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EDITED BY

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

*Keeper, Natural History Department, Royal Scottish Museum
President, British Ornithologists' Union*

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, F.Z.S., H.M.B.O.U.

LEONORA J. RINTOUL, F.Z.S., H.M.B.O.U.

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

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M.B.O.U.

ANDERSON FERGUSSON, F.E.S.

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ON WHALES LANDED AT THE SCOTTISH WHALING STATIONS, ESPECIALLY DURING THE YEARS 1908-1914—PARTS IV. TO VI. THE BOTTLENOSE, HUMPBACK, AND FINNER WHALES.

By D'ARCY WENTWORTH THOMPSON.

(Continued from "The Scottish Naturalist," 1918, page 237.)

IV. THE BOTTLENOSE-WHALE (*Hyperoodon rostratus*, auctt.).

THIS small whale is probably that of all others which is oftenest cast ashore on our own coasts. It is without doubt plentiful on our whaling-grounds; and in the North Atlantic it has been the object of a not unimportant Norwegian,¹ and at times Scottish, fishery, especially to the north of Faroe, north-east of Iceland towards Jan Mayen, and up to the verge of the Arctic ice-field.² It was hunted partly for its oil, which is of fine quality and hardly distinguishable (if at all) from sperm; for its spermaceti, which substance again it yields in common with the sperm-whale; partly also, I have been told (though I cannot vouch for it), for its skin, which is said to make good leather, like that of the Beluga; and partly, it is also said, for the sake of the ambergris, or a variety

¹ In 1886, for instance, the Norwegians took 1311 Bottlenose-whales (T. Southwell, *Zoologist* (3), xii., p. 126, 1888).

² See Chart in Hjort's *Fisken og Hvalfangst*, 1902, p. 192.

thereof, contained in its intestine, and formed, doubtless, as also in the Cachalot, as a by-product of the digestion of its cuttlefish food.

But in all the years we are considering, only twenty of these whales are reported to have been landed at our Scottish stations. I imagine that while this small whale is remunerative when caught in considerable numbers, and when "tried out" at sea, it does not pay to tow it ashore, as has to be done in Scotland, from the often distant fishing-grounds. The few of which we have record were mostly captured to the northward of Shetland and of Rona, and we may deal with them in a word or two.

Of our twenty individuals, ten were landed during the month of June, the rest from April to September; eight in 1912, seven in 1913, and two, one, two respectively in 1909, 1910, and 1911. Fourteen out of the twenty were females, or 70 per cent. of the whole.

The lengths of the males varied from 13 to 22 feet; of the females from 16 to 25 feet. The median values were, respectively, $18\frac{1}{2}$ and 21 feet, and the arithmetical means 17.8 and 20.7 feet. The mean length, for both sexes together, was 19.8 feet. From this it would appear that not one of our Bottlenoses was full grown, for specimens are recorded up to and a little over 30 feet long.

In girth these Bottlenoses varied from 7 to 12 feet for the males, and from 6 to 12 feet for the females, the arithmetical means being 9.3 and 10.7 feet. The ratio of girth to length was, for both sexes alike, approximately 52 per cent.; but the ratio varied individually from about 35 per cent. to 70 per cent. Our mean ratio is considerably higher than we have found for the Finners—the Bottlenose is, in general, a thicker and a rounder whale. A Finner-whale of 60 feet long, as we shall see, has an *average* girth of about 23 feet; if we could imagine a Bottlenose of 60 feet long, its girth on the average would be about 31 feet. Captain David Gray puts the ratio of girth to length higher still, stating that a full-grown Bottlenose of 30 feet long would measure 20 feet in girth; as a matter of fact, some three or four of our twenty Bottlenoses show a similarly high ratio: viz., a male of 17

feet long, with a girth of 12 feet, and three females 19, 18, and 16 feet long, with girths, respectively, of 12, 12, and 11 feet. All four were taken in June 1912.

The great majority of British specimens, as is well known (and as William Thompson remarked so long ago as 1840), have occurred on our coasts in autumn, especially in August and September, this being the time of their southward migration. A smaller number have occurred in late winter and early spring. The Bottlenose occurs on the Norwegian coasts, according to Collett, at the same seasons as with us; at Faroe it is found in autumn, chiefly in September, but neither in winter nor in spring: the general trend of its annual migration—to the northward as far as the edge of the ice in summer, and southward again to warm Atlantic waters in winter—is simple and plain. Besides cuttlefish, which would seem to be its chief and favourite diet, it also feeds largely on herrings; and Collett records (for instance), on the authority of Captain Lauenborg, an occasion (1st August 1884) when many hundreds of these whales were seen gathered together off Cape Langenes in Iceland, at a time when the water was “filled full of herrings.”

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V. THE HUMPBACK-WHALE (*Megaptera longimana*,
Rudolphi).

Of the Humpback-whale, only thirty-one specimens were landed in Scotland during the period 1908-14; in the preceding years, 1904-07, according to Mr Haldane's account, five were landed in each of the four years—that is to say, between 1908 and 1914 the Humpback constituted less than 1 per cent. (31 out of 3969 whales, or 0.78 per cent.) of the total catch. This is in strong contrast to the Norwegian

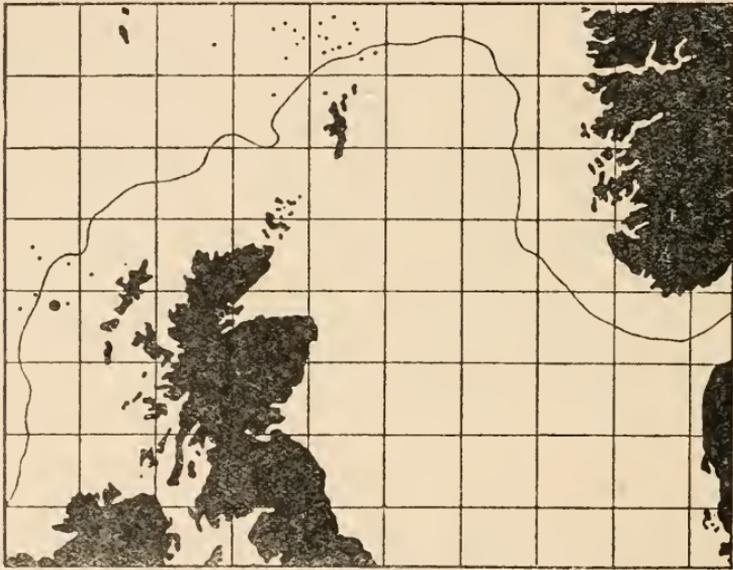


FIG. 7.—The Scottish Catch of Humpback-whales, 1908-1914.

figures. In Hjort's Finmark statistics (*Hvalfangst*, p. 187), and in Mr Cocks' for Finmark and the Murman coast, we have the following catches recorded:—

| | 1883-1887. (Cocks.) | | 1896-1901. (Hjort.) | |
|----------------------|------------------------|--------|------------------------|--------|
| Blue-whales | 530 | 14.9 % | 246 | 6.0 % |
| Finners | 1794 | 50.4 % | 2448 | 60.1 % |
| Sei-whales | 951 | 26.7 % | 851 | 20.9 % |
| Humpbacks | 287 | 8.0 % | 525 | 12.9 % |
| | 3562 | | 4070 | |

showing a percentage of Humpbacks from ten to sixteen times as great as ours. Since the Humpback is a large and valuable whale, we have no reason to suppose that it is neglected by

our whalers, as is the Bottlenose. It is a scarce species on our coasts, so far as we know, and at least during the whaling-season.

Of our thirty-one specimens, twenty-three were males, a proportion of about 74 per cent. The males ranged in size from 27 to 51 feet long, the females from 30 to 50 feet. The median size of the former was 41 feet, of the latter 42½ feet; the arithmetical means were 41.4 and 41.1 feet—in other words there was no evidence of inequality of size in the two sexes. The girth varied from 16 feet in a 35-foot whale to 38 feet in a 41-foot whale: *i.e.* from 44 to 93 per cent. of the length. The median value was 56 per cent.—a very high value, but not more, in fact rather less, than we might expect from the general form and appearance of the animal.

We have nothing particular to say about the region of capture (Fig. 7); about two-thirds of the specimens were got to the north of Shetland and Rona, the rest on the St Kilda grounds. The dates of capture are shown in the following table:—

Total catch of Humpbacks, 1908-1914.

| | MALES. | | | | | | | FEMALES. | | | | | | | Total. |
|-------|--------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|-------|-------|--------|
| | 1908. | 1909. | 1910. | 1911. | 1912. | 1913. | 1914. | 1908. | 1909. | 1910. | 1911. | 1912. | 1913. | 1914. | |
| May | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 |
| June | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 2 |
| July | 1 | 4 | 5 | 2 | ... | 1 | ... | 1 | ... | 1 | ... | ... | ... | ... | 15 |
| Aug. | ... | 4 | 4 | 1 | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | 11 |
| Sept. | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | 2 |
| | 1 | 8 | 9 | 3 | ... | 1 | 1 | 1 | 3 | 2 | 1 | ... | ... | 1 | 31 |

It will be seen that July was the chief month of capture, and that twenty-six out of the whole thirty-one were got in July and August. Twenty-two were got in the years 1909 and 1910; none at all in 1912; and only one or two in 1908, 1913, and 1914. In Finmark this whale occurs early in the season. Out of 175 caught in a certain year, according to Hjort, 104 were got before the 1st of June; indeed, its capture in the north of Norway begins as early as February. In July it is found far north, in the neighbourhood of Bear Island.

VI. THE FINNER OR COMMON RORQUAL

(*Balænoptera musculus*, auctt. ; *B. physalus*, Fabr. ; *B. rorqual*, Lacep. ; *Physalus antiquorum*, Gray).

The Common Rorqual, the "Finner" of our whalers, the Finhval, Rörhval or Sildehval (*i.e.* "herring-whale"), or sometimes Loddehval, of the Norwegians, forms the greater part of the catch at all our Scottish whaling-stations. Between the years 1908-14, 2409 Finners were caught out of a total catch of 3969 whales; that is to say, Finners constituted 63.2 per cent., or nearly two-thirds, of the entire catch.

The sexes are on the whole equally balanced, 49.3 of the whole number being males during the period we are considering, viz. from 1908 to 1914. If we include the four preceding years, for which we have in this case enough material to hand in Mr R. C. Haldane's papers,¹ the proportion of males works out (for the whole eleven years) at 51.7—again a close approximation to equality.

Finner-whales captured during 1904-1907.

| | 1904. | 1905. | 1906. | 1907. ¹ |
|-------------------------------|-------|-------|-------|--------------------|
| Males | 236 | 248 | 153 | 183 |
| Females | 164 | 202 | 167 | 122 |
| Total | 400 | 450 | 320 | 305 |
| Percentage of Males | 59.0 | 55.1 | 47.8 | 60.0 |

The proportion of males to females varies a good deal from year to year, and its variations seem to be quite irregular or fortuitous. When we take the proportions of the sexes not from year to year but from month to month, over the whole available period (1908-1914), we find a greater appearance of regularity; the tendency on the whole being for the proportion of males to increase as the season advances, at least until the month of August. The catch during September tells the other way, but the numbers in that month are very small.

The table (p. 7) gives a condensed list of all the captures.

¹ Mr Haldane's figures for 1907 do not include the catch at Olna station, where the Finners are simply recorded as "many," and those for 1904 do not include Bunaveneader, where thirty-seven Finners were caught but the sex was not recorded.

Finner-whales caught at the Scottish Whaling-stations, 1908-1914.

| | April. | | May. | | June. | | July. | | August. | | September. | | October. | | Total. | | Grand Total. | Per-centage of Males. |
|-------------------------------|--------|----|------|-----|-------|-----|-------|-----|---------|-----|------------|----|----------|-----|--------|------|--------------|-----------------------|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | | |
| 1908 | 24 | 22 | 27 | 27 | 26 | 44 | 59 | 58 | 41 | 44 | 4 | 3 | ... | ... | 181 | 198 | 379 | 47.8 |
| 1909 | 26 | 25 | 31 | 30 | 34 | 38 | 47 | 53 | 42 | 63 | 13 | 26 | 1 | 3 | 194 | 238 | 432 | 44.9 |
| 1910 | 4 | 6 | 20 | 26 | 32 | 35 | 43 | 47 | 72 | 53 | 26 | 17 | ... | ... | 197 | 184 | 381 | 51.7 |
| 1911 | 9 | 9 | 28 | 43 | 29 | 38 | 43 | 51 | 49 | 39 | 1 | 5 | ... | ... | 159 | 185 | 344 | 46.2 |
| 1912 | 8 | 26 | 25 | 33 | 34 | 30 | 29 | 29 | 37 | 37 | 3 | 1 | ... | ... | 136 | 156 | 292 | 46.6 |
| 1913 | 5 | 1 | 27 | 25 | 44 | 44 | 38 | 36 | 21 | 16 | 1 | 1 | ... | ... | 136 | 123 | 259 | 52.5 |
| 1914 | 5 | 10 | 35 | 27 | 23 | 21 | 58 | 53 | 51 | 18 | 14 | 8 | ... | ... | 186 | 137 | 323 | 57.6 |
| Total | 81 | 99 | 193 | 211 | 222 | 250 | 317 | 327 | 313 | 270 | 62 | 61 | 1 | 3 | 1189 | 1221 | 2410 | 49.3 |
| Grand Total | 180 | | 404 | | 472 | | 644 | | 583 | | 123 | | 4 | | 2410 | | ... | ... |
| Percentage of Males | 45.0 | | 47.8 | | 47.0 | | 49.2 | | 53.7 | | 50.0 | | ... | | ... | | ... | ... |

Among the larger sizes, females are much the more numerous, as we see by the following little table:—

| | Number of | | Percentage of | |
|-------------------------------|-----------|----------|---------------|----------|
| | Males. | Females. | Males. | Females. |
| Finners of 50 feet and over . | 1107 | 1114 | 49.8 | 50.2 |
| " of 60 " " . | 706 | 823 | 46.2 | 53.8 |
| " of 70 " " . | 39 | 181 | 17.7 | 82.3 |
| " of 80 " " . | 0 | 2 | 0.0 | 100.0 |

The largest catches are made during the months of July and August, but on the whole the season is a prolonged

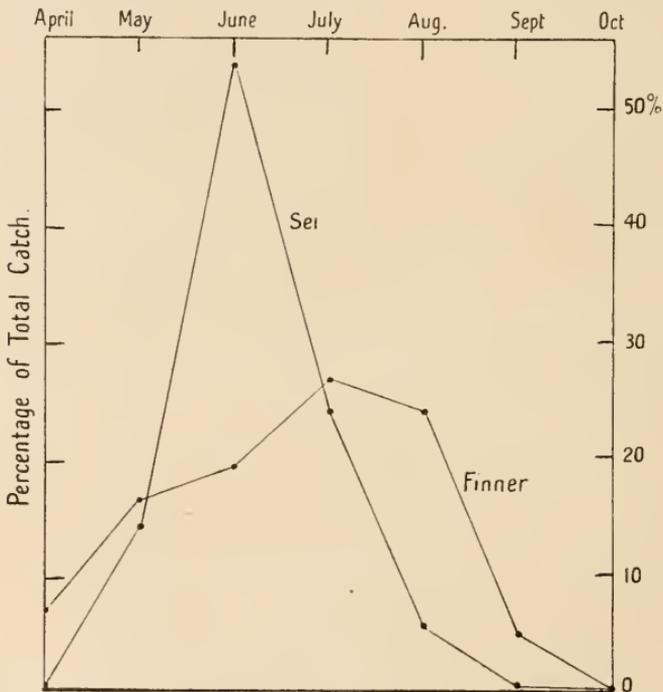


FIG. 8.—Seasonal Distribution of Finner- and Sei-whales (1908-1914).

one, the catches being large from May to August, and though very much smaller yet not insignificant during April and September (Fig. 8). As we shall presently see, and as our diagram already shows us, this extended season is in marked contrast to what we have to do with in the case of the Sei-whale.

In a series of charts (Figs. 9-12) I show the place of capture of all our recorded Finners from the earlier to the



FIG. 9.—The Scottish Catch of Finner-whales during April and May (1908-1914).



FIG. 10.—The Scottish Catch of Finner-whales during June (1908-1914).

later months of the fishing season. It will be seen that to the northward of Shetland the catches were abundant during all the months. In the southern part of the field, on the other hand, to the west of St Kilda, no Finners were caught during April and May, few in June, but more and more from July onwards. In the intermediate region, between the Faroes and the Hebrides, large catches were



FIG. 11.—The Scottish Catch of Finner-whales during July (1908-1914).

made in the beginning of the season, fair catches towards the end, but few in June and very few in July. The seasonal distribution of the Sei-whale, as we shall presently see, is very different.

The Finner is generally considered to be a fish-eating whale, following the shoals of herring and, in Arctic seas of the "Lodde" or Capelin (*Mallotus villosus*). But it is well known to feed also on "kril," and Mr R. C. Haldane has argued with much force that the latter is really its chief and favourite food—"that he only takes to herrings

when he cannot get his favourite kril and shrimps," and that in some years the Finner-whales seem to be "entirely shrimp-fed." Under these circumstances, and with this double diet in view, it would be very unsafe to speculate much upon the migrations, and the causes of migration, of this whale, or to attempt to correlate its movements too closely and directly with those, for instance, of the herring.

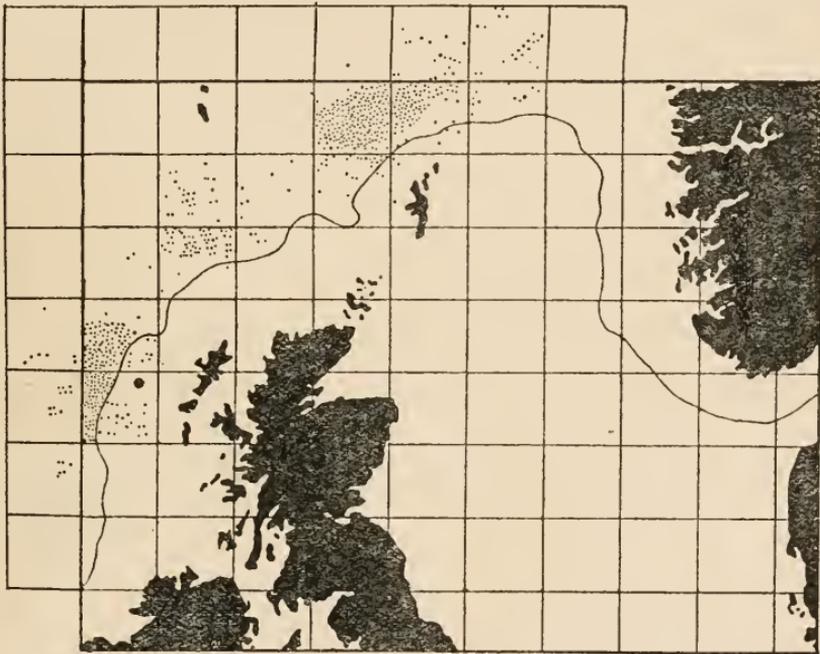


FIG. 12.—The Scottish Catch of Finner-whales during August, September, and October (1908-1914).

The problem is a very complicated one, and the interrelations of kril, herring, and whales are not as yet to be unravelled.

We have much less evidence of extensive and regular migrations in the case of this whale than, for instance, in the case of the Blue-whale or the Humpback; and Guldberg thinks that its migrations are limited in extent, and are in the main directly confined to a pursuit of the herring and the capelin. All that we know for certain is that the Finner visits the north of Norway and Finmark, in April and May, *together with* the Lodde-shoals; and that it appears on our own north-western coasts and on the southern coasts of Norway, *together with* the herring.

The following table gives the recorded lengths of all our Finners:—

Recorded lengths (in feet) of all Finner-whales captured at Scottish Whaling-stations, 1908-1914.

| Feet. | Males. | Females. | Feet. | Males. | Females. | Feet. | Males. | Females. |
|-------|--------|----------|-------|--------|----------|-------|--------|----------|
| 35 | 1 | ... | 51 | 11 | 5 | 67 | 43 | 54 |
| 36 | ... | ... | 52 | 23 | 16 | 68 | 45 | 69 |
| 37 | ... | 1 | 53 | 19 | 16 | 69 | 17 | 52 |
| 38 | 1 | 1 | 54 | 28 | 10 | 70 | 20 | 76 |
| 39 | 2 | 2 | 55 | 51 | 62 | 71 | 1 | 32 |
| 40 | 7 | 9 | 56 | 45 | 36 | 72 | 9 | 31 |
| 41 | 6 | 7 | 57 | 27 | 28 | 73 | 2 | 16 |
| 42 | 11 | 5 | 58 | 86 | 38 | 74 | 3 | 11 |
| 43 | 3 | 7 | 59 | 49 | 25 | 75 | 2 | 7 |
| 44 | 6 | 9 | 60 | 185 | 117 | 76 | 2 | 4 |
| 45 | 18 | 28 | 61 | 44 | 30 | 77 | ... | 1 |
| 46 | 5 | 10 | 62 | 78 | 55 | 78 | ... | 1 |
| 47 | 4 | 9 | 63 | 68 | 45 | 79 | ... | ... |
| 48 | 12 | 10 | 64 | 57 | 57 | 80 | ... | 1 |
| 49 | 6 | 9 | 65 | 94 | 103 | 81 | ... | ... |
| 50 | 62 | 55 | 66 | 36 | 60 | 82 | ... | 1 |

We may summarise this table as follows, using the statistical method of medians, quartiles, etc.:¹—

| | E. | D ₁ . | Q ₁ . | M. | Q ₃ . | D ₉ . | E. |
|---------------|----|------------------|------------------|----|------------------|------------------|----------|
| Males . . . | 34 | 50 | 56 | 60 | 64 | 68 | 76 feet. |
| Females . . . | 37 | 50 | 57 | 63 | 67 | 70 | 82 feet. |

The difference in size between the two sexes is not great, but the females are perceptibly the larger (Fig. 13). The median size of the males is 60 feet, that of the females 63 feet; the arithmetical means are, respectively, 59.5 feet and 61.4 feet. The two largest males were 76 feet long, the longest female 82 feet; 3.3 per cent. of the males and 14.8 per cent. of the females measured 70 feet or over. One-half

¹ I may explain once again the simple statistical method here employed. We give, firstly, the "extreme" lengths—the lengths of the smallest and largest individual fish. Then, supposing the whole series to be arranged in order of magnitude, from the least to the greatest, the "median" size is that of the fish half-way up the list; the two "quartiles" are those of the individual fish one-quarter and three-quarters up the list. We might similarly include a full series of "deciles"; but those given are only the first and last, *i.e.* the sizes of the fish which stand one-tenth of the way, and nine-tenths of the way, up the list in order of magnitude.

of all the males lay between 56 and 64 feet; one-half of the females between 57 and 67 feet. The smallest male was 34 feet, the smallest female 37 feet long.

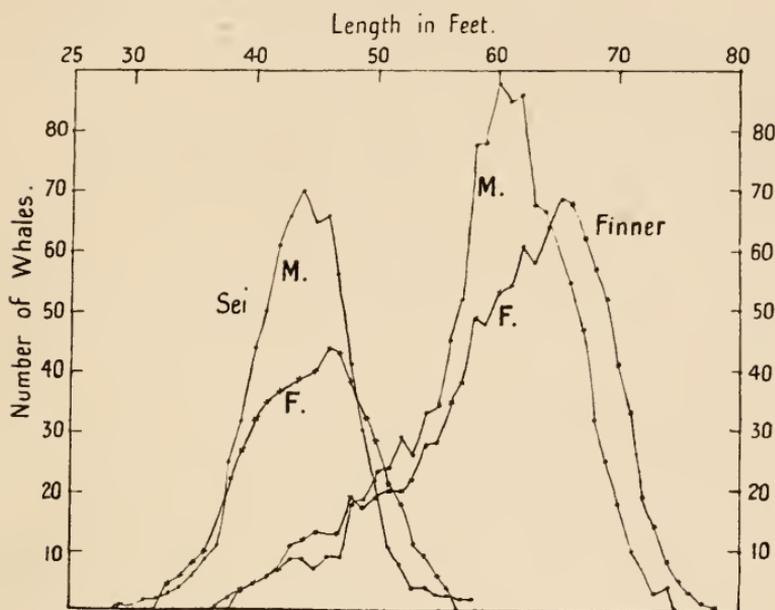


FIG. 13.—The comparative Lengths of all Sei- and Finner-whales, male and female (1908-1914). (Smoothed curves, the recorded lengths being averaged, consecutively, in groups of 5 feet.)

In the following table I set forth, similarly, the median, quartile, and other data for our male and female Finners, arranged this time in groups, according to the months in which they were captured.

Abbreviated List of the Sizes of all Finner-whales, according to the Sex and Season of Capture.

| | E. | D. | Q. | M. | Q. | D. | E. |
|-----------------------------|----|----|----|----|----|----|----|
| <i>Males</i> —April . . . | 34 | 53 | 56 | 60 | 64 | 65 | 72 |
| May . . . | 40 | 50 | 55 | 60 | 64 | 67 | 74 |
| June . . . | 39 | 50 | 54 | 60 | 63 | 67 | 76 |
| July . . . | 38 | 50 | 56 | 60 | 64 | 67 | 75 |
| August . . . | 40 | 55 | 58 | 60 | 65 | 67 | 76 |
| September . . . | 45 | 50 | 56 | 60 | 63 | 65 | 69 |
| <i>Females</i> —April . . . | 37 | 49 | 53 | 61 | 65 | 70 | 73 |
| May . . . | 39 | 50 | 57 | 62 | 67 | 70 | 76 |
| June . . . | 38 | 47 | 55 | 62 | 68 | 71 | 78 |
| July . . . | 39 | 49 | 56 | 62 | 67 | 70 | 77 |
| August . . . | 40 | 55 | 60 | 65 | 68 | 71 | 82 |
| September . . . | 45 | 50 | 59 | 60 | 65 | 67 | 72 |

It will be seen (1) that there is very little difference in size from month to month, and that (for instance) the median sizes are remarkably constant throughout the season; (2) only in regard to the size of the smallest whales do we see signs of a gradual increase as the season goes on—in other words there is some little indication that the youngest whales, of about 35 feet long or thereby, are growing perceptibly bigger, by several feet, during the six months of the fishing season.

When we examine the full statistics of sizes of all the 2400 Finners, we easily see that the recorded measurements are only approximate, for there is a marked predominance of records at the even or round numbers, 50, 55, 60, 65 feet, etc. We do not find in these series of figures (or in Fig. 13) any indication of "age-groups," that is to say of a breaking up of the whole series into separate "cusps," indicative of successive annual increments of growth. To begin with, the measurements are not accurate enough for this purpose, and it may well be also that the natural inequalities and irregularities of individual growth soon smooth over and obscure the differences of size due to the mixture of the several batches or "broods," each one year older than another.

It is obvious that the recorded girths vary very greatly—that is to say, for a given length the statements as to girth vary immensely in individual whales. I find, for instance, that among the male Finner-whales taken during the month of August, fifty-seven whales, all of 60 feet long, are said to have measured in girth from 19 to 32 feet (with a median of 23 feet); and twenty-five whales, with a girth of 23 feet, are said to have varied in length from 56 to 67 feet (with a median of 61 feet). To correlate the whole series of measurements in our 2400 Finners would be a very heavy task, and I shall only attempt to set it forth in the simplest of ways—namely, by determining the median and quartile values both for length and for girth, and by taking the ratio between these.

The following is the result, taking the whole catch firstly according to months or seasons, all years together; and secondly according to the several years of our whole period:—

Median Values of Length and Girth, and the corresponding Ratios, in Finner-whales, 1908-1914.

| | | MALES. | | | | | | FEMALES. | | | | | | | | | | | | | | |
|--------------------------------|---|------------|-----|----------|--------|------------|--------|----------|-----|------------|--------|-----|-----|-----|-----|------|-----|-----|------|-----|-----|------|
| | | Quartiles. | | Medians. | | Quartiles. | | Medians. | | Quartiles. | | | | | | | | | | | | |
| | | L. | G. | L. | Ratio. | L. | Ratio. | L. | G. | L. | Ratio. | | | | | | | | | | | |
| I. According to Season— | | | | | | | | | | | | | | | | | | | | | | |
| April | . | 56 | 19 | 60 | 33.9 | 64 | 23 | 64 | 23 | 53 | 19 | 60 | 22 | 60 | 22 | 35.9 | 60 | 22 | 36.7 | 65 | 26 | 40.0 |
| May | . | 55 | 20 | 60 | 36.4 | 64 | 29 | 64 | 29 | 57 | 20 | 62 | 24 | 62 | 24 | 35.1 | 62 | 24 | 38.7 | 67 | 29 | 43.3 |
| June | . | 54 | 19 | 60 | 35.2 | 63 | 25 | 63 | 25 | 55 | 19 | 62 | 23 | 62 | 23 | 34.5 | 62 | 23 | 37.1 | 68 | 26 | 38.2 |
| July | . | 56 | 20 | 60 | 35.7 | 64 | 27 | 64 | 27 | 56 | 20 | 62 | 24 | 62 | 24 | 35.7 | 62 | 24 | 38.7 | 67 | 28 | 41.8 |
| August | . | 58 | 21 | 60 | 36.2 | 65 | 28 | 65 | 28 | 60 | 23 | 60 | 23 | 65 | 27 | 38.3 | 65 | 27 | 41.5 | 68 | 30 | 44.1 |
| September | . | 56 | 22 | 60 | 39.3 | 63 | 28 | 63 | 28 | 59 | 24 | 60 | 28 | 60 | 28 | 40.7 | 60 | 28 | 46.7 | 65 | 30 | 46.1 |
| Mean | . | ... | ... | ... | 36.1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 36.7 | ... | ... | 39.9 | ... | ... | 42.2 |
| 2. According to Years— | | | | | | | | | | | | | | | | | | | | | | |
| 1908 | . | 57 | 20 | 60 | 35.1 | 64 | 25 | 64 | 25 | 56 | 20 | 64 | 23 | 64 | 23 | 35.7 | 64 | 23 | 35.9 | 67 | 28 | 41.8 |
| 1909 | . | 56 | 20 | 60 | 35.7 | 65 | 28 | 65 | 28 | 58 | 22 | 65 | 24 | 65 | 24 | 37.9 | 63 | 26 | 41.3 | 68 | 30 | 44.1 |
| 1910 | . | 58 | 21 | 61 | 36.2 | 65 | 28 | 65 | 28 | 59 | 22 | 66 | 26 | 66 | 26 | 37.3 | 65 | 26 | 40.0 | 69 | 30 | 43.5 |
| 1911 | . | 54 | 20 | 60 | 37.0 | 60 | 25 | 60 | 25 | 55 | 20 | 62 | 24 | 62 | 24 | 38.7 | 62 | 24 | 38.7 | 67 | 27 | 40.3 |
| 1912 | . | 54 | 19 | 60 | 35.2 | 62 | 27 | 62 | 27 | 55 | 20 | 61 | 23 | 61 | 23 | 36.4 | 61 | 23 | 37.7 | 65 | 28 | 43.1 |
| 1913 | . | 55 | 19 | 60 | 34.5 | 63 | 28 | 63 | 28 | 55 | 20 | 60 | 23 | 60 | 23 | 36.4 | 60 | 23 | 38.3 | 66 | 28 | 42.4 |
| 1914 | . | 60 | 21 | 62 | 35.0 | 65 | 29 | 65 | 29 | 60 | 21 | 63 | 24 | 63 | 24 | 35.0 | 63 | 24 | 38.1 | 68 | 28 | 41.2 |
| Mean | . | ... | ... | ... | 35.5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 36.4 | ... | ... | 38.7 | ... | ... | 42.3 |

We see from all this (1) that the mean ratio of girth to length is about 38 to 40 per cent. ; or (taking the figures as they stand) the mean girth of a 60-foot whale would be about 23 feet for the males, and 23.9 feet for the females ; (2) the difference in relative girth between males and females is not very great, but constant, or very nearly so, throughout our tables ; (3) the values tend to increase from the lower quartiles to the medians, and again to the upper quartiles : in other words, the larger whales have the greater relative girth—the girth tends to increase somewhat faster than the length of the whale ; (4) on the whole there is a tendency, not very regular but yet apparently unmistakable, for the relative girth to increase month by month during the course of the season ; (5) the annual values are irregular, and there is a considerable difference between the relative girths in the different years ; as far as we can judge the whales of 1909 and 1910 seem to have been fatter than usual, and those of 1912 unusually lean.

