can have reached this remote island except across some former land connection; but more systematic collection of specimens throughout the whole year, and carried on for a period of several years, is needed before it is possible to form anything like a definite conclusion upon this most interesting problem.

LIST OF SPECIES.

<i>Carabus catenulatus</i> , Scop.,	(5)	* <i>Quedius mesomelinus</i> , Marsh,	
<i>Pterostichus niger</i> , Schall.,	(47)		(3)
" <i>nigrita</i> , F.,	(16)	" <i>umbrinus</i> , Er.,	(62)
* " <i>strenuus</i> , Pz.,	(33)	" <i>boops</i> , Gr.,	(1)
* " <i>diligens</i> , Stm.,	(1)	<i>Philonthus æneus</i> , Ross,	(13)
<i>Loricera pilicornis</i> , F.,	(13)	" <i>finetarius</i> , Gr.,	(5)
* <i>Amara spinipes</i> , Brit. Cat.,	(3)	* " <i>marginatus</i> , F.,	(2)
		<i>Lathrobium fulvipenne</i> , Gr.,	(18)
<i>Nebria brevicollis</i> , F.,	(264)	* <i>Stenus providus</i> , Er., v. <i>rogeri</i> ,	
<i>Calathus cisteloides</i> , Pz.,	(38)	Kr.,	(1)
<i>Trechus obtusus</i> , Er.,	(1)	<i>Oxytelus rugosus</i> , F. (one is var.	
* <i>Cercyon hemorrhoidalis</i> , F.,	(1)	<i>terrestris</i> , Lac.)	(3)
<i>Tachyporus chrysomelinus</i> , L.,	(2)	* <i>Geotrupes spiniger</i> , Marsh,	(3)
		<i>Aphodius rufipes</i> , L.,	(1)
<i>Tachinus rufipes</i> , De G.,	(354)	<i>Cryptohypnus riparius</i> , F.,	(3)
* " <i>pallipes</i> , Gr.,	(3)	<i>Otiorhynchus blandus</i> , Gyll.,	(21)
" <i>laticollis</i> , Gr.,	(5)		
<i>Ocypus olens</i> , Müll.,	(24)	<i>Barynotus schönherri</i> , Zett.,	(1)
" <i>ater</i> , Gr.,	(3)	<i>Apion cruentatum</i> , Walt.,	(1)
<i>Quedius fuliginosus</i> , Gr.,	(9)	<i>Silpha rugosa</i> , L.,	(1)
* " <i>cinctus</i> , Pk.,	(1)		

DIPTERA NEW TO THE SCOTTISH LIST.

By A. E. J. CARTER.

ALL the insects here mentioned appear to be unrecorded from Scotland. Some of them are fairly common and widely distributed, and their absence from our List is, of course, due to the small number of entomologists who collect or study the Diptera. I have to thank Mr James E. Collin for kind help. All my specimens of Empidæ have been examined by him; some are undescribed species, but I have not included any of them here. Species captured by the Rev. James Waterston are in all cases marked by his initials: all the other records are from my own captures.

1. *Rhamphomyia tibiella*, Zett.—Both sexes taken at Blairgowrie in June 1911-13. The ♀ of a pair taken *in coitu*, 12th June 1913, had the ♂ of a small yellow *Tanytus* sp. as prey. Mentioned by Lundbeck (*Diptera Danica*, iii., 1910) as occurring in England, but not yet recorded in any of our journals.
2. *Empis pennaria*, Fln.—This appears to be a fairly common insect. Both sexes from Bavelaw, 2nd June 1904 (J. W.); Aberlady, 7th June 1904 (J. W.); Cramond, 15th June 1904 (J. W.); Musselburgh, Polton, Blairgowrie, 1st June to 2nd July 1905-12.
3. *Empis æstiva*, Lw.—Apparently not so common as the last. Loch Tay, ♀, 2nd July 1904 (J. W.); Botanic Garden, Edinburgh, 2 ♀♀, 15th July 1904 (J. W.); St Boswells, ♀, 22nd July 1904 (J. W.); Polton, 2 ♂♂, 6th August 1906; Comrie, ♂♀, 10th July 1907; Blairgowrie, ♂, 12th, July 1908.
4. *Hilara clypeata*, Mg.—Aberlady, ♂, 24th May 1904 (J. W.); Blairgowrie, ♀, 1st June 1913.
5. *Hilara cornicula*, Lw.—A small black species somewhat like the last, but having the dorso-central and acrostichal bristles different. Two specimens only. Polton, ♀, 24th June 1905; Blairgowrie, ♂, 13th June 1910.
6. *Hilara thoracica*, Mcq.—Musselburgh, ♂, 17th June 1904; Arniston, ♀, 17th July 1906 (J. W.). The former specimen I identified as *tenella*, Fln., and it was so recorded in *Ann. Scot. Nat. Hist.*, 1906, p. 155.

7. *Hilara bivittata*, Strobl.—Blairgowrie, ♂ ♀, 12th July 1908, ♀, 16th June 1912. This is another addition to Verrall's "List," but is mentioned by Lundbeck (*loc. cit.*) as occurring in England.
8. *Hilara albocingulata*, Wood.—St Boswells, ♀, 22nd July 1904 (J. W.). This interesting species was described by the late Dr Wood in *Ent. Mo. Mag.*, 1913, p. 13, from specimens taken in Herefordshire; apparently it has not been recorded from any other locality.
9. *Hemerodromia albicornis*, Mg.—Blairgowrie, ♂ ♀, 16th June 1913. In Verrall's List (1901) it is noted as requiring confirmation as a British species.
10. *Hemerodromia unilincata*, Ztt.—St Boswells, 2 ♀ ♀, 22nd July 1904 (J. W.).
11. *Drapetis aterrima*, Curt.—Aberlady, ♂, 3rd August 1905. Another species requiring confirmation as British, according to Verrall's List. My insect is the true *aterrima* of Curtis, and is described in *Diptera Danica*, iii., p. 255, as *setigera*, Lw. It appears that Lundbeck is in error in his determination of these two species.
12. *Eutarsus aulicus*, Mg.—Polton, ♀, 6th August 1906. The only specimen I have seen; it has the abdomen darkened towards the apex.
13. *Mydæa nigricolor*, Flin.—Bute, 2 ♂ ♂, 12th September 1904 (J. W.); Arniston, ♂, 7th July 1906 (J. W.); Blairgowrie, ♂, 18th August 1910; Polton, 2 ♂ ♂, 25th June 1915. Meade, Schiner, etc., say this species is rare.
14. *Hydrophoria caudata*, Ztt.—Blairgowrie, ♂, 5th June 1908, ♂, 13th June 1910. Two conspicuous lateral tufts of hair in front of the anal lobes distinguish the ♂ of this species.
15. *Pegomyia gilva*, Ztt.—Comrie, 5 ♂ ♂, 9th to 14th July 1907, answer to this species as given in Stein's monograph (*Wiener Ent. Zeit.*, 1906); it may be, however, only a variety of *vittiger*, Ztt. I know the latter from Aberfoyle, but did not find it at Comrie.
16. *Pegomyia tenera*, Ztt.—Comrie, 2 ♂ ♂, 9th and 12th July 1907. Rather like *univittata*, v. Ros.: care is required to see the darkened tips of the palpi, otherwise it runs down in Stein's Table to *geniculata*. This and *gilva* are both additions to Verrall's List, although *tenera* was included by Meade in his "Descriptive List," 1897. Both are given as distinct species in *Kat. Pal. Diptera*, 1907.

17. *Homalomyia umbrosa*, Stein.—Blairgowrie, ♂, 3rd June 1911.
A distinct species, not known to Malloch when he drew up his paper on the genus published in *Scot. Nat.*, 1912.
18. *Sciomyza dubia*, Fln.—Polton, ♂, 6th August 1906; Musselburgh, 2 ♀ ♀, 26th June 1907. These agree with the description in Hendl's "Revision" (1902). The species was added to the British List by Meade (*Ent. Mo. Mag.*, 1899, p. 102), but it had previously been recorded by Verrall (*Entom.*, 1891, p. 236).
19. *Tetanura pallidiventris*, Fln.—Polton, 2 ♀ ♀, 9th September 1906; Blairgowrie, ♂, 23rd June 1908, ♀, 6th June 1911.
20. *Psila pallida*, Fln.—Aberlady, ♂, 7th June 1904. An entirely pale yellow species, which is certainly the one described by Schiner under this name.
21. *Sapromyza decipiens*, Lw.—Callander, ♂, 9th September 1904. Becker (1895) gives this as a synonym of *sordida*, Hal., but they are distinct. I have seen specimens of the latter from England.
22. *Sapromyza difformis*, Lw.—Blairgowrie, ♀, 12th June 1913. I have also a ♀ from Bonhill (Malloch). This is rather like the common *rorida*, Fln., but has only one sterno-pleural bristle, and the acrostichal bristles are distinctly bi-serial.
23. *Piophilila nigricornis*, Mg.—Blairgowrie, ♂, 25th May 1908.

Cryphalus abietis Ratzb. in Peeblesshire.—On 24th August I found considerable numbers of *C. abietis* on young silver firs on Earlyvale Estate near Eddleston. Some account of its occurrence may be of interest. The wood in which I found it is of considerable extent and consists of spruce and Scots pine with here and there isolated groups of silver fir which have apparently been introduced as underwood. The majority of these firs were in a sickly condition and on these *Cryphalus* was found. Scarcely a stem was free of it. It attacks the tree at each whorl of branches where tiny heaps of "bore meal" indicate its presence. *Cryphalus abietis* is probably widely distributed in Scotland, its apparent rarity being due to the comparative scarcity of its host plant which has recently been entirely given up as a forest tree. The majority of our silver firs are now old trees whose branches are well above ground and out of reach for the average collector.—JAMES W. MUNRO, Edinburgh.

Crossbill in North Uist.—I heard from my brother Mr G. Beveridge, who had been spending a few weeks' furlough in North Uist, that on the 11th June 1916 he had the fortune to find near Scolpaig a fine male Crossbill (*Loxia curvirostra*). The bird, which was in excellent condition, is now being preserved by Small & Son of Edinburgh. The Crossbill seems of uncertain occurrence in the outer islands, and with the exception of the above I have never seen a specimen in the flesh from North Uist.—FRED S. BEVERIDGE, 3rd Batt., The Royal Scots, Glencorse. [This bird belongs to the Continental race.—EDS.]

Lesser Whitethroat in Kirkcudbrightshire.—From 4th to 8th June 1916, inclusive, I had under close observation, at Kirkcraugh, the residence of Mr King-Webster, on the coast about midway between Creetown and Gatehouse-of-Fleet, a Lesser Whitethroat (*Sylvia curruca*) which was in full song in the trees round about the house. I have no doubt that it was breeding there, although I failed to locate the nest, and I state this with the greater confidence, as about the same time I had discovered at least three pairs of the birds nesting in North and South Tynedale, in Northumberland and Cumberland. In all those stations (fuller details of which are given in the current number of the *Vasculum*) the Lesser Whitethroat was previously unknown, and in two of them the young were duly reared and left the nests on 18th June. Many of our summer visitors have been so scarce this season (some of them entirely absent) that it is the more interesting to find *S. curruca* in such evidence. I may add that I was at Kirkcraugh in the same week last year, and have no hesitation in saying that there was certainly no Lesser Whitethroat there then.—GEORGE BOLAM, Alston.

Pied Wagtails' curious nest at Largo.—A pair of Pied Wagtails (*Motacilla alba lugubris*) built a nest, this year, as they have done for several years previously, in one of the tubs containing New Zealand flax on the terrace at Lahill. The young hatched about 8th June, and for a week thereafter, we had cold, strong, northerly winds, and evidently as a protection against these, the birds built a sheltering rampart on the north side of the nest. This rampart consisted of hair and fluff, and stood about two inches higher than the original edge of the nest.—EVELYN V. BAXTER and LEONORA J. RINTOUL, Largo.

Great Crested Grebes at Kilconquhar Loch.—In view of the recent spread, in Scotland, of the Great Crested Grebe (*Colymbus*

cristatus cristatus), we have, for some time, been on the outlook for its arrival on Kilconquhar Loch. Although we have several times seen this species on the loch, outside the breeding season, this is the first year that it has remained and nested there. At least two and possibly three pairs established themselves on the loch, and we saw the birds and their young on several occasions. This is the first record of Great Crested Grebes nesting in East Fife, though they have bred for some time in the west. What struck us as rather an interesting instance of belated display was seen by us on 18th August. When nearing the edge of Kilconquhar Loch we heard a most extraordinary grunting call-note, and creeping forward behind a screen of reeds saw three Great Crested Grebes close to the edge of the loch. The birds were lying on the water, with their beaks and necks outstretched, and laid flat on the surface, their occipital tufts laid back, and their ruffs drawn close in and down so that they seemed to meet under their chins; while first one and then another uttered this extraordinary note. They occasionally drew themselves up to their full height, holding themselves stiffly, with their bills pointing straight down to the water; frequently, they interrupted this display by diving. As far as we could see, they were still in full summer plumage, and one of them was accompanied by two large stripey young. The spring display of the Great Crested Grebe has been fully described and illustrated by Mr Julian S. Huxley (*Proc. Zool. Soc.*, p. 491), and it would appear to be a modified form of this which we saw in August. Although we have frequently seen autumn displays of eider and other birds, we have never before had an opportunity of witnessing this in the Great Crested Grebe, and the late date and presence of the young struck us as interesting.—EVELYN V. BAXTER and LEONORA J. RINTOUL, Largo.

Continental Redbreast and Lesser Black-backed Gull in Fife.—On 24th April, at the mouth of the Cambo burn, we saw a Continental Redbreast (*Erithacus rubecula rubecula*). It was very wild, and hid in holes and under overhanging banks, as was the habit of the Continental Robins we have seen on the Isle of May. Its pale breast and excessive wildness were in marked contrast to the ruddy hue and confiding disposition of our British bird. This is the first record of the occurrence of the typical form in the Tay Area. In Largo Bay on 9th July we saw four or five British Lesser Black-backed Gulls (*Larus fuscus britannicus*) standing together, and with them, a Lesser Black-backed Gull with coal-black mantle, undoubtedly a specimen of *Larus fuscus fuscus*.—EVELYN V. BAXTER and LEONORA J. RINTOUL, Largo.

Larentia salicata, Hb., in Midlothian and Clackmannan.

—As an extension of the recorded range of this moth in the south of Scotland, its occurrence on Dalmahoy hill, a few miles west of Edinburgh, this year, may be worth putting on record. On 22nd July I startled two, one of which was captured, on the steep rocky face of the north side of the hill. The species is given for "Forth" in Buchanan White's *Lepidoptera of Scotland*, his record being, as he informed me in November 1893, from the Ochil Hills behind Dollar, where I have myself taken it, namely, on 24th June 1905, above Castle Campbell, which is in Clackmannanshire. It is regarded as an alpine and sub-alpine insect.—WILLIAM EVANS, Edinburgh.

Reoccurrence of *Pityogenes chalcographus* L. in Scotland.

—On 27th July I obtained a male of this rare bark beetle at Blackford Hill near Edinburgh. It settled on the sleeve of my coat. The only record of *P. chalcographus* in Scotland is for Clyde. It is given in the Glasgow Natural History Society's list, but with no indication of its source. Sharp, however, includes it in his list giving the locality Clyde and it is evidently his own record.—JAMES W. MUNRO, Edinburgh.

FUNGOID AND INSECT PESTS OF THE FARM. By F. R. Petherbridge, M.A., Cambridge: Farm Institute Series, 1916, 8vo, 174 pp. and 54 illustrations. Price 4s. net.

Within the limited space of this volume the author has given a most useful summary of the principal farm pests comprised in the title. Part I deals with fungi, including potato disease, finger and toe, mildews, ergot, rusts and smuts, while Part II contains an equally serviceable account of the various butterflies, moths, beetles, flies, aphides, sawflies, and eelworms which attack our crops. Each pest in its turn is briefly, yet adequately described, and then follow a series of remedial measures carefully detailed in plain language so that there can be no possibility of error. The illustrations are excellent and instructive, and we predict a large sale for this capital little handbook, published as it is at a price which brings it within easy reach of everyone. We note only a couple of slight errors; on p. 114, bottom line, the last figure should be 4 not 3, and on p. 160 *probosces* should be *proboscides*.



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EDITORIAL.

THE *History of British Mammals*, by Barrett-Hamilton and Hinton, has now reached its 19th Part, this having appeared since our last issue. In this part we note the conclusion of the account of the Black or Ship Rat, in the shape of a history of the third sub-species, viz. the Tree or Roof Rat (*Epimys rattus frugivorus*). The Tree Rat is carried by ships to all parts of the world, and in Britain appears not infrequently in ports. Three instances of such introduction are quoted, while an example taken on a ship at Leith is referred to in the table of dimensions. The remainder of Part XIX. is occupied by a valuable account of the Brown or Common Rat (*Epimys norvegicus*), which runs to twenty-six pages, a summary of the characters of the genus *Mus*, and the first portion of an elaborate article on the House Mouse (*Mus musculus*). From the pages of this valuable and exhaustive publication we learn that the Common Rat, an Asiatic species, first arrived in Scotland between the years 1764 and 1774, and reached Selkirkshire between 1770 and 1777, the upper Tweed between 1776 and 1792, and Morayshire about 1814. The account of the habits of this species is extremely interesting and full of detail; the animal is

stated to make an attractive and amusing pet, and to be quite palatable! For on the authority of Owen Jones "rat-pie tastes like rabbit if made from well-fed animals."

Some years ago the Rev. E. A. Woodruffe-Peacock contributed an interesting paper on "Thrush Stones and *Helix nemoralis*, L.,"¹ in which he showed that the shells of these snails found at thrushes' anvils were in a very large proportion unbanded, and that shells with a single band came next in frequency. The banding of the shell may, therefore, be supposed to possess a certain value as a protective character; and to further test such a theory an investigation was recently undertaken by A. E. Trueman, of University College, Nottingham, who records his results in a short paper entitled, "Shell-banding as a Means of Protection."² Two collections were made in the same locality, one a "standard" collection of unbleached dead shells found during the winter, and the other an "anvil" collection of shells broken by thrushes. Of the latter, some 2000 specimens were obtained, and percentages were then worked out of the varieties of banding in the two collections. It was found that "although fully two-fifths of the standard collection had the normal five bands, little more than half this proportion of the broken shells were so marked." Of unbanded shells the standard collection contained 25 per cent., and the broken shells 38 per cent. The figures show that the chances of an unbanded shell being observed are roughly three times as great as of a normal, *i.e.* five-banded, shell. Previous work in support of the theory of protection by banding thus appears to be confirmed by these results, although it is admitted that banding alone is not a guarantee of safety. The subject is certainly worthy of still further attention—on a larger scale.

¹ *Naturalist*, 1909, pp. 171-74 and 257-59.

² *Ann. and Mag. Nat. Hist.*, October 1916, pp. 341-42.

SOME NOTES ON BIRDS SEEN AT RAASAY.

By JEAN HELEN GASKELL.

I STAYED for nearly two months on the Island of Raasay last summer, from 16th June to 9th August, and while I was there made a few observations on the birds I saw in the neighbourhood of Raasay House. Since then I have read a very interesting paper in the *Ibis* for 1904, by Charles Collier, F.Z.S., M.B.O.U., on "The Birds of Raasay," and I think perhaps my few notes may be of interest to compare with his, in showing the difference in numbers of some of the common birds.

For instance, he says that House Sparrows are "very numerous," whereas I found them remarkably scarce. Only at Leadhills and in Western Australia have I noticed so few sparrows. All the time I was at Raasay, although I looked for them every day, I never saw a Starling. Mr Collier reports this bird as "not very plentiful during the summer," and in the *Fauna of North West Highlands and Skye* it was "found at Raasay, near Clachan."

Another little bird which was very scarce was the Hedge Sparrow. I only saw one on the island, while I did not hear or see a Cuckoo or a Corncrake all the time I was there. Chaffinches were in great numbers, and there were many Robins which Mr Collier found "scattered in the woods and round the crofts and shore, but not very numerous," while Cole Tits and Blue Tits were also very common.

On 26th June a flock of Long-tailed Tits (about twenty) settled on a tree near the house; they stayed some time, about half an hour, and then flew into a shrubbery some distance away. They returned a few days after for a short time. After that I did not see them again, but I thought I heard them in a thick wood once more but could not see them.

On 29th June a Turtle Dove flew into a tree near the house; it stayed there a short time and then flew away. It returned shortly after and rested a few minutes on the ground and then flew away again. An Eider Duck and four young

ones frequented the bay; many nest on Rhona, the little island north of Raasay. I did not see Terns till 23rd July, but after that there were always several pairs in the bay.

Gannets appeared fishing in the bay on 2nd August, and from then till I left I saw a few every day.

After the 11th July there were a great many Spotted Flycatchers with young ones.

Swallows were not common; I only saw two flying over the inland loch one evening and one near the house on another occasion.

Reed Bunting—I saw one female. Mr Collier reports it uncommon.

The other birds I saw were:—

Stonechat—saw a few males in beautiful plumage; Hooded Crow—common and remarkably bright and distinct in colouring; Bullfinch—common; Grey Wagtail—several pairs; Pied Wagtail—common; Blackbirds and Thrushes—quite common but not very numerous; Woodpigeons—common; Common Sandpipers—numerous; Rockpiper—numerous; Yellow-hammers—common; Wheatears—a few pairs; Wren—common; Meadow-piper—common; Willow Warblers—a few; Whitethroats—very few; Oystercatchers—common; Herons, Curlew, Black-backed Gull, Herring Gull, and Common Gull—numerous.

The Capercaillie in Renfrewshire.—In the paper on the Birds of Renfrewshire (*Scottish Naturalist*, 1915, p. 269), it is specially noted that all the known records refer to females. Another female was reported to me in April near here. Dr Macfie of Langhouse, Inverkip, writes me:—"On the 19th of August 1916, the gamekeeper and I were within six yards of a young cock Capercaillie, sitting in a fir-tree. It flew off, and I could easily have shot it. Since then the keeper has seen three or four hens and another cock. The one I saw on the 19th was a young cock, probably a last year's bird." As these are the first definite records of the male occurring in the county, they are worthy of being recorded.—T. THORNTON MACKIE, Kilmacolm.

WIGTOWNSHIRE AND ITS INLAND MOLLUSCAN
FAUNA.

By W. DENISON ROEBUCK, M.Sc., F.L.S.

*(Continued from page 256.)**Hyalinia nitidula.*

Springbank, near Stranraer, September 1890 (W. Evans); Corsemalzie, several in garden, 25th May 1909 and 4th November 1910 (Jack G. Gordon); Alticry, Mochrum parish, several in garden, 26th October 1910 (*id.*); Isle of Whithorn, a few, also a few var. *subnitens*, August 1909 (Marie V. Lebour); Stranraer, a few, 15th August 1909 (J. F. Musham); Dunskey Wood, Portpatrick, two, 18th August 1909 (*id.*): one on stone by roadside about two miles from Whithorn, 12th August 1916 (Alex. Ross).

Hyalinia radiatula.

Portpatrick, R. Rimmer, one, 1890 (Roy. Scot. Mus., 1913); Isle of Whithorn, one, August 1909 (Marie V. Lebour); Dunskey Wood, Portpatrick, one, 18th August 1909 (J. F. Musham); road-plantation between Isle of Whithorn and Port William, one, 1st August 1916 (Alex. Ross).

Hyalinia crystallina.

Springbank, near Stranraer, September 1890 (W. Evans); Dunskey Wood, Portpatrick, one, 18th August 1909 (J. F. Musham).

Hyalinia fulva.

Portpatrick, R. Rimmer, 1890, one (Roy. Scot. Mus., 1913); Springbank, near Stranraer, September 1890 (W. Evans); Dunskey Wood, Portpatrick, one, 18th August 1909 (J. F. Musham).

Zonitoides nitidus.

Dunskey Wood, Portpatrick, one, 18th August 1909 (J. F. Musham).

Zonitoides excavatus.

Knockglass, near Stranraer, September 1890 (W. Evans); Stranraer, several var. *vitrina*, 15th August 1909 (J. F. Musham).

Pyramidula rotundata.