(To be concluded.)

THE BIRDS OF NORTH UIST.

By FRED. S. BEVERIDGE, Lieut. 3rd Bn. The Royal Scots.

(Concluded from "The Scottish Naturalist," 1918, page 254.)

Cygnus musicus, Bech. Whooper Swan.—Fairly common winter visitor. Found on all suitable lochs on the island—seldom more than seven or eight birds are seen together. Often in company with the Bewicks.

Cygnus bewickii, Yar. Bewick's Swan.—Common winter visitor. Large flocks of a hundred or more are often observed—they seem most partial to salt water and are found in immense flocks between Newton and Lochmaddy and at Loch Eport.

Tadorna cornuta, Gmel. Sheldrake. (B.)—Common, but a decreasing resident. Throughout the winter they become comparatively scarce.

Anas boscas, Linn. Mallard. (B.)—Common resident species. Scattered throughout the island—never found in large flocks except during hard winters. Their numbers are increased considerably during the autumn migration. Sir Arthur Orde, Bart., so I am informed, introduced the smaller foreign Mallard to the North Uist group, turning down several birds at Langass and Newton. Several specimens of the above have fallen to my own gun in these islands—the weight of these birds seldom exceeding 1 lb. 14 oz.

Anas strepera, Linn. Gadwall.—Fairly common. An increasing winter visitant. Mr M'Elfrish has obtained this species at Newton and Loch Blashaval, but only seems to have observed single birds or odd pairs. At Scolpaig and Griminish small flocks of between twenty and thirty birds are not uncommon. Common at Balranald in winter. My brother has observed paired birds during the summer.

Spatula clypeata, Linn. Shoveller. (B.)—Rare. Very local, but there is an odd pair now nesting at Balranald—Mr M'Elfrish has found nests there of recent years. At Langass and Griminish a pair are seen nearly every winter.

Dafila acuta, Linn. Pintail.—Fairly common, but very local. A winter visitor, though odd pairs have been seen during the summer months. Supposed to breed at Balranald, but I have never seen nest or eggs from any part of North Uist. A young ♂ shot at Vallay Island, 21st November 1911, seems to have been bred in the vicinity, but, as I have already stated, no further proof is forthcoming.

Nettion crecca, Linn. Teal. (B.)—Common. Breeding

extensively at Balranald, where it is more in evidence than *Anas boscas*. Flocks visit the islands during winter but seldom leave the coast.

Mareca penelope, Linn. Wigeon.—A common winter visitor. As a likely breeding species I quote the following:—August 1912, five observed till middle of month (three young birds); 20th August 1912, adult ♂ killed at Grinish; 8th August 1913, seven seen on loch; 25th August 1914, five seen on loch. Other records of young birds killed during September are not infrequent. Considering these examples its nesting in North Uist seems probable.

Fuligula ferina, Linn. Pochard.—Common winter visitor. A supposed breeding species. Undoubtedly examples remain throughout the summer. On 8th August 1911, I observed a pair at Balranald, and these behaved as if they had young hard by.

Fuligula cristata, Linn. Tufted. (B.)—An increasing species. Now reported breeding at Balranald. Mr J. G. Millais, in his admirable work, *British Diving Ducks*, states that it did so some years ago. This I now confirm, though not until recently.

Fuligula marila, Linn. Scaup.—Rare winter visitor. Mr M'Elfrish obtained a pair near West-ford some six years ago. Has been seen at Loch Blashaval. An example from Loch Olavat, obtained 29th October 1903, is now in my collection. This last mentioned was in a very exhausted condition.

Clangula glaucion, Linn. Goldeneye.—Fairly common winter visitor. Adult ♂, seldom met with.

Harelda glacialis, Linn. Long-tailed Duck.—Common. Winter visitor arriving in October and remaining till May. These birds practically assume full summer plumage before departing.

Somateria mollissima, Linn. Eider. (B.)—Common; resident in large numbers. Not, however, on the increase.

[*Oidemia fusca*, Linn. Velvet Scoter.—Reported now and then from the Sound of Harris, but have seen no specimens.]

Mergus merganser, Linn. Goosander. A rare winter visitor. Seen occasionally, but have only one record of a bird being actually obtained—this was a ♂ in December 1903. Peel also observed this species in North Uist.

Mergus serrator, Linn. Merganser. (B.)—A common resident, increasing in numbers. Breeds freely throughout the island. Large flocks are often seen during the winter.

Mergus albellus, Linn. Smew.—Rare. Observed in North Uist by Mr C. V. H. Peel. An odd pair may be seen during severe frost.

Columba palumbus, Linn. Wood-pigeon.—An example from

near Lochmaddy many years ago, recorded by the late Dr Harvie-Brown.

Columba livia, Gm. Rock-dove. (B.)—Common resident. A great many crosses between the true wild bird and tame pigeons—which have been kept from time to time at Paible and Claddach. These birds are usually of a light sandy colour or of a darker hue than the wild bird. Albinos are not uncommon. Rock-pigeons seem to change their haunts very unaccountably: from the beginning of the century till 1910 they were most plentiful on the western coast, whilst after that date they changed to the vicinity of Newton and Cheese Bay. I see no reason for this local migration, as the tillage around their new abode is far scantier than on the west side. On the other hand the invasion of Starlings may have been the cause of this movement.

Turtur communis, Selby. Turtle-dove.—One reported to have been seen at Lochmaddy on 6th July 1912.

Lagopus scoticus, Lath. Red Grouse. (B.)—Fairly common resident species. Owing to numbers of Hoodies and other vermin, is slowly disappearing.

Phasianus colchicus, Linn. Pheasant.—A few brace were turned down by Sir Arthur Orde, but, as was expected, never throve and very soon died out.

[*Coturnix communis*, Bonn. Quail.—No authentic occurrence. Recently supposed to have been observed at Varlish. On 8th May 1917 Peel records the Quail from Barra, in which island it is not infrequent.]

Crex pratensis, Bech. Land-rail. (B.)—Common summer visitor, breeding freely, but fluctuates considerably. Have noticed that this species is very ready to seek safety in flight in North Uist. It does not seem to do so on the mainland of Scotland.

Rallus aquaticus, Linn. Water-rail. (B.)—Fairly common; resident in small numbers.

Gallinula chloropus, Linn. Moorhen. (B.)—A very common resident species.

Fulica atra, Linn. Coot. (B.)—Common, breeding in all suitable localities. A steadily increasing species.

Ægialitis hiaticula, Linn. Ringed Plover. (B.)—Common, resident. Immense flocks to be seen on the strands which abound in North Uist. Usually in company with the Sanderling and Dunlin.

[*Ægialitis curonica*, Gm. Little Ringed Plover.—A supposed example was recorded from Vallay in 1909.]

Charadrius pluvialis, Linn. Golden Plover. (B.)—Common,

and resident in small numbers. Large flocks visit the island in winter. These are especially plentiful in April, after which month they migrate.

Squatarola helvetica, Linn. Grey Plover.—Rare. Visits the island occasionally during winter.

Vanellus vulgaris, Bech. Lapwing. (B.)—A common and, happily, a greatly increasing resident.

Streptilas interpres, Linn. Turnstone.—A common migrant and winter visitor. Arriving in large numbers about the middle of August—small flocks often remaining till the end of April.

Hamatopus ostralegus, Linn. Oystercatcher. (B.)—Common breeding species. During the winter months this bird is not at all plentiful.

Phalaropus fulicarius, Linn. Grey Phalarope.—An example recorded for September 1900.

Phalaropus hyperboreus, Linn. Red-necked Phalarope. (B.)—A summer visitor. Most birds arrive by the middle of May and seldom remain longer than the 5th of August; though I have noted single birds as late as 22nd August 1914. The number of nests in North Uist has sadly diminished, and in localities where a dozen or more pairs nested up till 1911, one would have to search in vain for more than three nests to-day.

Scolopax rusticola, Linn. Woodcock.—An autumn migrant, fairly common locally, especially on Eaval. Few birds remain throughout the winter, and stragglers may be seen during the spring months.

Gallinago caelestis, Fren. Common Snipe. (B.)—A common resident, increasing as a breeding species. Large numbers arrive in the autumn. During the months of December and January it is not so numerous.

Gallinago gallinula, Linn. Jack Snipe.—Fairly common autumn migrant. Arrives in the early part of September. Have seen single birds in the first week of May.

Tringa alpina, Linn. Dunlin.—Fairly common spring migrant—in the autumn it is not so common.

Tringa minuta, Leisler. Little Stint.—First came to my notice in 1907. Since then this species has been observed nearly every year between August and beginning of October.

[*Tringa subarquata*, Güld. Curlew Sandpiper.—Described as having been seen in September 1909. However, no authentic record is forthcoming.]

Tringa striata, Linn. Purple Sandpiper.—A common winter

visitor. Small flocks often remain till June, but these are exceptional.

Tringa canutus, Linn. Knot.—Rare. Odd birds in partial summer plumage are seen at the beginning of August, usually between 8th and 12th. Small flocks of a dozen or so are extremely rare, and when found are very shy.

Calidris arenaria, Linn. Sanderling.—Large flocks arrive during August and September—to be seen over the many strands on the island in company with the Ringed Plover. Very scarce as a spring migrant.

Machetes pugnax, Linn. Ruff.—Observed at Griminish in September 1910. Others occasionally reported. One killed at Langass reported in *The Scottish Naturalist*, 1914.

Totanus hypoleucus, Linn. Common Sandpiper. (B.)—Fairly common summer visitor. Breeds sparingly throughout the island.

Totanus calidris, Linn. Redshank. (B.)—A common resident. [*Totanus fuscus*, Linn. Spotted Redshank.—Twice recorded as seen 11th September 1909 and 25th December 1910. As I have not handled a specimen from the island this still remains in brackets.]

Totanus canescens, Gm. Greenshank.—Fairly common, remaining throughout the year. Have never had sufficient evidence of its nesting, though I have seen birds of the year at the beginning of August. The late Wm. Macgillivray records this as a nesting species.

Limosa lapponica, Linn. Bar-tailed Godwit.—Common winter visitor. Immense flocks seen during spring and autumn migration.

Limosa belgica, Gm. Black-tailed Godwit.—Rare. Single birds and occasionally pairs are observed every year. These are reported mostly during September.

Numenius arquata, Linn. Common Curlew. (B.)—Common. Breeds very sparingly. Large flights arrive about the middle of August.

Numenius phaeopus, Linn. Whimbrel.—Common visitor. Odd birds may be seen nearly every month in the year. In September 1914 there were immense numbers.

Sterna fluviatilis, Nau. Common Tern. (B.)—Fairly common; an increasing summer visitor, breeding with the Arctic Terns, but never so numerous as they.

Sterna macrura, Nau. Arctic Tern. (B.)—Common summer visitor. Breeds in large colonies throughout the island. This species suffers considerably at the hands of the inhabitants, who, under guise of picking shell-fish, search all the islands and fore-shore for nests.

Sterna minuta, Linn. Little Tern. (B.)—Fairly common; a few pairs breeding in the more secluded localities. This Tern never seems to nest in company with the Arctic or Common Terns. Small colonies of about half a dozen pairs are occasionally found.

Larus minutus, Pall. Little Gull.—Has not been recorded since obtained in 1883 by Mr John Macdonald at Newton.

Larus ridibundus, Linn. Black-headed Gull. (B.)—A common resident; breeding on the increase. There are no very large gulleries, but small colonies consisting of from 80-120 nests are to be found scattered throughout the island.

Larus canus, Linn. Common Gull. (B.)—A common resident.

Larus argentatus, Gm. Herring-gull. (B.)—Common. Breeding in considerable numbers. Colonies of these birds may be found on the islands in Loch Scadavay.

Larus fuscus, Linn. Lesser Black-backed Gull. (B.)—Fairly common; resident in increasing numbers. This species fluctuates considerably, some seasons being as abundant as the larger *Larus marinus*.

Larus marinus, Linn. Great Black-backed Gull. (B.)—Common; resident in considerable numbers.

Larus glaucus, Fab. Glaucous Gull.—Fairly common winter visitor. Most specimens obtained have been immature birds—adults being rare.

Larus leucopterus, Fab. Iceland Gull.—Rare. Seldom observed save in very hard weather. Dr Mackenzie has a fine example taken at Scolpaig towards the end of last century. One killed at Vallay 12th October 1917.

Rissa tridactyla, Linn. Kittiwake. (B.)—Common, especially during autumn and winter. A few pairs breed in the more suitable localities.

Megalestris catarrhactes, Linn. Great Skua.—Rare. Examples seen usually in September, but these seldom remain for any length of time. Though between 17th August and 8th September 1912 I had a single bird under observation. Also one observed from 30th July to 19th August 1910.

Stercorarius pomatorhinus, Tem. Pomatorhine Skua.—Only know of one example, killed at Scolpaig 17th October 1912. This specimen is now in my collection.

Stercorarius crepidatus, Gm. Richardson's Skua. (B.)—Fairly common resident. Breeds at Newton and Loch Eport. Scarce during the winter. The dark or sooty form of plumage is rarely met with.

Stercorarius parasiticus, Linn. Buffon's Skua.—An example procured at the same place as the Pomatorhine Skua on 17th October 1912. Also in my collection.

Alca torda, Linn. Razorbill.—Uncommon, but not infrequent in Lochmaddy Bay, Loch Eport, and near Weaver's Point. Does not nest in North Uist to my knowledge.

Uria troile, Linn. Common Guillemot. (B.)—Resident and fairly common. Breeds sparingly. The bridled variety is not uncommon.

Uria grylle, Linn. Black Guillemot.—Fairly common, but keeps well out to sea, and is seldom seen save in small flocks.

Mergulus alle, Linn. Little Auk.—Fairly common winter visitor, in rough weather only. Most noticeable around Lochs Eport and Blashaval.

Fratercula arctica, Linn. Puffin.—A rare winter visitor; though commonly washed up dead—a victim of the north-west gales.

Colymbus glacialis, Linn. Great Northern Diver.—A fairly common spring migrant; a few pairs being seen during the summer months. Rare during the winter.

Colymbus arcticus, Linn. Black-throated Diver. (B.)—Fairly common, though a decreasing resident. The nesting sites of this bird are more or less local—though I will not mention the precise district for obvious reasons.

Colymbus septentrionalis, Linn. Red-throated Diver. (B.)—A fairly common breeding species—seldom met with in winter. This is our commonest member of the Colymbidæ.

Podiceps auritus, Linn. Slavonian Grebe.—Uncommon, but not infrequent in some localities during late autumn and winter. Met with a pair on a reedy loch at Griminish on 14th August 1912—which date seems very exceptional. Peel also obtained this grebe in North Uist.

Podiceps fluviatilis, Tun. Little Grebe. (B.)—A fairly common resident; has increased considerably of late years. The fact that frost drives this bird to the coast is generally accepted, but I may add that frost or no frost this species is always more abundant on the coast during December and January. As the lochs in North Uist are seldom frozen, this trait can hardly be accounted for.

Procellaria pelagica, Linn. Storm Petrel.—Fairly common winter visitant; considerable numbers are seen off the coast. Occasionally washed up dead.

Procellaria leucorrhoa, Vieillot. Leach's Petrel.—Rare; though occasionally seen off shore. An example obtained between

Griminish Point and Haskier, in 1902, is now in my brother's possession.

[*Puffinus anglorum*, Tem. Manx Shearwater.—Reported now and again off the coast—but have never seen an example from North Uist. Seen near Haskier on 13th September 1909.]

Fulmarus glacialis, Linn. Fulmar.—Specimens are washed up every year from St Kilda. But the live bird is very rarely met with.

A Note on the Identification of Ducks' Eggs.—In cases where the identification of a Duck has not been determined at the nest, it has been customary to seek the aid of the down and feathers forming the lining of the nest as means of establishing the identity of the eggs. Miss Jackson, who has made a special study of the nest down of a number of British Ducks, in recently expressing her views on this interesting subject, has remarked (*British Birds*, October 1918), "I should like, however, to point out that it is, I consider, impossible to identify a nest-lining of any of the above species by the examination of the down alone, and that the feathers are by far the most important means of identification." The Ducks specified by Miss Jackson are the Mallard, Gadwall, Teal, Garganey, Wigeon, Shoveler, Pintail, Pochard, Tufted Duck, Scaup, and a few others which do not breed in Britain.

The object of this note is not to take exception to, or criticise, Miss Jackson's conclusions, but merely to relate a little experience of my own regarding the feathers which may be found in a Duck's nest. A few years ago I examined the lining of a Pintail's nest obtained at Loch Leven and found that it contained, in addition to Ducks' feathers, several of those of the Red Grouse. This raises an important point, namely, if a Duck gathers feathers to supplement her own, for the purpose of forming a bed for her eggs, it is quite possible, indeed probable, that she may pick up the feathers of other species of Duck and introduce them into her nest. Such alien ducks' feathers would certainly be more readily obtained at Loch Leven than those of the Red Grouse—a bird which nests in the district but not in the immediate vicinity of the loch.

The incident described may, perhaps, be regarded as exceptional, but nevertheless it clearly indicates that the feathers found in a Duck's nest are not all of them necessarily those of the real owner; some, possibly the most diagnostic ones, may belong to another species.—WM. EAGLE CLARKE, Edinburgh.

AN OLD-TIME RECORD OF THE BREEDING OF THE WHITE STORK IN SCOTLAND.

By WILLIAM EAGLE CLARKE.

ALTHOUGH the Stork is a regular summer visitor to the counties bordering the North Sea opposite to our own shores, yet it does not seem, even in the long past, to have been other than a more or less irregular visitor to the British Islands. Probably it was more frequent in its appearances in the eastern counties in former years, when it was more numerous in its continental haunts than at the present time, but the North Sea seems always to have formed the western limit of its range.

Professor Newton, whose knowledge of ornithological literature was in many respects unequalled, remarks (*Dictionary of Birds*) that "though often visiting Britain, it has never been a native or even an inhabitant of the country."

My attention, however, was recently drawn to a remarkable record—one which has apparently been overlooked by the numerous ornithologists interested in all that concerns our British birds—relating to the nesting of a pair of Storks in Scotland in the early years of the fifteenth century. This notable event is recorded in Goodall's edition of the *Scotichronicon* (vol. ii., book xv., chap. xxiv., p. 449) published in 1759.

This great historical work was commenced by John Fordum, who died about the year 1384, under the title of *Chronica Gentis Scotorum*, and was edited and continued by Walter Bower, the Abbot of Inchcolm, as the *Scotichronicon*, the latter author being responsible for all the records subsequent to the 1383. In Bower's chronicles for the year 1416 it is related that:—

"An. D. millesimo quadringentesimo decimo sexto, obiit dominus Jacobus Biset, Prior Sancti Andreae, in crastino nativitatibus Sancti Johannis Baptistae. Hoc etiam anno par avium ciconiarum venerunt in Scotiam, et super ecclesiam S.

Ægidii de Edinburgh nidificabant, et per unam ratam anni ibi morabantur; sed quò postea avolaverunt, nescitur. Maxima est illis, ut dicit Plinius, cura foetûs, adeo ut, dum nidus perpensiùs fovent, assiduo accubitu plumas exuunt. Sed et pullis non minus eximia pietas exstat erga matres: nam quantum temporis matres impenderint foetibus educandis, tanto tempore et ipsae à pullis aluntur. Unde et pia avis dicitur."

Translated in English, it runs as follows:—

In the year of our Lord, fourteen hundred and sixteen, there died, on the morrow of the birth of Saint John the Baptist, Master James Biset, Prior of Saint Andrews. In this same year a pair of storks came to Scotland, and nested on the top of the church of S. Giles of Edinburgh, and dwelt there throughout a season of the year; but to what place they flew away thereafter no one knows. So very great is their solicitude for their young, that as Pliny tells, while they are tending their nest most closely, with constant sitting they wear off their feathers. But not less extraordinary parental duty is evinced by the chicks to their mothers; for at such time as the mother birds are burdened with the rearing of their progeny, the old ones are even fed by their young. Whence it is called "pia avis"—the dutiful bird.

The learned Abbot's quotation from Pliny clearly indicates that he was interested in bird-life, and also that he had some knowledge of the literature relating to that subject.

The church of St Giles on which the Storks nested was a new stone edifice commenced in 1387 to replace a former church destroyed by fire in 1385, and some of it doubtless forms part of the Cathedral of to-day.

THE LATE CAPTAIN SYDNEY E. BROCK.

By the death of Capt. Sydney E. Brock, 10th Batt. Royal Scots, another Scottish naturalist has fallen in the war for right and freedom. Wounded on the field of battle at Courtrai, France, on 16th October last, Capt. Brock was brought to Aberdeen where he died at a military hospital, as the direct result of his wounds, on 11th November, the very day on which hostilities ceased. Strange that he who wrote the simple, heartfelt tribute to the memory of his friend, J. C. Adam, which appeared in the October number of this magazine, should so soon have shared his fate.

Sydney Edward Brock, who came of an old line of West Lothian farmers, was born at Overton, near Kirkliston, in that county, on 6th October 1883, and about fifteen years ago succeeded his father as tenant of the farm. Educated at Kirkliston and Edinburgh, his school-days too were mainly spent in the same surroundings. Thus Linlithgowshire was the chief field of his observations, and there is reason to believe that he had the preparation of a "Fauna" of the county in his mind.

Capt. Brock was a naturalist in the best sense of the word: from his boyhood he loved Nature for its own sake, and the main pleasure of his life was derived from its investigation. In his studies he brought to bear a happy blend of originality and that sense of proportion so essential for the avoidance of the not uncommon tendency to push ideas to extremes. Except in a very limited way, he was not a collector of specimens: what appealed to him was the living creature—its habits and all that these signify. Bird-life was his chief study; but with his broad outlook he could not fail to be interested in other branches of natural history, and already he had acquired considerable knowledge of our native Aculeata and Hemiptera.

For a number of years prior to the outbreak of the war S. E. Brock was a regular contributor to the pages of this

magazine, his first two communications being notes on the "Tree-Sparrow in West Lothian," printed in the 1906 volume of the *Annals of Scottish Natural History*. In all nineteen notes and papers have appeared under his name. The most important are:—"The 'Display' of the Goosander" (*Scot. Nat.*, 1912); "The Tufted-Duck (*Fuligula cristata*) in the Nesting Season" (*ibid.*); "Notes on a Carrion-Crow Roost" (*ibid.*, 1913); "Display of the Mallard in Relation to Pairing" (*ibid.*, 1914). And, as showing his interest in other groups, his notes on "Insect Visitors to *Fumaria officinalis*, L." (*Ann. Scot. Nat. Hist.*, 1910), and "Linlithgowshire Heteroptera" (*Scot. Nat.*, 1912) may also be mentioned. To the *Zoologist* for 1910, and *British Birds* for 1914, he contributed respectively the two following papers, perhaps his most important productions, viz.:—"The Willow-Wrens of a Lothian Wood," and "Ecological Relations of Bird-Distribution." While on active service in France he made notes on the birds that came under his observation, and has left in MS. a paper on the "Bird-life of Peronne District," in which the subject is considered from the ecological point of view.

From Capt. Brock Scottish natural history had every reason to expect in the near future much important work, especially in the development of the ecological problems which had begun to engage his attention, and his early death is undoubtedly a very real loss to the cause. Quiet and unobtrusive, if not actually shy, he was, it should be said, less widely known among naturalists than his ability and devotion to his hobby merited; while his capacity for true friendship could only be appreciated by those who had come to know him intimately.

W. E.

Common Guillemot inland in Southern Scotland.—On 5th October 1918, a very stormy day here, my son found a Common Guillemot in the farmyard of Weston Dunsyre (near Carstairs Junction). We kept the bird for eleven days, when it died. We think the occurrence of a Guillemot so far inland may be worth recording.—WILLIAM WILSON, Dunsyre.

Late Nesting of Wood-pigeon.—Though it is well known that the Wood-pigeon frequently nests as late as October, it may be of interest to put on record that young were found in the nest on 13th October. From the middle of September I paid frequent visits to two small fir plantations near Darvel to ascertain if many Wood-pigeons nested late in our locality. During my visit on 22nd September I located no fewer than eight nests—five of them with two young each, two with two eggs each, and one with one egg. All the eggs were quite fresh.

I also flushed a bird off another nest which contained nothing. The last visit I was able to make was on 13th October when three nests containing two, two and one young respectively, were noted.—NICOL HOPKINS, Darvel.

Bird Notes from Lauderdale.—An example of the Great Northern Diver was captured after some difficulty by two young men on Earnsclough Water, a tributary of the Leader. It was forwarded to Edinburgh and identified by Mr Eagle Clarke, who had the bird sent to the Zoological Park. At the time of its capture (20th November) the weather was calm and frosty.

A pair of Pied Flycatchers nested last June by a small wooded stream near Lauder. Notwithstanding the wide destruction of their nesting-woods, Great Spotted Woodpeckers successfully reared their young by the Leader this past summer.

Woodcock have increased largely as a nesting species in Lauderdale within the past few years, and a number of nests were found during the spring and summer in Thirlestane Castle Woods. A Rough-legged Buzzard is frequenting the Lauderdale glens this winter. Redwings and Fieldfares were later than usual in arriving, but are now in great numbers. Bramblings again are rather scarce.

When at Longcroft, five miles up towards the hills, one of our keenest and most intelligent bird observers, a young shepherd, told me that for three weeks or more past he had seen a party of Goldfinches, once as many as five, among the thistles and other seeds by Longcroft Water. This is interesting in view of one or two other Border records, and a suggestion that they may be increasing. Near the same place some years ago I saw two feeding by the roadside.—WM. M'CONACHIE, Lauder.

Recovery of a Marked Gull.—Can any of the readers of *The Scottish Naturalist* throw any light on the history of a Gull that I picked up in my grounds at Harecraig, Broughty Ferry? It had been dead for some time, and on its leg I found a spiral pink ring without any markings or name.—WILLIAM MACKENZIE.



Starlings and Sparrow-hawk.—On the 20th September, while removing a binder from one field to another, a large flock of Starlings, from 200 to 300, swooped over my head, landed practically among my feet, and crept into two stooks of oats, then a Sparrow-hawk swooped down among them just about fifteen yards from me. I rushed round the stook, when he rose straight in the air to a great height and disappeared baulked of his dinner. Then the Starlings began to come out of the stooks in a steady flow for about three minutes' duration, a most exciting three minutes for me.—WILLIAM WILSON.

***Alosterna tabacicolor*, De G., in Lanarkshire.**—This longicorn is rare in Scotland, and it may therefore be of interest to mention that a few specimens were taken near Lanark during the summers of 1917 and 1918. This is the second recorded station for the species in the county, as Mr King has already noted the capture of a single specimen from the Gorge of Avon (*Glasgow Naturalist*, i., 138). Records of the beetle from the Forth area are given by Mr Evans in this magazine (1916, p. 308). My captures were made upon the blossoms of *Spirea* and umbelliferous plants.—A. FERGUSSON, Glasgow.

***Liopus nebulosus*, L., in Lanarkshire.**—*Liopus nebulosus* is not at all a common beetle in Scotland, and even when found it does not seem to occur in numbers like some other local species of the Longicornia. In the Clyde area it has hitherto only been recorded from one locality in Dumbarton and two localities in Stirling (*Trans. Glasgow Nat. Hist. Soc.*, viii., N.S. 305; *Glasgow Naturalist*, i., 138), and the records from these counties are based upon the capture of single specimens. I am glad to be able to report it from Lanarkshire upon the capture of one example by sweeping the herbage below some oak trees near Lanark in June 1918. Although I beat the trees and swept under them again no more specimens were seen.—A. FERGUSSON, Glasgow.

***Rhagium mordax*, De G. (inquisitor, Brit. Cat.), and *R. bifasciatum*, L., in Clyde.**—With reference to Mr Evans' notes upon the occurrence of these longicorns in the Forth area (*Scottish Naturalist*, 1916, pp. 307, 308), it may be of interest to detail their ascertained distribution in the Clyde area. As elsewhere, *R. bifasciatum* is here our only common longicorn, and I have it noted from the counties of Ayr, Lanark, Stirling, Main Argyle, and Dumbarton, while it probably occurs in the remaining counties within the area. *R. mordax* is a much scarcer insect,

although, in my experience, when it is found to be present in a locality it usually occurs in fair numbers. In the list of Clyde Coleoptera it was noted from Lanark, Main Argyle, and Cantire. The Lanarkshire record was from Douglas, where Mr Evans found many in rotten birch in November 1900, but unfortunately in the list this record, through error, was credited to the Rev. J. E. Somerville. Since the publication of the Clyde list, I have found the species in Ayrshire at West Kilbride, and in Arran, where it occurred plentifully in the stumps of old birch trees near Machrie Bay in September 1914, thus giving the insect a status in Clyde Isles. I may add that it has been taken in a second Lanarkshire locality near Lanark on flowers of *Spiræa* in company with *R. bifasciatum*.—A. FERGUSSON, Glasgow.

CURRENT LITERATURE.

WHALES STRANDED ON BRITISH COASTS.—During the years 1913-1917 systematic reports were made by Receivers of Wrecks and H.M. Coastguard, of all Cetacea known to have been stranded on British coasts. These records have been analysed annually by Dr S. F. Harmer, who now publishes a general summary of the information gained during the five years in question. Of some twenty species of cetaceans generally regarded as British, fifteen have been recognised during these years, and of these the following have been represented on the coast of Scotland—Lesser Rorqual, Rudolphi's Rorqual or Sei Whale, Common Rorqual, Sperm Whale, Bottle-nosed Whale, Sowerby's Whale, Killer or Grampus (the only specimen recorded was from the Solway Firth), White-beaked, White-sided, and Common Dolphins, and the Common Porpoise. A valuable fund of information is supplied by these statistics collected by the British Museum (*Proc. Zool. Soc.*, 1918, p. 147).

BIRDS IN SHETLAND.—Mr Edmund Selous continues in the October number of *The Naturalist* his "Ornithological Observations and Reflections in Shetland."

SCOTTISH MOLLUSCA.—Records of land and freshwater mollusca from the following Scottish counties are contained in W. Denison Roebuck's "Census authentications" (*Journ. Conch.*, May 1918)—Wigtown, Stirling, Dumbarton, Argyll, Kincardine, South Aberdeen, Banff, East Inverness, East Ross, Inner and Outer Hebrides. The

most interesting of the many records are perhaps those of *Helix nemoralis* from St Cyrus, which further defines the northern limit of the species in Britain, and of *Milax sowerbyi* from Argyll, the most northerly record along the western side of Scotland.

PARASITIC BEETLES IN SCOTTISH HOMOPTERA.—Mr F. Muir records that amongst Delphacidæ collected by him in Scotland by sweeping over a small patch of grass, about thirty per cent. bore *Stylops* parasites (*Ent. Mo. Mag.*, vol. 54, 1918, p. 137).

ANT-DWELLING MOTH (*Myrmecozella*) AT RANNOCH.—In a short account of that curious guest of the ants—*Myrmecozella ochraceella*—Rev. J. W. Metcalfe describes the large numbers of Ant-dwelling Moths in all stages of freshness found in a particular ants' nest near Rannoch. The ant turned out to be a distinct variety—*Formica rufa* var. *alpina*; and the abundance of the moth in this nest, contrasted with its scarcity in true *rufa* nests in the district, leads the author to speculate that the rare variety may be preferred as a host by the Ant-dwelling Moth (*Entom.*, October 1918, p. 222).

BOOK NOTICE.

AN ORNITHOLOGIST'S FIELD NOTE BOOK. By Hugh S. Gladstone.
London: Bickers & Son, Ltd., 1918. Price 2d.