Portpatrick, one, R. Rimmer, 1890 (Roy. Scot. Mus., Edin-

burgh, 1913): Stranraer, a few, R. Rimmer (*id.*); Springbank, near Stranraer, two, 15th September 1890 (W. Evans); Port Logan, September 1890 (*id.*); Corsemalzie, numerous under stones in garden, 23rd May 1909 (Jack G. Gordon); Isle of Whithorn, several, August 1909 (Marie V. Lebour); Stranraer, numerous, including one of var. *rufula*, 15th August 1909 (J. F. Musham); The Battery, Portpatrick, a few, 16th August 1909 (*id.*); stones by roadsides about two miles from Whithorn, two, 12th August 1916 (Alex. Ross); about Cairn, Isle of Whithorn, two, 12th August 1916 (*id.*); road-plantation between Isle of Whithorn and Port William, one, 1st August 1916 (*id.*); small woodland plantation above the harbour, Isle of Whithorn, one, 1st August 1916 (*id.*).

Acanthinula aculeata.

Dunskey Wood, Portpatrick, one, 18th August 1909 (J. F. Musham).

Helix aspersa.

Stranraer and Port Logan, September 1890 (W. Evans); Portpatrick, The Battery, numerous and fine, 16th August 1909 (J. F. Musham); Isle of Whithorn, a few adults, 17th July 1916 (Alex. Ross); Isle of Whithorn, very abundant in gardens, 12th August 1916 (*id.*).

Helix nemoralis.

Springbank, near Stranraer, 14th September 1890, fragment of one var. *libellula* 00300, and fragment of an adult var. *rubella* 00300 with band broad (W. Evans); Stranraer, numerous, 14th August 1909—one adult var. *rubella* 00300 and one young var. *libellula* 12345 sent (J. F. Musham); Isle of Whithorn, two adults and two young var. *libellula* 12345, and one adult var. *libellula* 00300, 17th July 1916 (Alex. Ross); stones by roadsides about two miles from Whithorn, one young var. *rubella* 00300, and one adult var. *libellula* 00345 with the bands medium brown and bands 1 and 2 appearing at the mouth, 12th August 1916 (*id.*); Stairhead Cliffs, Isle of Whithorn, one adult var. *libellula* 00300, and one weather-worn adult var. *carnea* 12345, 12th August 1916 (*id.*); about Cairn, Isle of Whithorn, one adult var. *libellula* 00300, with band black and distinct with paler space, yellow, below it, 12th August 1916 (*id.*); small woodland plantation above the harbour, Isle of Whithorn, two exceedingly young var. *libellula* 12340, 1st August 1916 (*id.*).

Helicigona arbustorum.

Isle of Whithorn, two immature and very thin-shelled examples of var. *pallida*, 17th July 1916 (Alex. Ross).

Helicella caperata.

Portpatrick, one, R. Rimmer, 1890 (Roy. Scot. Mus., Edinburgh, 15th May 1913); Port Logan, September 1890 (W. Evans); Isle of Whithorn (Marie V. Lebour): The Battery, Portpatrick, and Dunskey Wood, 16th August 1909 (J. F. Musham); Torrs sandhills, Old Luce, numerous, small, 10th June 1911 (Jack G. Gordon); Craginarget shore, Old Luce, numerous, small, swarms on banks, 4th May 1910 (*id.*); about Cairn, Isle of Whithorn, one adult, 12th August 1916 (Alex. Ross).

Helicella acuta.

Galloway, W. Bean (Greville Collection, Roy. Scot. Mus., Edinburgh); Port Logan, abundant, including numerous var. *strigata*, D. Robertson (mixed in a tube with specimens from Millport, Cumbrae, in Kelvingrove Museum, Glasgow, 15th May 1913); Kirkmaiden golf-course, Port William, common, crawling on plants, a few each of vars. *bizona*, *strigata*, and *articulata*, sent, 7th October 1909 (Jack G. Gordon).

Hygromia rufescens.

Stranraer, a few, 14th August 1909 (J. F. Musham).

Hygromia hispida.

Corsemalzie, numerous in garden, 10th May 1909, a few in garden, 30th August 1910 (Jack G. Gordon); Alticry in Mochrum parish, numerous in garden, including one var. *sericea*, 26th October 1910 (*id.*); Portpatrick, The Battery, a few, 16th August 1909 (J. F. Musham); Dunskey Wood, Portpatrick, a few, 18th August 1909 (J. F. Musham); Isle of Whithorn, a few, August 1909 (Marie V. Lebour); Whithorn, ruins of Abbey, 28th May 1912 (Edward Collier).

Vallonia pulchella.

Isle of Whithorn, two, August 1909 (Marie V. Lebour).

Pupa cylindracea.

Port Logan, September 1890 (W. Evans); Dunskey Woods, Portpatrick, 18th August 1909, a few (J. F. Musham); Isle of Whithorn, August 1909, several, also a few of a brown-mouthed variety (Marie V. Lebour); Garheugh Rocks, Luce Bay, Mochrum parish, numerous under stones, 28th April 1910 (Jack G. Gordon); road-plantation between Isle of

Whithorn and Port William, several, 1st August 1916 (Alex. Ross); about Cairn, Isle of Whithorn, two, 12th August 1916 (*id.*); under stones near the shore, Isle of Whithorn, several, 12th August 1916 (*id.*); Luce Bay, numerous by shore, 10th May 1916 (Jack G. Gordon).

Pupa anglica.

Road-plantation between Isle of Whithorn and Port William, three, 1st August 1916 (Alex. Ross).

Vertigo pygmaea.

Isle of Whithorn, several, August 1909 (Marie V. Lebour).

Sphyradium edentulum.

Isle of Whithorn, one, August 1909 (Marie V. Lebour).

Balea perversa.

Isle of Whithorn, two, August 1909 (Marie V. Lebour): road-plantation between Isle of Whithorn and Port William, one young, 1st August 1916 (Alex. Ross).

(*To be continued.*)

White Variety of Black Slug in Stirlingshire.—I recently received from the late Dr Harvie-Brown a fine example of *Arion ater* var. *alba*, subvar. *marginata*, sent to him by Mr James Dick of Burnside, Kippen, found at that place. The white form of this species seems to be rare. The only Scottish examples I have seen are one of subvar. *marginata*, taken at Uddingston, Lanarkshire, June 1889, by Mr Alex. Shaw, and one of which the subvar. was not noted, from North Esk, near Morphie, Kincardineshire, found by Mr W. Duncan in May 1891. My own record of subvar. *elegans* in the yard of Thornelee Railway Station, Selkirkshire, August 1886, is an error, the species being the small *Arion intermedius*; the error is excusable, inasmuch as the latter species was not added to the British list till some years later, but my note of the find was sufficiently explicit and detailed to leave no doubt as to the correct specific identification.

Stirlingshire is one of the counties for which I propose to write a list for publication in this journal: I shall therefore be pleased to see any specimens of Mollusca that may be sent to me with the view of making it more complete.—W. DENISON ROEBUCK, 259 Hyde Park Road, Leeds.

HYLASTES CUNICULARIUS, ER., AND ITS
RELATION TO THE FOREST.

By JAMES W. MUNRO, B.Sc. (Agr.), B.Sc. (For.).

INTRODUCTORY.

THREE members of the genus *Hylastes*, Er., may be said to be of economic importance in our Scottish woodlands, namely, *H. ater*, Pk., *H. palliatus*, Gyll., and *H. cunicularius*, Er. The first two species have for long been known as two of our commonest bark beetles. *H. cunicularius*, on the other hand, has hitherto been overlooked, probably owing to its close resemblance to *H. ater*.

Of the habits and life-histories of all three species our knowledge is scanty, and is largely derived from the German literature. Owing to the fact, however, that our Scottish forest conditions are markedly different from those prevailing on the Continent, it is essential that we should study our forest insects afresh from that aspect. The following paper is a short account of observations on *Hylastes cunicularius* made in the field under forest conditions that are, unfortunately, all too prevalent in Scotland.

MATERIAL.

The material for the comparison of *cunicularius* with its congeners is based, partly on specimens taken at Skene, Aberdeenshire, in 1914, and partly on specimens collected on Darnhall Estate, Peeblesshire, during 1915-16. These specimens have been submitted to the British Museum, and the identity of the species has been confirmed there.

The materials for the illustration of the life-history and of the injuries caused to young plantations by *H. cunicularius* were obtained on Darnhall.

THE ADULT.

As I hope, in a later paper, to deal with the genus *Hylastes* more fully than is possible here, I can best describe

H. cunicularius by contrasting it with its more common congeners, which are familiar to most naturalists interested in the Coleoptera.

The essential features distinguishing the three species are the configuration and sculpture of the thorax. The following table gives the characters of each species. Figure 1 illustrates the configuration of the thorax in each. It is a

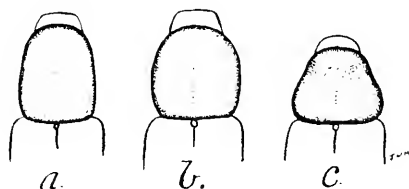


FIG. 1. The Thorax. Camera Lucida Sketch, all $\times 10$.

a = *H. ater*, Pk. *b* = *H. cunicularius*, Er. *c* = *H. palliatus*, Gyll.

familiar figure in the continental text-books, and my only excuse for introducing it here is its usefulness. The specimens from which I have drawn it are all Scottish.

CHARACTER.	<i>H. ater.</i>	<i>H. cunicularius</i>	<i>H. palliatus.</i>
THORAX . .	Sparsely punctured on disc, sides sub-parallel. Oblong elliptical, longer than broad.	Evenly punctured throughout, sides rounded. Roundly elliptical, as broad as long but varying slightly.	Evenly punctured throughout, sides tapering anteriorly. Blunt-pear-shaped. Broader than long.
COLOUR WHEN MATURE.	Black, shining.	Dark brown to black, dull.	Brown to dark brown.
LENGTH . .	4-5 mm.	3½-5 mm.	2½-4 mm.
USUAL BREEDING-HOST.	Scots Pine.	Spruce.	Spruce, Scots Pine and occasionally Larch.

From the above table it will be seen that *H. ater* and *H. cunicularius* are very similar. The sparse puncturing on the disc of the thorax in *H. ater*, however, causes the thorax to appear shiny, and this feature, together with the more

elongate appearance of the beetle, is a most useful character for distinguishing *H. ater* from *H. cunicularius* in the field.

THE EGG.

The egg of *H. cunicularius* does not call for any special notice. It is oval in shape, shining white in colour, and shows neither sculpturing nor micropyle. It does not differ from the usual scolytid type of egg.

THE LARVA.

The larva of *H. cunicularius* is of the typical scolytid type, a curved, whitish, legless grub with yellow head and biting jaws.

THE PUPA.

Except in the distinctly oval shape of the pro-thorax, the pupa of *H. cunicularius* does not differ markedly from that of the other members of the genus.

THE BROOD GALLERY.

The "Brood" or "Mother" gallery of *H. cunicularius* is typical of the species. It conforms to the *Hylastes* type in being crutch-shaped. Its distinctive features are its breadth, its shortness, and the short equal arms of the crutch. Its shortness contrasts it with that of *H. ater*, which is long and narrow, and the equal arms of the crutch contrast it with that of *H. palliatus*, in which (and this is also a feature of *H. ater's* gallery) one arm of the crutch is invariably considerably longer than the other.

The "crutch" is the so-called brood chamber. It is the first portion of the gallery to be cut. In it the male is usually found while the female is cutting the mother gallery proper.

Figure 2 is a sketch of a typical *cunicularius* brood gallery cut in a spruce root, half an inch in diameter. It shows the typical small crutch, which in the gallery shown is slightly deflected (a very common feature), and the egg

niches, which are invariably cut in the bast and bark. The black circle at the foot of the gallery is the entrance. *a* shows the gallery as cut in the bark, *b* shows its counterpart on the root itself. In *b* it will be seen that the egg niches are absent and that the shape of the gallery is much less definite.

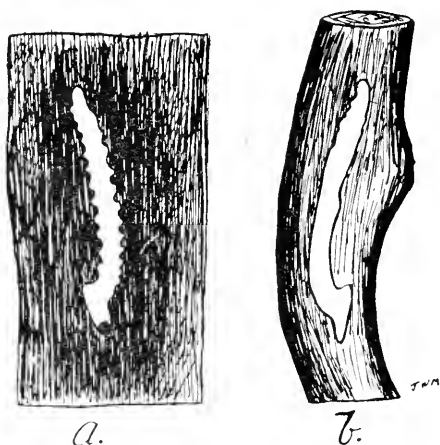


FIG. 2. Mother Gallery of *H. cunicularius*, Er., on Spruce Root.

a. Gallery cut in bark showing egg niches. *b.* Gallery shown on root.

THE LARVAL GALLERIES.

The larval galleries arise at right angles to the mother gallery, from the egg niches. At first they are distinct but only for a very short distance, as they become confused and ultimately form a large cavity gnawed in the bark. Later on, however, they may emerge again to end in well-defined pupating pits or chambers.

HABITS.

H. cunicularius is essentially a soil-dweller, breeding in spruce roots just below the soil level. It prefers roots from half an inch to two inches in diameter, but also breeds on larger and smaller roots.

Its "feeding" ground, which is distinct from its breeding

ground, is the young coniferous plantation. Here, if the beetles are newly emerged and sexually immature, they feed to develop their reproductive faculties ("reifungs-frass") or, if mature, to recuperate after their first breeding period ("ernährungs-frass"). It is this "feeding," or "frass," which makes *H. cunicularius* the enemy of the forester. It attacks young, recently-planted conifers just below the root-collar, gnawing away the bark, girdling the root-stem, and by preventing the sap-flow causes the young trees to wilt and die.

Figure 3 shows the lower portion of a young (four-year-old) Scots pine destroyed by the adult *cunicularius*. On the plant from which Fig. 3 was made five *H. cunicularius* and two *H. ater* were feeding. The gnawed portions of the young plant are unshaded in the figure.

Often *H. cunicularius* is accompanied by the large Pine Weevil, *Hylobius abietis*, L., which gnaws the bark of the young plant *above* ground. In fact, so common is this association of *H. cunicularius* and the Weevil that, until recently, I was inclined to consider the Scolytid was a follower of the Weevil, which is much the more common beetle and is, in fact, our worst forest pest. That *H. cunicularius* is, however, primarily destructive I have now abundant evidence.

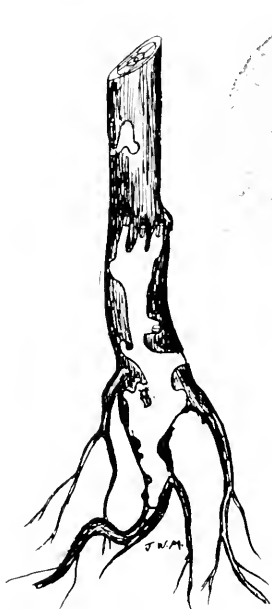


FIG. 3. Lower Portion of young Scots Pine, showing "frass" of *H. cunicularius*.

RELATIONS TO THE FOREST.

The relations of *H. cunicularius* to the forest can, I think, best be illustrated by the description of an attack by it.

On 7th October 1915, on Darnhall Estate, Peeblesshire, I

observed *Hylastes* damage in a young plantation of Scots pine, larch, and spruce, and obtained *H. ater* and *H. cunicularius* at work. Adjoining this plantation a small area of woodland, consisting of spruce and Scots pine, in which the spruce predominated, had been and was still being felled. During the spring of 1916, this smaller area was planted up with four-year-old plants of Scots pine, larch and spruce. It is on this newly planted area that my observations have been made.

I believe it to have been infected from the larger, older plantation on which I first observed *Hylastes* at work in October 1915, for at that time out of seven stumps examined only one yielded *Hylastes* (and only three specimens at that), all *H. ater*.

In 1916, the youngest plantation was badly infested, and in August one-third of the young plants had been destroyed chiefly by *H. cunicularius*. Further, the spruce stumps on the area yielded numbers of *H. cunicularius* larvæ, pupæ and adults, while a few showed galleries containing eggs with the females still at work. The Scots pine stumps, only about twenty in number, yielded *H. ater*. These facts lead me to believe, as I have said, that the area was infected from the larger older plantation, but how infected I have not been able to discover.

The plantation then under observation consists of an area full of spruce stumps and roots. Now it is a feature of the spruce that it is shallow-rooted. Its roots do not go deep in the soil, but extend for long distances just below the soil surface and are often exposed at certain points. On these roots *H. cunicularius* must occur in hundreds. I have taken adults on a portion of a root fifteen feet distant from its source at the stump. In this network of infected roots the young conifers have been planted, and the wonder is, not that half of them will probably be destroyed before the year is out, but that any should survive.

One most interesting feature of this attack must be noticed. After the area in question had been completely felled, the forester took the precaution of burning all the brushwood on the top of the stumps, thus charring them and

the exposed portions of their roots considerably. As has been shown, this charring has proved of no avail. The gallery illustrated in Figure 2 occurred only half an inch distant from a badly charred section of the root.

This failure of a much discussed preventive measure is extremely interesting. At first sight it would seem to indicate that the measure is useless. I am not inclined to make so sweeping an assertion, but I believe rather that charring is useless unless carried out just prior to, or better still, during the breeding period of the beetle, that is, in early April or May according to the weather conditions prevailing.

CONCLUSION AND SUMMARY.

Hylastes cunicularius, Er., undoubtedly breeds in Scotland, and may prove to be more common than we at present believe.

It is essentially a spruce-dweller, breeding below soil level.

It feeds in the roots in which it was reared, but if opportunity offers migrates to young coniferous plantations, where it feeds on spruce, Scots pine and larch. Its life-history and habits are strikingly similar to those of *H. ater*, Pk., but owing to the branching of the roots of its breeding host, the spruce, it is probably a more formidable enemy of young trees planted in old spruce clearings than *H. ater* proves in similar pine clearings.

In the larval stage *H. cunicularius* is harmless. The adult, on the other hand, injures or totally destroys newly planted conifers of various kinds. Spruce, Scots pine, and larch have been found attacked by it. In the areas under observation, the loss caused by *H. cunicularius* may be stated as not less than a pound per acre, allowing the cost of planting to be three pounds per acre, a low estimate.

Whinchat imitating Swallow's Notes.—On 18th May 1916, near Cathcart, I heard a Whinchat imitating the sweet twittering of the Swallow. This it did repeatedly, and, while so engaged, a Rook passed over, momentarily startling it and causing it to utter quick notes of alarm or annoyance: not its own, however, but the *feet-a-feet, feet-a-feetit* (as Saunders expresses them) of the Swallow when alarmed, especially if the bird is concerned about the presence of some prowling cat. Both the twittering and the alarm notes were uttered so well that, had I not seen the bird in the act, I should have said that they were really the genuine notes of the Swallow, which, I think, I know pretty well. What seemed remarkable was that the bird, when startled, did not make use of its own notes, the well-known *utick, utick*. Of course, the Whinchat is known to be a mimic. Besides its own short but pleasant song, difficult to describe, I have frequently heard it emit notes rather like some of those of the Common Whitethroat; and, occasionally, in a May gloaming, my attention has been arrested by a series of peculiar jarring notes, that, on the spur of the moment, I did not recognise, but which, on reflection and investigation, I traced to a Whinchat stirring late.—JOHN ROBERTSON, Glasgow.

Easternness Mollusca: Additions.—In my paper in the May number I overlooked three species collected by Mr G. A. Frank Knight in 1894 or 1895 and published in the *Annals of Scottish Natural History* for July 1895, p. 151. Two of these, *Unio margaritifera*, of which a single valve from the River Spey was sent, and *Pisidium nitidum*, of which there were a few from Loch Morlich at an elevation of 1046 feet, are additional to the list, bringing its total enumeration up to twenty-nine species.¹ Of the third, *Limnæa peregra*, there were numerous examples of its var. *ovata* from Nethy Bridge. I shall be glad to hear of further additions to so small a number.²—W. DENISON ROEBUCK, 259 Hyde Park Road, Leeds.

¹ The first had previously been recorded from the Spey, at Kincaig, near Kingussie (W. Evans, August 1889), in my Scottish "Census," 1890.

² It should be said that a number of species not included in my recent list, collected "at and near Aviemore" in May 1893, were assigned by me to Easternness, in *Ann. Scot. Nat. Hist.*, 1893, pp. 169-170. Mr Evans, from whom they were received, believes most of them were found within the limits of Easternness, as shown in my sketch map; but corroboration of the records is desirable.

HALICLYSTUS AURICULA (RATHKE), AND
OTHER MEDUSÆ IN THE FIRTH OF
FORTH.

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

IN a paper on the Fauna of the Forth Area, published about eight years ago in the *Proceedings of the Royal Physical Society* (vol. xvii., pt. 1), I mentioned (p. 15) that in 1890 I had found, near North Berwick, a lucernarian, believed to be *Haliclystus auricula* (Fab.). The specimen having been lost, the identification was given, however, with some reserve, and there appears to be no other record for the area. It was, therefore, a source of no little satisfaction to me when on 1st August this year (1916) my son, W. Edgar Evans, found another example in the same neighbourhood. It was adhering to a sea-weed, *Chondrus crispus*, growing on the rocks at low-water mark (spring tide) a few hundred yards west of the harbour, North Berwick. It was brought home alive, but survived only two or three days. When expanded, its diameter, inclusive of the arms, on the tips of which the tentacles are clustered, was about 18 mm., and 10 to 12 mm. at the intervening spaces. The groups of tentacles are eight in number, and the number of tentacles in each is about 50, except in the case of a rather stunted arm which bears scarcely 40. The stunted arm is placed close to one of the normal ones, but otherwise the arms are fairly equidistant though there is a tendency to an approximation in pairs. On the margin of each sinus between the arms there is a distinct "statorhab," or anchor. In life, the colour was a pinkish brown with the tips of the tentacles yellowish.

The presence of the anchors alone proves the specimen to be a *Haliclystus* and not a *Lucernaria* (as now restricted), but it is not so easy to decide what the specific name should be—whether *auricula* or *octoradiatus*. Writing in 1863 in the *Journal of the Boston Society of Natural History*, James Clark considered, as likewise did Haeckel in 1879 (*System Medusæ*), that there are two forms, one having the arms approximated in pairs, and 100 to 120 tentacles in each group

when adult; the other having the arms equidistant and 30 to 60 tentacles per group. To these they applied the names *auricula* and *octoradiatus* respectively. In a subsequent paper (1878) on *H. auricula* (*Smithson. Contrib. Knowl.*, vol. xxiii., 1881) Clark repeats that the number of tentacles per group is about 100, but his figures show no more than 30 to 35. Beaumont, after examining many specimens from the coasts of England and Ireland, is of opinion that they all belong to one species, the number of tentacles and other characters varying according to age, etc.; and for it he uses the specific name *auricula* of Rathke—see his paper in *Proc. Roy. Irish Acad.*, 3rd ser., vol. v., p. 806, 1899, where the matter is discussed at some length. For figures of *H. auricula* reference may be made to Johnston's *History of British Zoophytes*, 2nd ed., 1847, vol. i. p. 246. The author, who was the well-known Berwick naturalist, does not say where his specimens were obtained. Prof. M'Intosh, however, in his list of the Marine Invertebrates and Fishes of St Andrews (1875), states that the species is locally common on the coast there.

In his second paper alluded to above, Clark compares this stalked medusa to "a lady's parasollette heavily tasselled at eight about equally distant points around the edge." "Imagine," he says, "the parasollette turned inside out, so that the usually concave under side becomes convex, and it would then have the shape which our Lucernarian most frequently assumes." American examples would appear to attain rather larger dimensions than European ones.

Rhizostoma octopus (L.) = *cuvieri*, Gosse. — On 13th December 1913, Mr W. M. Ingles found a large Jelly-fish stranded among the rocks west of North Berwick, and, perceiving that it differed markedly from the common species seen there, he carried it home and placed it in water in his bath that he might examine it more carefully. Comparing it with figures of Jelly-fishes in a book on Natural History to which he had access, he confidently referred it to *Rhizostoma cuvieri*, and at once wrote telling me of the occurrence. Before I could visit him, however, the fast decaying organism had been thrown out, so that I

had not the satisfaction of seeing it. From his description there can be no doubt it was a *Rhizostoma*, in all probability *R. octopus* (L.). It was about 16 inches in diameter, there were eight arms or appendages, and it was of a solid consistency. The beautiful reddish-purple colour of the margin of the "umbrella" was specially commented on. Pearcey (*Trans. Nat. Hist. Soc., Glasg.*, vol. vi., n.s., 1902, p. 244) has recorded the occurrence of a *Rhizostoma*—species not determined—at the mouth of the Firth of Forth, a few miles south-east of the Isle of May. On the west coast *R. octopus* is recorded from the Firth of Clyde (Browne, *Proc. Roy. Soc. Edin.*, xxv., 771).