Under the above title Captain Gladstone has prepared and published a very neat little list ($4\frac{3}{4} \times 3$ ins.) of the British birds which are either breeding species in or regular visitors to our islands. Its main object is to furnish, in a convenient form, a note book in which to enter for future use, or for pleasure, the various birds observed on a visit to a new locality or during a country walk. The list is printed in single column and on one side of the paper only, in order to afford space for the addition of any of the rare species, or for further information relating to the others. It has also an educational value to beginners, since the faunal status of each species is indicated. The nomenclature is that of the British Ornithologists' Union's List. The list fulfils its object, and supplies what has long been a want.

(Authors are responsible for nomenclature used).



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ANIMALS AND MAN.

THE distinctive feature of scientific development in modern times has been the tendency to decentralisation. Not only have the great sciences become more independent and more self-centred, but round each nucleus have clustered secondary centres of development, which are constantly increasing in number, and each of which tends to become more and more independent of the parent science. Like other sciences, that concerned with animal life has both benefited and suffered from this phase of specialisation. It has benefited in having been enabled to probe more intensively the manifestations of life; it has suffered in so far as each new development, laying stress on its independence, has lost touch with the wider knowledge of which it is a branch. Of the latter-day developments of zoology, that which has most attracted popular interest and attention is the phase of Economic Zoology, which selects from the wider field of animal lore only such facts as have some immediate bearing on the welfare of man, and claims these for its province. It is well to remember, however, that Economic Zoology is not and cannot be a self-centred and self-sustaining science, independent of the zoology of the schools; it is a mistake, as Mr M. A. C. Hinton has pointed out, to suppose that there are "two kinds of science—one called 'applied,' essential, it extracts gold; the other called 'pure,' quite unimportant,

it extracts nothing but facts." The interest and value of Economic Zoology lies in that it focusses attention upon the facts of animal life which have been found to be intimately connected with the progress of humanity.

In the desire to stimulate the new appreciation of the value of the naturalist's labours and to spread the benefits derived from them, the trustees of the British Museum are issuing an "Economic Series" of pamphlets, in which various aspects of the relationship of animals to man are discussed by experts on the staff of the Natural History Museum. In view of the great developments which have taken place in recognising the links between the life-histories of certain creatures and the health of their human neighbours, it is not surprising to find that a large proportion of the pamphlets deals with the relationship between insects and disease. In this connection the characteristic features, life-histories, and habits of House-flies, Lice, Fleas, Mosquitoes, and Bed-bugs are described in separate pamphlets (price 1d. each), their influence and importance as disease-carriers are discussed, and the best available advice is given for their destruction and control. The practical value of these popular memoirs can be readily imagined when it is recollected that House-flies are to some extent responsible for the spread of cholera and typhoid fever, dysentery and infantile diarrhoea; that Lice act as carriers of typhus, relapsing fever, and trench fever; that Fleas are responsible for the transmission of bubonic plague, which between 1896 and 1911 accounted for upwards of 7,000,000 deaths in India alone; that, without the agency of Mosquitoes, malaria, once common in Britain, and a present-day scourge of Southern Europe, as well as the yellow fever of South and Central America, would disappear; and that the Bed-bug, apart from its own disagreeableness, is thought to share in the guilt of spreading relapsing fever and many other diseases.

The responsibility of animals in the prevalence of disease among men is, however, by no means confined to insects, and a pamphlet by Mr S. Hirst (No. 6, price 6d.) deals with the economic importance of Scorpions, Spiders,

Mites, Ticks, and Centipedes. Not only do some of these transfer to man the organisms causing diseases, such as African relapsing fever, the river fever of Japan, and probably the Rocky Mountain spotted fever, but others create distempers on their own account: itch, caused by the burrowing of the itch-mite in the skin, is by no means a rare complaint in this country, and many must have suffered in hot summer fields from the attentions of the tiny scarlet "harvest-bug." Furthermore, many are parasitic upon and harmful to domestic animals, including horses, cattle, sheep, and poultry.

Of the larger disease-carriers none more deserves attention than the Rat, which shares in the spread of plague, trichinosis, rat-bite fever, dysentery, foot-and-mouth disease, and influenza among horses. Mr Martin Hinton, in a valuable booklet on *Rats and Mice as Enemies of Mankind* (No. 8, price 1s.), shows that the account against the Rat and its relatives does not end here, but that the monetary loss caused yearly by their damage of food and property demands a united effort to exterminate the pests. He suggests various measures for the city and for the country, whereby the ravages of Rats may be checked and a welcome reduction made in their overbearing numbers.

One of the series is an interesting variant from the records of the more familiar types of relationship between animals and man, namely, Dr R. Kirkpatrick's *The Biology of Waterworks* (price 1s.). Here the unwelcome visitors introduced to unsuspecting householders by way of water-pipes pass under review; an account is given of the well-known assemblages of fresh-water plants and animals (and they include eels and sticklebacks) which have been found inhabiting the water-systems of towns in Britain or the Continent, as well as of the part played by lesser organisms in the purifying action of modern sand-filters.

This "Economic Series" is an admirable expression of an excellent idea. To the naturalist, it affords interesting and dependable summaries of information; it ought to convince the ignorant and the doubter that the study of natural history is neither a fad nor an interesting (but

useless) accomplishment—that, on the other hand, upon the thoroughness of our knowledge of animal life not only depends the health of man, but that, besides, a fair proportion of his wealth, represented by the health of his stock and of his crops and by the preservation of his stores and property, lies in the keeping of the science of nature-study.

JAMES RITCHIE.

Albino Otter.—On 16th February 1919 my keeper, Mr Charles Aitken, trapped a bitch Otter in a young plantation here; two days later in the same wood he caught a young one alive. He heard it calling, and traced it to a patch of bracken where he captured it. On 19th February he was on the shore below the wood and saw something of a light colour moving among the rocks. He got to within about fifteen yards of it before it took any notice of him, then it heard his feet on the shingle, looked up and ran towards him, and he was able to catch it. It turned out to be a young Otter about the size of the first, *i.e.*, about 18 inches long, but it has pink eyes and is the colour of a yellow white ferret, or perhaps I should say its colour resembles a light sandy cairn terrier. At present both are feeding and doing well. I don't know whether this is common or not, but I have not heard of one before.—JOHN H. P. LESCHALLAS, Glenfinart, Ardentinny.

A Crèche of House-mice.—We have just heard of a curious occurrence in the economy of House-mice (*Mus musculus*). A rick of wheat was being thrashed out in February 1919, and in it was discovered a regular crèche of House-mice. In a space among the straw, about 7 ins. in diameter, were no fewer than sixty-one young mice, a good many just a day or two old, and others slightly larger, all huddled together in this small space—probably for the sake of warmth.

It would be interesting to know whether other readers of the *Scottish Naturalist* have had parallel experiences.—EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL.

ON WHALES LANDED AT THE SCOTTISH WHALING STATIONS, ESPECIALLY DURING THE YEARS 1908-1914—PART VII. THE SEI-WHALE.

By D'ARCY WENTWORTH THOMPSON.

(Concluded from "The Scottish Naturalist," 1919, page 16.)

VII. THE SEI-WHALE (*Balænoptera borealis*, Lesson ;
Balæna rostrata, Rudolphi).

The Sei-whale (*i.e.* the Saithe-whale), or Rudolphi's Rorqual, is distinguished from the Common Rorqual or "Finner" by a number of characters—by its smaller size, its shorter flippers, its narrow plates of baleen, its much higher and more falcate dorsal fin. Naturalists were long of recognising it; and our exact knowledge of the species only dates from Collett's well-known paper of 1886, in which the first-fruits were given us of the results of the modern Norwegian whale-fishery. The two species are perfectly well known to the whale-fishers; they differ considerably in their commercial value, and (for one thing) the baleen of the Sei-whale is very much the more valuable, and commands several times the price of that of the Finner in the Paris market.¹

The Sei-whale is a "plankton-whale," living chiefly on *Calanus* and other forms of "kril," but not upon herrings. The difference in diet, however, between it and the Finner is not so complete and sharp as it has often been said to be; for, as we have already seen, the Finner's diet of fish is not his only one, and perhaps not his chief one.

During the seven years with which we are mainly dealing, 1291 Sei-whales were landed at our Scottish stations, of which number 714 were males—that is to say, 55·3 per cent. An excess of males seems to be the general rule, at least in our waters, and in some years the excess is considerable.

The following is a complete list of our captures from year to year and from month to month:—

¹ Cf. Haldane, *Ann. Scot. Nat. Hist.*, 1906, p. 136; 1907, p. 13.

Sei-whales caught at the Scottish Whaling-stations, 1908-1914.

| | April. | | May. | | June. | | July. | | August. | | September. | | October. | | Total. | | Grand Total. | Per-centage of Males. |
|-------------------------------|--------|-----|------|----|-------|-----|-------|-----|---------|----|------------|-----|----------|-----|--------|-----|--------------|-----------------------|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | | |
| 1908 | ... | ... | 2 | 3 | 87 | 69 | 26 | 23 | 9 | 9 | 3 | 1 | ... | ... | 127 | 105 | 232 | 54.7 |
| 1909 | ... | ... | 23 | 17 | 97 | 41 | 20 | 13 | 4 | 5 | 3 | ... | 1 | ... | 148 | 76 | 224 | 66.1 |
| 1910 | ... | ... | 14 | 21 | 43 | 45 | 36 | 24 | 4 | 3 | ... | ... | ... | ... | 97 | 93 | 190 | 51.1 |
| 1911 | ... | 3 | 22 | 32 | 38 | 18 | 6 | 7 | 1 | 3 | ... | ... | ... | ... | 67 | 63 | 130 | 51.5 |
| 1912 | ... | ... | 8 | 5 | 19 | 20 | 31 | 21 | 3 | 1 | ... | ... | ... | ... | 61 | 47 | 108 | 56.5 |
| 1913 | 1 | 1 | 16 | 12 | 18 | 20 | 23 | 36 | 15 | 16 | 1 | ... | ... | ... | 74 | 85 | 159 | 46.5 |
| 1914 | 1 | ... | 7 | 6 | 102 | 81 | 27 | 20 | 2 | 1 | 1 | ... | ... | ... | 140 | 108 | 248 | 56.5 |
| Total | 2 | 4 | 92 | 96 | 404 | 294 | 169 | 144 | 38 | 38 | 8 | 1 | 1 | ... | 714 | 577 | 1291 | 55.3 |
| Grand Total | 6 | | 188 | | 698 | | 313 | | 76 | | 9 | | 1 | | 1291 | | ... | ... |
| Percentage of Males | (33.0) | | 48.9 | | 57.9 | | 54.0 | | 50.0 | | (90) | | (100) | | ... | | ... | ... |

The Sei-whale has but a short season on our coasts (*cf.* Fig. 8). Very few indeed are captured in April and again very few in September, during both of which months the Finners are fairly plentiful. There is a well-marked and high maximum in June, when (as we have already seen) the Nordcaper and the Bottlenose have also, apparently, their maxima. In Finmark, according to Hjort, the Sei-whale comes at the same time as the Blue-whale, namely from June to September; but Cocks speaks of it as coming early in June and departing early in August.

Harmer (*Brit. Mus. Report*, No. 5, 1918) tells us that a specimen was stranded on the Scilly Islands, on 13th October 1917, that is to say immediately after the season during which the species frequents our fishing-grounds.

We may illustrate the marked difference in season between the Sei and the Finner by the following table, which shows the relative numbers of the two species captured from month to month:—

| | April. | May. | June. | July. | August. | Sept. | October. |
|-------------------------------------|--------|------|-------|-------|---------|-------|----------|
| Sei-whales . . . | 6 | 188 | 698 | 313 | 76 | 9 | 1 |
| Fidders . . . | 180 | 404 | 472 | 644 | 583 | 123 | 4 |
| No. of Sei per 100 Fidders . . . | 4 | 47 | 148 | 49 | 13 | 7 | ... |

The catch of Sei-whales varies very greatly from year to year—very much more than does the catch of Fidders. Amplifying part of our former table by including Mr R. C. Haldane's data for the years 1904-1907, and again comparing (as we have just done for the months) the yearly numbers of Sei and of Fidders, we have the following results:—

| | 1904. | 1905. | 1906. | 1907. | 1908. | 1909. | 1910. | 1911. | 1912. | 1913. | 1914. |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Sei . . . | 9 | 34 | 326 | 151 | 232 | 224 | 190 | 130 | 108 | 159 | 248 |
| Finner . . . | 400 | 450 | 320 | 305* | 379 | 432 | 381 | 344 | 282 | 259 | 322 |
| No. of Sei per 100 Fidders | 2 | 8 | 102 | (50) | 61 | 52 | 50 | 38 | 37 | 61 | 77 |

* Not including the large catch at Olna station.

The catch was extremely small in 1904, and again small in 1905; indeed in the former year Sei-whales were practically absent from our whaling-grounds. All of a sudden, in 1906 there was a very great influx, and the catch of that year remains the largest on record. This was also the year of

our largest catch of Blue-whales, and there appears to be a considerable amount of correlation between the two species in regard to their local abundance, but this correlation is not so close as that which I have already pointed out between the Blue-whale and the Nordcaper. As to the Sei-whale, Hjort, Guldberg, and Cocks tell us that in the north of Norway, from the North Cape to the Murman coast, only six Sei were taken in 1884, but the extraordinary number

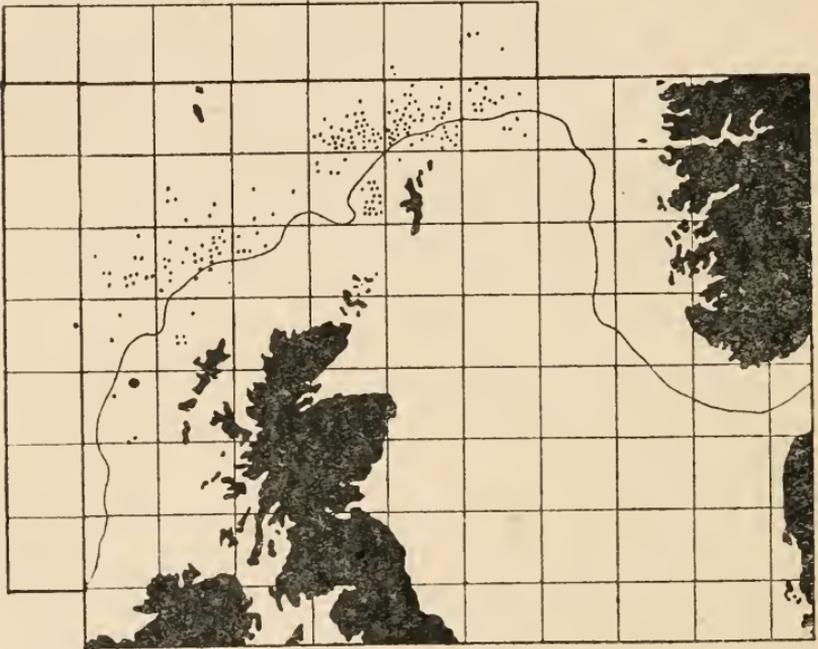


FIG. 14.—The Scottish Catch of Sei-whales during April and May (1908-1914).

of 659 were got in 1885. Mr Cocks' figures for the Finmark coast are slightly different, but to the same effect:—

| | Finner. | Sei. | No. of Sei per 100 Fimmers. |
|----------|---------|------|--------------------------------|
| 1885 . . | 473 | 771 | 163 |
| 1886 . . | 608 | 62 | 10 |
| 1887 . . | 301 | 113 | 37 |

We can only wish that we had a longer series of these Norwegian statistics, for all that Guldberg (1904) tells us besides is that after 1885 the Sei were met with on the same coast in some years but were never seen in others. However,

the record of 1885 is important in itself, and seems to indicate a phenomenal immigration of precisely the same kind as that which occurred in our Scottish waters just eleven years later.

From our Charts (Figs. 14-17) we see that, while the *general* distribution of the Sei- and Finner-whales upon our north-western coasts is much the same, there are yet certain remarkable seasonal differences. In the early part of the season (Figs. 9, 14), the areas occupied by the two species are very much the same. In June (Fig. 15) we have

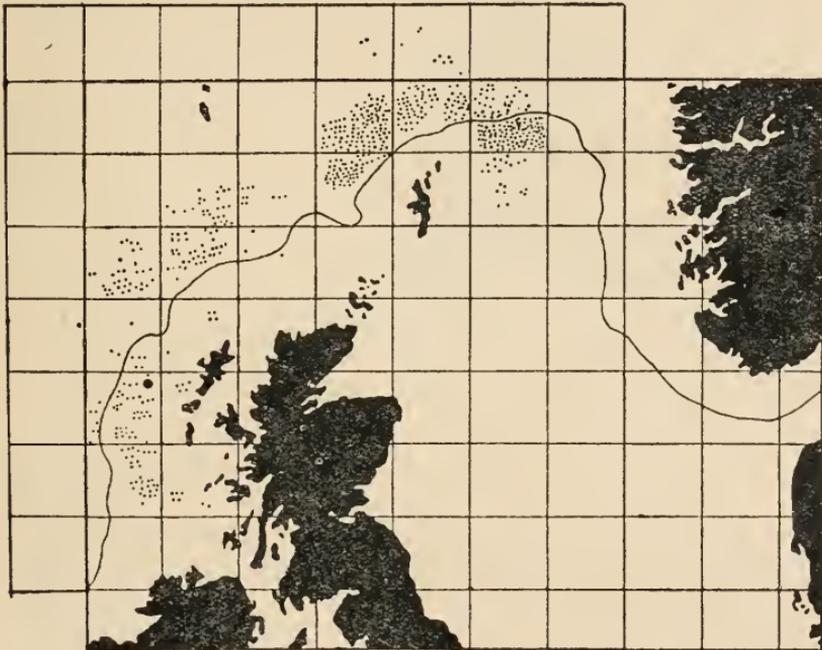


FIG. 15.—The Scottish Catch of Sei-whales during June (1908-1914).

numerous captures of Sei-whales in the neighbourhood of St Kilda and southward thereof, while in the case of the Finner our Chart (Fig. 10) was blank or nearly so in these regions. In July (Fig. 16) there are still a number of Sei-whales south of St Kilda, about half-way to Ireland, while on the corresponding Chart of the Fanners none are seen so far to the south. On the other hand, during the later months (Figs. 12, 17), that is to say in August and September, when the Fanners are abundant around and to the westward of St Kilda, the Sei have almost completely disappeared from

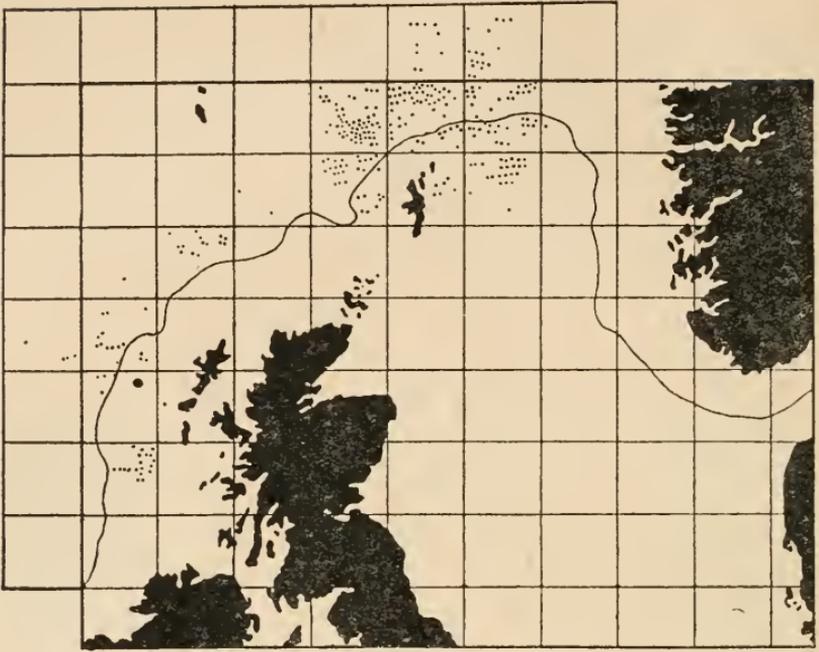


FIG. 16.—The Scottish Catch of Sei-whales during July (1908-1914).

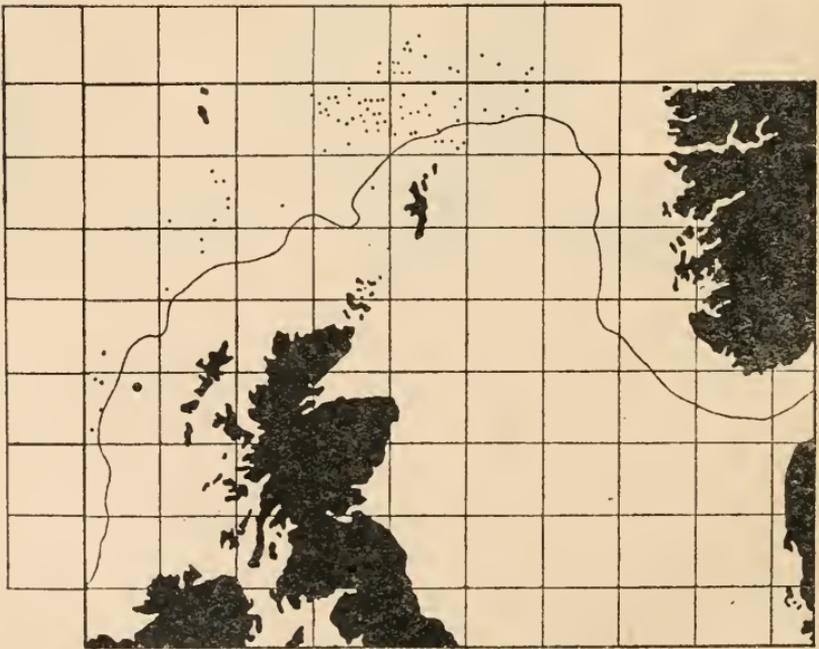


FIG. 17.—The Scottish Catch of Sei-whales during August, September, and October (1908-1914).

this portion of the Chart, and what captures are made are mostly to the northward of the Shetlands.

The following table gives the recorded lengths of all our Sei-whales:—

Recorded Lengths (in feet) of all Sei-whales captured at Scottish Whaling-stations, 1908-1914.

| Feet. | Males. | Females. | Feet. | Males. | Females. | Feet. | Males. | Females. |
|-------|--------|----------|-------|--------|----------|-------|--------|----------|
| 26 | ... | ... | 39 | 13 | 14 | 52 | 5 | 15 |
| 27 | 1 | 1 | 40 | 78 | 65 | 53 | 3 | 14 |
| 28 | ... | ... | 41 | 40 | 36 | 54 | 3 | 8 |
| 29 | 1 | ... | 42 | 73 | 29 | 55 | 4 | 6 |
| 30 | 3 | ... | 43 | 47 | 29 | 56 | 4 | 3 |
| 31 | ... | 2 | 44 | 68 | 28 | 57 | 1 | 1 |
| 32 | 1 | 1 | 45 | 101 | 70 | 58 | 2 | 1 |
| 33 | 4 | 4 | 46 | 60 | 41 | 59 | 1 | ... |
| 34 | 4 | 5 | 47 | 47 | 33 | 60 | 3 | ... |
| 35 | 6 | 12 | 48 | 56 | 49 | 61 | ... | 1 |
| 36 | 6 | 9 | 49 | 17 | 23 | 62 | 1 | ... |
| 37 | 12 | 8 | 50 | 27 | 44 | 63 | ... | ... |
| 38 | 18 | 14 | 51 | 3 | 10 | 64 | 1 | ... |

(Also one female, recorded as measuring 72 feet.)

Summarising this table in our usual way, by determining the median, the two quartiles, and the first and last deciles, and at the same time giving these values for the catches of the several months, we have as follows:—

Epitome of Sizes (median, quartile, etc.) of Sei-whales landed at Scottish Stations, 1908-1914.

| | E. | D ₁ . | Q ₁ . | M. | Q ₃ . | D ₉ . | E. |
|-----------------------------|------|------------------|------------------|--------|------------------|------------------|---------|
| <i>Males</i> —April . . . | (43) | ... | ... | (43.5) | ... | ... | (44) |
| May . . . | 34 | 40 | 42 | 44 | 46 | 48 | 64 |
| June . . . | 36 | 39 | 41 | 44 | 47 | 49 | 62 |
| July . . . | 27 | 39 | 41 | 44 | 46 | 49 | 60 |
| August . . . | 29 | 37 | 40 | 45 | 46 | 49 | 50 |
| September . . . | 37 | ... | ... | 44 | ... | ... | 50 |
| <i>Females</i> —April . . . | 33 | ... | ... | ... | ... | ... | 45 |
| May . . . | 31 | 37 | 40 | 44 | 48 | 49 | 53 |
| June . . . | 28 | 39 | 41 | 45 | 49 | 50 | 58 |
| July . . . | 33 | 40 | 41 | 45 | 48 | 51 | (72?) |
| August . . . | 33 | 38 | 44 | 45 | 48 | 50 | 54 |
| <i>Total</i> —Males . . . | 27 | 40 | 41 | 44 | 46½ | 49 | 64 |
| Females . . . | 28 | 39 | 41 | 45 | 48 | 51 | 61 (72) |

The median size, then, is found to be 44 feet for the males, and 45 feet for the females; the arithmetic means

are, respectively, 44.1 and 44.7 feet. The females are thus but a trifle the larger (*cf.* Fig. 13). There is, however, a notable difference in some parts of the scale, and especially between 50 and 55 feet, where the females markedly predominate; in the still larger sizes this predominance is not maintained so far as our present data go. This we see in the following short table:—

| | Number. | | Percentage of Total. | |
|----------------------------------|---------|----------|----------------------|----------|
| | Males. | Females. | Males. | Females. |
| Sei-whales of 45 feet and over . | 341 | 320 | 48 | 56 |
| " of 50 " " " . | 58 | 104 | 8 | 18 |
| " of 55 " " " . | 17 | 13 | 2.4 | 2.3 |
| " of 60 " " " . | 5 | 2 | .7 | .3 |

One female is recorded as measuring 72 feet in length, the next largest being only 61 feet. The former is said to have been caught fifty miles north-west of St Kilda, in July 1911; but 72 feet is so exceptional, or rather so unprecedented, a length for a Sei-whale that one cannot help suspecting a possible mistake in the record. The largest Sei-whales recorded by Mr Haldane during the years 1904-1907 were 59 feet for a male, and 57 feet for a female. We must note, however, in regard to our alleged 72-foot specimen, that several other Sei-whales are recorded from the same locality and the same month, nearly all of them being very much over the average size. Their lengths are recorded as follows:—Males, 58, 60, 60 feet; females, 43, 48, 50, 56, 61, 72 feet. We are hardly entitled to reject the last of these, unless we are prepared at the same time to cast doubt on the measurements or the identification of the whole batch. The size of Rudolphi's whale has been generally understated. For instance, we are told in the British Museum "Guide to the Whales, Porpoises, etc." (1909) that it "never exceeds 50 feet in length," and Mr Southwell says it "seldom exceeds 48 feet."

The largest that I can find in Mr Haldane's notes are a male of 56 feet and a female of 57 feet, both caught in 1906; but of Sei-whales of 50 feet and over he has a fair number.

It is noteworthy that in the case of the Sei-whale, the ratio of girth to length is practically identical with what we

have found in the case of the Finner; only that in this case there is no difference to be discovered between the male and female fish. The median ratio is about 38.5 per cent. for males and 38.2 per cent. for females, giving, for a 45-foot fish, a girth of 17.3 feet in the male and 17.2 feet in the female—in other words, a wholly insignificant and negligible difference. There is here, as in the case of the Finner, a perceptible tendency for the girth to increase in a greater ratio than the length. On the other hand, there is much less sign, and probably no real evidence, of a tendency for the girth to increase from month to month during the fishing season.

*Ratio of Length to Girth in the Sei-whale
(median and quartile values).*

| | MALES. | | | | | | FEMALES. | | | | | |
|---------------------------------------|-----------|-----|---------|-----|-----------|-----|-----------|-----|---------|-----|-----------|-----|
| | Quartile. | | Median. | | Quartile. | | Quartile. | | Median. | | Quartile. | |
| | L. | G. | L. | G. | L. | G. | L. | G. | L. | G. | L. | G. |
| May . . . | 42 | 14 | 44 | 16 | 46 | 18 | 40 | 14 | 43 | 16 | 48 | 19 |
| June . . . | 41 | 15½ | 44 | 17½ | 47 | 19½ | 41 | 16 | 45 | 17 | 49 | 19 |
| July . . . | 39 | 14 | 44 | 17 | 49 | 20 | 41 | 16 | 45 | 17 | 48 | 19 |
| August . . | 40 | 14 | 45 | 16 | 46 | 18 | 42 | 16 | 45 | 17½ | 49 | 19 |
| September | ... | ... | 44 | 18½ | ... | ... | ... | ... | ... | ... | ... | ... |
| Percentage Ratios of Girth to Length. | | | | | | | | | | | | |
| May . . . | 33.3 | | 36.4 | | 39.1 | | 35.0 | | 37.2 | | 39.6 | |
| June . . . | 37.8 | | 39.8 | | 41.5 | | 39.0 | | 38.4 | | 38.8 | |
| July . . . | 35.9 | | 38.6 | | 40.8 | | 39.0 | | 38.4 | | 39.6 | |
| August . . | 35.0 | | 35.6 | | 39.1 | | 38.1 | | 38.9 | | 38.8 | |
| September | ... | | 42.0 | | ... | | ... | | ... | | ... | |
| Year . . . | 35.5 | | 38.5 | | 40.1 | | 37.8 | | 38.2 | | 39.2 | |

The corresponding values for the several *years* are very irregular. In some years the relative girth is apparently much less than in others; but there is no close correspondence in this respect between the males and the females, and this is enough in itself to throw doubt on the value or trustworthiness of our results. Thus the smallest average

girths, or the leanest whales, appear to have occurred in 1910 in the case of the males, and in 1911 in the case of the females. I have given a good deal of time to the problem, but I cannot draw a clear and intelligible story out of it; and I see no such prospect of useful results as to lead me to carry it further.

A Summary of the Seasonal Abundance of the several Species.

It might perhaps be useful, but it would take too much space, to bring together in tabular form our chief results for all the several species of whales. I will rest content with a single small table, showing the differences between the species in regard to their season of abundance—that is to say, the percentage proportion of the whole catch obtained during the several calendar months:—

| | April. | May. | June. | July. | August. | Sept. | October. | Total. |
|-------------------|--------|------|-------|-------|---------|-------|----------|--------|
| Blue-whale . . . | ... | ... | 12·8 | 27·5 | 28·4 | 29·4 | 1·8 | 99·9 |
| Sperm-whale . . . | ... | 2·4 | 19·0 | 21·4 | 57·1 | ... | ... | 99·9 |
| Humpback . . . | ... | 3·2 | 6·4 | 48·4 | 35·5 | 6·4 | ... | 99·9 |
| Finner . . . | 7·5 | 16·8 | 19·6 | 26·7 | 24·2 | 5·1 | ·2 | 100·1 |
| Sei-whale . . . | ·5 | 14·6 | 54·1 | 24·2 | 5·9 | ·7 | ·1 | 100·1 |
| Nordcaper . . . | ... | 4·5 | 65·7 | 28·4 | 1·5 | ... | ... | 100·1 |
| Bottlenose . . . | 15·0 | 10·0 | 50·0 | 15·0 | 10·0 | ... | ... | 100·0 |

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The following are a few more papers, in addition to those already cited:—

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THE GOLDEN EAGLE IN GALLOWAY.

By Sir HERBERT MAXWELL, Bart.

THE following note about the Merrick, 2750 feet, the highest hill in the Scottish Lowlands, occurs in the topographical MSS. of Walter Macfarlane (died 1767), preserved in the Advocates' Library :—

“In the remote parts of this great mountain are very large Red deer, and about the top thereof that fine bird called the Mountain Partridge, or, by the commonalty, the Tarmachan, about the size of a Red cock [grouse], and in flesh much of the same nature; feeds, as that bird doth, on the seeds of the bullrush [an error], and makes its protection in the chinks and hollow places of thick stones from the insults of the eagles, which are in plenty, both the large gray and the black, about that mountain.”