Phialidium cymbaloides (v. Ben).—On 14th June 1909 I secured a specimen—one of several seen—of this little medusa in Burntisland Harbour, and sent it to Mr E. T. Browne, who kindly determined it for me. It is an addition to the list of medusæ and ctenophores from the Firth of Forth dealt with in the paper contributed by Dr J. H. Ashworth and myself, in December 1908, to the *Proceedings of the Royal Physical Society of Edinburgh* (xvii., pt. 6, pp. 300 to 311). The hydroid from which this medusa is liberated belongs to the genus *Campanulina*, either *C. repens* or *C. turrita* according to Browne (Report on Medusæ found in the Firth of Clyde, *Proc. Roy. Soc. Edin.*, xxv., pt. 9, p. 771, 1905). The former is recorded from the Forth, but apparently not the latter.

Regarding the species recorded in the 1908 paper referred to above, further occurrences of the majority of them might be cited, but it may be enough to give the following:—*Sarsia tubulosa*, Granton Harbour, common, 5th June 1909, and Burntisland Harbour, a few, 14th June 1909; *Meliceritidium octocostatum*, plentiful in a creek at the Isle of May, 21st September 1910; *Eutonina socialis*, Granton Harbour, very common, 5th June 1909, Burntisland, abundant and of various sizes, many (mature) being as much as 30 to 35 mm. in diameter, 14th June 1909, North Berwick, plentiful, and Isle of May, a few, 17th June 1909; *Tima bairdii*, many stranded between North Berwick and Canty Bay in March 1909 and at Largo Bay the following

winter. *Æquorea*, however, has not again been met with. The fine ctenophore, *Bolina infundibulum*, occurred again in Burntisland Harbour, but only a few, on 14th June 1909 (one captured was about $2\frac{1}{4}$ ins. long), and one was seen at North Berwick three days later. Any one who would undertake the thorough investigation of the Hydroid Medusæ of the Firth of Forth could not fail to add largely to the list, especially among the smaller forms.

The Striped Hawk Moths (*Chærocampa celerio*, L., and *Deilephila livornica*, Esp.) in the Border Counties.—It may not be without interest to supplement here Mr William Evans' retrospect of the occurrences of *Chærocampa celerio* in the Lothians (*Scot. Nat.* for September last, p. 241), by the following notes of records for the Scotch Border counties. Personally I have never been so fortunate as to meet with the insect in life, though we have one or two Northumbrian records of its capture. There is (or used to be) a specimen in Berwick Museum, in the collection of the late William Shaw, which was taken by his brother, hovering over Verbenas at Eyemouth, Berwickshire, in the autumn of 1872. This specimen (which I saw a few years later) was Shaw's justification for including the species as "Rare" in his "List of Eyemouth Lepidoptera," published in *Hist. Bk. Nat. Club* for 1873 (vol. vii., p. 123); and I happen to have a note that up to the time of his death, in 1908, he had never seen another. Its capture was also referred to by Dr Hardy in the same publication, vol. vi., p. 398.

In his very useful "List of the Lepidoptera of Roxburghshire," published in 1882 (*Hist. Bk. Nat. Club*, vol. x., pp. 149 *et seq.*), Mr Adam Elliot included *C. celerio* as "Has occurred; I have a specimen from the western district"; and Mr W. Grant Guthrie, in 1895 (*ibid.*, xv., p. 233), mentioned one as having been "brought into the house by a cat" in Hawick, but without giving any date: very possibly referring to the same specimen. Of the almost equally rare *Deilephila livornica*, Berwick Museum also possessed a specimen, which was caught by the late Dr P. W. MacLagan in a garden in Castle Terrace, Berwick, probably in 1870, or at any rate thereabouts. Of this species Mr Guthrie (*op. cit.*) likewise recorded

an example taken at Hawick some time previous to 1895, but without date. It might be interesting if other readers of the *Scottish Naturalist* could add to these records. — GEORGE BOLAM, Alston, Cumberland.

Spotted Redshank (*Totanus fuscus*) in Fife.—On 30th August this year, I saw at Morton, near Tayport, a bird which was entirely new to me. The bird itself might have passed without remark as a Redshank, but its note was one which I had never heard before. It (or rather they, for I saw two of them at different places) rose from the sides of little pools among the rushes, where I expected to find Snipe. They were exceedingly shy, rising at 150 yards, and going away at once, right out of sight: but their note could still be heard after the birds themselves were no longer to be seen. My brother, Captain R. Berry, Northumberland Fusiliers, who was sitting beside one of the lochs, and who has lived in India for many years, told me that the note was one with which he was quite familiar, and that it took him back in memory to the Tanks in Mysore; but the bird that uttered this note there, and which he described, was undoubtedly a Black-winged Stilt, and these were much smaller birds. The following week, on 5th September, I was again at Morton, accompanied this time by Miss Baxter and Miss Rintoul, and they both saw one of these birds, and also heard its call. They expressed the opinion that it was a Spotted Redshank; but I had not as yet been near enough to it on any occasion to have an opinion of my own. On 8th September, I went to Morton to look for it, and this time I was successful in stalking and shooting it. The bird proved, as expected, to be a Spotted Redshank, a young male, in fairly good plumage though somewhat in moult. I have of course handed it over to the Royal Scottish Museum. The Spotted Redshank has not so far been authoritatively recognised as occurring in "Tay." In Harvie-Brown's "Fauna of the Tay Basin," there is a record from Montrose, which, however, he declares to be doubtful. But while not a common bird, it is one which occurs with moderate frequency along the eastern coasts of Scotland and England, more particularly on autumn migration. It is not known to breed anywhere outside the Arctic Circle. To a casual observer, the bird's note will, in my opinion, be the best key to its identity. According to Seebohm, "its ordinary note is a shrill, clear whistle, closely resembling that of the Redshank. Naumann expresses it as *tyuit* pronounced as one syllable." My comment on that statement is that the note is accurately described as a shrill, clear

whistle, and that Naumann's syllabication is exceedingly good and recognisable; but that the note is utterly unlike that of the Common Redshank, and could never be confused with it for a moment. In connection with my brother's believed familiarity with it, I am interested to find the following note in Dresser: "Its" (the Black-winged Stilt's) "call-note resembles not a little that of the Spotted Redshank (*Totanus fuscus*)," and Naumann says that only a very practised ear can detect the difference. It consists of a clear, loud, flute-like whistle, but is not very often uttered, for, as a rule, it is rather a silent bird than otherwise. These Spotted Redshanks, on the contrary, were calling continuously when on the wing, until they were out of hearing.—WILLIAM BERRY, Newport, Fife.

Nightjar in the Island of Lewis.—I send you a specimen of the Nightjar (*Caprimulgus europæus*) which I received to-day (18th July) from Bragar, Barvas. I send it more particularly because Howard Saunders, in his *Manual of British Birds* (2nd edition), says that it does not frequent the Outer Hebrides.—D. MACKENZIE, Stornoway.

[Since the account of this species in last edition of Saunders' *Manual* was written, the Nightjar has been recorded to have visited the Outer Hebrides on two occasions, namely Island Ghlaiss in August 1897, and in North Uist in June 1907. Mr Mackenzie's record appears the first instance to be made known of the bird's appearance in the "Long Island."—EDS.]

Dryocætes autographus, Ratz., in East Lothian.—The paucity of records of this Bark Beetle for Scotland, or indeed for Britain, as disclosed in Mr J. W. Munro's note in the *Scottish Naturalist* for April last, would seem to be sufficient justification for the following further record from another county. In the vicinity of Gifford, East Lothian, a number of coniferous plantations have been cut down during the last few years. On 17th October 1916, in one of these clearings, I detected the borings of *Dryocætes autographus* in the bark of a spruce stump, and soon had the satisfaction of bringing to light a number of the beetles themselves. Another spruce stump and a fallen tree of the same species were also tenanted. Systematic search for it by one acquainted with its habits would, I feel sure, show *D. autographus* to be widely distributed in Scotland.—WILLIAM EVANS, Edinburgh.

Scottish Records of Braconidæ.—The following Scottish records are given by Claude Morley in the June issue of the

Entomologist (pp. 125-130): *Rhogas circumscriptus*, Nees, Birnam (Perth) and Banchory (Kincardine); *R. nigricornis*, Wesm., Invershin (Sutherland); and *Ademon decrescens*, Nees, Hebrides.

The Gadwall in Midlothian.—A pair of Gadwalls (*Anas strepera*) took up their abode this year at one of the reservoirs in the south-western section of Midlothian, where they were observed by me on several occasions in April to June. From their behaviour I am certain they were breeding in the locality, though I failed to find the nest. They were also, as I have since learned from Mr J. Raeburn, seen and independently identified by him. There does not appear to be any previous record of this duck for Midlothian.—WILLIAM EVANS, Edinburgh.

Records of Scottish Mollusca.—In the *Journal of Conchology* (July 1916, pp. 87-89) J. T. Marshall gives the following Scottish records: *Rissoa costulata*, Ald., off Loch Ryan, also Lamlash; *R. striata*, A. Ad., var. *aculeus*, Gould, from a raised beach in Skye; *R. proxima*, Ald., Clyde, Davar Island, Sanda Island, Mull of Cantire, off Loch Ryan, and south of Arran; *R. vitrea*, Mont., Clyde mouth and off Loch Ryan; *R. fulgida*, Ad., Skipness, mouth of Loch Tyne, and off Loch Ryan; *R. semistriata*, Mont., Mull of Cantire, var. *pura* Jeff., Benbecula; *R. cingillus*, Mont., Benbecula; and *Hydrobia ventrosa*, Mont., Sanda Island (a doubtful record).

A Humble-bee's attempt at Nest-building in a Shawl.—Possibly the readers of the *Scottish Naturalist* will be interested in a poor bee who fell a victim to house-building in a Shetland shawl. Bees had been repeatedly noticed trotting on the floor of my mother's bedroom, and one was removed from this shawl, the other day, to the window, apparently in a very bad temper. The shawl had been with some other garments accumulating for the laundry, and when I unfolded it to-day (6th August), I discovered a dead bee inside, the wool all teased out as by a mouse, and a little lump of wax. The whole surface of the shawl, inside, is very sticky.—MARY M. WILSON, Strathtay, Perthshire.

[I have carefully examined the bee sent with Miss Wilson's note, and find it is a queen of *Bombus jonellus*, Kirby. Very little seems to have been recorded regarding the situation of the nest in the case of this species. Sladen, in his recent book on the British humble-bees, states that he only once found a colony of *B. jonellus*; "this was in a squirrel's nest in the top of a Scotch fir." In the choice of a nesting place, it—like its near ally, *B. pratorum*—is probably more in agreement with the surface-builders or carder-bees than with the

underground dwellers. A nest which I discovered on a moor at Elvanfoot in September 1900, was practically on the surface of the peat beneath thick heather and moss.—WILLIAM EVANS.]

Hylastes cunicularius, Er., in Aberdeenshire.—On 5th October 1914 I obtained larvæ and adults of this Bark Beetle on a recently cut spruce stump in a mixed wood of Scots pine and spruce on the shore of the Loch of Skene. At the time I was uncertain of the identity of the species, but through the courtesy of Dr Stewart MacDougall, it has since been confirmed by Mr Gahan at the British Museum. *H. cunicularius* has not been previously recorded from Aberdeenshire.—JAMES W. MUNRO, Edinburgh.

Larentia salicata, Hb., in South-east of Scotland.—In reference to Mr William Evans' note on the occurrence of this moth in the neighbourhood of Edinburgh (*Scot. Nat.*, 1916, p. 266), it may be of interest to mention that, in addition to having taken it in North Northumberland, I found one in 1898 on the sea-cliffs at Marshall Meadows. This is within "Berwick Bounds," but is scarcely a mile from the Scottish march at Lamberton. I have a recollection that another had been taken on or near Lamberton Moor some years previously, but I am unable at the moment to find the record of it. The late Adam Elliot had already recorded the species for Roxburghshire as "flying over the hillsides in the higher localities at dusk" (*Hist. Bk. Nat. Club*, vol. x., p. 153, etc., 1882); and I think a single specimen was taken near Duns, in Berwickshire, a few years earlier; but it never seems to have been discovered at all commonly on the Borders.—GEORGE BOLAM, Alston.

Deleaster dichrous, Grav., in Roxburghshire.—James E. Black, in the *Ent. Mo. Mag.*, August 1916 (p. 186) records the capture of this beetle near the River Slitrig about the end of May.