A month or two ago I must have written of all these animals as being extinct in this fine wild district. The last Red Stag in the Forest of Buchan was shot, it is said, by the minister of Kirkinner about the year 1747, fifty years or so before MacQueen of Pall-a-chrocain killed the last Wolf on the Monadhialh among the headwaters of the Findhorn.¹ A shepherd in Glen Trool told me long ago that the Ptarmigan disappeared from the Southern Uplands in “the year o’ the short corn”—1827 (or was it 1828?), and the efforts of the Duke of Bedford to re-establish this species have not proved successful so far.

The Golden Eagle last reared its brood in this district in 1835, and the Erne or White-tailed Eagle in 1866. In 1905 a pair of Golden Eagles returned to Cairnsmore and built an eyrie, but failed to hatch the solitary egg that was laid therein. One at least of this pair was shot near Kirkcudbright in the following winter. I have not since heard of a Golden Eagle being seen hereabouts

¹ *Lays of the Deer Forest*, by John Sobieski and Charles Edward Stuart, vol. ii., pp. 244-247.

until I received the following note from Mr Charles Stark, a competent observer in Glen Trool:—

“On 2nd December [1918] I was looking at some rabbit snares in Buchan, and, happening to look up, I saw what I thought was a buzzard. I went on, when, to my surprise, a golden eagle swooped down and took a rabbit from a snare about ten yards from me, leaving only the head in the snare. This morning [4th December] a similar occurrence took place, only this time from a trap instead of a snare. The trap pin had got loose in the ground, which was soaked with heavy rain, and the bird carried off the trap with the rabbit. On the first occasion the eagle took his prey to a precipice on Glenhead Farm, overlooking the Gairland Burn; but this morning he went off in the direction of the Dungeon, so far as I could see in the blinding rain. Shortly after coming here on 4th March last I saw an eagle on two occasions. A shepherd on the farm of Palgown informed me that a pair of eagles used to frequent that part of the Merrick known as the Lum o’ the Gutter, and always came and went by Loch Doon.”

Shepherds and game preservers may view with scant favour the return of these formidable birds of raven to our Galloway Hills; but for the artist and the field naturalist a soaring eagle is the one feature necessary to make perfect the savage grandeur of Glen Trool.

Benyellary, the peak adjoining the Merrick and its rival in height, bears in modern spelling the ancient Gaelic name *beinn iolair*—the eagle’s hill. It stands on the border of the Forest of Buchan, treeless now, of yore the hunting-ground of the Comyns, Earls of Buchan, wherein survive several names commemorative of the chase, such as Shalloch o’ Minnoch, which gives the sound of the Gaelic *sealg*, hunting-ground, and Mulwharker = *maol adhairce* (pron. “aharky”), bare hill of the hunting-horn.

Bank Voles in Clyde.—As I have only seen the Bank Vole recorded from four or five places in the Clyde faunal area, it may be worth recording that I obtained several here in February 1919.—JAMES BARTHOLOMEW, Glenorchard, near Glasgow.

THE GREAT CRESTED GREBE IN FORTH.

By WILLIAM EVANS, F.R.S.E., M.B.O.U.

IT is now thirty-four years ago (June 1885) since, to my surprise, I observed a pair of Great Crested Grebes on Loch Gelly, Fife, under circumstances which left little doubt in my mind that they were breeding there (see *Ann. Scot. Nat. Hist.*, 1894, p. 181). My surmise was borne out by their return in subsequent years, the appearance of a brood in 1896, and nestbuilding witnessed in 1898 by Mr R. Godfrey. On the same page of the *Annals* as mine there is a note by Mr Harry Cumming stating that he had received eggs taken in Stirlingshire in April 1890, the locality being, I understand, Carron Dam. Then we have Mr Oswin Lee's account of a nest with eggs at Lake of Menteith, south-west Perthshire, in the end of April 1896 (*Annals*, 1897, p. 161). In the same locality another nest with two fresh eggs was found by myself on 21st May 1896, and I have seen others in more recent years when several pairs have frequented this sheet of water. I have a jotting to the effect that a Great Crested Grebe was observed on Lake of Menteith in 1887, but cannot trace the origin of the note.

In the course of the last twenty years one locality after another has revealed the presence of the species in the breeding season, and in several of them eggs have been obtained or young seen. On 18th August 1906 there were two pairs with broods of four and two respectively on Camilla Loch, near Auchtertool, Fife, the young birds being, so far as I could judge, scarcely half-grown. Such late broods can only be accounted for by the loss of earlier ones. At Loch Leven, where in July 1906 I had no less than fourteen birds (mostly in pairs) in sight at the same time, six nests were found on 5th July 1908 by Mr H. Raeburn, who brought me an egg from one of them; while on 14th June 1910 I saw two nests there. Loch Lubnaig, too, has for some years been known to me as a breeding haunt; in 1912 a nest with eggs was found there as I was informed at the time by Mr G. Blackwood. Coming to Midlothian, I

have seen eggs from two localities, namely Cobbinshaw Reservoir in 1907 (three nests), and reservoir near Balerno in 1916. In both localities I had noticed single birds before these years. A pair also nested, I believe, on Gladhouse Reservoir in 1911, but in this instance I have no positive evidence to adduce; while in the neighbouring Portmore Loch, Peeblesshire, I saw a pair in April 1912 (*cf.* the vol. of this Magazine for the latter year, p. 186). In the summer of 1916 Misses Baxter and Rintoul observed two pairs and their young on Kilconquhar Loch in the east of Fife (*Scot. Nat.*, 1916, p. 264). Birds in full nuptial dress have been seen on a number of other lochs in the area, *e.g.*, Ballo Reservoir, Lomonds, April 1904, and two lochs near Doune; but I have no evidence of nesting at any of them, though that is not always to be accounted for by the absence of reeds or other sheltering vegetation—there is the angler, a by no means imaginary foe, to be reckoned with. Looking to all the circumstances I am inclined to doubt if there are as many now nesting in the area as was the case ten to fifteen years ago.

As a winter visitor to the Firth of Forth the Great Crested Grebe has, of course, long been on record; and there is scarcely an inland piece of water of any extent on which it has not at one time or another been known to occur during the non-breeding season. Were it necessary I could give many instances, drawn from every county falling within the boundaries of "Forth."

Waxwing on Deeside and Goosanders on the Deveron.

—I was up Deeside on the 24th December 1918, and when passing the entrance to Cairntoun it may be of interest to state that I saw a Waxwing feeding on the hips about five yards away from me. I could see the wax on the wing, and when it flew, the wax on the tail. I have taken the greatest interest in birds all my life, and this is the first time I have seen one outside.

The day before I was on the Deveron, at Duff House, walking up the river. I saw no end of Goosanders and Golden-eye. If something is not done to reduce the number of Goosanders our salmon will all disappear.—P. D. MALLOCH, Perth.

WOODCOCK AND THE SAFETY OF
THEIR YOUNG.

By WILLIAM EVANS, F.R.S.E., M.B.O.U.

IN this magazine for the months of October and December last, Sir Herbert Maxwell and Mr Abel Chapman record instances which had recently come under their observation of Woodcock carrying their young. While the subject is one the discussion of which I have no intention of entering upon—we are all familiar with it as a periodical topic of correspondence in the newspapers—the occasion seems opportune for a statement of my own experiences in connection with the matter. To avoid misunderstanding, let me say at the outset that I am not criticising the above-mentioned records, but merely narrating what I have myself seen. That Woodcock occasionally lift and bear away their young when danger threatens them I do not dispute, but I feel sure “feigning” is a far more common habit, and the occasion of much misapprehension.

Setting aside some early and now rather hazy incidents, I shall confine myself to observations made in recent years, and regarding which the note-book can be consulted in order to refresh the memory.

On 22nd April 1911 I was passing through a wood on Saltoun Estate, East Lothian, when a Woodcock suddenly got up within two or three yards of me. She rose on my left, and as if to attract attention to herself, flew off in front of me, gradually crossing to my right. Her flight, which was only a few feet above the ground, seemed very laboured, and her whole aspect suggested that she was carrying something underneath her body. Her tail was spread out and deflexed, while immediately in front of it she had a distinctly bulky appearance. Her bill was pointing downwards, but not to the extent of being perpendicular, and I thought I could see her toes. When she had proceeded about thirty yards she dropped to the ground, still, however, continuing to flap her



wings, and began moving her legs in an agitated manner. This lasted for only four or five seconds, when she rose, and in the same laboured fashion flew on another thirty or so yards, again dropping to the ground and repeating the same manœuvres. On rising this time she flew off in ordinary Woodcock style, and was soon out of sight among the trees. I had glasses with me, but there was no time to get them into use, and in any case I could not risk taking my eyes off the bird even for a second. Immediately she had disappeared I hastened to the spots where she had alighted, taking the farther one first, to ascertain if a young bird had been dropped, but no trace of one could be found. Returning to the place where she originally got up, I soon discovered a few-days-old youngster squatting on the ground. The thought at once occurred to me that perhaps its mother would return and bear it away if I were out of sight. I therefore concealed myself beneath a shelter of fir branches from which a not too distant watch could be kept on the place; but again, though I remained in hiding for over half an hour, I had no success.

The impression conveyed to my mind by this bird's appearance and actions was such that at the time I felt sure she must be carrying a young one. But when I came to think the matter over, I realised that there was no proof; I could not say that I had seen the young one, though appearances suggested its presence. Perhaps this was only one of those cases in which the observer is deceived by the parent bird's "antics" (a "ruse" some would call it) to draw off his attention from her chicks. Naturally one would have welcomed an early opportunity of testing the point, but none presented itself that year.

In the beginning of May 1912 (a visit to Saltoun in April had been unproductive), and again in May 1913, I visited the Tynninghame woods, also in East Lothian, and under the guidance of Mr Thomson, the headkeeper, succeeded in finding four Woodcocks with broods. What happened in each instance is told below. A further case on 2nd May 1914 presented no new features.

On 4th May 1912 Thomson took me to investigate two

Woodcocks' nests which had been discovered about a fortnight before. The first nest visited contained an addled egg and the remains of others that had hatched. Not far from it a Woodcock, probably the parent bird, got up, but not near enough, nor in a sufficiently clear space, for us to observe her actions distinctly, and in the circumstances a search for the young seemed hardly worth while. Proceeding to the second nest we found the eggs (it was known there were four) had all hatched, and in the expectation that the bird and her family would still be in the neighbourhood a search for them was instituted. Before we had gone far, a Woodcock rose on our right within about three yards of our feet, and flew diagonally across our path in the same laboured fashion, and repeating the same manœuvres, as I had witnessed at Saltoun the previous spring. The feet seemed, however, to be drooping more. On the spot from which the bird rose, four chicks, apparently not more than three or four days old, were found sitting together. If, as seems highly probable, this was the brood from the nest we had just inspected, then the mother had not carried away a young one, for as above stated the nest was known to contain only the usual set of four eggs. And even if she were a different bird, the chance that she had a brood of five is very remote.

In 1913 I had another day at Tynninghame in search of young Woodcock on 10th May. Seven nests were seen. On four of them the birds were still sitting, while the other three contained the remains of hatched eggs (in one of them there was also an addled egg). Two broods were all we could discover. One consisted of four well-grown youngsters, which fluttered off, one after another, immediately the old bird got up. While the young birds fled away from us, the old one, going in the opposite direction, passed nearly over our heads and alighted for a few seconds a short distance behind me. When on the ground she flopped about in a very agitated manner, clearly an expression of anxiety for the safety of her brood. That no young one was carried in this instance I am quite certain. With regard to the other brood, nothing of a definite nature could be made out.

Owing to the thick cover we only got a glimpse of the old bird as she rose, and two youngsters, which shortly afterwards crept away from under the bushes, were apparently left to take care of themselves.

The fact that I had now seen two Woodcocks that had left the full complement of four young behind act nevertheless in the same way as the Saltoun bird, convinced me that she too was merely endeavouring to draw me away from her little ones. When young are carried it is probably a much more deliberate act, not to be expected of a bird suddenly flushed from her brood.

In his "Rough Notes" Booth gives a most interesting account of his observations when endeavouring to ascertain how the juvenile is carried, which is well worthy of perusal. The following quotation will suffice to show that he not only failed to discover how the young were carried, but even to make certain that they were carried at all:—

"In the wooded ravine on the hill of Tarlogie, near Tain, a woodcock (as far as I was able to judge) was twice seen in the act of conveying its young. The following extracts from my notes of June 1869 may afford some explanation as to the difficulty of ascertaining accurately the manner in which the young one is carried, or (as some observers are inclined to believe) whether the whole idea does not arise from misapprehension caused by the excited actions of the bird while endeavouring to draw the attention of intruders from the brood."

For recent evidence that the young are occasionally carried, reference should be made to the *Irish Naturalist* of 1899 and 1913, and Mr Sword's paper read to the Stirling Natural History Society in 1912.

Whooper Swans at Duddingston Loch.—On the forenoon of 19th January 1919 a flock of thirteen wild swans—*Cygnus musicus*—calling loudly, came up from the Firth to the loch; they flew low down over the water, but as it was ice-bound they rose again and made for the sea: they were all adult birds. This is the first time I have seen the Whooper at the loch. —WILLIAM SERLE, M.B.O.U.

THE COLLECTION AND PRESERVATION OF
DIPTERA.

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

THE approach of a new collecting season, which promises to the entomologist something like a return to pre-war conditions, has suggested to the writer the desirability of penning a short series of hints on the capture and preservation of Diptera—if only to show with what facility a good collection of these interesting insects can be acquired, and how extremely simple are the methods of preparing for the cabinet as compared with those employed for beetles, bugs, or butterflies. Although, of course, a collection of Diptera can never vie with one of Lepidoptera in beauty of general appearance, yet it can fairly be claimed that when the two-winged insects are examined under the lens the more popular group must yield in the matter of interest and variety. The very simplicity, too, of the operations by which flies are rendered available for examination may be used as an argument in favour of their study, for the time occupied in relaxing, setting, carding, and the like, so desirable (if not necessary) in the case of other insects is entirely saved in the case of Diptera, and specimens are ready for examination and identification in the majority of cases after the simple expedient of pinning. Another factor which tells in their favour is that flies of some sort or other may be found anywhere and everywhere, practically all the year round, and at any time of day, while, as a rule, their capture is a comparatively simple process. Moreover, since they are very susceptible to the fumes of the cyanide bottle, they die quickly without damaging themselves, and it is not difficult, therefore, to acquire a series of specimens in excellent condition.

Since flies are ubiquitous it is unlikely that the collector will fail in the acquisition of useful material, provided he choose a suitable day and a good locality for work. Consider-



ing the seasons first, it may be pointed out that specimens may be obtained on sunny days from January onwards, but that naturally as the spring and summer advance the number of species to be had increases, reaching the climax about the end of June. July and August are both good collecting months, but later than this the species as well as the individuals fall off gradually in numbers, although certain kinds may be obtained as long as there is favourable weather. The most suitable time for collecting is the forenoon of a calm, sunny day, especially after rain, while, since the habits of flies in general are so various, the kind of locality to be worked naturally depends largely upon the particular group or groups desired. For example, the Hover-flies or Syrphidæ, which are the most attractive to the beginner, are habitual frequenters of flowers, especially those of composite and umbelliferous plants. A large patch of flowering-heads of such plants as Cow-Parsnip (*Heracleum*), *Angelica*, Rag-wort, and the like is sure to yield a plentiful supply of specimens, not only of Syrphidæ but also of Muscidæ, Tachinidæ, Anthomyiidæ, and Empidæ. When such a favourable mass of bloom is met with, and the sun is shining brightly, it is best to remain there for an hour or two, capturing the flies as they settle on the flowers. Such a method of collecting—waiting for the flies to appear—is not only an easier but often a much more profitable one, than the covering of miles of ground by toilsome tramping.

In the spring primroses, marsh marigolds, and shallows are fruitful sources of interesting species, such as the members of the genus *Chilosia*, while later on even buttercups, daisies, and dandelions afford an astonishing variety of Diptera, and should not be despised. As it is next to impossible to identify at sight the numerous species of Anthomyiidæ, etc., which haunt wayside flowers, it is a wise plan to capture the flies wholesale without any attempt at discrimination, leaving the task of discarding undesirable specimens until the time for pinning arrives. Only then does one really discover the value of a day's captures, and what appears in the field to be an ordinary black proletarian

may often turn out on examination to be a specimen of considerable interest.

A great wealth of species may often be obtained by the simple expedient of *sweeping* a mass of luxuriant weeds, such as those which clothe the banks of a roadside ditch, or the undergrowth of a damp wood. In such habitats one finds an astonishing variety of Acalyptrate Muscidæ, Empidæ, Dolichopodidæ, and various families of Nematocera (Crane-flies, Gnats, Midges, etc.). A sunny glade in a wood, or even a small opening in the trees which allows a gleam of direct sunlight to penetrate and illuminate the foliage of low shrubs or large weeds, is always worthy of attention, for many flies (e.g., *Syrphus*, *Lucilia*, and many genera of Anthomyiidæ) are very fond of sunning themselves on leaves warmed and illuminated in this way, while if such a fly is disturbed it will return again and again to precisely the same leaf. Hence if it is missed by the first stroke of the net let the collector wait a few moments and the fly will return and offer a second, third, or even many chances.

Certain Syrphidæ (*Eristalis*, *Volucella*, *Syrphus*) may be seen (and heard!) hovering in the air high above one's head and apparently stationary. To approach by careful stalking and capture one of these handsome insects by a rapid and skilful stroke of the net, under a hot sun and in the dangerous vicinity of strong, trailing bramble-shoots, whose recurved prickles are waiting to rend to shreds the delicate gauze of the net if carelessly allowed within their sphere of action, offers a degree of sport and excitement which may hardly be credited by those who have not tried the experiment. If the fly be missed, and it *is* missed more often than not, it darts away to a considerable distance like a stroke of lightning, returning again after a second or two to the same spot to tempt once more the panting and perspiring pursuer.

A change of scene may be recommended after sufficient sport (and let us hope, a fair spoil) has been obtained in this way, and a cooler spot may now be chosen. The neighbourhood of water offers to the collector many chances of acquiring a variety of interesting species. The low vegetation of a marsh may be swept with good results in the way

of Cordyluridæ, Ephydridæ, Limnobiidæ, and Dolichopodidæ, while the foliage of the trees overhanging the margins of a pond or stream often harbours a number of Empidæ, Simuliidæ, and other groups. The hour of sunset is *par excellence* the time for the appearance of the tiny but interesting and beautiful midges of the family Chironomidæ. Large swarms, each as a rule made up of a single species, may be commonly seen disporting over a damp spot on the margin of a ditch or stream on a calm, clear afternoon when the sun is disappearing, and in a few minutes more specimens can be obtained than it is possible to pin and preserve — to say nothing of the task of identification. Lastly, Dung-flies (*Scatophaga*, *Borborus*, etc.), Carrion- and Flesh-flies (*Sarcophaga* and its relatives), and Fungus-gnats (Mycetophilidæ) are to be sought for in the habitats suggested by their names, while obviously Gad-flies, Bot-flies and other parasitic forms are seldom met with except in the vicinity of their hosts.

APPARATUS REQUIRED.

The outfit of a collector of Diptera is comparatively simple and inexpensive. The first item to be considered is the net. The material of which the bag is made should be much softer and finer meshed than those usually employed by the lepidopterist, should be either green or white, while in shape it should taper backwards from its mouth almost to a point. The writer uses a soft green silk gauze, but some collectors prefer a white material for the sake of greater facility in detecting the minuter specimens. The ring should be of strong wire (about one-eighth of an inch in diameter), and nickel-silver may be strongly recommended as not liable to rust, while the ring should by means of loops or rivets be divided into four segments so that when not in use it can, without removing the bag, be folded up and carried in a bag or even in the pocket. The stick to which it is screwed should not be longer than 2 feet, and must be light but strong, preferably of bamboo. A spare bag should invariably accompany the collector, in case of accident to the first one. The butterfly-nets (small model) supplied by Deyrolle & Co.,

of Paris, are admirably suited in every way (material, ring, and stick) for the collection of Diptera.

Either one or two killing-bottles (preferably the latter) must be taken into the field, and these should have a wide mouth and be made of good strong glass. They should be about 3 inches in total height, and the bottoms should be charged to a depth of a half to three-quarters of an inch with a mixture of plaster of Paris and cyanide of potassium. It is advisable to put the preparation of such a bottle in the hands of a chemist—it is safer and the cost is trifling. Ether and chloroform are sometimes used, but as these are extremely volatile it is necessary to charge the bottles several times during the course of the day, the liquid being dropped upon a piece of cotton-wool or upon small pieces of blotting-paper which may be carried in any ordinary wide-mouthed bottle. This is a troublesome process in the field, and although specimens killed with ether are usually in beautiful condition, the carrying of a supply of the fluid for replenishing purposes is somewhat of a nuisance, while its presence is constantly felt through its penetrating (and to some people sickly) odour. A decided objection to the use of chloroform lies in the fact that flies killed by this medium usually expire in distorted and unnatural positions, with a very undesirable stiffening of the legs and other appendages. It is a great advantage to carry two killing-bottles and to use them alternately, for when the collector is kept busy such a plan ensures a longer closure of each bottle before it is reopened, thus making death certain and avoiding the escape of specimens. A number of circular glass-topped boxes should be carried in the pocket or collecting-bag, and it is convenient to have these of the same diameter as the mouths of the killing-bottles, thus facilitating the safe transference of the specimens (especially if there is any wind), which operation should be performed periodically, say every half-hour or so. A third killing-bottle may even be carried for the reception of solitary specimens of more than ordinary interest, and from this extra bottle each specimen should be transferred, as soon as dead, to a separate box. This plan should be followed whenever it is desired to isolate any

particular specimen for the purpose of recording any observations which may have been made regarding habits or other points of interest, which records should be jotted down, *at the time*, in a note-book. The boxes should be numbered in ink on the bottom previous to starting from home, a plan which will prevent mistakes being made in the field, where the collector has usually plenty of other work to do. So long as the observation recorded in the book bears the number of the box containing the fly concerned, the sequence of the numbers used is of no consequence whatever. For Crane-flies (Tipulidæ) which, if mixed with other flies in the killing-bottles invariably lose most of their legs, it is desirable to provide a number of well-made chip boxes, with firmly fitting lids, putting each specimen alive and *direct from the net* into a separate box, and immediately afterwards marking the outside of the lid with a pencil to indicate that the box contains a specimen and must not be opened again until home is reached. These Crane-flies can then all be killed and pinned at the same time, and the loss of limbs reduced to a minimum.

It will thus be seen that the whole outfit for a day's collecting of Diptera comprises only the following: a folding net, with bag, ring, and stick complete, a spare bag, two (perhaps three) small cyanide bottles, a couple of dozen glass-topped boxes, and a like number of chip boxes. The whole of this apparatus can be stowed away in a jacket well provided with pockets, and if a good lens and a pair of fine forceps (with points protected by a cork) be added the collector may set out with little encumbrance and much confidence. A canvas bag of a suitable size for holding everything (lunch included!) may be slung over the back, but if this can be dispensed with so much the better.

Before leaving this section of our subject let it once more be emphasised that little discrimination need or should be used in the gathering of specimens. It is an easy matter to discard, when pinning, common species or duplicates, and if everything that comes into the net be bottled, killed, and boxed, many species will reward the collector which otherwise he might never come across. It is also desirable to urge

upon our readers the desirability of enlisting more workers into the ranks of Dipterology. More students are urgently needed, for there are many problems to be solved, many of which will have, sooner or later, a direct bearing upon agricultural and medical questions of the highest importance to man himself. The first step is to collect, preserve, and study as many species as possible, so as to gain a good grounding in the general characteristics of the Order, after which some group may be taken up in greater detail and studied in all its bearings. There is work enough for all, and the sooner we have an army of specialists in this exceptionally interesting order of insects the better we shall be able to tackle the many economic problems which still await solution.

(To be continued.)

Sparrow-hawk and Wood-pigeons.—The Sparrow-hawks in this part of Berwickshire have increased in numbers during the last few years, owing to the usual toll not having been exacted from the nesting pairs, and the evidence of their depredations is frequently manifested to any one taking a walk in the neighbourhood of their haunts. Some weeks ago, on the margin of a plantation, I came suddenly upon a female Sparrow-hawk dining off a Wood-pigeon, and on searching around I found the remains of three or four others that had evidently fallen victims to the same depredator. Since then I have examined the remains of about a dozen other pigeons, all of which seemingly had met their fate through the same agency. The head and neck of the victims are always picked quite clean, and sometimes very little flesh is left on the breast. In other cases the breast is untouched, while all the meat is eaten from the back. If the killing is all done by one bird it must have an extensive hunting range, as the localities where the remains were found are in each case several miles apart. The Wood-pigeon is a large quarry for a Sparrow-hawk to tackle, and it is unusual to find one systematically preying on them as this one appears to be doing.—T. G. LAIDLAW, Duns.

An Old Reference to the Hebridean Thrush (*Turdus ph. hebridensis*).—When Mr W. Eagle Clarke first described this local race in the *Scottish Naturalist*, 1913, pp. 53-55, he was careful to point out that the difference in plumage between it and the ordinary British race had already been noticed and quotes Robert Gray's reference in 1871. It may be of interest to point out that as far back as 1830, a Scottish correspondent writing under the initials "W. L." (Selkirkshire), in London's *Magazine of Natural History*, vol. iii., pp. 237-238, on the "Habits of the Thrush," says in a footnote on p. 238: "Being once on the western shore of Harris in the month of June, I was greatly surprised to hear the song of the Thrush resounding on all sides from the heathy and rocky banks of the sea; but I have always suspected it to be another species, darker and less." In vol. vi. (1833), pp. 218-219, the same writer makes some observations "On the Migration of a Species of Thrush." He seems to have been under the impression that the Hebridean Thrush was only a summer migrant to its breeding haunts, and that enormous numbers met with on the Yarrow in April, resting and feeding four years previously, belonged to the same small dark form. He also somewhat weakens his case by the supposed identification of a pair on the Braid Hills, Edinburgh, apparently nesting, and suggests that they had fallen behind on migration to the Hebrides. He states that every year some of these dark birds are seen resting and feeding on migration in spring, but never in such numbers as in 1829. Edward Blyth (*T. c.*, p. 516) suggested that the birds in question were Redwings, but "W. L." in vol. vii., p. 144, distinctly states that this is not the case, but that the birds were Thrushes, darker and less in size, which he is still convinced belong to another species. Mr Eagle Clarke shows that the birds are in reality quite up to the standard of the mainland birds in size, but the darkness of the plumage would naturally give the impression of reduced size, just as light colouring has the opposite effect. The only discrepancy occurs in the note on the migratory flocks, where W. L. states that in addition to the characteristics mentioned, the birds were less conspicuously mottled on the breast, while the Hebridean bird has very numerous black ovate spots. Possibly some of your readers may be able to identify the writer from his initials, for keen ornithological observers and contributors to scientific journals were not very numerous in the earlier thirties. It would also be of interest to ascertain whether under stress of exceptional weather, this race ever occurs on the mainland of Scotland.—F. C. R. JOURDAIN.

The Goldfinch in East Renfrewshire.—Birdcatchers notwithstanding, the Goldfinch maintains its position as a nesting species in small numbers in East Renfrewshire. Two or three seasons ago I frequently saw a pair of birds flying between the open country and the gardens adjoining terrace houses within the Glasgow boundary, where, I have reason to believe, they were nesting. Last season (1918) there was a nest in a high hawthorn hedge alongside a much frequented public road at Giffnock. The nest, however, was not interfered with, and eventually I had the satisfaction of seeing the young on the wing attended and fed by their parents. On 1st February of this year I saw a party of nine birds frequenting birch-trees near Giffnock. They were busily engaged in extracting nutriment of some sort from the birch buds.—JOHN ROBERTSON, Glasgow.

Rare Diptera in Forfarshire.—On the 17th June 1917 I saw a large Asilid fly at rest on one of the paths in my garden here, and from the bright colour of the legs knew it to be a species I had not seen before. I hurried to the house for my net, but the fly had gone. I looked for it every day, but did not see it until the 24th, when I was fortunate enough to catch it on a low bush. It proved to be a ♀ of *Pamponerus germanicus*, L., a fine and large insect, and the only Palaearctic species of the genus. Verrall (*Brit. Flies*) says it “appears to be dying out in England, as recent captures are very few.” Irvine moor seems to be the only recorded Scottish locality. It has been taken with the Beetles *Hoplia philanthis*, *Phyllopertha horticola*, and *aphodius* sp., as prey.

I am glad to be able also to record *Rhamphomyia culicina*, Fln., from the garden, where I found a ♂ on 31st May 1918. This is at present known from a few localities only, and May is an early date for it as it is an autumn species (cf. *Ann. Scot. Nat. Hist.*, 1911, p. 83). I can also record a ♂ of *Cnemodon vitripennis*, Mg., taken 27th June 1917, a species not hitherto reported from Scotland, though I have a ♀ taken by Rev. James Waterston at Arniston in July 1906.—A. E. J. CARTER, Monifieth.

Sirex noctilio, F., in Forfarshire.—A fine ♀ of this rare Sawfly was found on 14th August 1918 in an outhouse in a friend's garden here, in which a quantity of wood recently felled in the district had been placed. The insect was alive when given to me, and had, I should say, not long emerged from the wood. I think there can be little doubt about its being a genuine native, as the outhouse is several years old, and only the locally grown timber was about the place.—A. E. J. CARTER, Monifieth.

Notaris (Eriirhinus) æthiops, F., in Renfrewshire and Stirlingshire.—*Notaris æthiops* was included in the Clyde list of Coleoptera upon the authority of a note by Mr E. C. Rye in the Entomologists' Annual for 1868 (p. 56), in which he stated that he had found it among some beetles sent to him for names from Paisley by Mr Morris Young. Although no definite locality was mentioned, it is probable that Mr Young found the insect in Renfrewshire, and I have been able to confirm its occurrence in that county by the capture of a single specimen in flood refuse upon the banks of a stream near Lochwinnoch in April 1912. Other two specimens were swept from some reeds in a marshy spot at Rowardennan in Stirlingshire during July 1915. The beetle is considered scarce both in England and Scotland.—A. FERGUSSON, Glasgow.

Octhebius lejolisii, Muls. et Rey., in Arran.—During August last I found this interesting semi-marine beetle at Catacol in Arran in its characteristic habitat, little brackish pools on the rocks just above high-tide mark. The beetles were present in fair numbers, and the larvæ were also observed. In Scotland this beetle seems to be entirely southern and western in its range, so far as recorded, the other records being from Kirkcudbright, Ayr, Main Argyle, Mid Ebudes, Westernness, and North Ebudes.—A. FERGUSSON, Glasgow.

The Butterflies of the Island of Coll, Inner Hebrides.—At a recent meeting of the Royal Physical Society, Edinburgh, Mr Francis Cowan exhibited and made remarks upon a collection of Butterflies formed by him during recent years in the Island of Coll. The following species were shown or alluded to:—the Dark Green Fritillary (*A. aglaia*), very common; Small Pearl-bordered Fritillary (*A. selene*), one only; Small Tortoiseshell (*V. urticae*), very common; Painted Lady (*V. cardui*), captured and seen on several occasions; Meadow Brown (*E. janira*), quite common; Small Heath (*C. pamphilus*), everywhere; Marsh Ringlet (*C. typhon*), northern type quite common; Grayling (*S. semele*), very common; Green Hairstreak (*T. rubi*), not uncommon; Common Blue (*L. icarus*), everywhere, and swarming in certain localities; Green-veined White (*P. napi*), not very common; and Red Admiral (*V. atalanta*), only one specimen seen.

(Authors are responsible for nomenclature used).



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In Memoriam.

WILLIAM DENISON ROEBUCK, M.Sc., F.L.S.

WE greatly regret to record the death, in the sixty-ninth year of his age, of William Denison Roebuck, which took place in his native city of Leeds on the 15th of February. Mr Roebuck was best known to our readers as the author of the valuable series of papers which have appeared in this magazine on the distribution of Mollusca in Scotland. The scene, however, of his activities as a naturalist was the county of York, where no man past or present has done so much for the systematic investigation of Fauna and Flora of that great county. In 1876 Mr Roebuck was appointed honorary secretary of the newly formed Yorkshire Naturalists' Union—a federation of over forty local societies with a total membership of several thousands—an office which he held for thirty years. During the whole of this period he was indefatigable, and, thanks to his labours and his great powers of organisation, the Union became the leading organisation of its kind in Great Britain. His knowledge, too, of the literature of British zoology was remarkably wide and of great value to those engaged in systematic and field work. In addition to being the author of numerous papers on insects, shells, and mammals, he was a joint author of the *Yorkshire Vertebrata* in 1881, and editor of *The Naturalist*

from 1884 to 1902. Mr Roebuck was president of the Yorkshire Naturalists' Union in 1903, and of the Lincolnshire Naturalists' Union in 1909-10. Such is a very brief sketch of a strenuous and remarkable life devoted to the service of natural science in Yorkshire, and his loss will be long felt by naturalists throughout the county and beyond.

Hebridean or Continental Song Thrush?—We have been much interested in reading Mr Jourdain's note on old references to racial forms of the Song Thrush. May we venture to suggest that W. L.'s "smaller and darker thrushes . . . seen resting and feeding on migration in spring" on the Yarrow in April were birds of the typical form *Turdus philomelus philomelus*, passing on their way to their nesting places on the Continent. It is well known that this form occurs in Scotland on its spring passage, and we know from personal observation that the typical Song-thrush looks smaller and darker when seen in the field than do our home-bred birds. The fact that W. L. states that his birds were "less conspicuously mottled on the breast," points to these migrants being *T. ph. philomelus*, whereas the breast spots of the Hebridean *T. ph. hebridensis* are noticeably larger and more numerous than those of *T. ph. clarkei*. It is indeed a sign of keen observation on the part of this Selkirkshire naturalist that he should have noticed the difference in the field between such closely allied races before they had been differentiated by our men of science. We, ourselves, have frequently studied all three races in the field, and were struck by the fact that while the typical form looks darker, smaller, and slimmer than our *T. ph. clarkei*, the Hebridean sub-species, although darker in colouring looks fully as large as, if not larger, than our breeding birds on the Scottish mainland, and the very heavy spotting on the breast is always very noticeable.

W. L. was William Laidlaw, born 19th November 1780. Captain H. S. Gladstone, in his *Birds of Dumfriesshire*, writes of him as follows: "The friend, factor and amanuensis of Sir Walter Scott;" an author of lyrics; compiled under the direction of his patron part of the *Edinburgh Annual Register* after 1817; an able and observant field naturalist, who above his initials W. L. frequently contributed to the *Magazine of Natural History*—notably articles concerning eagles at Loch Skene. He died at Marybank near Balnagowan on 18th May 1845.—LEONORA JEFFREY RINTOUL and EVELYN V. BAXTER.

ON THE GREAT CRESTED GREBE AS A
SCOTTISH BREEDING SPECIES.

By EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL.

ONE of the most interesting, though one of the most difficult, branches of Ornithology is the study of the extension of breeding range of certain birds, their centres of dispersal, their routes of arrival, and the reasons for the spread of the species. Within the last few decades Scottish ornithologists have watched with interest the spread of various birds through the country. Dr Harvie-Brown dealt ably with that of the Starling, Tufted Duck, Fulmar, etc., but there still remain several of which the increase seems to us sufficiently interesting and important to be placed on record. In this paper we propose to deal with the Great Crested Grebe (*Podiceps cristatus cristatus*), which has now become fairly plentiful as a breeding species in Central and Southern Scotland. We shall give a chronological list of the breeding places known to us, with the first date of colonisation as far as we have been able to ascertain it, subsequently dealing more fully with the records arranged under faunal areas and counties. We are aware that this list must, of necessity, be incomplete, and shall be very grateful to any readers who, having knowledge of other nesting places of the Great Crested Grebe in Scotland, would send us records of the same. When dealing with the early records of the Great Crested Grebe as a breeding species in Scotland, we are confronted by considerable difficulties and some contradictory statements. Fleming in his *History of Brit. Animals*, p. 131 (1828), says: "It seems to be stationary even in Zetland." In view of the scarcity of present-day records from Shetland, where Buckley and Evans (*Fauna of Shetland*, p. 208) record it as an occasional visitor only, while during all the years of his work there Saxby saw the species but once (*Birds of Shetland*, p. 272), it would seem probable that Fleming's statement with regard to Zetland at any rate was based on

some misapprehension, possibly confusion with one of the Divers. In 1833 Selby, in his *British Birds*, ii. p. 394, says: "Breeds on a few of the northern Scottish lakes." In 1889 when Mr Robert Read recorded what he believed to be the first instance of the Great Crested Grebe breeding in Scotland, the Editor of the *Zoologist* (1889, p. 386) added the following supplementary note: "Mr Harvie-Brown writes that he has long considered the fact of the Great Crested Grebe nesting in Scotland to be well established, and is himself acquainted with Scottish localities where it breeds. He thinks Mr Read quite right in withholding indication of the precise spot wherein he found the nest above referred to, and although he is not aware that this bird breeds anywhere in Sutherland or Caithness, he is of opinion that the northern Scottish Lakes of Selby include an area sufficiently explicit for the information of naturalists, or at all events for publication." This one would take to be a definite statement of fact; but when we come to refer to the series of *Faunal Areas of Scotland*, edited by Dr Harvie-Brown, we find no indication of any breeding place of the Great Crested Grebe north of the Tay Area. In the volume *On the Fauna of the Tay Basin and Strathmore*, published in 1906, we find the following: "Selby relates that 'the Great Crested Grebe breeds on a few of the northern Scottish lochs,' but, unfortunately, he gives no indication whatever of the county or locality otherwise." Dr Harvie-Brown would appear by this to have changed his views; possibly he found, on further investigation, that the records on which he based his first statement were unreliable, or in order to protect the birds from the depredations of the collector, he purposely made the information he supplied very vague. We are of opinion that too much reliance should not be placed on Selby's statement, although there are one or two nesting places in Perthshire of which we have not been able to find the first date of colonisation, and it is just possible that there may have been an early home of the species in this county; this, however, should certainly be described as Central rather than Northern Scotland. Jardine, in 1843, records that he "never met with" the Great Crested Grebe "on the border in summer, and

considered it to be a winter visitor to Scotland, and as that in no great abundance." (*Nat. Lib. B. Birds*, part iv., p. 202.)

The first time the Great Crested Grebe is recorded as breeding in Scotland is in the *Zoologist*, 1889, p. 386, by Mr Robert Read, who found a nest that year at Harelaw Dam in Clyde. Although this is the first published record, yet, as will be seen below, there are several perfectly authentic instances of earlier breeding on other lochs, which were not published at the time, but of which we have been kindly informed by correspondents. After this Great Crested Grebes were found breeding in various localities, and we append a list of the definite dated records we have been able to discover, dealing more fully with these under faunal areas.

CHRONOLOGICAL LIST OF SCOTTISH BREEDING PLACES OF THE
GREAT CRESTED GREBE.

- 1877 (about). Loch o' the Lowes, Perthshire (Lieut.-Commander J. G. Millais, *in litt.*).
- Between 1879 and 1881. Lindores, North Fife (Lieut.-Commander J. G. Millais, *in litt.*).
- 1886 (about). Bishop Loch, Lanarkshire (John Robertson, *in litt.*).
1889. Harelaw Dam, Renfrewshire (*Zoologist*, 1889, p. 386).
1890. Carron Dam, Stirlingshire (*A.S.N.H.*, 1894, p. 181).
1891. Castle Loch, Lochmaben, Dumfriesshire (*Birds of Dumfriesshire*, p. 459).
1896. Loch Gelly, South Fife (*Scot. Nat.*, 1919, p. 49).
1896. Lake of Menteith, S.W. Perthshire (*A.S.N.H.*, 1897, p. 161).
1896. White Loch of Myrton, Wigtownshire (*A.S.N.H.*, 1897 p. 19).
1897. Brother Loch, Renfrew (John Robertson, *in litt.*).
1900. Loch Fithie, Forfar (*Fauna of the Tay Basin and Strathmore*, p. 351).
1904. Snaigow, Perthshire (*Trans. Perth Soc. of Natural Science*, 1905, vol. iv. p. 84).
1904. Black Loch, Lindores, N. Fife (*Fauna of the Tay Basin and Strathmore*, p. 352).
1904. Mill Loch, Dumfriesshire (*Birds of Dumfriesshire*, pp 459 and 460).
1906. Camilla Loch, South Fife (*Scot. Nat.*, 1919, p. 49).
- 1906 (about). Woodend Loch, Lanark (John Robertson, *in litt.*).
1907. Cobbinshaw Reservoir, Midlothian (*Scot. Nat.*, 1919, p. 50).

1908. Loch, Roxburghshire (*Birds of Northumberland and the Eastern Borders*, p. 684).
1908. Loch Leven, Kinross (*Scot. Nat.*, 1919, p. 49).
1910. Clearburn Loch, Selkirkshire (*Scot. Nat.*, 1912, p. 186).
1910. Loch Fitty, South Fife (Fred. S. Beveridge, *in litt.*).
1911. Castle Loch, Mochrum, Wigtownshire (*Report on Scot. Orn.*, 1911, p. 10).
- 1911 (about). Loch Ardingning, near Strathblane, Stirlingshire (John Robertson, *in litt.*).
1912. Kilbirnie Loch, Ayrshire (*Glas. Nat.*, 1916, p. 24).
1912. Loch Lubnaig, S.W. Perthshire (*Scot. Nat.*, 1919, p. 49).
1912. Redmyre Loch, Forfar (Henry Boase, *in litt.*).
1912. Lundie Loch, Forfar (Henry Boase, *in litt.*).
1912. Marlee Loch, Perthshire (Henry Boase, *in litt.*).
1913. Loch in Elginshire (*Scot. Nat.*, 1914, p. 46).
- 1913 or 1914. Bardowie Loch, Stirlingshire (John Robertson, *in litt.*).
1914. The Hirsle Loch, Coldstream, Berwickshire (*Scot. Nat.*, 1915, p. 156).
- Before 1915. Breeding several lochs in Renfrewshire (*Scot. Nat.*, 1915, p. 275).
1916. Reservoir near Balerno, Midlothian (*Scot. Nat.*, 1919, p. 50).
1916. Kilconquhar Loch, South Fife (*Scot. Nat.*, 1916, p. 264).
- . Drummond Castle Loch, Perthshire. Date of colonisation wanted.
- . Dupplin Loch, Perthshire. Date of colonisation wanted.

CLYDE.

This area is a favourite habitat of the Great Crested Grebe; it has been found breeding in every county within its borders, and appears to be still on the increase.

Renfrewshire.—A nest was found by Mr Robert Read at Harelaw Dam in 1889, and the bird continues to breed there regularly as well as at the Brother Loch since 1897. Not more than two pairs nest at each place in a season. Occasionally it has nested at Little Loch, Long Loch, Walton Dam, and probably at Castle Semple Loch.

Lanarkshire.—The keeper on Lochwood estate, which borders Bishop Loch, states that the Great Crested Grebe has nested regularly on the loch since he came there about 1886, but there has been no increase in numbers, only a pair or two breeding each season. This takes us back a few years earlier than the Harelaw Dam record. At Woodend Loch, about a mile east of Bishop Loch, Mr John Robertson saw a nest about 1906, and the bird probably nests there most seasons.

Ayrshire.—A pair nested at Kilbirnie Loch in 1912, and since then a pair has frequented the loch each summer, but the place is too accessible to the public for the Grebes to nest successfully.

Dumbartonshire.—It is reported to breed on at least one of the reservoirs on the Kilpatrick Hills.

S.W. Stirlingshire.—Under date of 3rd March 1919, Mr James Bartholomew of Glenorchard writes: "Mr J. A. Anderson, Bardowie Castle, tells me that a pair nested at Bardowie Loch for the first time in 1913 or 1914. Since then there have been two pairs nesting. Mr T. Ripley Ker of Dougalston tells me that there was a pair of Great Crested Grebes nested about eight years ago on Loch Arding, near Strathblane, but they have not nested there since." It also nests on Craigallian Loch and Carbeth Loch, near Strathblane.

For the above unpublished data we are indebted to Mr John Robertson, who has taken much trouble to help us, and to whom we are more than grateful.

Mr Charles Kirk, in 1917, writes that Great Crested Grebes are nesting at several places within six miles of Glasgow.

SOLWAY.

The Great Crested Grebe does not seem to be as widely distributed as a breeding species in Solway as would be expected. We have records of only three colonies, which we give below:—

Dunfriesshire.—The only breeding records for the county hail from the vicinity of Lochmaben, where Mr George Johnstone saw a young bird with its parent on the Castle Loch in the summer of 1891. The species has increased summer by summer since 1903 or 1904, until in 1910 it was comparatively numerous. In 1905 a brood was successfully reared on the Mill Loch.

Wigtownshire.—In 1896 Great Crested Grebes bred for the first time on the White Loch of Myrton. On the 7th of June 1894 Mr John Robertson saw an adult Great Crested Grebe sailing about on the loch (*in litt.*), while Sir Herbert Maxwell writes (*A.S.N.H.*, 1897, p. 19): "On the 7th November in the same year (1894) I detected for the first time a solitary immature specimen of this bird on the White Loch; it remained till the great frost drove it away, but it returned in spring and remained all the following summer and mild winter of 1896, still alone. However, during my absence in spring it must have secured a mate, for now there are three or four young ones disporting themselves with their parents." The only other Solway record is from the Castle Loch, Mochrum, in 1911.

TWEED.

This is another area in which the Great Crested Grebe does not breed as commonly as one would expect, as far at least as we have been able to ascertain.

Berwickshire.—In 1914 a pair of Great Crested Grebes bred on the loch at The Hirsell, Coldstream, and two young birds were hatched. Lord Home writes: "I am afraid the young birds died, but from what cause is not known; the keeper picked up one dead. It is curious that the Grebes never returned as the lake, being surrounded with reeds, is an ideal place for them, and it is kept very quiet for the sake of the different wild-fowl that frequent it. Convalescent officers used to fish for pike sometimes, and it is possible that the Grebes did not like the boat."

Roxburghshire.—On 10th July 1908 a pair of Great Crested Grebes with biggish young were seen on a loch in Roxburgh, and in subsequent years the species returned and bred at the same place.

Selkirkshire.—On Clearburn Loch in this county a bird and young were seen in June 1910; the next year "a moorland loch in Selkirkshire" is recorded by Mr Abel Chapman (*Brit. Birds*, vi., p. 108) as having been colonised by this species, and he has kindly informed us that these records refer to the same sheet of water.

Peeblesshire.—It is perhaps worth mentioning that the only Peebles record of the Great Crested Grebe is that of a pair on Portmore Loch on 14th April 1912. Mr Wm. Evans writes: "They were swimming close together, and from their actions I should not be surprised if they nested on the loch" (*Scot. Nat.*, 1912, p. 186).

FORTH.

This area has been ably dealt with by Mr Wm. Evans in the March-April number of *The Scottish Naturalist*, 1919. As will be seen from the details given below, Great Crested Grebes are more widely distributed in Forth than in either of the two areas last dealt with, though Mr Evans is of opinion that fewer nest in Forth now than was the case several years ago.

Midlothian.—In 1907 three nests were found on Cobbinshaw Reservoir, and in 1916 one was found at a Reservoir near Balerno. Mr Evans writes: "A pair also nested, I believe, on Gladhouse Reservoir in 1911, but in this instance I have no positive evidence to adduce" (*Scot. Nat.*, 1919, p. 50).

Stirlingshire.—Stirlingshire holds one of the early records of the breeding of Great Crested Grebes in Scotland: in April 1890, eggs were taken at Carron Dam in that county.

South-West Perth.—In April 1896 Mr Oswin A. J. Lee found a nest and eggs at the Lake of Menteith; Mr Evans found another nest with two fresh eggs in May of that year, and has seen others there in later years; while on 8th August 1917 we saw at least two pairs of adults and several young on the same sheet of water. A nest with eggs was found on Loch Lubnaig in 1912 by Mr G. G. Blackwood.

Kinross.—Curiously enough, the first record of the Great Crested Grebe nesting on Loch Leven was not till 1908, though we feel positive that the loch was colonised earlier than this. In that year six nests were discovered on 5th July by Mr H. Raeburn, and nests have subsequently been found there.

South Fife.—In 1896 a brood of Great Crested Grebes was reared on Loch Gelly, the first time eggs or young had been seen there, though as long ago as June 1885 Mr Evans saw a pair of these birds on the loch under circumstances which left little doubt in his mind that they were breeding there. The tenant at the adjoining farm told him that he had seen the birds on the loch for the four previous summers, which takes us back to 1881. On Camilla Loch, near Auchtertool, two pairs with half-grown broods of four and two respectively were seen on 18th August 1906. In 1910 one with two young was observed on Loch Fitty, while in 1916 we observed two pairs and their young on Kilconquhar Loch.

TAY.

This is another well-populated area and may be the original home of the Great Crested Grebe in Scotland.

North Fife.—The earliest breeding record we have for Lindores Loch is that kindly sent us by Lieut.-Commander J. G. Millais, who found Great Crested Grebes and their young on the loch between 1879 and 1881. Mr Corstorphan, who lived for many years (from 1894) near the loch, knew the Grebes during all the time of his residence there. Mr Allan Briggs records having found a pair on 19th May 1894, sailing about accompanied by two young ones, on a small sheet of water in Fife (*A.S.N.H.*, 1894, p. 181). Mr Briggs did not mention the locality, but in an annotated copy of Dr Harvie-Brown's *Fauna of the Tay Basin and Strathmore*, we learn that it was Lindores Loch. We have known the Grebes ourselves there for a good many years now, and have found their nests and eggs, and have seen the young on many occasions. In 1904 a pair were found nesting on a small weedy loch to the west of Lindores, called the Black Loch.

Forfar.—In 1900 Mr James Davidson found Great Crested Grebes nesting on Loch Fithie. Mr Henry Boase has kindly informed us that, in 1912, he found the species breeding at Redmyre Loch and Lundie Lochs. Referring to the former, he writes: "It was in that year (1912) that a nest of the Great Crested Grebe was found, with four eggs, on the 4th of May, at Redmyre; but it is probable these eggs did not hatch. In the following year a nest with five eggs was found on 24th May, and apparently these did not hatch either. In 1914, although this bird appeared as usual at the loch, no nest could be found, nor were young seen later in the season. In 1915 none were seen at Redmyre at the usual time in May. In 1916 a nest with three eggs was located on 29th April, and apparently these hatched out, as one young bird was seen with an adult on 1st July. A nest with three eggs was located at Redmyre on 19th May 1917, but no young were seen later in the season. In 1918 while the display of a pair was watched at Redmyre on 15th April, nesting did not follow; both birds had gone by 25th May. It has always surprised me that the Grebe should so often have failed to bring up young at Redmyre, and it strikes me that the explanation may be as follows. Judging by what I have seen, the Great Crested Grebe seems to build in such a position as will enable it to approach the nest under water. Now Redmyre Loch is very exposed and has a well-marked fluctuation of water-level. Consequently a nest, built in comparatively deep water, may in a week or two be left high and dry, as indeed happened in 1917. This would most certainly cause the abandonment of the nest, and it is worth remembering that in 1916, when the eggs were hatched, the spring and early summer were abnormally wet."

Information is wanted from lochs east of Forfar.

Perth.—In Perthshire is the oldest known breeding place of the Great Crested Grebe in Scotland. Lieut.-Commander J. G. Millais writes as follows: "The first place I remember seeing them in Perthshire, in the year 1877, was the Loch o' the Lowes, and they and the Tufted Duck seem to have arrived and bred about this date; very shortly afterwards I saw a pair on Dupplin Loch." In 1904 two nests were found at Snaigow near Murthly, and next year a fresh locality was occupied near Dunkeld (*Fauna of the Tay Basin and Strathmore*, p. 352); there is a breeding place on Drummond Castle Loch, of which we have not been able to discover the first date of colonisation; and Mr Henry Boase informs us that in 1912 he found them breeding on Marlee Loch.

MORAY.

Elgin.—In 1912 a pair of Great Crested Grebes arrived on a loch in this county and remained during the summer months, but neither nest nor young ones were seen. In May 1913 a nest containing one sucked egg was found; a second nest was made, and the Grebes were seen in July swimming about with one young one. This is the only definite record of the Great Crested Grebe breeding north of the Grampians.

As far as we can ascertain, these are the only areas in which the Great Crested Grebe is known to have nested; in winter they leave their breeding lochs and frequent the coastal estuaries and bays, where they may be seen in ones and twos or in small parties, which, as spring approaches, break up into pairs and betake themselves to the fresh water. Before leaving the salt water a modified form of their nuptial antics often takes place. They also visit, irregularly, fresh-water lochs and rivers where they do not nest; even in the breeding season birds, sometimes in full nuptial plumage, may be found on lochs far from their breeding haunts. It may be of interest very briefly to indicate its status in the other areas of Scotland.

DEE.

Saunders in his *Manual*, p. 717 (1899), says it probably breeds on a loch in Aberdeenshire; but Sim in his *Fauna of Dee* (published 1903) regards it as a rare visitor only to the area.

ARGYLL AND INNER HEBRIDES.

An uncommon visitor to the area; two pairs in breeding plumage were seen on a loch in Tiree, 22nd May 1900 (*A.S.N.H.*, 1901, p. 145).

NORTH-WEST HIGHLANDS AND SKYE.

A fine specimen, in full breeding plumage, was seen on Loch Borrolan, W. Sutherland, on 7th May 1903, which left soon after; two had been seen on the loch since the previous February (*A.S.N.H.*, 1904, p. 127). We have been able to find no other record for the area.

SUTHERLAND.

A rare visitor.

OUTER HEBRIDES.

No record.

ORKNEY ISLANDS.

A rare visitor.

SHETLAND.

A rare visitor.

As will be seen from the above evidence the headquarters of the Great Crested Grebe in Scotland are the faunal areas of Clyde, Forth, and Tay; north and south of this the species becomes much more sporadic in its distribution. Whence these centres were colonised it is difficult to say, but bearing in mind the localities and dates given above, it would appear to us to have been by immigration from the east. This would naturally follow the valleys of the Tay and Forth, the former leading to the lochs in the neighbourhood of Dunkeld, the latter through Fife and Stirlingshire to the Clyde breeding places. The fact that the lochs along the sea-board were not the first to be colonised does not militate against this theory; in the case of the Tufted Duck similar facts were observed, and Dr Harvie-Brown in the *Annals of Scottish Natural History*, 1896, p. 6, writes: "It is significant to find that the lochs of Wigtownshire, or those nearer to the coast-line, are *not* the first to have become populated by breeding birds. Are the individuals arrested by the more favourable localities visible to them, first on their autumn N.E. to S.W. migration, or does the occupation follow only upon their second or spring observations? *i.e.*, are they arrested and induced to breed more by the amenities of the place in spring than autumn? We incline to the former belief, and that they are 'brought up' or arrested in spring by the unsuitability of the areas beyond. Once acclimatised, or once they have reared young, the wave of dispersal, as it were, rolls back upon itself over the 'lines of least resistance,' and localities formerly passed over become occupied. This we consider is a well-founded belief, built upon the facts we are able to bring forward not only here but in other areas we shall treat of." A similar back-wash would seem to have occurred in the Great Crested Grebe.

Another factor in the distribution of the species is the

presence of suitable breeding haunts of the English "mere" and "broad" type, the usually rocky margins of Scottish lochs not affording suitable nesting sites. This explains, to some extent at least, the sporadic nature of the birds' distribution within the area occupied, though, even now, there are apparently suitable breeding places unoccupied or only very recently colonised.

We have frequently noticed that, before a new breeding place is occupied, it will be haunted for a season or two by a bird or pair of birds apparently prospecting, a habit by no means confined to this species. As far as can be told from field observation, these birds are often in full nuptial dress, but we have seen them in what we take to be the plumage of the birds of the previous year; it therefore seems probable that the Great Crested Grebe does not breed till it is at least two years old. When a loch has been fully colonised the number of pairs seems to remain constant, and any surplus birds appear to resort to neighbouring lochs which, if found suitable, in due course become fresh breeding haunts.

The fact that the records of Great Crested Grebes breeding in Scotland lie almost entirely after the Wild Bird Protection Act of 1880, points to the benefit conferred upon wild-fowl generally by that measure. Previous to this it is fairly safe to assume that such a very conspicuous bird as a Great Crested Grebe in full plumage, when appearing in a new locality, had a poor chance of survival. It is hoped that protection will be generally afforded them, and that this beautiful species will continue to increase and to grace our lochs with its stately presence.

Our most cordial thanks are due to all the correspondents who have sent us information on the species under consideration. We have received much kind help from: Mr John Robertson, the Earl of Home, Dr Eagle Clarke, Mr F. S. Beveridge, Lieut.-Commander J. G. Millais, and Mr Henry Boase, to all of whom we are much indebted for kindly interest and assistance.

The Little Ringed Plover in North Uist.—In a list of birds of North Uist contributed by Lieut. F. S. Beveridge to the current number of *The Scottish Naturalist*, I note (p. 19) the inclusion of the Little Ringed Plover, *Ægialitis curonica*, Gm., with the following remark, "A supposed example was recorded from Vallay in 1909." There is no need to say "supposed." A specimen was obtained, identified, and duly recorded in the year referred to.

In *The Field* of 20th February 1909 I wrote as follows:—"I have lately received a note from Mr H. E. Beveridge of Kirchesters, Kelso, N.B., informing me that in October last he shot in North Uist a small Plover which he thought might be the Little Ringed Plover, but could not tell how it was to be distinguished from the larger and commoner species. As a very good pen-and-ink sketch of the bird accompanied his letter, and was of the natural size, it seemed likely that his identification of the species was correct; but, in order to remove all doubt, I sent him a description, laying stress on the fact that if the bird were the Little Ringed Plover it would have the shaft of the first primary white, and all the others dusky. He replied that it entirely corresponded with my description; so that the occurrence of this species in North Uist may now be definitely recorded."

I presume from the similarity of name that my informant is a relative of the author of the list now referred to. Be that as it may, I am glad to see that Lieut. F. S. Beveridge has not adopted the modern changes of names which have been proposed for so many of the species mentioned by him, but follows the long established nomenclature employed in the standard text-books on British birds. In one instance, however, he is mistaken, namely, in the case of the Purple Sandpiper which he calls *Tringa striata*, Linn. It is true that this is the name adopted by Saunders, following Dresser; but, as I pointed out nearly twenty years ago (*Handbook British Birds*, 1901), the *Tringa striata* of Linnæus is not a *Tringa* at all but a *Totanus*, having a characteristically barred tail and a white rump, and is evidently from Linnæus' description the Redshank. It has taken a good many years to convince people of this, but as the authors of the last edition of "*The Ibis List of Birds*" (1915) have adopted this view (p. 390), it ought now to be generally recognised.—J. E. HARTING.

NOTES ON SOME OF THE PERACARIDA (*MYSIDACEA*) AND EUCARIDA (*DECAPODA*) OF ST ANDREWS, IN THE LIVING CONDITION.

By Prof. M'INTOSH, F.R.S., &c., Gatty Marine Laboratory, St Andrews.

THE following notes on the living Crustacea were made for the most part in the early sixties of last century when working up the marine fauna of St Andrews, and they have been verified on various occasions since that date. The region is characterised by the presence of many edible Crabs and of the Lobster, by the frequency of *Lithodes maia*, *Corystes cassivelaunus*, and *Hyas coarctatus* in the deeper water of the Bay. *Munida* is rare, only a single specimen having been procured in deep water, and that since the publication of the *Marine Invertebrates and Fishes*. *Galathea squamifera* is common between tide-marks—chiefly at the Castle rocks. As pointed out in the work just quoted, St Andrews forms a bold contrast in its Peracarida and Eucarida—on the one hand with the Zetlandic area, and on the other with the Channel Islands, whilst it likewise differs from the Outer Hebrides and the western shores. Each of these areas is characterised by certain peculiar types which are absent from St Andrews.

MYSIDACEA.

Mysis flexuosa, O. F. Müller.—It is curious that Bell does not mention this species from Scotland, yet it is by far the commonest form. Some show a pretty pink tint on the two terminal segments of the tail.

Mysis vulgaris, J. V. Thompson.—The tail is rather ovato-lanceolate than lanceolate, as Bell states. The peduncle of the antennules has its widest part at the bifurcation, and the scale of the antenna is only about two and a half times as long as the peduncle, thus differing from Bell's description.

Mysis griffithsiae, Bell.—These long, slender, pale forms have a brownish dot behind the eye and a few similar specks along each side of the abdominal segments, the pigment being symmetrically

arranged, viz., one spot well up on the outer division, two on the next—a short proximal and a longer distal one which extends nearly to the tip. The telson has a spot near the tip and a linear one at the base. The eyes are yellowish in spirit (and in life?), best seen from the ventral surface. A row of brownish specks runs up the centre of the under surface of the abdomen, one to each segment.

Palæmon squilla, L.—Those having eight spines on the upper edge of the rostrum differed from Bell's description, which is that the "true and certain criterion being the fact that of the upper teeth two are invariably placed on the median line of the carapace posterior to the base of the rostrum, and the third immediately over the margin of the ocular notch," whereas in the St Andrews specimens three spines were behind and the fourth over the ocular notch. In the notches between the spines are many hairs, and there are tufts of hairs on the hands of the second pair of feet. It is interesting that the pools frequented by this species are situated not far from high-water mark beyond the Rock and Spindle. A few large stones, or a submerged ledge, occur in them, and the sides are coated with *Fucus serratus* and green algæ (not *Ulva*). It balances the antennæ most gracefully in the water, and remains still (except for the movement of the pleopods) as it watches an intruder, ready, however, to dart with extreme rapidity under a ledge or stone, where its mate probably lurks. With the exception of a stray *Carcinus*, it is the most powerful of the crustaceans in the pool, which may harbour a small *Cottus*, a few Mysidæ and Gammari.

Pandalus Montaguï, Leach.—The large eyes have a peculiar black dot on the inner (mesial) margin. The antennæ have their reddish bands broader than the white. It keeps moving these cautiously in all directions, and frequently extends them at right angles. The antennules are regularly feathered from a little below the tip nearly to the base, and it jerks these backward and forward. Like its allies it changes colour according to its surroundings. There are four circles of coloured bands on the abdomen.

Hippolyte varians, Leach.—Green is not the common colour of those from deep water or from the laminarian region at St Andrews. Most are of a liver-brown tint, with four or five granular light spots bordered with yellow along the carapace, though sometimes these spots are scarcely visible, and the general brownish hue is of various degrees of intensity. Many have a spot at the base of the telson, and several of a yellowish hue over the abdominal segments. The smaller specimens often have a pale yellow streak along the centre of the back. In addition, others are yellowish brown, or bordered with

a light magenta, or spotted with this colour on the dorsum, the antennæ being speckled and the eye-stalks red; some, both large and small, are green, or mauve striped with white, from the rostrum half way backward, then merging into dots and disappearing, or green similarly striped on the back. A few are striped with grey and translucent greenish bands alternately, with brown markings, the anterior third of the tail translucent, the rest dark brown. No form could better illustrate Nature's camouflage. They swim with great rapidity, darting here and there and dexterously avoiding the forceps hiding under the broad fronds of *Laminaria saccharina*, and even leaping out of the water when closely pursued.

Spirontocaris pusiola, Kröyer.—In this, and others allied, the lower terminal spine of the rostrum is longest. The telson has four sets of small spines, but is not furnished with hairs at the tip. It has two strong lateral bristles and some smaller central. Dr Howden of Montrose, who found it in the Forth, may have included two small spikes close to the long spines of the tail as making his five spines, for it is doubtful if any have five spines in the telson. They are spotted with reddish pink here and there, but this does not interfere with their general light hue. The legs are banded across by the same light magenta or reddish pink. Their motions in the water are graceful, and they keep the elevated antennules in a continual tremor, whilst the antennæ are chiefly borne laterally.