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EDITORIAL.

BY the death of Mr J. M. Campbell, Scotland loses one of its most enthusiastic amateur naturalists. Serving for a quarter of a century as a lighthouse-keeper, under the Northern Lighthouse Board, Mr Campbell made the fullest use of his ample opportunities of observing the bird-life around his lonely station, whether at the Bell Rock, the Bass Rock, or the Noss Head, Wick. At the Bell Rock he devoted much of his time also to lower marine life, and in 1904 published an interesting and well-known volume entitled *The Natural History of the Bell Rock*, in which he treats of the seasonal fluctuations in the bird-life round the lantern and in the lower life peopling the surrounding waves and rock-pools. At the Bass he assiduously studied the habits of the Gannet, and made a series of valuable notes, which are incorporated in Mr Gurney's monograph. He also contributed some useful records of insects occurring at the Bass lantern, which are included by Mr Evans in the papers recently published by him in our pages.

Examples of melanism *or* albinism occur not infrequently in many groups of the animal kingdom, but it is only rarely that one comes across an instance where both kinds of variation are simultaneously present. In a recent article

entitled "Varieties of the Curlew and Lapwing,"¹ F. W. Frohawk describes and figures a Curlew, shot at Dunbeath, Caithness, in 1908, whose plumage presents a combination of both melanism and albinism. This remarkable specimen forms part of Mr Whitaker's collection of varieties of British Birds at Rainworth. Frohawk's illustration, in his well-known style, shows us a bird with the mantle, scapulars, secondaries, and the greater part of the primaries pure white, a few white mottlings on the head, and the remainder of the upper parts deep black. The under parts are entirely dusky brown mottled with black, the bill is black, while the legs and feet are of a deep leaden grey. In the same article numerous colour-variations, white, pied, and cinnamon of the Curlew and the Lapwing are also described or alluded to.

A further instalment has recently appeared of T. E. Lones' "Notes on the Fauna of the Country of the Chess and Gade."² In this contribution many interesting notes are given regarding the structure and habits of the two Copepod Crustaceans, *Canthocamptus staphylinus*, Jurine, and *Cyclops viridis*, Jurine. Figures are given of both species.

We have received copies of a paper by Henry Coates, entitled "'Wanted to Complete'—Perthshire Vertebrates."³ This is an appeal for assistance to complete the series of Vertebrates in the Perth Museum, of which the author is the curator. Had space permitted we should have been glad to give the list of desiderata in full, but we trust that such of our readers as are able or willing to assist will procure a copy of the pamphlet, which gives full particulars regarding the wants of the Museum.

¹ *The Field*, 9th September, 1916, p. 407.

² *Zoologist*, September 1916, pp. 337-47.

³ *Trans. Perthshire Soc. Nat. Science*, vol. vi., part 3, pp. 1-19 (1916).

PIED WHEATEAR AND OTHER RARE
BIRDS IN ORKNEY.

By JOHN BAIN.

ON 1st November 1916 I obtained on the island of Swona a Wheatear which was quite new to me. I sent it to Dr Eagle Clarke, who informs me that it is a young female of the Pied Chat (*Ænanthe leucomela*). This is the second British specimen, the only previous record being one from the Isle of May in 1909.

This autumn has not been a very good one for birds, but I have two other uncommon visitors to record. One was a Red-breasted Flycatcher on 29th September. Strange to say, this bird was in the same small geo and sitting on the same ledge of rock as that I recorded last year. The other was a Black Redstart, a young male, which I caught in the storehouse, where it was exceedingly busy catching flies on the window.

ON THE FIRST WINTER PLUMAGE OF THE
FEMALE PIED WHEATEAR, *ÆNANTHIE*
LEUCOMELA.

By WM. EAGLE CLARKE, LL.D., F.R.S.E.

THE capture of the second British example of the Pied Wheatear (*Æ. leucomela*, Pallas = *Æ. pleschanka*, Lepache), recorded above, is not only interesting as an example of the wanderings from its accustomed tracks of a south-eastern European and southern Siberian summer bird, but is useful since it affords an opportunity of describing the species in a stage of plumage which has been hitherto treated of in a very sketchy and wholly inadequate manner.

This Orcadian specimen is a young female in its first

winter dress—the stage in which the bird is most likely, in one or other sex, to occur in our islands.

Head, mantle, and scapulars dark drab, with paler edgings to the feathers, which are very faint on the head and most pronounced on the scapulars. Ear coverts brown; rump white.

Primary and secondary wing feathers and their coverts blackish; the former and their coverts outwardly margined and tipped with whitish buff; secondaries and rest of coverts with greyish buff.

The two centre feathers of the tail are black except the basal third, which is white; rest of the tail white with a broad black terminal band, broadest on the outer feathers; all the outer margins and tips edged with whitish buff. Throat and fore-neck greyish buff, the dark basal portion of the buff-edged feathers being in evidence and giving a dusky appearance. Breast dull sandy buff. Abdomen, flanks, and under tail coverts light buff.

Under surface of the primaries dark silvery grey, with pale buff inner margins; coverts dusky, edged with white and most pronounced on the smaller series; axillaries dull black.

Wing, 92.5 mm. (3.62 ins.). Third and fourth quills longest and equal, the second and fifth equal, and the third, fourth, and fifth emarginated towards the tips. Bill and legs black.

Acronycta aceris in Aberdeenshire—a Correction.—In the August number of the *Entomologist* (p. 191) G. E. Hartley corrects his record of this species in the same journal (p. 22). The moth, on emergence, proved to be *A. leporina*. Since the occurrence of *A. aceris* was stated at the time to be an addition to the Aberdeenshire list, and as such was quoted in our issue of March (p. 70) it is important to note the above correction.

Hoopoe in Ayrshire.—A female Hoopoe was obtained at Monkton, Ayrshire, on 30th September last. I understand this bird has not been recorded for Ayrshire for thirty-four years, when a specimen was got near Kilmarnock.—CHARLES KIRK, Glasgow.

WIGTOWNSHIRE AND ITS INLAND MOLLUSCAN FAUNA.

By W. DENISON ROEBUCK, M.Sc., F.L.S.

*(Concluded from page 274.)**Clausilia bidentata.*

Portpatrick, 1890, one, R. Rimmer (Roy. Scot. Mus., 1913). Stranraer, a few, 1890, R. Rimmer (*id.*); Port Logan, September 1890 (W. Evans); Portpatrick, The Battery, a few, 16th August 1909 (J. F. Musham); Garheugh Rocks, Luce Bay, Mochrum parish, numerous under stones, 28th April 1910 (Jack G. Gordon); Stairhead Cliffs, Isle of Whithorn, several, 12th August 1916 (Alex. Ross); about Cairn, Isle of Whithorn, a few, 12th August 1916 (*id.*); under stones near shore, Isle of Whithorn, several, 1st August 1916 (*id.*).

Cochlicopa lubrica.

Port Logan and Springbank, near Stranraer, September 1890 (W. Evans); Corsemalzie, several under stones, 23rd May 1909 (Jack G. Gordon); Stairhead Cliffs, Isle of Whithorn, one, 12th August 1916 (Alex. Ross); about Cairn, Isle of Whithorn, one, 12th August 1916 (*id.*); road-plantation between Isle of Whithorn and Port William, three, 1st August 1916 (*id.*).

Carychium minimum.

Springbank, near Stranraer, a few, September 1890 (W. Evans).

Succinea elegans.

Physgill Burn, near St Ninian's Cave, three on stones, 21st July 1916 (Alex. Ross).

Limnæa palustris.

Loch Lennows, monst. *decollatum* on weeds, several small and much-eroded examples, 12th May 1909 (Jack G. Gordon).

Limnæa truncatula.

Portpatrick, two, 1890, R. Rimmer (Roy. Scot. Mus., Edinburgh, 1913); Stranraer, a few, 1890, R. Rimmer (*id.*); Stranraer, numerous, 15th August 1909 (J. F. Musham); Loch Chesney, Mochrum, one, young, 31st June 1909 (Jack G. Gordon).

Limnæa peregra.

Stranraer (Roy. Scot. Mus., Edinburgh, October 1888); Lochnaw, (*id.*); Larbrax (*id.*); Chippermere, near Port William (P.

Adair, before 1891); Port Logan, September 1890 (W. Evans); Stranraer, September 1890 (*id.*); var. *ovata* in Malzie Burn, Corsemalzie, two, 2nd May 1909 (Jack G. Gordon); var. *lagotis*, Loch Lennows, Mochrum, one, small, 12th May 1909 (*id.*); var. *microcephala*, Malzie Burn, Corsemalzie, two on stones, 9th May 1909 (*id.*); var. *microcephala*, on weeds in pool on Whitedyke Moor, Corsemalzie, one, 21st May 1909 (*id.*); Loch Chesney, var. *microcephala*, three at bottom, on stone, same date (*id.*); Low Moor, Corsemalzie, numerous, adult and young, in ditch, 1st September 1916 (Jack G. Gordon).

Physa fontinalis.

Ardwell, several, 15th September 1890 (W. Evans); Loch Lennows, a few, 10th June 1911 (Jack G. Gordon).

Planorbis albus.

Loch Chesney, Mochrum parish, six of various ages and sizes on stones under water, 21st May 1909 (Jack G. Gordon).

Planorbis contortus.

Loch Chesney, three on stones under water, 21st May 1909 (Jack G. Gordon); Quhillart Moor, Corsemalzie, one, small 30th August 1916 (*id.*).

Ancylus fluviatilis.

Piltanton Burn, near Stranraer, September 1890 (W. Evans); Dunskey Wood, Portpatrick, a few, 18th August 1909 (J. F. Musham); Loch Chesney, three small examples, 21st May 1909 (Jack G. Gordon); three larger specimens, in Malzie Burn, Corsemalzie, 24th May 1909 (*id.*).

Bythinia tentaculata.

Malzie Burn, Corsemalzie, a few eroded examples on stones, 9th May 1909, and one very young, 30th August 1916 (Jack G. Gordon); Loch Elrig, Mochrum parish, 17th June 1909 (*id.*).

Lukvata piscinalis.

Loch Lennows, Mochrum parish, a few small eroded specimens on the bottom, 12th May 1909 (Jack G. Gordon); Loch Chesney, a few small and eroded examples on the bottom, 20th April 1910 (*id.*); Garlieston, common in mill-dam, 28th May 1912 (Edward Collier); Portyerriock in Whithorn, 28th May 1912 (*id.*).

Unio margaritifer.

Malzie Burn, Mochrum parish, not uncommon, 9th May 1909

(Jack G. Gordon). Mr Gordon counted twenty-three living specimens near the same place, and states that it also occurs in the River Cree.

Sphaerium corneum.

Malzie Burn, Corsemalzie, four on the bottom, 4th May 1909 (Jack G. Gordon); Loch Lennows, five on the bottom, 12th May 1909 (*id.*); Loch Chesney, on the bottom, three young examples, same date (*id.*); ditch round the Moor, Corsemalzie, one, 6th July 1916 (*id.*).

Pisidium fontinale.

Ditch round the Moor, Corsemalzie, 6th July 1916 (Jack G. Gordon).

Pisidium pulchellum.

Ardwell, September 1890 (W. Evans).

Pisidium cinereum.

Portyerriock in Whithorn, 28th May 1912 (Edward Collier); Quhillart Moor, 4th September 1916 (Jack G. Gordon).

Pisidium obtusale.

Ditch in wood, Corsemalzie, 8th September 1916 (Jack G. Gordon).

Every record in this list—which totals up to fifty-two species—is an “authenticated” one, the paper being the third of a series drawn up by me in my official capacity as Hon. Recorder to the Conchological Society of Great Britain and Ireland, with a view of stimulating closer investigation throughout Scotland.

The most striking absentees from the list are the following, which have all been authenticated from the two adjoining counties, Ayrshire on the north, Kirkcudbrightshire on the east:—

Hyalinia pura.

Punctum pygmaeum.

Helix hortensis.

Helicella virgata.

Helicella itala.

Hygromia fusca.

Pupa muscorum.

Vertigo substriata.

V. pusilla.

Succinea putris.

Acicula lineata.

Pisidium pusillum.

And there are various others, *e.g.* *Agriolimax laevis*, which should certainly be found. Of *Pisidia*, two species not in

this list have been recorded by Mr Kennedy (*loc. cit.*). I shall be pleased to have the opportunity of adding to the above records, and not merely for this area but for most Scottish counties—for which purpose my address is 259 Hyde Park Road, Leeds.