Doryphorus gordonii, Bate.—The rostrum has six teeth above, a large upper one at the tip and a smaller below, and it is not incurved at the base. In the second pair of feet the wrist has only two joints and the hand is much enlarged. The telson has but three pairs of minute spines, whilst the tip has four long spines, the two outer longest.

Nephrops norvegicus, L.—Bell states that its colour is generally "pale flesh, rather darker in parts, the pubescence light brown"; but this chiefly applies to examples in spirit. The chelipods have their upper surface of a bright scarlet, enlivened by the white points of some of the tubercles, and the under surface has also much scarlet. The dorsum of the abdomen and the walking legs have various shades of red. The ovigerous females are generally small.

Homarus gammarus, L.—The examples from St Andrews usually have five teeth on each side of the rostrum, four being the number mentioned by Bell, who notes the presence of two small teeth at the base of the rostrum, but he omits them in *Galathea*. The smallest example was one four inches long, tossed on shore by

a storm, and it lived for months in the laboratory till the introduction of an adult, which soon crushed and devoured it. All the fishermen state that if a lobster enters a crab-pot first no edible crab will venture in, though other lobsters do.

Galathea squamifera, L.—An important specific distinction, not pointed out by Bell, is the occurrence of two small, sharp spines at the base of the rostrum, one on each side of the middle line, and best marked in the males—both British and continental. These are useful in separating it from *G. dispersa*, which has three on each side of the middle line. Moreover, another feature not mentioned by Bell is the presence of a prominent rounded tooth on the dactylopodite, about a third of the length from the base. The same author describes the limbs as covered with “small, scale-like tubercles”; but it may be added that these are beautifully arranged, gently rising from the level of the limb and ending in what might be called a dentate edge, below which is a series of hairs which form a fringe.

Galathea strigosa, L.—Besides the seven spines on the rostrum mentioned by Bell, there is a small one at the base of these, and two at the base of the rostrum, as in *G. squamifera*, but with two or three others on each side, and they are set differently from either of those of the form just mentioned in *G. dispersa*.

Galathea dispersa, Bate.—Amongst other features this species is readily distinguished by a character not mentioned by Bell, viz., the presence of about three spines on each side of the middle line, and set rather closely together.

Porcellana platycheles, Lamk.—Bell’s figure shows the posterior pair of feet too slender, for the basal segment is much thicker than the terminal; the antennæ are also longer. He states that the carapace in the young is covered with short hairs, but such are also present in the adult. No mention is made of the antennules, which have very mobile bases springing from a large notch at the anterior and inner corner of the carapace. This basal segment is followed by an arched portion with two strong teeth on its anterior edge. Some short, strong hairs occur on the inner side of the basal segment, whilst on the outer are branched pinnate hairs.

Lithodes maia, Leach.—The carapace is minutely reticulated all over superficially. Its hairs are very strong, and the surface is infested with Balani, Sepulids, Anomiæ, *Tubulipara repens* and *T. patina*, *Cellepora*, and roots of zoophytes.

Pagurus bernhardus, Leach.—When disturbed on a slope in a rock-pool, this hermit crab rolls to the bottom and simulates an inanimate shell. This species has ten branchiæ along the side, a single stunted one, like *Carcinus mœnas*, on the base of the first pair of foot-jaws. The latter have no branchial whips, so that the gills would appear to be cleaned only by the water which has free access, or the flexible margin of the carapace exercises some influence on them; and they differ considerably from those of the Brachyura. The mandible, maxillæ, and maxillipedes lean to the Macrourus type. The mandible has a hard and sharp cutting edge, and the tip of the well-developed palp curves beneath it on each side and aids in all the functions of the parts. The first maxilla has its protopodite broad and flattened, the inner division of its endopodite narrowed below, broad at the tip, whilst the outer division is a slender process with an avian tip. The second maxilla has its two divisions of the protopodite broader than in *Astacus*, and both are split at the tip, the posterior more deeply and unequally, whilst the endopodite forms a small pointed process. The exopodite (plus the epipodite of some—scaphognathite) is rather short and broad but powerful. The first maxilliped has a long anterior division of the protopodite of a curved ovate-lanceolate shape, the posterior division considerably smaller and irregularly quadrate. The endopodite is a slender rod bent at the base at an obtuse angle. The exopodite is broad at the base, with a projecting rounded external margin, and tapers distally to its articulation with the slender, curved terminal process. The second maxilliped has a stout, limb-like endopodite, and the more slender, cylindrical exopodite is about the same length, with a longer terminal process than in the first, the whole more nearly resembling the organ in *C. mœnas*. The third maxilliped has its endopodite greatly enlarged and elongated, as in the lobster, so that it is very prominent, whilst the cylindrical exopodite is comparatively small and its terminal process slender.

Corystes cassivelaunus, Penn.—Bell states that “the surface is covered with minute scattered tufts of very short hair, scarcely distinguishable by the naked eye,” but none of those obtained shows this feature; thus in a male in which the new carapace was just attaining firmness, the pointed calcareous tubercles alone covered the surface of the carapace, which, at its junction with the abdomen, had a fringe of hairs beneath the thickened rim. The smoother dorsal surface of the abdomen, on the other hand, had isolated hairs all over, as well as a fringe of long hairs at its border.

Cancer pagurus, L.—Bell's description of the hand of this form "as rounded, without any ridge" applies only to the adult, for in the young there are five or six distinct longitudinal rows of prominent tubercles on the inferior surface. The parasites found in the stomach are probably derived from its food, fragments of fishes forming the usual bait in the crab-pots; the same Trematode,¹ however, is found in the tissues of both *C. mænas* and this form, where it occurs on the fibrous bands of the hepato-pancreas, or on the ducts. Indeed in the stomachs are the lenses of fishes, ragged portions of muscles and tendons, as well as crystalline styles—probably of mussels. In a fresh example a large number of small air-bubbles formed on the surface of the stomach, and they kept forming after the manner of those due to the application of acid to a calcareous substance. The great lateral projection of the carapace containing the so-called "liver" distinguishes this species from *Carcinus mænas*, in which little of the soft tissues intervene between the branchiæ and the wall of the carapace. Their vitality in comparison with that of *C. mænas* is low.

Carcinus mænas, L.—In some the large number of Trematodes in the liver (hepato-pancreas) is remarkable, and they occur also along the nerves, in the muscles of the wall of the stomach, on those near the heart, on the male generative organs and other parts, and they are found in small crabs only an inch across the carapace, as well as in the older forms.² The Ascarides, however, are more rarely met with. The vitality of the shore-crab is remarkable, many surviving for six weeks in a damp cellar or in a botanic vasculum. Bell states that it "simulates death as completely as do many Coleopterous insects," and that he has seen them running about in the soft state. Neither feature has hitherto been observed at St Andrews, where thousands have been under notice. It seems to moult at St Andrews chiefly in early autumn. Ova occur on the pleopods in October as well as in December and January, so that Bell's comment "as early as April and as late as September" requires addition. The ectoparasitism of the common mussel causes grave results, those settling in the sockets of the eyes producing blindness, those in the gill-chambers fixing the branchial "whips" with the byssus, and compressing the gills by their bulk, whilst those in the abdominal region fix the pleopods and the entire structure to the cephalo-thorax.

In a small female, $2\frac{1}{2}$ inches across the carapace, and which showed commencing putrefaction, large brownish masses stretched

¹ *Micros. Jour.*, July 1865, Plate viii.

² *Vide* Dr Wm. Nicoll's recent account of their structure.

under the carapace laterally and posteriorly, like the masses of ova usually seen there, and entirely composed of embryos, yet no egg-cases were visible. They swarmed in great numbers, and had brownish-red pigment on their bodies, yet no egg-capsules were visible. This occurred in 1863, and unfortunately the specimen has been lost. Such would appear to have been foreign structures.

Portunus depurator, L.—Bell states that the anterior margin of the carapace has three flat teeth; but he does not add that the margin of these is beaded, and this is continued all round the raised margin, the posterior lines of the carapace being also regularly though less distinctly granulated.

Portunus holsatus, O. Fabr.—This species occurs in great numbers at St Andrews, and, since the introduction of nets for capturing the food-fishes, has become a source of considerable annoyance and even loss to the fishermen, since it severs the meshes of the net, probably with its sharp chelipeds.

Macropodia rostrata, L.—All the examples procured were males, which appear to preponderate in most captures. One, 7 inches across the limbs, had each limb enlivened by many tufts of green *Ulva*; another had many tufts of *Plumularia pinnata* on its body and limbs, whilst two had meshworks of *Campanularia verticillata* on the dorsum, antennæ, and limbs, the zoophyte creeping round the great cardiac tubercle and adding to the length of the antennæ. Another had a pale patch of *Halichondria panicea* extending forward to the gastric tubercle, whilst the sandy tube of a *Terebella* curved over the right branchial region, and opened between the first pair of walking limbs.

Hyas araneus, L.—In specimens which have recently moulted, hairy ridges arise just in front of the cardiac region and run forward nearly to the tip of the rostral forks. These had been overlooked by Bell, who also observes that there are no spines, though numerous groups of short, sharp, spine-like hairs occur over the entire surface of the abdomen and adjoining portion of the cephalothorax. In one, near the base of the groove on which the gills rest, were a number of small dark points in the hollows. These proved to be stalked ova, probably of a leech, the aëration of which by the branchial currents must have been perfect. Most of the specimens are brownish purple or reddish purple, and the tips of the ambulatory limbs are much sharper in the young. In general, the ova are borne in layers attached to the hairs of the endopodites of the

pleopods, each of which anteriorly occupies the centre of the layer, whereas posteriorly the ova are continuous. The exopodite forms a hairy border to the ova for more than two-thirds of its extent, and it gives a regular or finished arrangement to the parts. The broadest mass of the ova is situated between the endopodite and the exopodite, the internal portion being narrower.

Hyas coarctatus, Leach.—The habitat of this species differs from that of *H. araneus* since none has occurred amongst the rocks, all coming from the deeper water and being often tossed on shore after storms, in the cavities of *Halichondria panicea*. In Bell's plate the dorsal tubercles are not well figured, for they form a somewhat regular row from the rostrum backward; and he does not mention the rows of strong hairs from the tip of the rostrum backward. This form is as liable to external growths as the former, Patches of *Halichondria*, which also may envelop the carapace. tufts of *Plumularia catharina*, *Gemellaria loricatea*, *Sertularia rugosa*, slender anemones, Anomiæ, Balani, Nymphons, Rhizopods, algæ, and rich debris intermingled, are common. A female loaded with ova had a thick tuft of *Chalina oculata* springing from the base of the rostrum flanked by two tufts of *Sertularia abietina*, 2 inches in length, whilst the dorsum had Balani and Ascidiæ, the latter also invading the limbs.

A Note on the Identification of Ducks' Eggs.—When reading Dr Eagle Clarke's note (*ante*, p. 24) one might be led to suppose from the quotation given from Miss Jackson's article in *British Birds*, October 1918, that she was stating some new fact with regard to the identification of ducks' eggs by the feathers found amongst the down in the nest, whereas ten years ago, to go no further back in past history, attention was fully drawn to this point by Mr Heatley Noble in an illustrated article with a coloured plate of the feathers in *British Birds*, 1908. Dr Eagle Clarke's statement is certainly very interesting and at the same time very disconcerting, because it appears to cast considerable doubt on the reliability of the feathers in the down being a sure means of identification. It would be interesting to know if others, when examining the nests of ducks, have come across feathers belonging to other species of birds, because, if so, it would, I think, pretty effectively rule out the "feather" test as being quite unreliable.—
F. W. SMALLEY, M.B.O.U.

ON THE OCCURRENCE OF *GLOMERIS PERPLEXA*,
LATZ., NEAR EDINBURGH; WITH A REVISED
LIST OF FORTH MYRIAPODS.

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

WHEN searching for mites and other small creatures in ground moss on the banks of the Esk below Hawthornden, Midlothian, on 17th November 1917, I shook from a tuft of *Dicranum scoparium* a small Pill-millipede, which I had no doubt was *Glomeris perplexa*, Latz. Mr R. S. Bagnall, who has taken the same Diplopod in the north of England and in the Clyde Area, has seen my specimen and confirms the identification. Authorities differ as to whether this little Glomerid is a distinct species, or a form of either *G. marginata* or *G. connexa*. In his "Preliminary Check List of the British 'Myriapoda'" (*Journ. Zool. Research*, October 1918) Bagnall gives it specific rank, which I can well believe it deserves. It is much smaller than the only other British representative of the genus, *G. marginata*, and dark purplish brown with a double row of yellowish marks along the back and some on the sides. So far as I know it has only been recorded once before from Scotland, namely from "Clyde" as alluded to above.

Since my paper on "The Myriapods (Centipedes and Millipedes) of the Forth Area" was published in 1907 (*Proc. Roy. Phys. Soc., Edin.*, xvi. and xvii.), great advances have been made in the study of the group; many species have been added to the British List, genera have been split up, and other changes introduced. No one has done more to increase the list than Mr R. S. Bagnall, whose investigations on the Symphyla have been so fruitful in new species. As already mentioned, he has recently issued a "Preliminary Check List" of British Myriapods, and it seems desirable to revise the Forth list in accordance therewith, incorporating

at the same time Mr Bagnall's and my own additional records.

For some time past I have adopted the Watsonian scheme of counties and vice-counties for the grouping of records. When, as in the present instance, the great majority of these have already been published in detail, the tabular form of presenting the ascertained distribution has manifest advantages, and it is consequently here employed. In the table three exotic species, which have only occurred in greenhouses, etc., are placed within square brackets; while the doubtful *Lithobius borealis* may possibly have been *L. lapidicola*, Meinart. As regards the nomenclature, I would have been glad to see a less luxuriant crop of new generic names (*e.g.*, the seven species I previously recorded under the generic name *Iulus*, now require six genera for their accommodation); but that is a sign of the times, and I fear there is no escape from it. In the case of the specific names, however, there are, fortunately, few changes to make on my original list, when certain "priority" claims, alluded to below, have been taken into account. There has just been published, in the *Annals and Magazine of Natural History* (ser. 9, vol. iii., p. 253, March 1919), a paper on Myriapoda by Dr Hilda and the Rev. Graham Brade-Birks, entitled, "Some Observations on Nomenclature," in which, after having examined "classical" specimens in the British Museum, they advocate the restoration of a number of Leach's and Newport's names to their place of priority. This, I need hardly say, is a source of satisfaction to me, seeing that, following the lead given by Mr Pocock, these names were almost without exception adopted in my 1907 paper, the foreign synonyms being at same time indicated. An examination, however, of the old specimens preserved in the British Museum was, as I pointed out, the obvious way to remove any dubiety there might be concerning the status of these names, and I am glad that this has now been made by thoroughly competent students of the group.

Records subsequent to the publication, in 1907, of my account of the Myriapods of the Forth Area are contained in the following papers:—

"The Scottish Symphyla," R. S. Bagnall, *Scot. Nat.*, 1913, pp. 182-185.

"Macrosternodesmus palicola, Bröl., in Scotland (Forth)," W. Evans, *Scot. Nat.*, 1917, p. 274. The specimen recorded was taken on the Isle of May in Nov. 1912, and is the "Forth" example alluded to by Bagnall in one of his papers. The occurrence of *Brachydesmus superus* on the May is also mentioned in this note.

"Records of Some Myriapoda from the Forth Area," R. S. Bagnall, *Scot. Nat.*, 1918, pp. 79, 80. Among the species recorded as additions to the list is *Brachyiulus littoralis*, Verhoeff. Bagnall now, however, regards this as a synonym of *Julus pusillus*, Leach, a species already on the list (*cf.* his paper "On the Synonymy of Some European Diplopods," *Ann. and Mag. Nat. Hist.*, Nov. 1918, p. 407). The specimen of *Symphylella minutissima*, from "near Edinburgh," was taken in a quarry on Swanston Farm at the foot of the Pentlands.

"Records of some new British Diplopods and Pauropods, with a Preliminary Check List of the British 'Myriapoda,'" R. S. Bagnall, *Journ. Zool. Research*, Oct. 1918, pp. 87-93. My specimen (♀) of *Monacobates tenuis* was from Dalmeny Park, Linlithgowshire, 14th Feb. 1914. Mr Bagnall's specimens were taken in the Calton Hill district of Edinburgh in 1918.

"Insects and other Terrestrial Invertebrates from the Bass Rock," W. Evans, *Scot. Nat.*, Nov. 1918, pp. 259-265. Four species of Myriapoda are given.

The following further records of my own complete the data on which the annexed table is based:—

Glomeris marginata, Vill.—Colinton Dell, Midlothian, July 1893.

Tachypodiulus niger (Leach).—Fidra Island, Sept. 1910, and near Keith, East Lothian, April 1916; Avonbridge, Stirlingshire, April 1912.

Ophiulus pilosus (Newp.) = *O. fallax* (Mein.).—Dalmeny, ♂, April 1905; Wharry Glen, near Bridge of Allan, ♂, Dec. 1905; Cullalo, Fife, Feb. 1908; Dirleton Common, East Lothian, in mole's nest, Jan. 1909.

Cylindroiulus punctatus (Leach).—Near Drem, East Lothian, Oct. 1911; Carron Glen, Stirlingshire, Oct. 1915.

C. frisius, Verh.—Dalmeny shore, Linlithgowshire, ♂, 20th April 1905; Isle of May, Fife, one, Sept. 1897, a dozen, Sept. and Oct. 1910, several, Feb. and April 1912; Largo Links, Fife, in mole's nest, Feb. 1908; Dirleton Links, East Lothian, in mole's nests, March 1908 and Jan. 1909. All the coast records under *I. britannicus* in my former paper belong to this species.

Brachyiulus pusillus (Leach) *nec* Verh. (= *littoralis*, Verh.).—Largo Links, several, in moles' nests, Feb. and March 1908; Gullane, East Lothian, several, in moles' nests, March 1908; Dirleton Links, near North Berwick, a dozen, in moles' nests, March 1908; Boquhan Glen, Stirlingshire, one, 8th June 1912.

Schizophyllum sabulosum (L.).—Braid Burn, near Edinburgh, ♂, July 1907; Waughton, East Lothian, one, Oct. 1911.

Amsteinia fuscus (Am Stein).—Near Winchburgh, West Lothian, Jan. 1909; Binning Wood, Tynninghame, East Lothian, Jan. 1913; Carron Glen, Stirlingshire, Oct. 1915.

Blaniulus (Trichoblaniulus) guttulatus (Bosc.).—Aberfoyle, S.-W. Perthshire, May 1919.

Polymicrodon polydesmoides (Leach), (= *latzeli*, Verh.).—Dalmeny Park, April 1905; near Winchburgh, two under stone, Jan. 1909; Causewayend, near Manuel, Stirlingshire, March 1912; Fidra Island, near North Berwick, one, Sept. 1910; Tynninghame, one under bark of dead birch, Jan. 1913; Whittingehame, one in fungus, Oct. 1913; near Keith, one under bark of fir, April 1916.

Craspedosoma rawlinsii, Leach, *nec* Verh. (= *simile*, Verh.).—Shore west of Grangemouth, Stirlingshire, one under stone at edge of mudflat, March 1913; Lake of Menteith, S.-W. Perthshire, under stones at water's edge, one, May 1908, and one, May 1913; north bank of River Forth, opposite Craigforth above Stirling, common (two dozen collected in a short time) in flood refuse, 28th March 1914.

Brachydesmus superus, Latz.—Largo Links, Dirleton Common, and Ravelrig Moss (Midlothian), a good many in moles' nests, March 1908; Isle of May, several, Nov. 1912.

Polydesmus coriaceus, Porat.—Bo'ness, West Lothian, one, March 1910.

P. complanatus, L.—Carron Glen, Oct. 1915.

Scutigereilla immaculata (Newp.).—Boquhan Hills, Stirlingshire, one, June 1912.

Scolopendrellopsis subnuda (Hans.).—Gullane Point, East Lothian, one, 20th Sept. 1913.

Symphylella vulgaris (Hans.).—Gullane Point, two, 20th Sept. 1913. For the identification of this and the previous species I am indebted to Mr Bagnall.

Allopauropus gracilis (Hans.).—Quarry near Swanston, Midlothian, a few, Sept. 1912.

Lithobius crassipes, L. Koch.—Ravelrig Moss, in mole's nest, March 1908; Avonbridge, April 1912; Portmore Loch, Peeblesshire, April 1912; Isle of May, Nov. 1912 and May 1914.

L. calcaratus, C. Koch.—South of Leadburn, April 1908; summit of Scaldlaw, Pentlands, several, 9th May 1911.

L. melanops, Newp. (= *glabratus*, C. Koch.).—Several, Fife Ness, Oct. 1908; Isle of May, Feb. and Nov. 1912.

Lamyctes fulvicornis, Mein.—Besides the specimen from Ben Ledi previously recorded, I find I got another near Callander in Sept. 1906.

Geophilus insculptus, Attems (= *proximus* of my 1907 list).—Near Manuel, Stirlingshire, March 1912; Isle of May, one, Sept. 1909; Edinburgh, ♂ and ♀, April 1901, and a few, May 1919 (determined by Mr and Mrs Brade-Birks).

Brachygeophilus truncorum (Bergs. and Mein.).—South of Leadburn, two in mole's nest, April 1908; Fife Ness, Oct. 1908; Isle of May, Sept. 1911 and Nov. 1912.

Scolioptanes crassipes (C. Koch.).—Trossachs, one, June 1913. Writing in 1831 regarding the glow-worm, James Duncan remarks as follows: "Another luminous insect, the *Geophilus electricus*, has, I believe, been occasionally mistaken for the true glow-worm by casual observers in the neighbourhood of Edinburgh" (*Mem. Wernerian Nat. Hist. Soc.*, vi., p. 495). The species may have been *S. crassipes*.

S. maritimus (Leach).—Under stones at edge of mudflat east of Grangemouth, Stirlingshire, several, Sept. 1913; Isle of May, common, Sept. 1910 and Sept. 1911.

Schendyla nemorensis (C. Koch.).—Colinton Dell, one under stone, Oct. 1912.

Myriapoda: ascertained distribution in Forth Area.

| NAME. | 82 Haddington. | 83 Edinburgh. | 84 Linlithgow. | 86 E. Stirling. | 87 S.W. Perth and Clackmannan. | 85 Fife and Kinross. |
|--|-------------------|------------------|-------------------|--------------------|--------------------------------------|-------------------------|
| <i>Diplopoda.</i> | | | | | | |
| <i>Polyxenus lagurus</i> (L.) . . . | × | ... | ... | ... | ... | ... |
| <i>Glomeris marginata</i> , Vill. . . . | × | × | × | ... | ... | ... |
| <i>Glomeris perplexa</i> , Latz. . . . | ... | × | ... | ... | ... | ... |
| <i>Tachypodiulus niger</i> (Leach) . . . | × | × | × | × | × | × |
| <i>Julus scandinavicus</i> , Latz. (= <i>ligulifer</i> , Latz.) | × | × | × | × | ... | × |
| <i>Ophiulus pilosus</i> (Newp.) | × | × | × | ... | × | × |
| <i>Cylindroiulus punctatus</i> (Leach) . . . | × | × | × | × | × | × |
| <i>Cylindroiulus britannicus</i> (Verh.) . . . | ... | × | ... | ... | ... | ... |
| <i>Cylindroiulus frisius</i> , Verh. | × | ... | × | ... | ... | × |
| <i>Brachyiulus pusillus</i> (Leach) | × | × | × | × | ... | × |
| <i>Schizophyllum sabulosum</i> (L.) | × | × | × | ... | × | × |
| <i>Monacobates tenuis</i> , Bigler | ... | × | × | ... | ... | ... |
| <i>Amsteinia fuscus</i> (Am Stein) | × | × | × | × | × | × |
| <i>Isobates varicornis</i> (C. Koch) | × | ... | ... | ... | ... | ... |
| <i>Blaniulus guttulatus</i> (Bosc.) | × | × | × | × | × | × |
| <i>Polymicrodon polydesmoides</i> (Leach) | × | × | × | × | × | × |
| <i>Craspedosoma rawlinsii</i> , Leach | ... | × | × | × | × | × |
| <i>Macrosternodesmus palicola</i> , Bröl. . . . | ... | ... | ... | ... | ... | × |
| <i>Brachydesmus superus</i> , Latz. | × | × | × | ... | ... | × |
| <i>Polydesmus complanatus</i> , L. | × | × | × | × | × | × |
| <i>Polydesmus denticulatus</i> , C. Koch | ... | × | ... | × | ... | ... |
| <i>Polydesmus coriaceus</i> , Porat | × | × | × | ... | ... | ... |
| [<i>Orthomorpha gracilis</i> , C. L. K.] | ... | × | ... | ... | ... | ... |
| <i>Symphyla.</i> | | | | | | |
| <i>Scutigerebella immaculata</i> (Newp.) | ... | × | × | × | × | × |
| <i>Scutigerebella spinipes</i> , Bagn. | ... | × | ... | × | ... | ... |
| <i>Scutigerebella biscutata</i> , Bagn. | ... | × | ... | × | ... | ... |
| <i>Scolopendrellopsis subnuda</i> (Hans.) | × | × | × | ... | ... | × |
| <i>Symphylella vulgaris</i> (Hans.) | × | × | ... | ... | ... | × |
| <i>Symphylella delicatula</i> (Bagn.) | ... | × | ... | ... | ... | ... |
| <i>Symphylella minutissima</i> (Bagn.) | ... | × | ... | ... | ... | ... |

Myriapoda: ascertained distribution in Forth Area.

| NAME. | 82 Haddington. | 83 Edinburgh. | 84 Linlithgow | 86 E. Stirling. | 87 S.W. Perth and Clackmannal. | 85 Fife and Kinross. |
|--|-------------------|------------------|------------------|--------------------|--------------------------------------|-------------------------|
| <i>Pauropoda.</i> | | | | | | |
| <i>Allopauropus gracilis</i> (Hans.) . . . | x | x | ... | ... | ... | ... |
| <i>Chilopoda.</i> | | | | | | |
| <i>Lithobius crassipes</i> , L. Koch . . . | x | x | x | x | x | x |
| <i>Lithobius duboscqui</i> , Bröl. . . . | x | ... | ... | ... | ... | ... |
| <i>Lithobius calcaratus</i> , C. Koch . . . | x | x | ... | ... | x | x |
| <i>Lithobius borealis</i> , Mein. ? . . . | ... | ... | ... | ... | x | ... |
| <i>Lithobius forficatus</i> , L. | x | x | x | x | x | x |
| <i>Lithobius variegatus</i> , Leach . . . | ... | ... | ... | ... | x | x |
| <i>Lithobius melanops</i> , Newp. . . . | x | x | x | x | ... | x |
| <i>Lamyctes fulvicornis</i> , Mein. . . . | ... | ... | ... | ... | x | ... |
| [<i>Scutigera coleoptrata</i> (L.)] . . . | ... | x | ... | ... | ... | ... |
| <i>Cryptops hortensis</i> , Leach . . . | ... | x | ... | ... | ... | ... |
| [<i>Mecistocephalus carniolensis</i> , C. Koch] | ... | x | ... | ... | ... | ... |
| <i>Geophilus longicornis</i> , Leach . . . | x | x | x | x | x | x |
| <i>Geophilus insculptus</i> , Attems . . . (<i>G. proximus</i> of my 1907 paper) | x | x | x | x | ... | x |
| <i>Geophilus carpophagus</i> , Leach . . . | x | x | x | x | x | x |
| <i>Brachygeophilus truncorum</i> (B. & M.) | x | x | x | x | x | x |
| <i>Scolioplanes crassipes</i> (C. Koch) . . | ? | ? | x | ... | x | x |
| <i>Scolioplanes maritimus</i> (Leach) . . | x | ... | x | x | ... | x |
| <i>Schendyla nemorensis</i> (C. Koch) . . | x | x | ... | ... | ... | ... |
| <i>Stigmatogaster subterraneus</i> (Leach) | ... | x | ... | ... | ... | ... |

Dorytomus longimanus, Forst. (vorax, Fab.), in Ayrshire.—During January of this year I found a male of this Weevil hibernating under bark of willow near Ayr. According to Dr Sharp (*Scottish Naturalist*, v., 144) it is rare in Scotland, and it has apparently not been observed in the Clyde area since it was recorded from Glasgow in Murray's Catalogue of the Coleoptera of Scotland (1853).—A. FERGUSSON, Glasgow.

Addenda and Correction to List of North Uist Birds.—*Re* my notes on North Uist, which began in *The Scottish Naturalist* of November 1918, I find I have overlooked important facts concerning Monach Lighthouse.

In the *Vertebrate Fauna of the Outer Hebrides* (1888), Appendix D, p. 251, the following were accepted as good:—

Bluethroat (*Cyanecula suecica*), Linn., 11th October 1888.

Redstarts (*Ruticilla phoenicurus*), Linn., 28th September and 1st October 1888.

Golden-crested Wren (*Regulus cristatus*), K. L. Koch, 12th May 1888.

Brambling (*Fringilla montifringilla*), Linn., 29th April 1888.

Barn Owl (*Strix flammea*), Linn. Undated.

These observations, made by Mr Joseph Agnew, lighthouse-keeper at Monach, are of great importance.

Ref. p. 251 *The Scottish Naturalist*, 1918, my remarks *re* *Pyrhacorax graculus*, Linn., should be enclosed by brackets. Thus the total number of species, as having occurred, should read 151 with the addition of eight doubtful examples.—FRED. S. BEVERIDGE.

Smews off the Aberdeenshire Coast.—On the afternoon of 18th April 1919, I was sitting on Craig Ewan Point, just north of Peterhead, when I saw four Smews a little distance out to sea. I was there for about three hours, and the birds were still there when I left. The white heads, necks, and bodies of the three male birds were plainly to be seen, with the black patch at back of head and lines of black nearly meeting across the breast. The female's rufous head and white body could be easily distinguished. The male birds dived frequently and very quickly, remaining under water for a few seconds each time. The female seldom dived. All four birds constantly stood upright in the water, beating their wings rapidly. There were very few birds about that afternoon; one Red-throated Diver sailed up to the Smews, but was disturbed by some boats a little way off. A week before, there had been a flock of fifty Turnstones and about eighteen Redshanks on the foreshore, but the holiday-makers had scared away all the birds; only a couple of Rock Pipits recently arrived were left there. During the last fortnight, Larks, Meadow and Rock Pipits, and one female Wheatear have arrived. This easternmost point of Scotland is too bleak and bare for winter birds; there is so little shelter for them.—MARY G. S. BEST, F.Z.S., W.R.N.S.

Woodcock and the Safety of their Young.—In reference to Mr W. Evans's remarks on "Woodcock and the Safety of their Young," it may be of interest to record a somewhat similar experience. On 14th June 1918, I flushed a Woodcock from some bracken in an open space among the rhododendrons growing near the top of an exposed rocky hill. She began to fly straight away from me up wind, but on meeting the full force of the blast as she rose, she turned and came back close past me, and I was able to see that she was carrying a small young one. Her flight was laboured and unusual, and her tail much depressed, so that her position in the air recalled that of a wasp when carrying a fly. The wind was strong and she quickly dipped over the rock or cliff a little way behind me. On going back and cautiously looking over the edge I saw her standing on a sort of ledge not far off and rather below me, but facing my way—up wind—and I could also see the young one crouched at her feet between her legs. As soon as she caught sight of me, she bent her neck and pushed the young one securely into position with her bill, raising her wings as she did so, and flew off out of sight down among the trees below. On going back to the place where I first saw her, I soon came upon three other young birds, apparently hatched two or three days previously, so I sat down to see if the old bird would come back to them. And this she soon did, settling some distance off and running in an anxious fussy way in and out through the brackens, trailing her wings. It was most difficult to keep her in sight and under continuous observation, and she detected my movements in trying to do so. Whereupon she rose and flew off, but holding her body and tail in exactly the same position as when she was carrying a young bird; and when she topped the bushes and began to dive down the hillside, I could see that her legs and feet were hanging down. I shifted my position and kept watch till she came again, and then exactly the same thing happened as before—she spotted me and went off with the same flight, before she got up to where the chicks were squeaking. So I came away disappointed at not having seen her either bring back the first youngster or remove another. The young bird was carried close to the old one's body and well concealed by the lowered tail. In fact, from behind it would not have been possible to see it at all, and it was only when the old bird flew past me, or was facing towards me, that I could tell that a young one was being carried. And the fact that the same unusual manner of flight was adopted, when a chick was not being carried, might easily deceive one on the look-out for such a performance. I do

not think the tail was spread out, as Mr Evans describes, but certainly bent down and inwards to a remarkable extent, giving the bird an unusual, buncy appearance.—G. BROOKSBANK, Aberfeldy, Perthshire.