Cumberland-bred Black-headed Gulls nesting in Scotland.—*Apropos* of the mention of ringing birds in the "Report on Scottish Ornithology" number, it may be of interest to state that two Black-headed Gulls (*Larus ridibundus*), bred and ringed in Cumberland by myself, were picked up dead in Scottish gulleries in the nesting season and among the nests. The first was one which I marked at Greystoke, Mid-Cumberland, which, two years and eleven months afterwards, was found dead in the breeding season in a gully at Tentsmuir in Fife. The second I marked at Ravenglass on the Cumberland coast. It was picked up dead one year and eleven months afterwards, also in the nesting season, and among the nests, in a gully near Kirknewton, Midlothian. There is little doubt but that both these birds were nesting in these gulleries. Two other Cumberland-bred birds were found dead near Scottish gulleries in the nesting season, and were possibly nesting there. The first of these was a Ravenglass-bred bird, which, eleven months later, was found dead in Dumfriesshire close to two gulleries, and the second was a bird marked on Denton Fell, Cumberland, and found dead thirteen months afterwards close to a gully, also in Dumfriesshire.

It might be stated that three other Ravenglass-bred birds were found dead among the nests in the breeding season in other gulleries in England and Wales, as mentioned in my article in *British Birds*, vol. viii., pp. 209-218, as follows: (1) In a gully in Delamere Forest, Cheshire, exactly one year afterwards; (2) in the Llanfairpwll gully, Anglesea, North Wales, one year and one month afterwards; (3) in a gully on Stanedge Moor, S.W. Yorkshire, four years and one month afterwards. A fourth, marked on the Llyn Mynyddlod gully, Merionethshire, Wales, was found dead three years later on a gully at Hebden Bridge, Yorkshire. Three Ravenglass-bred birds were found dead in their parent gully during the nesting season—two, two years, and the third three years afterwards. —H. W. ROBINSON, Lancaster.

NOTES ON INSECTS CAPTURED IN THE
ISLAND OF RAASAY.

By WILLIAM EVANS and PERCY H. GRIMSHAW.

THE following insects were taken by Mrs J. H. Gaskell during a stay of two months on the island of Raasay in the past summer, and submitted to us for determination and record. At our request Mrs Gaskell kindly supplied some information regarding the nature of the country where the insects were obtained. In her letter she states that the south end of the island near the house is well wooded, and there is a little arable land and some grass. The specimens indicated as caught "in bracken" were all caught very near the sea in very thick bracken, while those marked "in grass" were taken on the lawns by the house, which stands on the edge of a wood (mainly larch and Scots pine) and has fields in front which slope down to the sea.

LEPIDOPTERA.

Six species of butterflies and six of moths were taken as follows:—*Vanessa urticae*, L., one, 8th August; *Argynnis aglaia*, L., one male and one female, 28th July; *Argynnis selene*, Schiff., one, 24th July, and one, 26th July; *Erebia ethiops*, Esp., two, 26th July, caught in marshy ground on the edges of the moor, seen in great numbers; *Epinephele janira*, L., two males, 24th July; *Cænonympha pamphilus*, L., one in bracken, 19th July; *Metrocampa margaritaria*, L., one, 2nd August; *Acidalia fumata*, St., one, 25th July; *Bupalus piniaria*, L., one, 24th July; *Melanippe montanata*, Bork., one, 24th July; *Camptogramma bilineata*, L., one in bracken, 19th July, and one in heather, 26th July; *Crambus culmellus*, L., two in heather, 25th July.

HYMENOPTERA.

Bombus lucorum, Smith, one, 22nd July; *Bombus muscorum*, L., one female, 19th July; *Tenthredo olivacea*, Htg., one female in heather, 25th July; *Glypta* sp., one female in grass, 8th August; and a specimen, not determined, belonging to the tribe *Phygadeuonides* (Fam. *Ichneumonidae*), taken in bracken, 19th July.

COLEOPTERA.

Harpalus aeneus, F., one, 26th July; *Quedius fuliginosus*, Gr., one in grass, 8th August; *Necrophorus mortuorum*, F., one male, 2nd August; *Necrophorus ruspator*, Er., one male, 22nd July; *Longitarsus laevis*, Duft., several on lawn, 13th July; *Hylobius abietis*, L., one, 22nd July.

NEUROPTERA.

The only insect taken belonging to this order was a teneral specimen of the Dragon-fly, *Sympetrum striolatum*, Charp. It is a female, and was captured on 25th July.

HEMIPTERA.

Leptopterna ferrugata, Fall., nymph in bracken, 19th July; *Philænus spumarius*, L., three in bracken, 19th July; *Euacanthus interruptus*, L., one in bracken, 19th July; *Limotettix quadrimaculata*, Fab., one on lawn, 13th July; *Cixius cunicularius*, L., one in bracken, 19th July.

DIPTERA.

Metrioctenemus fuscipes, Mg., one male on lawn, 13th July; *Limnobia bifasciata*, Schrk—a single male of this fine species was taken in heather, 26th July. (This is probably the most interesting insect in the whole collection. The only previous Scottish records are Guisachan, Inverness, and the Clyde district.) *Tipula scripta*, Mg., one female in heather, 25th July; *Hæmatopota pluvialis*, L., one female, 24th July; *Bicellaria nigra*, Mg., one male in grass, 8th August; *Hilara chorica*, Fall., one female in grass, 8th August; *Dolichopus* sp., one female, two much crushed for identification; *Sympycnus annulipes*, Mg., one male in grass, 8th August; *Volucella pellucens*, L., one male, 19th July; *Calliphora erythrocephala*, Mg., one female, 2nd August; *Phaonia basalis*, Ztt., one male in heather, 26th July; *Hylemyia strigosa*, Fab., one female in bracken, 19th July; *Fannia serena*, Fln., one female in bracken, 19th July; *Caricea tigrina*, Fab., one on lawn, 13th July; *Cænosta elegantula*, Rond., one female on lawn, 13th July; *Themira minor*, Hal., one male on lawn, 13th July; *Sapromyza* sp., one in bracken, 19th July; *Drosophila* sp., one on lawn, 13th July; *Hydrellia griseola*, Fln., two on lawn, 13th July; *Ceratomyza denticornis*, Pz., one on lawn, 13th July; *Opomyza germinationis*, L., several on lawn and in bracken, 8th, 13th, and 19th July; *Balioptera venusta*, Mg., one in bracken, 19th July; *Agromyza floveola*, Fln., one in bracken, 19th July.

SOME FOREST INSECTS IN ABERDEENSHIRE.

By WALTER RITCHIE, B.Sc.

THE LARGE LARCH SAWFLY (*Nematus erichsonii*).

WHILE on a visit to Aboyne in the beginning of August, I found the caterpillars of this Sawfly in clusters in several plantations in the district. In the first instance I found them in the Glentaner Estate, on the larch trees alongside the south Deeside road, about one mile west of the suspension bridge over the River Dee at Aboyne. These trees were about seventy years of age. I showed a number of the caterpillars to Dr R. Stewart Macdougall, who determined them as *Nematus erichsonii*. Having discovered that this insect was in the neighbourhood, I examined a number of similarly aged larch trees in a plantation on the Forest of Birse Estate, and I found on them caterpillars of the same species here and there throughout the plantation. I also found many Large Larch Sawfly larvæ on a young fifteen-year-old larch which I chanced to examine in a narrow strip of woodland on the northern portion of the Ballogie Estate, and also in clusters on a larch tree on the Balfour Estate. The plantation in which the latter occurred was about forty years of age. In every case but one I found the caterpillars on the branches on the sunny side of the trees. The upper branches appeared to be well foliated, the lower ones only being severely attacked, and in some cases these were completely defoliated. In the beginning of September I also came across quite small caterpillars of *N. erichsonii*. The female Sawfly lays her eggs in niches cut in young larch shoots, and a number of these were seen curled and withered as a result of the egg-laying. The area over which the caterpillars were dispersed measured about eight square miles. The damage caused by this species in England led to its being placed among the insects scheduled under the Destructive Insects and Pests Order. By this Order the presence of the insect in any plantation must be reported

at once to the Board of Agriculture. (See Leaflet, No. 22, Board of Agriculture for Scotland.) This is the first recorded case of *N. erichsonii* caterpillars being at work in Aberdeenshire.

ATTELABUS CURCULIONOIDES, L.

On the 16th June this year I found a single specimen of this insect in an oak wood about two miles east of the village of Aboyne. According to Fowler (*Coleoptera of the British Islands*) this beetle is considered rare in Scotland, having been found only in the Forth and Tweed areas. *Attelabus curculionoides* bites the blades of the oak and Spanish chestnut across on both sides of the midrib, and then rolls up the severed portion of the blade into a ball which hangs by the midrib. The specimen alluded to was caught when resting in a flower of the Lesser Wintergreen (*Pyrola minor*).

CRYPTORHYNCHUS LAPATHI, L.

On 28th December 1915, I found tunnels of the larvæ of this insect on the various species and varieties of willow that are growing on the right bank of the river Dee, near Aboyne village. These willows skirt the river bank for a distance of over one mile, and in almost every one of them I found larval tunnels. At a later date I examined the stems and branches, and found some of them to be simply riddled with larval tunnels. At the same time I collected some hundreds of specimens of adults and larvæ. This weevil is in Central Europe a destructive enemy of alder, but although alder trees of various ages were growing amongst the willows I never found any of them attacked by *Cryptorhynchus*.

CRYPTHALUS ABIETIS, RATZ.

On the 9th April last I found this insect breeding freely on the wind-blown stems of silver fir in a wood on the Ballogie Estate. At a later date I discovered numerous adults boring into the suppressed branches of the younger standing silver fir trees in this same wood.

SCOLYTIDS (INCLUDING *HYLASTES CUNICULARIUS* AND *PITYOPHTHORUS RAMULORUM*) AND OTHER COLEOPTERA (INCLUDING *METABLETUS TRUNCATELLUS*) TAKEN IN THE FORTH AREA.

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

MR J. W. MUNRO'S helpful papers and notes on bark and wood boring beetles, in the present volume of this magazine and elsewhere, have revived my interest in these insects, and induce me to give particulars of my personal records for the Forth area. These, and the records of species belonging to other families included in the present paper, may be regarded as a continuation of my notes on Scottish Coleoptera begun in the *Annals of Scottish Natural History* for 1900. The principal lists are in the volumes for that year and 1903, since which date a number of short notes have from time to time appeared in that and other journals.

Scolytidae (Bark Beetles).

Two of my better captures in this family are a specimen of *Hylastes cunicularius*, Er., taken in a wood of Scots pine and spruce near Kirknewton, Midlothian, on 23rd May 1895; and one of *Pityophthorus ramulorum*, Perr. (*pubescens*, Marsh), beaten, on 12th March 1904, from a heap of pine branches where a tree had recently been cut down, near Gifford, East Lothian. The *Hylastes* has been examined by Mr Munro, and compared with authentic specimens of *cunicularius* in his collection, and he concurs in the identification. Owing to its great similarity to *H. ater*, this species is easily passed over, and therefore may not really be so rare as has been supposed. The *Pityophthorus* was determined for me by Dr D. Sharp some years ago as a variety (?) of *P. ramulorum*. In Newbery and W. E. Sharp's recent list of British Coleoptera we find *P. ramulorum*, Perr., given, with *pubescens*, Marsh, as a synonym. Both of the above beetles are additions to the Forth list. Prof. Hudson Beare has recorded *P. pubescens* from Rannoch. *H. ater*, Payk., is common and does not call for a full list of records,

but as showing how widely it is distributed in the Edinburgh district the following occurrences, all in Scots pine stumps, may be mentioned:—Woods near Kirknewton and Balerno (county of Edinburgh) fairly common, April 1903, etc.; Dalmeny Park and Drumshoreland (Linlithgow), April 1905 and August 1916 respectively; Gifford (Haddington), October 1916; near North Queensferry (Fife), November 1896. Though not given for Forth in Sharp's Scottish Catalogue, *H. ater* was recorded from Craiglockhart by Duncan in 1831 (*Mem. Wern. N. H. Soc.*, vi., 500), and from near Stirling in June 1844 by R. N. Greville (*Zool.*, 698). *H. palliatus*, Gyll., while perhaps not so common as *ater*, is also widely distributed, occurring in spruce (chiefly) and other conifers. My specimens were taken in the vicinity of Kirknewton, Midcalder district, in dead spruce, Scots pine, and larch, April 1903, March 1913, etc.; Balerno, March 1905, February 1911, etc.; Heriot (Edinburgh), May 1911; Drumelzie, Westcraigs (Linlithgow), dead, October 1916; Saltoun (Haddington), April 1911; Gifford, October 1916; Cullalo (Fife), April 1897; Dollar (Clackmannan), April 1897; Comrie (Perth), April 1899.