Lycæna artaxerxes and Eupithecia helveticaria in East Lothian.—The Artaxerxes butterfly, long associated with Arthur's Seat, is now so rare in the Lothians that its discovery in the western portion of the Lammermuirs on 5th August 1916 gave me peculiar pleasure. The date was late for it by about a month, and the dozen or so seen were mostly much worn. The locality was revisited on 11th July 1917, when Artaxerxes was again in evidence, but not numerous, in several spots. It would be interesting to know if this little butterfly still exists anywhere on the Pentlands. In July 1872 I met with it in the western part of the range, as recorded in the *Annals Scot. Nat. Hist.* for 1897, p. 92, where the month is erroneously given as June.

I take this opportunity to record the occurrence also on the Lammermuirs of that interesting "Pug" moth, *Eupithecia helveticaria*, for which the Pentland Hills have been so long noted. In the last week of October 1916 two larvæ were beaten from a juniper bush on the hillside above the farm of Halls, south-west of Dunbar; but I failed to rear either of them. On 20th October 1917, about a dozen larvæ were beaten off junipers above Yester; and from these two moths were obtained the following May.—WILLIAM EVANS, Edinburgh.

Cychramus luteus, F., in Lanarkshire.—In his Coleoptera of Scotland (*Scottish Naturalist*, iii., 374), Dr Sharp recorded this beetle from the Solway and Clyde areas. Apart from this general mention of its occurrence in Clyde, the only specific record for the species in that area is contained in Murray's Catalogue of the Coleoptera of Scotland (1853), where it is noted from Ayrshire. I have found it sparingly near Lanark during the last two summers. The insect is said by Fowler (*Coleoptera of the British Islands*, iii., 259) to occur on flowers of whitethorn in spring as well as in decaying fungi; and Dr Sharp (*loc. cit.*) states that it is found in fungi. My specimens were all taken on the flowers of umbelliferous plants during the month of August.—A. FERGUSSON, Glasgow.

REPORT ON
SCOTTISH ORNITHOLOGY
IN 1918
INCLUDING MIGRATION



BY

LEONORA JEFFREY RINTOUL AND EVELYN V. BAXTER

Hon. Members of the British Ornithologists' Union, etc.

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REPORT ON SCOTTISH ORNITHOLOGY IN 1918, INCLUDING MIGRATION.

INTRODUCTORY REMARKS.

THE year 1918 is a notable one in the history of mankind, for in it we and our Allies won the Great War, to which end, for over four years, all our energies had been bent.

In the year in question, the pursuit of Ornithology was carried on under greater difficulties than ever before; everyone was using their time and strength in some form of war work, leaving little opportunity for the field expeditions of happier days. In spite, however, of lack of time and other restrictions, our recorders have sent us quite a large volume of notes; the way they have kept up their contributions through all the trying period of the War, reflects the greatest credit on their keenness and energy. We thank, very gratefully, all those who have sent us observations in 1918, and we hope that in 1919 we shall get back to our pre-war strength and that many more recorders will send notes than ever before. There are many blanks which, alas, can never be filled, but we hope that numerous recruits will join our ranks and help us to carry on. We have to deplore the deaths of Duncan Fergusson, Corrou, and Captain S. E. Brock, Kirkliston, both of whom gave us much help with former Reports.

Our best thanks are due, in the Northern group of localities, to—William Crowe and Claude M'Eachern, North Unst; John S. Tulloch, Lerwick; W. H. Greenaway, Foula; John Gilmour, Westray; The Lightkeepers, Whalsay

Skerries; M. Sanderson, N. Ronaldshay, and John Bain, Noss Head. In the Eastern group of localities, to—A. C. Jackson, E. Ross; W. Berry, Lentrane; Major Stables, Cromarty Firth; Robert Clyne, Cromarty Lighthouse; Jane Gowan, Cullen; A. E. Mahood, Banff; F. Cattenach, Banff; H. Thomson, Banff; ——— Connacher, Banff; A. Macdonald, Durris; Major P. Waldron, Pitlochry; Colonel J. Drummond Hay, Perth; H. R. Colman, Broughty Ferry; Henry Boase, Dundee; George Cuthill, Alyth; Douglas Hunter, Edinburgh; R. Page, Edinburgh; William Evans, Edinburgh; William Eagle Clarke, Edinburgh; Francis Magee, Collessie; F. L. S. Wedderburn, Largo; Sim Baigrie, Isle of May and Pladda; John Pagan, Bathgate; and Andrew Hopkins, Eyemouth. In the Western group of localities, to—John Morrison, Stornoway; George Beveridge, North Uist; D. M'Donald, Kyleakin; J. Moore, Mull of Kintyre; Stewart Wilson, Rhinns of Islay; D. Mowatt, Pladda; H. C. Marriot, Glasgow; T. Robertson, Glasgow; C. A. Vynne, Glasgow; H. G. Cumming, Glasgow; William Rennie, Glasgow; John Robertson, Glasgow; T. W. Wilson, Glasgow; T. Hill, Glasgow; D. M'Donald, Glasgow; J. M'Crindle, Glasgow; Andersonian Ornithological Section, Glasgow; W. Jamieson, Glasgow; R. A. M'Croskie, Glasgow; R. Ballantyne, Glasgow; T. T. Mackeith, Kilmacollm; John Craig, Beith; Nicol Hopkins, Darvel; and James Bartholomew, Glenorchard. In the Southern group of localities, to—A. C. Gairns, Broughton; G. Davidson, Melrose; T. G. Laidlaw, Duns; William Beggs and G. Mackie, Little Ross; J. G. Gordon, Corsemalzie; and John R. Lawrence, Mull of Galloway.

As far as Scottish Ornithology is concerned, 1918 was an uneventful year, migration ran its normal course, without any of the great rushes or irruptions of continental visitors which are the feature of some seasons. Even weather movements were remarkable by their absence, the only one of any size recorded being in January. Although no new species was added to the Scottish list there were a fair number of uncommon visitors and an interesting extension of breeding range. The summer visitors were fairly normal

in their dates of arrival, but in autumn the arrival of winter visitors is recorded at very early dates.

The following abbreviations are used in this Report:—

1. = *The Scottish Naturalist*.
 2. = *British Birds* (magazine).
- (O.H.) = Outer Hebrides.
(L.) = Lantern.

We are indebted to the Weekly Weather Report of the Meteorological Office for the meteorological data contained in this Report.

BIRDS NEW TO FAUNAL AREAS, AND UNCOMMON VISITORS.

Owing partly to the exceptionally difficult conditions under which observation was carried out in 1918, and partly to the unfavourable weather conditions which prevailed during the periods when migration is at its height, the list of uncommon visitors this year is a very short one. Various interesting species put in an appearance, however, and are duly chronicled below. A male Hawfinch (*Coccothraustes coccothraustes coccothraustes*) was caught in a damaged condition in the woods at Castlecraig, Peeblesshire (1. 1918, 34), this being the first record of the species for that county. Four Ortolans (*Emberiza hortulana*) visited the Isle of May on 6th May, and six were present there on 9th May, while a Waxwing (*Bombycilla garrulus*) is recorded at Cairntown, Deeside, on 24th December (1. 1919, 50). Black Redstarts (*Phenicurus ochrurus gibraltariensis*) were fairly well represented in 1918, single birds occurred on the Isle of May on 12th and 13th April, 5th, 6th, and 9th May, and "some" there on 7th May. A large grey Owl, believed to be a Snowy Owl (*Nyctea nyctea*), was seen on North Unst on 21st April, and a bird of this species occurred at Port Errol, Aberdeenshire, on 7th September (1. 1918, 274). On 28th April a Rough-legged Buzzard (*Buteo lagopus lagopus*) is recorded from Vallay (Outer Hebrides), where this species occurs but rarely, and one frequented the Lauderdale Glens in the winter of 1918-19

(I. 1919, 29). A male Hen-harrier (*Circus cyaneus*) is reported from Noss Head on 12th January and single birds of this species from Vallay on 24th May and 8th September. A specimen of Leach's Fork-tailed Petrel (*Oceanodroma leucorhoa*) was found dead five miles west of Montrose on 16th October (I. 1918, 267), while the only Green Sandpiper (*Tringa ochropus*) recorded this year was at the Castle Loch, Mochrum, on 30th July. A Grey Phalarope (*Phalaropus fulicarius*) was found in a dying condition at the Mull of Galloway on 21st February. For the first fortnight of June a Black Tern (*Hydrochelidon nigra nigra*) frequented a small loch near the lighthouse at North Ronaldshay, "it did not associate with the other Terns and was much chased by Lapwings," and a male bird of the year was shot near Glasgow on 18th September (I. 1918, 266). On 3rd November an Ivory Gull (*Pagophila eburnea*) is recorded from North Ronaldshay.

EXTENSION OF BREEDING RANGE.

An interesting extension of breeding range discovered in 1918 is that of the Gadwall, nesting in North-East Fife. In the *Scottish Naturalist*, 1918, p. 266, Mr Berry records the finding of a nest of this species on 25th May; later in the season two young Gadwall were shot "in a mixed bag of ducks." This is the first record of the nesting of the Gadwall in the Tay Area. As the following information was not published in time to be included in the 1916 Report, we must mention here the extension of the breeding range of the Great Skua to the Orkneys. It is claimed that this was first definitely established in 1916, it has bred in this group each year since and appears to be increasing in numbers (2. xii. 50 and 170). There are, however, three eggs from the Seeböhm Collection in the British Museum ascribed to this species and said to have been taken in Orkney. Some doubt has been cast on the correctness of this record on, as it seems to us, insufficient grounds (*Ibis*, 1913, 516). It is quite conceivable that the Great Skua may have nested sporadically in the Orkneys.

SUMMER AND NESTING.

This year again we are, happily, in a position to record a fair number of species increasing in various localities. From Possil Marsh comes a note of more Magpies, Kestrels, and Sparrow-hawks, this being probably attributable to absence of gamekeepers, the usual enemies of these birds. Willow-warblers, Wood-warblers, Garden-warblers, Redstarts, and Tree-pipits were more numerous than usual at Duns, and Garden and Sedge-warblers and Tree-pipits at Kilmacolm. Tree-pipits, Spotted Flycatchers, Wood-warblers, Whinchats, Redstarts and Corncrakes are described as "rather more numerous" in the Kirkmichael district; Goldcrests are common there, and several parties of young were seen. Garden- and Wood-warblers and Cuckoos were much commoner in the Darvel district than last season. Other birds were "forward in good numbers, but the above three are most marked." An extra number of Sedge-warblers reared their broods successfully at Duddingston (i. 1918, 216), and in the Dundee district Missel-thrushes were "rather above previous averages," Blackbirds "reoccupied some of their town haunts which were deserted last year," while Goldcrests "made a distinct recovery." Missel- and Song-thrushes were plentiful in Mid-Banffshire, and Blackbirds there were quite as numerous as usual, perhaps more so. Lesser Redpolls and Skylarks too are described as numerous, while more Whitethroats than ever before are noted at Durris. From Collessie (Fife) we have reports of an increase in the number of Swifts and Cuckoos, nearly double the usual number of the former having nested there, while Great Spotted Woodpeckers are increasing about Melrose. Reports from the Isle of May show more Shags and Oystercatchers nesting; formerly one pair of Shags nested on a ledge on the cliffs on the west side, but in 1918 Mr Baigrie says more bred, and adds, "the other ones are in a cave, farther north than the old pair." Four nests of Oystercatchers were found, two being the old number. At least 300 Black-headed Gulls nest now at Loch of Park, Lower Deeside, they were

first seen there in 1915, some eggs were found in 1916, and they have increased rapidly since (i. 1918, 242). Many Common Gulls nested beside the Black-headed Gulls at North Ronaldshay (Orkney) and Lesser Black-backed Gulls had one nest, the first time our correspondent has known them to nest there. Pheasants and Partridges were plentiful in Banffshire, and Woodcock are increasing greatly as a nesting species in Lauderdale (i. 1919, 29).

Turning to scarcity of species in various districts, we find that fewer Rooks nested in the neighbourhood of Beith than in 1917; our correspondent tells us that three of last year's rookeries were deserted. Siskins were scarce at Banff, none being seen in their last summer's breeding-places. Crossbills too were scarce, and only a few Missel-thrushes and Song-thrushes nested in Duff House grounds (Banff); both species are described as being very scarce. This was, however, only a local falling off in numbers, as the same two species are recorded as plentiful in mid-Banffshire. Further scarcity of Thrushes, Blackbirds, and Redbreasts is noted near Turriff, while Lesser Redpolls, Meadow-pipits, Pied Wagtails, Grey Wagtails, Willow-warblers, Wheatears, Dippers, House-martins, Curlew, and Lapwings were below the average numbers in the Kirk-michael district. From Dundee we hear that Meadow-pipits, Grey Wagtails, Pied Wagtails, Whitethroats, House-martins, Swifts, Mallard, Tufted Ducks, Lapwings, and Moorhens were all much below their average numbers; Blackbirds had decreased slightly, while Wrens are becoming fewer and fewer. Not a single Stonechat bred on Corsemalzie (Wigtownshire) in 1918; usually about fourteen pairs nest, but only a single bird was seen on 22nd May, probably passing through. No Dippers bred in the Malzie Burn where for nearly a hundred years two pairs have nested annually, none was seen on the stream till a single bird appeared on 21st June. Chiffchaffs were absent from Corsemalzie, and only a few Willow-wrens and two or three pairs of Wood-wrens bred. Chiffchaffs and Grasshopper-warblers were not heard at Darvel up to 11th May; no Chiffchaffs, Blackcaps, nor Pied Flycatchers

were seen at Duns, where House-martins, Cuckoos, and Corncrakes were also scarcer than usual, while decrease in the numbers of Sedge-warblers is recorded from Melrose. Wheatears were much fewer than formerly at Vallay, N. Uist, also at Collessie, Fife, where House-martins too were below former years, only from 50 to 70 pairs nesting, as against about 250. Lapwings showed a decrease in numbers in Banffshire and at Beith, where Mr John Craig says, "I think there have been fewer Peewits' eggs lifted here this year than in any year I ever remember; when I was a boy Lapwings nested much nearer the town than they do now." Eider Ducks were fewer on the Isle of May, possibly from being more disturbed than in old days.

The Rooks at Beith have recolonised another rookery which they had deserted in 1916 owing to depredations of Carrion Crows. A Goldfinch nested in a high hawthorn hedge alongside a much frequented public road at Giffnock, and was successful in rearing its young (I. 1919, 63), while a pair of Pied Flycatchers nested in June near Lauder (I. 1919, 29). A colony of Tree-sparrows has become established near the Hydropathic at Melrose; they nested there for the first time in 1917.

A Great Tit's nest with nine young ones was found in an old pump at Beith; the old birds entered and left the nest by the mouth of the pump. The nest measured $7\frac{3}{4}$ inches across. Our correspondent there says that in his experience the large majority of Cole Tits nest in holes in the ground; of nine nests of this species found in one year, eight were in the ground. He found a Redbreast's nest in a tree, an unusual site, and a Wren's nest in a tree 17 feet from the ground. He also records three old Swallows' nests in a shed, having been taken by House-martins and built up for their own use. Great Spotted Woodpeckers were successful in rearing their young by the Leader (I. 1919, 29). The Cormorants at North Ronaldshay have forsaken their nesting-place on the Seal Skerry owing, it is thought, to blasting in connection with salvage work; while at Noss Head (Caithness) Fulmars made nests but did not lay eggs. Most of the Ringed Plovers' nests found at North

Ronaldshay were on the beach under large stones, some of them were fully 3 feet in, and it is suggested that the birds do this to protect their eggs from the Gulls which take them when they are laid in the open.

Our correspondent at Darvel (Ayrshire) tells us that he found fifty-nine different species nesting within a radius of three miles of Darvel; these comprised, among others, Merlin, Golden Plover, Dunlin, Snipe, Teal, Black and Red Grouse.

On 6th February Jackdaws were seen at their nesting holes in the cliffs at Cullen, and on the 13th Rooks at Dundee were "interested in repair work"; on the 20th a House-sparrow's nest at Cullen "looked complete," while on 23rd a Dipper at Darvel began to build. With March come the usual records of our earlier nesting birds; Rooks at Dundee began work in earnest on the 9th, a number of the nests were later deserted owing to frost and snow, these were pulled to pieces in mid-May; thereafter we have notes of Ravens, Rooks, Thrush, Blackbird and Tawny Owl, Ring-dove and Lapwing, all with eggs, and a Yellowhammer carrying nesting material in its bill, at Largo, on the 23rd. By 30th March young Starlings had flown at Eyemouth. A Dipper near Dundee, which began building on 18th March, had four eggs on 14th April. April brings increased notes of nesting. A Lapwing's nest with five eggs was found on 6th April at Callander (i. 1918, 139); on the 12th a Tawny Owl had a nest with five eggs in a small hole in a sandy embankment in a small wood at Darvel. As the month advances more species have eggs and young, and the later birds begin to nest. Great Spotted Woodpeckers were found nesting, as usual, in Duns Castle Woods, where, too, Hawfinches were seen. The first Shags' nests are reported from the Isle of May and North Unst, while young Thrushes and Dippers are reported from Eyemouth, and Mallard from the Dundee district. The Black-headed Gulls at Redmyre (Forfar) were building on the 15th, but the nesting season there was a failure, and quite one-third of the Gulls had left by 25th May. From Corsemalzie (Wigtown) come reports of Carrion Crows, Snipe, Grouse,

Yellow-hammer, Ringed Plover, Redshank, Curlew and Teal, all with eggs. Many of the above nests were lost owing to late heather burning. Stonechats had six young a day or two old on the 17th at Stranraer.

On the 6th of May the first Razorbill's egg was seen on the cliffs of the Isle of May. On the 8th a nest of Black Grouse was found at Corsemalzie, among dead bracken, containing seven eggs; these were well covered with bits of bracken. On the 16th the nest contained sixteen similar eggs, and it is suggested that two birds were laying in the same nest. Eight of the eggs hatched out on 16th June, the rest in various stages of incubation being eaten by Rooks. On 13th May a Little Grebe's nest with seven eggs was found at Loch Elrig (Wigtownshire). No young Cormorants were hatched at the nesting-place in Mochrum Loch (Wigtown) on 20th May; on the same date in 1917 quite big young were seen. Throughout May come notes of nesting of the late breeding birds, while the earlier species were seen with young birds. A Mallard with nine young ones, and "a few nests with young Shags," are reported from North Unst on 26th and 27th May respectively. Pied Wagtails are noted from Westray (Orkney) in June and July, and in these months and part of August, Gannets were seen daily on a skerry south-west of the Muckle Flugga Lighthouse, North Unst. In June we have records of young of many birds being seen. The nests and eggs of Gulls, Terns, and Warblers are reported from many stations, and some second broods of our earlier birds are noted. A Coot at Loch Chesney (Wigtownshire) had a nest with five eggs, within five yards of an old nest, these hatched on 14th May, and a Cuckoo's egg was found in the nest of a Reed-bunting at Mochrum Loch (Wigtown); it was reddish brown. At Corsemalzie five eggs of a Spotted Flycatcher, in an advanced state of incubation, were taken from a nest on 10th June; by the 23rd five more were laid in the same nest. Other notes sent during the month deal with normal progress of nesting and rearing of young, and do not call for special notice here. By July the nesting season is practically at an end, and

only some late nests still have eggs. In the first week of July a family party of Crested Tits was seen in a wood about three miles from Forres (1. 1918, 216). A Pheasant at Corsemalzie was sitting on nine eggs on the 11th, and Common Terns on a rocky islet in Castle Loch, Mochrum, had still a lot of unhatched eggs on the 13th, although nearly full-grown young were also to be seen. Cormorants, too, at the same place on the same date are described as "in all stages, quite a few eggs, to full-grown young, some speckled, others with quite white breasts." By 1st August all the breeding colony of Black-headed Gulls save one adult and one late young bird had left Loch Chesney, and on the same day a brood of five Black Grouse about a week old is reported from Corsemalzie. On the 7th the Cormorant Isle at Mochrum Loch was crowded with white-breasted birds; many of the older young were fishing round the island. On the 16th, two Wood-pigeons shot at Corsemalzie contained eggs ready for laying. A Sedge-warbler, with tail scarcely developed, was being fed by its parents fully a mile from the nearest nesting-place in the neighbourhood of Dundee on 25th August. The last young Fulmar left its nest at North Unst on the 3rd September, but there seem to have been quite an unusual number of late nests in September 1918. Young Sandmartins were still in the nest at Darvel on 1st, and Wood-pigeons with eggs are reported from Corsemalzie and Darvel on 5th and 22nd September respectively. On 4th September Mallard, Pheasants, and Partridges all had young unable to fly at the former place, and three young Black Grouse on the moor there on that day are described as "like Dab-chicks." A Skylark's nest full of young was found at Westray (Orkney) on 19th September, three nests of Wood-pigeons, near Darvel, on 13th October, with two, two, and one young respectively, while up to 26th October Starlings were feeding their young in the nest in Edinburgh.

WINTER.

The principal feature of the winter of 1917-18 was the scarcity of Fieldfares and Redwings in all parts of the

country. As this has already been dealt with fully in our 1917 Report, and in notes in the *Scot. Nat.*, 1918, pp. 93 and 239, it is unnecessary to do more than allude to it here. In January 1918 there was a severe storm of frost and snow which told heavily on the birds. On 19th January Mr Osgood Mackenzie writes from West Ross: "We are in the midst of a terrible snowstorm, and the poor birds (which were scarce before it came) will be scarcer after it goes. The few Woodcock can hardly flutter and the Blackbirds and Thrushes are few and far between, and the Sparrowhawks are rapidly thinning them down. I have only seen one Snipe during all this hard weather." On the same day we have a note that the Blackbirds here (Largo) are getting very weak and hardly able to fly, owing to frost, and at the same time many Skylarks, Blackbirds, Redwings, and Thrushes are reported to have died from cold at Little Ross. An interesting article appeared in *The Gamekeeper* for February 1918, in which the writer chronicles the birds he had observed dead between 6th and 19th January; it may be well to quote this list as showing the variety of species affected by the storm. The writer found 16 Red Grouse, 2 Blackgame, 11 Partridges, 7 Woodpigeons, 49 Blackbirds, 7 Thrushes, 1 Wren, 6 Robins, 14 Chaffinches, 11 Greenfinches, 7 Hedge-accentors, 2 Redwings (the small number of Redwings is interesting showing the scarcity of these birds this season), and 2 Pied Wagtails; along the shore he picked up 11 Guillemots, 5 Razorbills, 2 Little Auks, 2 Golden Plover, 2 Green Plover, 1 Pink-footed Goose, and 1 female Scaup—verily a goodly bag! In addition to these casualties from the storm the writer describes the number of Geese and Ducks seen in the Firth of Forth, and mentions the large bags obtained by various sportsmen during this time; these comprised many Wader, especially Golden Plover. At Lerwick on the 21st, many House-sparrows and Starlings were found "frozen to death in intense frost." Except for the above notes there was nothing in the period under review worthy of mention here.

The winter of 1918-19 was not in any way remarkable; most of the usual winter visitors were present in normal

numbers. Although it was cold yet there was no very big storm, and we have no report of unusual casualties. Wrens, Hedge-sparrows, Turnstones, and a few Redshanks wintered on Pladda, Arran. Redwings and Fieldfares, although late in arriving, are reported in great number at Lauder; Bramblings were rather scarce there and a Rough-legged Buzzard was seen frequently in the Lauderdale Glens (1. 1919, 29). Notes of unusual scarcity come from Possil Marsh, where we are told that apart from, perhaps, an occasional single bird no visiting Swans have been seen during the winter of 1918-19—the writer adds, “I can recall no precedent of such an occurrence”; while from the neighbourhood of Perth we hear of an extraordinary scarcity of Snipe and Jack-snipe during the shooting season. Our correspondent writes, “I have only killed 5 of the former and 4 of the latter. My average bag over the last five years previous being 193 Common and 65 Jack-snipe; this includes the very bad season of 1918, when I only got 91 whole Snipe and 21 Jacks—what has come over the Snipe?” A great dearth of Snipe is also noted in the Melrose district.

RINGING.

The records under this heading are meagre in the extreme in 1918; owing to absence of the organisers on active service, the returns received have not yet been published in full. There is, however, one very interesting return, namely a Pied Wagtail marked as a nestling at Moulin near Pitlochry, Perthshire, on 4th June 1916, and reported from Aviles, Asturias, Spain, on 1st January 1918 (2. xii. 154). A Wren ringed in Stirlingshire in June 1917 was found at the same place in January 1918 (2. xii. 155), and a Lapwing also ringed in that county in July 1916 was recovered at the same place in April 1918 (2. xii. 156). Lastly a Gull, “with a spiral pink ring without any markings or name” on its leg, was picked up dead at Broughty Ferry (1. 1919, 29).

PLUMAGE.

The notes under this heading are few in 1918: the Rook with white feathers in its wings, as previously reported, was

observed on various occasions on Bruntsfield Links, Edinburgh, between 19th January and nesting-time when it disappeared for the season. It returned for the fifth winter in succession, but was not observed by our correspondent until 4th November, although earlier seen by others. On the 21st of that month another Rook similarly marked, but with fewer white feathers, appeared on the Links and frequented the neighbourhood during the winter. Most probably the second Rook was the offspring of the former bird. A hybrid Crow was seen at Cullen on 21st October; this bird was all black, "including throat and belly, but breast grey, and a grey band round the shoulders at base of neck," while a pure white Jackdaw was seen at Pitlochry on 11th September. In winter 1917-18 a Blackbird at Collessie had a white ring completely round its neck; this seems to have disappeared as spring advanced, as on 5th March we are told it only had a few white feathers on the neck. Two white Ringed Plover were seen at North Ronaldshay this year; they were seen last year too—one was mated to a normally coloured bird, and they had a nest. The eggs were the usual type. A female Herring Gull at Stirkoke, Wick, on 20th September is described as follows:—"White; tail-coverts, tail, wing-coverts, especially lesser coverts, tinged fawn. Outer primaries fawn brown, inner primaries and secondaries suffused fawn. Iris brown."

FOOD, HABITS, ETC.

On 25th March 1918, a Squirrel and a Magpie were seen at Corsemalzie (Wigtownshire) fighting in a fir-tree, the antics of the Squirrel being described as very amusing to watch. A party of thirty-seven Magpies were flushed from among fodder, etc., put out in a field for cattle at Alticig (Wigtownshire), while a bird of the same species was so intent on eating a blind-worm in a field at Corsemalzie in June, that it allowed our correspondent to walk up to within 15 yards of it before it rose. On 20th September, Starlings pursued by a Sparrow-hawk swooped close over the observer's head, "landed practically among my feet and crept into two stooks of oats" (I. 1919, 30). Seven Pied Wagtails

were seen on 20th July roosting in a small willow bush in reeds, in water in Mochrum Loch, Wigtownshire, at 9.30 P.M., and from Cullen under date of 13th September comes a note of Blue Tits feeding on the fruit of flowering currant of which they seemed very fond; three were seen on the bush at the same time—they pull off the berry and hold it in their feet against a branch while they peck at it. Sparrowhawks near Duns, Berwickshire, are taking toll of the Wood-pigeons there, Mr Laidlaw having seen the remains of more than a dozen killed by them (1. 1919, 61). A Peregrine was mobbed by Terns on approaching the shore at the Dornoch Firth on 2nd August, and another was seen at Portmahomack (E. Ross) "in full cry after a Redshank" on 18th October. On 16th July, a flock of about four hundred Lapwing were seen bathing in Loch Elrig (Wigtownshire) after a long shower; a Woodcock on 15th July flew past our correspondent at Corsemalzie, when he was standing in a wood, so close as to brush his coat pocket. Common Terns and Black-headed Gulls were seen in Wigtownshire, shaking themselves while on the wing, to dry their feathers after a heavy shower; the sound could be heard quite clearly. This is evidently a common habit with these birds; a Common Tern which was diving for Perch fry at the Castle Loch, Mochrum, was also seen to shake itself dry on the wing after having been submerged. In an article in the *Gamekeeper* for February, Blackgame are reported in numbers in Midlothian, and a party of fourteen were disturbed in a strip, where they had been feeding on fir, scratching away the snow to get at the food underneath.

MIGRATION

SUMMARY OF MOVEMENTS.

January.

In the first nine days of January we have no record of any migration. From 9th to 21st a good deal of weather movement took place in frost and snow; the species chiefly affected were *Turdine*, Starlings, Skylarks, Snow-buntings,

Lapwings, Snipe, and Woodcock; Golden Plover are recorded from the lanterns at Pladda and Little Ross, and Knots and Redshanks from the latter place. Thereafter the weather became milder and nothing worthy of note is reported till the end of the month.

February.

With a rise in temperature and mild weather for the season there were returns to breeding-places of Golden Plover, Lapwings, Curlew, and Shelduck, in the first half of February. A well-marked *Turdinæ* and Wader movement took place, and a good many Little Auks are recorded during this period. During the second half the same movements continued in a lesser degree, this diminution being probably due to the unsettled weather conditions which prevailed in the last fortnight of February.

March.

In the first fortnight of March the winds were chiefly easterly and the temperature low; during this period *Turdinæ*, Starlings, Skylarks, and Wader were still on the move. Pied Wagtails were returning to nesting-places, Swans were moving, and a White Wagtail, evidence of passage migration, appeared on the 15th. With unsettled weather and very variable temperature the second fortnight shows more returns to nesting-places, movements of Duck, and arrivals of a few summer visitors.

April.

With changeable weather and variable winds migration in April followed a very normal course; summer visitors were arriving in increasing numbers, winter visitors departing steadily, while a little passage migration is recorded.

May.

During the first half of May there was a large arrival of summer visitors; the period of maximum movement was from the 3rd to the 12th, during which time the wind was,

almost without exception, from some easterly quarter. A good deal of passage migration is also recorded, and winter visitors were leaving the country. After the 16th the main movement was at an end, some few arrivals are still recorded, belated winter visitors were leaving, and a few passage migrants were noted.

June.

No passage movements are reported in June, the winds being almost without exception from some northerly and westerly quarter; the first half of the month was warm, the second cold. The notes sent refer to the flocking of various species after nesting, and towards the end of the month returns of Wader and Black-headed Gulls to the shore are recorded.

July.

During the first half of July, with variable winds and a temperature mostly below normal, there were slight indications of autumn movement and further returns of Wader to the shore. After this to the end of the month the weather was thundery and unsettled, with heavy rain. More movement is recorded; some Passeres, Cuckoos, and Swifts were moving, Wader in small numbers arrived from overseas, and there was also a good deal of local Wader movement.

August.

In the first fortnight, with warm, unsettled weather, a certain amount of Passerine, Duck, and Wader movement took place, but no rush is recorded; rock-breeding birds and Terns were leaving their nesting-places. To the end of the month the weather remained unsettled; many of our summer visitors left, there was a good deal of passage migration, and two Whooper Swans are recorded from North Uist on the 24th.

September.

Throughout September the wind was almost entirely from some westerly quarter, the weather was cold and there was a great deal of rain; a steady movement took place

during the month, but no rush of any kind is recorded. In the first half an unusually large number of different species of winter visitors arrived in the country, the normal departures of our nesting-birds took place, and there was some passage migration. In the last half there were more winter visitors arriving, some departure of summer birds, and a little passage migration.