Hylesinus crenatus, F., is common in dead, or partly dead ash trees, from the bark of which I have taken it at Roslin, etc., October 1896; Boghall, March 1902; Blackford Hill and Craiglockhart, February 1915; near Musselburgh, June 1916 (all in the county of Edinburgh); Philpstoun (Linlithgow), April 1916; Gullane (one on wing), Tynninghame, and Gifford (Haddington), June 1901, December 1913, and October 1916 respectively; Dollar, April 1897. In 1896 I found this species in an elm at Comiston, near Edinburgh. No other species of the genus has come under my notice here.

Myelophilus piniperda, L., attached as its name indicates to the Scots pine, is undoubtedly our most abundant bark-beetle. Wherever there are pine plantations, one is almost certain to find the bark of practically every dead tree riddled with its borings. My notes include records from all the Watsonian counties and vice-counties (81 to 87) falling within the boundaries of the Forth area. *M. minor*, Hart., has not so far been detected in the area.

Hylastinus obscurus, Marsh, and *Phloeophthorus rhododactylus*, Marsh, are common in dead stems and branches of broom, the same plant usually yielding both species. On the south side of Blackford Hill and on the Braid Hills I have taken both plentifully in broom (October 1914, etc.); also at Kirknewton, February 1914; Lothianburn, April 1916; Whitehill, September 1916 (all in the county of Edinburgh); Milnathort (Kinross), April 1915; Ormiston and Tranent (Haddington), April and June 1916 respectively; Kinneil Mill (Linlithgow), March 1914; Eddleston (Peebles), November 1916. *H. obscurus* occurred alone at Blackshiels (Edinburgh), August 1916; Illieston (Linlithgow), November 1915; and Cardenden (Fife), April 1915. In March last I got both species in whin on Braid Hills, and *H. obscurus* in the same plant at Pentland.

The first recorded Scottish specimen of *Cryphalus abietis*, Ratz., was beaten by Prof. Hudson Beare off a shrub at Gorebridge (Edinburgh) in May 1905, and on Arniston Estate, in the same neighbourhood, I found the flight-holes of the species in dead branches of tall silver firs last September—only one beetle was then obtained, but on 18th November about fifty were got in a few pieces of similarly bored branches from a silver fir at Bush, near Roslin. Mr Munro kindly gave me specimens from Eddleston (Tweed area), where I have recently observed its borings myself. This is an excellent example of how a species may evade detection till a knowledge of its habits is made the basis of search for it.

The not less interesting spruce-inhabiting species, *Dryocetes autographus*, Ratz., has been met with in the following localities, namely, near Kirknewton, under the bark of spruce stumps in April 1903 (one on 2nd and a colony on 14th), and April 1905 (fifteen), and of a fallen tree of the same kind in July last; Harelaw ravine, near Balerno, abundant in blown-down spruces, February and May 1916 (I owe my knowledge of this colony to the kindness of Mr Munro, by whom it was discovered—see *ante*, p. 95); Blairadam, Kinross-shire, one caught on the wing in a fir wood, 3rd June 1909; and Gifford, Haddington-

shire, a fair number in spruce stumps, 17th October 1916, as already recorded (*ante*, p. 288).

Of *Tomicus acuminatus*, Gyll., I have only taken three examples in this area: they were beaten out of dead lopped-off branches of Scots pine, near Kirknewton (Midlothian), one on 3rd, and a pair on 14th April 1903. In the same locality *Pityogenes bidentatus*, Herbst., was taken in some numbers on dead (cut) Scots pine branches in April 1903, and again in June and July last; also at Roslin in October 1896, and this year at Mortonhall and Balerno (all in county of Edinburgh). In West Lothian I found it near Westcraigs in October last; and East Lothian specimens are from Luffness, September 1893; Gullane, August 1903; and Gifford, March 1904, etc. An example (male) of var. *quadridens* is from Bo'ness (Linlithgow), May 1901.

Trypodendron lineatum, F., which, owing to its habit of boring well into the solid wood of spruce stumps and logs, is difficult to obtain even when its presence has been detected, must for the present be regarded as one of our "good things." The only specimens taken in "Forth" appear to be two got by myself in a spruce stump in wood near Kirknewton (Midlothian), on 2nd and 3rd April 1903. Prof. Hudson Beare was with me on the first of these dates, and the specimen I then took is that recorded in his notes on "Scottish Coleoptera" in the *Entomologist's Record* of July 1903. In May 1916, the unmistakable borings of the species were discovered in a fallen spruce near Balerno, but no beetle was obtained. Mr Munro has given me a specimen from Eddleston (Tweed area), taken in October last, and I have another which I got myself in a spruce stump there in November. Search on oak and birch for *T. domesticum*, L., a specimen of which Prof. Beare took at Hawthornden in May 1905 by sweeping herbage, has not as yet been successful.

The other bark and wood boring beetles, belonging to the families *Curculionidae* (Weevils), *Cerambycidae* (Longicorns), etc., may next be referred to.

Hylobius abietis, L., the well-known pine weevil, is widely distributed and locally common in this area, where it has

been met with in every county. My specimens are from the following localities:—Penicuik district, many years ago; Balerno, May 1894; Kirknewton, April 1903 and June 1916; Boltonmoor (Haddington), June 1904; Gifford, etc., larvæ, October 1916; Drumshoreland, April 1905; Dunipace (Stirling), May 1914; Aberfoyle (South Perth), May 1896; near Thornton (Fife), August 1893; Isle of May Lighthouse, male at lantern, 13th August 1913. The last occurrence is of interest in more than a local sense. *Pissodes pini*, L., we also have in our pine plantations, but it is less common. My specimens were taken in Redford Wood, near Balerno, 10th May 1903 (a pair off branches of newly felled Scots pine); near Kirknewton, 28th February 1914 (also by beating freshly cut pine branches); West Bavelaw, in bark of dead pine, April 1916. Its galleries and larvæ have been observed at Kipps (Linlithgow) and Eddleston. Duncan, writing in 1831, mentions (*loc. cit.*, p. 506) that *H. abietis* was first ascertained to be an inhabitant of Britain by Sir J. E. Smith, the famous botanist, "who found it in Ravelston Wood, near Edinburgh."

Of longicorns we have few species, and all save one are rare. Taking them in their systematic order, the first on my list is *Asemum striatum*, L., of which two living examples were taken in a "clearing" near Kirknewton (Midlothian) on 20th June 1916. Observing a rather large flight-hole in a sound Scots pine stump, I drew the attention of Mr Munro, who was with me, to it, and in due course his axe exposed the two beetles and several larvæ in their galleries. A month later I took a dead beetle from the same stump, and found larval galleries in another. In Murray's Catalogue (1853) it is entered as "Rare near Edinburgh; Dollar, etc.," and I know of no more recent record for the Forth area. Our only common longicorn is *Rhagium bifasciatum*, which is to be found in decayed stems and stumps of pines in every county, as the following list of localities represented by specimens in my collection shows:—Penicuik, 1869; Bavelaw, May 1895; Dalmahoy, June 1895; Kirknewton, April 1890 and May 1891; near Dunbar, August 1915; Tartraven (Linlithgow), June 1914; near Stirling, 1887; old pine wood near Loch Coulter (Stirling), over a dozen in rotten stump, 30th October

1915; Cullalo and Blairadam; Clackmannan Forest, April 1897; Aberfoyle, May 1897; summit of Ben Ledi, 8th July 1902. The last is an interesting record as showing the insect's powers of flight and capacity for extension of range. A number of years ago I found several in a dead beech by the roadside west of Dalmahoy Hills. *R. mordax*, De G. (*inquisitor*, Brit. Catalogues, *new* L.), which affects birch, etc., is very scarce in this district; indeed, the only local specimen I have seen is one taken by Mr J. W. Bowhill at Pressmennan, East Lothian, on 4th July 1909. Hardy's record from Pease Bridge, Berwickshire, which Sharp assigned to "Tweed," really belongs to "Forth" as now defined. *Pachytacerambyciformis*, Schr., is another rarity which Dr Hardy took at Peasedean many years ago. On 11th July 1904 I captured my single specimen on the south side of Saltoun Wood, East Lothian. Another was seen, but took wing before I could catch it. I know of no other Scottish records. Of *Strangalia quadrifasciata*, L., a striking black and yellow species, I have a male captured at Saltoun Wood on 9th August 1902, as recorded in *Ann. Scot. Nat. Hist.* for 1903, p. 96; and three (two males and a female) caught in the same locality on 11th July 1904. Five altogether were seen on the latter occasion, but two of them, by timely flight, managed to evade my net. Mr A. E. J. Carter has shown me a specimen he took at Aberfoyle in July 1901. In 1903 (*loc. cit.*) I recorded *Grammoptera ruficornis*, F. (a single specimen), from the north bank of the Esk, near Polton, Midlothian, 18th June 1901. Now I am able to record *G. tabacicolor*, De G. (*levis*, F.), having taken two (male and female) on flowers of earth-nut, in Castle Campbell Glen, Dollar, 24th June 1905, and a third at Pressmennan, on valerian, in June 1911. It has also been taken in the latter locality by Mr Bowhill.

A few other longicorns have occurred as importations in timber. I have *Acanthocinus ædilis*, from Bo'ness, August 1901, and Granton, 16th August 1916; *Pogonochærus fasciculatus*, from Bo'ness Docks, September 1901; and *Monochamus sutor*, from Colinton Dell, near Edinburgh, September 1878 (see records in my 1900 and 1903 papers).

(*To be continued.*)

Dryocætes autographus, Rtz., etc., in Peeblesshire.—

On 15th October, in a very open belt of wood consisting chiefly of spruce, on Earlyvale Estate, Eddleston, Peeblesshire, I obtained both larvæ and adults of *Dryocætes autographus* on a wind-blown spruce stem. On another fallen spruce I obtained *H. palliatus*, Gyll., and the galleries of *Trypodendron lineatum*, Ol. A third spruce, however, yielded the most interesting bag, for on its branches I took *Pityogenes bidentatus*, Hbst, and *Cryphalus abietis*, Rtz. In one piece of branch I obtained the two species side by side. This last is a most interesting find, for hitherto *C. abietis* has been taken only on silver fir in Scotland, and *P. bidentatus* is normally a Scots pine dweller.—JAMES W. MUNRO, Edinburgh.

Cemiostoma laburnella, Heyd., in the Forth Area.—

Though apparently unrecorded from the Forth area, this dainty little moth is certainly locally common if not widely distributed. During the second and third weeks of August last (1916) it was very common on and about laburnum bushes in the Blackford district of Edinburgh. I first noticed it in Blackford Road, and subsequently found it in profusion at the shrubbery on the north side of Blackford Hill pond. The larvæ "mine" the leaves of laburnum, and cause large blotches on them. These blotches were much in evidence on the laburnums at the pond, and on the undersides of many of the leaves tiny silken webs covering the pupæ were to be seen. From some of the leaves brought home the moths were reared. Miss Balfour tells me this species is common at Whittingehame, and I recently observed that a laburnum at Gifford had the characteristic blotches on its leaves. During the first fortnight of August *C. spartifoliella* was very abundant on broom at Craiglockhart. The larvæ, in this case, live in the bark of their food-plant. Notwithstanding this difference in habits, the two moths are practically indistinguishable.—WILLIAM EVANS, Edinburgh.

The Feathered Thorn or October Moth in Aberdeenshire.—

As I have not observed this moth (*Himera pennaria*) in Aberdeenshire before, I send a record of a single specimen found by me in the woods of Crathes Castle on 11th November. The species, while moderately common in England, is said to be rather rare and local in distribution in Scotland, its scarcity increasing northwards till it reaches its northern limit in Ross-shire. The only previous Aberdeenshire record with which I am at present acquainted, is one from Aberdeen by Mr Clark, recorded in Prof. J. W. H. Trail's "Lepidoptera of Dee" in the *Trans. Aberdeen Nat. Hist. Soc.*—ALEX. MACDONALD, Durris.

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