October.

South-westerly winds and moderate temperature characterised the first half of October; the migrations were almost entirely arrivals of winter visitors, these coming into the country in a steady stream. Small movements of passage migrants and an ever-diminishing number of summer visitors is reported. In the second half, with variable winds and moderate temperature, the arrivals of winter visitors increased, the last of our summer visitors is noted, and some passage movements took place.

November.

In the first week, with strong winds chiefly from the south-west and moderate temperature, some movements among Starlings, Snow-buntings, *Turdinæ*, and Wader are reported. The weather to the end of the month continued unsettled, the winds being chiefly between south and west, and the same kind of migration, though in a lesser degree, continued till the end of the month. In the last fortnight movements of Swans and Geese are recorded.

December.

The first fortnight of December was unusually mild, thereafter the weather became cold and unsettled. There was very little movement during the month, a few records of small numbers of a good many species were received, but no big migrations are anywhere reported.



NOTES ON THE MOVEMENTS OF BIRDS IN 1918.

ARRANGED UNDER SPECIES.

THE RAVEN, *Corvus corax corax*.—Fifteen were seen together on 20th April and seven on 17th August, both at North Unst.

THE HOODED CROW, *Corvus cornix cornix*.—On 6th February a dozen were seen at Cullen, nine at Noss Head on 2nd March, five or six at Durriss on 22nd April, three at the Isle of May on 28th April, and one there on 7th May. Records of the autumn movement are very scant, arrivals being noted at North Unst on 17th August and North Ronaldshay on 21st December only.

THE CARRION CROW, *Corvus corone corone*.—On 17th January a Carrion Crow visited the Isle of May, two or three were seen at Cullen on 6th February, and small parties about Dundee from early in March till mid-May. Small numbers appeared on the Isle of May during April, and one was seen there on 14th May. Arrivals are noted about Dundee on 3rd and from Pladda on 21st November.

THE ROOK, *Corvus frugilegus frugilegus*.—Six appeared on Foula on 7th February, and from 17th March till the second week of April increases were noted at a Dundee rookery, while a flock of fifty visited Hamnafeldt Hill, Foula, on 29th March.

THE JACKDAW, *Corvus monedula*.—Birds of this species, but of which race is uncertain, visited Foula on 12th February, the Isle of May on 14th March and 1st April, and Lerwick on 3rd and 26th December, single birds in each instance.

THE STARLING, *Sturnus vulgaris vulgaris*.—From 14th to 19th January a weather movement caused by the hard frost which prevailed at that time is recorded from Kyleakin and Pladda, and from Lerwick on 21st January we hear that many were frozen to death. Notes of movement come from our southern stations between 2nd

February and 18th March, doubtless chiefly our own birds returning, though some may have been passage migrants; while emigration is reported from our northern stations between 13th March and 6th April. A flock of about thirty Starlings was seen at Dundee on 11th May, at Largo flocks were to be seen on 8th June, and on 11th June an assembly of about a hundred was observed at Loch Elrig, Mochrum.

On 7th September many arrivals are recorded at Pladda, and from 12th October to 28th November there are many notes of movement from our southern and south-western stations, probably chiefly emigration of our own Starlings to England and Ireland. Immigration was observed at our northern lanterns and stations between 5th November and 6th December. On 18th December fresh arrivals are noted at Pladda.

THE HAWFINCH, *Coccothraustes coccothraustes coccothraustes*.—See p. 101. A young one was found dead near Jedburgh on 6th June.

THE GREENFINCH, *Chloris chloris chloris*.—A Greenfinch is recorded from the Isle of May on 6th April, and flocks about Dundee on 11th and 12th May and 30th June. An immigration is noted at Cullen on 20th September.

THE BRITISH GOLDFINCH, *Carduelis carduelis britannica*.—Two Goldfinches were seen at Corsemalzie (Wigtownshire) on 5th May and a flock of sixty at Whithorn in the same county on 1st October, probably this sub-species.

THE SISKIN, *Carduelis spinus*.—The Muckle Flugga Rock was visited by two Siskins on 15th October, while on 2nd December a flock of twenty-seven was seen at Alticig (Wigtownshire).

THE TWITE, *Carduelis flavirostris flavirostris*.—A flock arrived at Pladda on 29th September, seventeen were seen at Glenling, Mochrum, on 7th October, and a flock of fifteen at Alticig (Wigtownshire) on 6th December.

THE MEALY REDPOLL, *Carduelis linaria linaria*.—A flock of twenty is reported from Dundee on 2nd February, and four from Galson (O.H.) from 5th to 10th October.

THE LESSER REDPOLL, *Carduelis linaria cabaret*.—On 28th November a flock of sixty was seen near the Malzie Burn, Corsemalzie.

THE LINNET, *Carduelis cannabina cannabina*.—Small arrivals are noted at Noss Head on 16th January and 23rd March, and at

Kyleakin on 29th March. Flocking had begun about Dundee on 14th July and at Loch Elrig on 23rd July, and immigration is reported at Cullen on 20th September.

THE CHAFFINCH, *Fringilla cœlebs cœlebs*.—Pretty constant movement of small numbers is recorded from the Isle of May from 18th March to 15th May, and single birds at the Muckle Flugga lantern at midnight on 2nd April and at Foula on 17th April. On 20th September immigration was noticed at Cullen, a flock at Pladda on 28th September, single birds pretty frequently at Galson (O.H.) between 29th October and 30th November, and at Westray on 24th November. On 2nd December a flock of about four hundred females was seen in a stubble field near Alticig (Wigtownshire), while a flock of over a thousand is recorded from Banff on 5th December.

THE BRAMBLING, *Fringilla montifringilla*.—Northward movement took place pretty steadily at the Isle of May from 13th April to 15th May, and a female was seen at Noss Head on 16th April. The only autumn record is from Pladda where one was seen on 7th September, but several stations comment on the scarcity or absence of this species during autumn and winter.

THE HOUSE-SPARROW, *Passer domesticus domesticus*.—Many were found at Lerwick on 21st January frozen to death during the intense cold which prevailed at the time.

THE TREE-SPARROW, *Passer montanus montanus*.—A flock of eight or ten were observed at Cullen on 9th March.

THE CORN-BUNTING, *Emberiza calandra calandra*.—Flocks of two and three hundred are reported near Eyemouth on 9th January and 17th March, fluctuating numbers at Noss Head between 12th January and 23rd March, a flock of twenty at Cullen on 24th January, and one of thirty there on 13th March, and a flock of about twenty at Collessie (Fife) on 27th February. In autumn movement is noted from Noss Head on 11th and 24th October, and from Galson (O.H.) from 12th November to 5th December.

THE YELLOW BUNTING, *Emberiza citrinella citrinella*.—A migrant appeared at Noss Head on 23rd April, and four at Vallay (O.H.) on 2nd May. In autumn two are reported from Noss Head on 11th October, and single birds at the same station on 9th and 17th November.

THE ORTOLAN, *Emberiza hortulana*.—See p. 101.

THE REED-BUNTING, *Emberiza schoeniclus schoeniclus*.—Two and three males are recorded near Largo on 4th and 8th January, a female at Noss Head on 12th January, and a pair “on passage” near Dundee on 14th March. Single birds are noted at Noss Head on 24th October and 9th November.

THE SNOW-BUNTING, *Plectrophenax nivalis*.—Small movements are recorded from stations in the Northern Isles and from Noss Head up to 9th March, while from 17th March to 2nd April more general movement is noted. Last seen at Foula on 13th April and at Whalsay Skerries on 18th April.

Early returns are reported in 1918; on 3rd September a Snow-bunting arrived on the Muckle Flugga, and the species is recorded from Galson (O.H.) in the beginning of September. Steady movements took place at our northern stations and in the Outer Hebrides from 17th September to 10th October, and again from 21st October to the end of November, considerable numbers being recorded during this last month. In November, too, we have records from our southern stations but of small flocks only. Slight movements are noted at Noss Head during December, and on the 20th of that month large numbers appeared on North Ronaldshay.

THE SKYLARK, *Alauda arvensis arvensis*.—A well-defined weather movement is recorded between 11th and 22nd January from the Isle of May, Pladda, and Little Ross; at the last station many were found dead from the cold. From 13th February to 12th April much movement is recorded almost entirely from our southern stations, but a little emigration is also noted from the Northern Isles during this period. Probably the majority of the records refer to movements of our breeding birds, though passage migrants may also have been represented. Some Skylarks on the Isle of May on 10th May doubtless belonged to this latter class.

During the first half of September passage to the south-east is recorded, and on 29th September considerable numbers passed Dundee before 10.30 A.M. going west. On 13th October many were passing east at Dundee, and on the 20th both south-eastward and westward passage was observed at this station, while on 21st October “lots of parties were crossing the merse lands in Wigtown Bay from the south-east, all day.”

THE TREE-PIBIT, *Anthus trivialis trivialis*.—Is first recorded from Cadder and Rouken Glen on 28th April, Darvel next day, and Beith on 30th April, and immigration is noted up to 22nd May. Some were present on the Isle of May on 8th and 10th May. In autumn, passage is reported from Balgay between 22nd July and

25th August, and three Tree-pipits at Noss Head on 11th September.

THE MEADOW-PIPIT, *Anthus pratensis*.—An arrival is recorded at Largo on 25th March, and from this time till mid-April considerable movement is noted from all parts of Scotland. An influx is reported from the Isle of May on 10th May. Autumn movement is first recorded from Dundee on 11th August, and from this time till 11th October there are continuous notes of the passage of this species; the periods of maximum movement seem to be 6th and 7th September, 24th to 26th September, and 11th October. The records come chiefly from our southern stations, but there are also a few from Noss Head. On 12th November five are reported from Galson (O.H.), and a flock of eleven and several single birds on the moor at Corsemalzie on 30th November.

THE ROCK-PIPIT, *Anthus spinoletta petrosus*.—An influx is noted at the Isle of May on 31st March, and one at the Little Ross lantern at 3 A.M. on 5th April. On 3rd September twelve arrived on the Muckle Flugga Rock, and on the 6th many appeared on Pladda, and several are recorded in Wigtown Bay on 21st October.

THE YELLOW WAGTAIL, *Motacilla flava rayi*.—Is first reported from Killermont (Clyde) on 24th April, Darvel and Houston on the 27th, and Rouken Glen and Summerston on 28th April. An adult female was sent from the Mull of Kintyre Lighthouse on 3rd May, and a female was observed in Bute on 17th May (1. 1918, 286). Last seen at Beith on 12th September and Alticig (Wigtownshire) two days later.

THE GREY WAGTAIL, *Motacilla cinerea cinerea*.—One is recorded from Largo Bay on 20th January, two from North Unst on 18th May, and one at the latter station on 20th August. A good deal of movement from breeding haunts to winter quarters is noted between 8th September and 13th October, and three Grey Wagtails visited Little Ross on 23rd October.

THE WHITE WAGTAIL, *Motacilla alba alba*.—The first record of the passage of this Wagtail is from Noss Head on 15th March, and from that time till 8th May steady movement appears to have taken place along both east and west coasts. The return movement in autumn is equally well marked: on 21st August seven, one being an adult, appeared at Noss Head, and records come constantly from this station, Banff, Tayport (Fife), Beith, Isle of Whithorn, and Alticig (Wigtownshire) up to 11th October, on which date seven, including two adults, are reported at Noss Head.

THE PIED WAGTAIL, *Motacilla alba lugubris*.—There are a good many notes of small numbers of wintering birds up to 2nd February. Immigration is first reported on 3rd March and throughout that month arrivals are noted, specially during the last week. On 6th May one visited Foula, and two were at Noss Head on 14th and one on 16th May. Autumn movement was well represented from 2nd September to 12th October, sometimes in considerable numbers and almost entirely from our southern stations, two at Noss Head on 11th October being the only record from the north. From 30th November onwards wintering birds again figure from many stations.

THE BRITISH WILLOW TITMOUSE, *Parus atricapillus kleinschmidti*.—A pair were seen at Corsemalzie on 28th March and 3rd April, and seven at Possil Marsh on 22nd December.

THE GOLDCREST, *Regulus regulus*.—A Goldcrest killed at the Little Ross lantern at 1.30 A.M. on 18th March was probably our *R. r. anglorum* returning to its breeding quarters, but one at the Isle of May on 14th May seems more likely to have been the typical form. "A pretty large migration" is recorded from Montrose on 11th October, and at 2 A.M. on the 12th numbers were at the Little Ross lantern and several were at the same light in the early hours of 22nd October.

THE WAXWING, *Bombycilla garrulus*.—See p. 101.

THE SPOTTED FLYCATCHER, *Muscicapa striata striata*.—Is reported from Corsemalzie on 4th May, Rouken Glen next day, Darvel on the 11th, and Dundee and Largo on 12th May. After this arrivals at nesting quarters took place up to 22nd May. From 22nd July throughout August a good deal of movement is noted. Last seen at Cullen and Redmyre (Tay) on 7th September, Corsemalzie on 26th September, and Glasserton on 30th September.

THE PIED FLYCATCHER, *Muscicapa hypoleuca hypoleuca*.—A male and female were on the Muckle Flugga Rock from 5th to 7th May, some on the Isle of May on the latter date, and one there next day. On 19th May this species is recorded from Broughton (Peeblesshire), and from Tarholm (Ayr) on 23rd May. The only autumn records are from Noss Head, where passage migrants are noted on 8th and 9th September.

THE CHIFFCHAFF, *Phylloscopus collybita collybita*.—Is first reported from Dalry (Clyde) on 6th April; Rouken Glen follows on 21st April. On 4th and 5th May a number were on the island at Little Ross, and at 11 P.M. on 6th May some were killed at that lantern.

THE NORTHERN CHIFFCHAFF, *Phylloscopus collybita abietinus*.—A Chiffchaff recorded from Noss Head on 22nd August probably belonged to this sub-species.

THE WILLOW-WARBLE, *Phylloscopus trochilus trochilus*.—The early records come from Melrose on 18th April, Kilmacolm on 19th, Corsemalzie next day, Summerston on the 21st, Killermont on the 22nd, Darvel on the 23rd, and Little Ross and Isle of May on 24th April. After this arrivals are reported from all over Scotland up to 25th May, the chief influx taking place between 30th April and 8th May.

Return movement is reported from the Isle of May on 7th August, and from that time till mid-September there are a good many notes of southward movement, evidently referring chiefly to the departure of our home-bred birds. A Willow-warbler at Noss Head on 27th August was probably a passage migrant from the Continent. Last seen Balgay on 14th September, Largo on 17th, Cullen on 19th, and Corsemalzie and Broughty Ferry on 20th September.

THE WOOD-WARBLE, *Phylloscopus sibilatrix sibilatrix*.—Arrivals are recorded from Tarholm near Ayr on 2nd May, Darvel and Corsemalzie on 7th, and Cullen on 17th May. Single birds are noted at Balgay (Forfar) on 28th July and 18th August.

THE GRASSHOPPER-WARBLE, *Locustella naevia naevia*.—Is reported from Beith on 11th May, Kilmacolm on 17th, Possil Marsh on 20th, and near Mount Stuart (Bute) on 22nd May.

THE SEDGE-WARBLE, *Acrocephalus schænobænus*.—Very early records of this species come from Summerston on 22nd, 24th, and 25th April, the only previous instance of such early arrival in Clyde being in 1893. Sedge-warblers are reported at Corsemalzie on 6th May, Beith on 8th, Darvel on 10th, Kilmacolm and Invergowrie on 12th May, and arrivals at breeding sites are noted up to 29th May.

By 24th July return movement had begun, and many notes come from our southern stations, evidently of the departure of our breeding birds, up to the end of August. Last seen Broughty Ferry on 30th August, Possil Marsh "over thirty on passage" on 8th September, and Corsemalzie, three on the moors, on 11th September.

THE GARDEN-WARBLE, *Sylvia borin*.—The records of arrival are rather late in 1918. On 7th May a Garden-warbler visited the Isle of May, and records come from Tarholm (Ayr) next day, Darvel on the 9th, Melrose on 13th, Beith and Rouken Glen on the 14th

May, further arrivals being noted up to 26th May. Last seen at Beith on 23rd July.

THE BLACKCAP, *Sylvia atricapilla atricapilla*.—Single birds are reported from the Isle of May from 6th to 8th May and Darvel on 11th May.

THE WHITETHROAT, *Sylvia communis communis*.—Is first recorded from Corsemalzie on 24th April, Milngavie and Possil Marsh on 27th April, and Bishop Loch, near Glasgow, on 4th May, while a male was killed at the Mull of Galloway lantern that night. Arrivals at nesting places are reported right up to 29th May, the period of maximum movement being between 10th and 16th May, when a large influx took place. A passage migrant is noted at Lerwick on 22nd May. Southward movement had begun by 22nd July and continued throughout August. Last seen Beith 29th August, Dundee 1st September, and Corsemalzie on 9th September.

THE LESSER WHITETHROAT, *Sylvia curruca curruca*.—The only record for the year is of several on the Isle of May on 5th May.

THE FIELDFARE, *Turdus pilaris*.—From 20th January to 4th February there are a good many records of small numbers of Fieldfares from such widely separated stations as North Unst, Foula, the Isle of May, and Little Ross, while on 24th January large flocks appeared at Durris. From 12th February till the end of April we have steady reports of movements of Fieldfares from stations all over Scotland, apparently passage migrants, as the great scarcity of this species in the autumn of 1917 and the ensuing winter would seem to indicate. Last seen at Balhousie, near Largo, on 3rd May, the Muckle Flugga on 5th, Noss Head on 7th, Bressay on 9th, and the Isle of May on 14th May.

Autumn arrivals took place at Corsemalzie on 4th October, High Glenling (Mochrum) on 10th, North Ronaldshay on 11th, Kilmacolm on 13th, and Noss Head on 14th October, and during the rest of the month spasmodic movement is noted. A large influx is reported between 2nd and 11th November, and two Fieldfares were at the North Ronaldshay lantern at 3 A.M. on 27th November.

THE MISSEL-THRUSH, *Turdus viscivorus viscivorus*.—Single birds are recorded from the Isle of May on 12th, 17th, and 24th February. On 16th June a flock of thirteen was seen on the moor at Corsemalzie, and flocking was noted at Kirkmichael on 18th June. On 5th August a great flock, estimated at 150, was seen in a turnip field at Corsemalzie, a Missel-thrush visited the Isle of May on 7th August, and one was seen at Lerwick on 12th October.

THE SONG-THRUSH, *Turdus philomelus*.—Numbers of Song-thrushes are recorded at the Little Ross lantern at 3 A.M. on 18th January and throughout February, and up to 18th March large movements are reported from our southern lanterns and stations, doubtless returns of our own breeding *T. ph. clarkei*. From 16th April to 8th May notes of small numbers come from Noss Head and the Isle of May, probably of emigrant *T. ph. philomelus*, and on 23rd June two Song-thrushes appeared at the latter station.

The Isle of May again records some Thrushes on 12th and 17th July and from 17th to 19th August, while Pladda sends notes from 7th September to 13th October of varying numbers, and immigration is reported at Cullen on 7th and 20th September. From 14th October to 9th November immigrants are recorded from the Northern Isles and Noss Head, probably of the typical form, while a large exodus, probably of our own breeding birds, is reported from our southern lanterns and stations between 30th October and 28th November.

THE REDWING, *Turdus musicus*.—Numbers of Redwings visited the Little Ross lantern at 3 A.M. on 18th January, and records of small numbers come from this station, the Isle of May, Cullen, and Lerwick up to mid-February. The only large flock noted was at Alticig on 28th February in snow, and in March small northward movements are reported, but Redwings were nowhere in Scotland as numerous as Fieldfares during the spring migration. Last seen at the Little Ross lantern, the Isle of May, and Foula on 13th April, and Lerwick on 15th April.

Autumn arrivals were early. The first noted is from Bathgate on 14th September, where a flock of twenty-six was seen going south. Redwings were migrating by night over Lerwick on 18th September, and six or seven were seen at Beith on 28th September. From 11th October to 25th November steady immigration took place, the period of maximum movement being from 18th October to 9th November. Towards the end of the period the southern lanterns report much activity, so probably many of these birds were but passage migrants with us, on their way to winter in milder climes.

THE RING-OUZEL, *Turdus torquatus torquatus*.—An early record comes from the Little Ross lantern, where a Ring-ouzel struck on 14th February, while on 18th March one was shot near Dunbar. From 9th to 22nd April varying numbers are reported on the Isle of May and one there on 3rd May; one was killed at the Pladda lantern on 17th April, a female was at Noss Head on 23rd April,

one at Giffnock on 24th and 25th April, and four at Noss Head on 10th May: these Noss Head birds were assuredly passage migrants, as were probably some of those on the Isle of May.

THE BLACKBIRD, *Turdus merula merula*.—From 18th to 22nd January Blackbirds are recorded from Little Ross (where many died of cold), Pladda, and Noss Head, evidently a weather movement. Steady movement, sometimes of large numbers, is reported from Little Ross (L), Rhinns of Islay (L.), and the Isle of May from 2nd February to 18th March, while on 6th March a male appeared at Noss Head. In autumn, varying numbers are noted at Pladda from 7th September to 13th October, while from 14th October till 18th November considerable immigration is reported from our Northern Isles and Noss Head. On 6th and 13th November rushes (of emigrants?) took place at the Little Ross lantern, and up to the end of that month slight spasmodic movement is noted at Pladda and Galson (O.H.).

THE WHEATEAR, *Ænanthe ðnanthe ðnanthe*.—Two males are recorded from Torrs Sandhills (Wigtownshire) on 29th March, three were seen at Dunure (Carrick) on 31st March, and Wheatears are noted at Ballaird Moor and Arthur's Seat on 1st April, and Broughton (Peeblesshire) and Braid Hills next day. After this, many arrivals at Scottish breeding-places took place, this lasting up to the end of April. From 13th April to 20th May much movement is reported from the Northern Isles, Noss Head, and the Isle of May; many of these were doubtless passage migrants, and the Wheatears which thronged round the Little Ross lantern on the nights of 2nd, 4th, 5th, and 6th May, and the male killed at the Mull of Galloway lantern on 4/5th May, may also have been passing through this country on their way to breed overseas.

Return movement is noted at the Isle of May as early as 10th July, while from 2nd August to 19th September steady records come of Wheatears on migration from stations all over Scotland, the majority being, in all probability, our own birds making their way southwards. Last seen at Cullen on 8th October, Bathgate next day, Foula on 14th, and Galson on 28th October.

Some of the above records may refer to the following subspecies.

THE GREATER WHEATEAR, *Ænanthe ðnanthe leucorrhœa*.—Passage migrants of this race are reported from Darvel and Dundee on 5th May, Noss Head on 7th, 14th, 15th, and 20th May, Dundee again on 7th, and the Isle of May on 9th, 10th, 13th, 16th, and 17th May.

Autumn passage is noted at Noss Head on 27th August, Beith on 3rd September, Girdsta (Shetland) from 9th to 13th September, Lerwick on 15th September, and Noss Head on 11th October.

THE WHINCHAT, *Saxicola rubetra rubetra*.—Is first recorded from Craigallian (Milngavie) on 27th April; on 3rd May a lot were on the Isle of May, and arrivals are noted at Aberlady on 4th May, the Mull of Galloway lantern that night, and Darvel, Summerston, Dundee, and Largo on 5th May. After this the spread was rapid and continued till 14th May. Passage migration is recorded from Noss Head from 7th to 18th May, and Whinchats on the Isle of May on 17th May may also have been passage migrants. By 23rd July movement was again observed near Dundee. Last seen Beith on 8th August, Dundee on 11th, and Tayport 17th August. Three visited Noss Head on 26th August and two were there next day, while on 8th September about a dozen on passage were seen at Possil Marsh.

THE BRITISH STONECHAT, *Saxicola torquata hibernans*.—A male and female were seen at Beith on 3rd September, one at Galson (O.H.) on 23rd October, and a male at Possil Marsh on 22nd December; these probably all belonged to the British sub-species.

THE REDSTART, *Phœnicurus phœnicurus phœnicurus*.—An early bird is recorded from the Isle of May on 22nd April, while some were at this station from 3rd to 8th May. Redstarts are reported at Melrose on 27th April, where a male was caught in a porch sheltering from a blizzard and six inches of snow were lying, Darvel on 5th May, Bathgate on 6th, Edinburgh and Aberlady on 7th May, and a passage migrant at the Muckle Flugga Rock on 5th May. Autumn movement is recorded at Beith on 13th July, the Isle of May on 17th, and Balgay (Forfarshire) on 23rd July. Departures took place during August, and a passage migrant is noted at Noss Head on the 27th of that month. Last seen Largo on 3rd September, Redmyre on 7th, and Balgay on 8th September.

THE BLACK REDSTART, *Phœnicurus ochrurus gibraltariensis*.—See p. 101.

THE REDBREAST, *Erithacus rubecula*.—A Redbreast appeared at Noss Head on 23rd February and one at the Isle of May on 10th March. A well-marked movement took place from 2nd to 14th April and another from 23rd April to 9th May; the stations recording these are the Muckle Flugga (and L.), Lerwick, Foula, Noss Head, and the Isle of May, and doubtless the records refer to the spring emigration from our shores of the Continental *E. r. rubecula*. On

7th August a Redbreast, probably one of our own *E. r. melophilus*, visited the Isle of May; some are noted at Pladda on 7th and 26th September, 13th October, and 21st November, and many at this station on 4th November. Single birds at Noss Head on 14th October and Lerwick on 18th November were probably of the typical form.

THE HEDGE-SPARROW, *Prunella modularis*.—Single birds are recorded from the Isle of May on 11th and 12th January and 2nd February, and some at the same station from 12th to 17th April, but it is impossible to say to which race these belong. One of the typical *P. m. modularis* was killed at the Muckle Flugga lantern on 6th April, and Hedge-sparrows at Noss Head on 6th May and 5th October may also have belonged to the typical form.

THE WREN, *Troglodytes troglodytes troglodytes*.—A Wren is recorded from Noss Head on 12th January, and one from the Isle of May on 21st March, while a Wren that was at the Muckle Flugga lantern at 9 P.M. on 2nd April may have belonged to the Shetland form *T. t. zetlandicus*. Some visited Pladda on 18th and 19th October, 4th November, and 18th December, and a Wren appeared at Galson on 30th October.

THE SWALLOW, *Hirundo rustica rustica*.—Early arrivals took place in 1918, a Swallow being recorded from Beith on 4th April and three at Summerston on 6th April. Thereafter no more were reported till 13th April at Tarholm (Ayr), several at Castle Kennedy (Wigtownshire) on 17th, Melrose on 19th, Kilmacolm and Broughton on 24th April. The spread was rapid after this date, and notes of arrival at breeding-places come from all over the country up to 10th May. The first note of Swallows from our island stations is from Foula on 6th May, and records of movement come from Shetland and the Outer Hebrides up to 26th May. On 24th July a Swallow was seen on the Isle of May and eastward passage was noted at Dundee, this being recorded at intervals up to 14th September. Westward movements were observed at the same station between 27th July and 29th September. By the end of August many had left the country and departures are recorded throughout September, while on 10th October one was seen at Westray (Orkney). Last seen at Bathgate on 3rd October, Beith next day, near Largo on 15th October "one flying west," and five flying south at Little Ross on 21st October.

THE HOUSE-MARTIN, *Delichon urbica urbica*.—Is first recorded from Castle Kennedy on 17th April, Bardowie, near Glasgow, and Broughton (Peeblesshire) on 27th April, Darvel and Kilmacolm

next day. After this, arrivals are noted all over the country till 18th May, by which time their breeding-haunts seem to have been occupied. Foula reports three House-martins on 6th May, and single birds are recorded from Lerwick on 20th and 29th May. On 12th and 17th July one visited the Isle of May, and eastward passage is recorded from Dundee on 27th July and 4th August, while westward passage was observed at this station between 18th August and 22nd September. By 9th September the great majority of this species had left us. Last seen at Swordale (E. Ross) on 16th September, Cullen on 19th, near Dundee on 29th September, and Largo on 4th October.

THE SAND-MARTIN, *Riparia riparia* ^s *riparia*.—The earliest records come from Summerston on 6th April, Dunragit, Old Luce, on 10th, and Beith on 13th April. Thereafter, arrivals are reported from many parts of Scotland up to 13th May. Autumn movement is noted from Invergowrie on 14th July, and westward passage at Dundee between 20th July and 4th August. Last seen Dundee on 11th August, Beith on 6th September, Largo on 9th, and Broughty Ferry on 13th September.

THE SWIFT, *Apus apus apus*.—Is first recorded from Little Ross on 3rd May, Kilmacolm and Wigtown on 6th, Melrose and Morningside on 8th, Darvel, Beith, Dundee, and Broughton on 11th May. Arrivals at breeding-places continued up to 18th May; some were at the Isle of May from 20th to 22nd May, and one at Foula on 6th June. Autumn movement is first noted on 17th July, and westward passage is reported at intervals from Dundee between 24th July and 22nd August. The majority of Swifts had left for warmer climes by mid-August. Last seen Beith on 18th August, Largo on 25th August, Morningside Park on 2nd September, Broughty Ferry on 9th September, Muirend (Glasgow) on 11th September (1. 1918, 273), Noss Head on 20th September, Edinburgh on 25th September (2. xii. 160), Newlands (Glasgow) on 13th October (1. 1918, 273).

THE NIGHTJAR, *Caprimulgus europæus europæus*.—Single birds are recorded from Corsemalzie on 18th May, and Kilchattan Bay (Bute) next day, and a pair and two immature birds on the moor at Corsemalzie on 30th August.

THE BRITISH GREAT SPOTTED WOODPECKER, *Dryobates major anglicus*.—A pair of Great Spotted Woodpeckers, probably belonging to this race, were seen at Possil Marsh on 24th and 29th April, and not on any subsequent occasion.

THE WRVNECK, *Jynx torquilla torquilla*.—The only record is of one at Noss Head on 26th August.

THE CUCKOO, *Cuculus canorus canorus*.—Is first noted at Tarholm (Ayr) on 19th April, Dullatur on the 21st, and Corsemalzie on 22nd April, after which many records of arrival come from all over Scotland up to 14th May. Last heard at Beith on 26th June, Corsemalzie next day, and Kilmacolm on 30th. Young birds were seen at Castle Loch (Wigtownshire) on 16th July, the Isle of May on 26th, and Noss Head on 28th July, and Bathgate on 1st August.

THE SNOWY OWL, *Nyctea nyctea*.—See p. 101.

THE LONG-EARED OWL, *Asio otus otus*.—A bird of this species visited the Isle of May on 21st April.

THE SHORT-EARED OWL, *Asio flammeus flammeus*.—On 24th January a Short-eared Owl was flushed just above high-water mark at Aberlady, and one was seen at Glenling (Mochrum) on 13th March, while on 11th September three were observed at Corsemalzie, one on a stook of corn, the other two in the heather.

THE PEREGRINE, *Falco peregrinus peregrinus*.—Single birds are recorded repeatedly from Noss Head and Lerwick during the first quarter of the year.

THE MERLIN, *Falco columbarius aesalon*.—Single birds are noted at the Isle of May on 12th April, Noss Head on 27th August and 12th September, and Pladda on 2nd October. Between 14th October and 19th November there are frequent records from Noss Head and Galson.

THE KESTREL, *Falco tinnunculus tinnunculus*.—Two Kestrels are reported from Lerwick on 27th January, and single birds from Noss Head on 3rd and 23rd February, Lerwick on 14th April, North Unst on 15th May, and the Isle of May next day. Return movement is noted at this last station on 9th August, and up to the end of November notes of small numbers come from many of our island stations.

THE GOLDEN EAGLE, *Aquila chrysaetus chrysaetus*.—One is recorded from Glen Trool (Kirkcudbright) on 2nd and 4th December (i. 1919, 48).

THE ROUGH-LEGGED BUZZARD, *Buteo lagopus lagopus*.—See p. 101.

THE BUZZARD, *Buteo buteo buteo*.—A Buzzard visited Corsemalzie (Wigtownshire) on 15th December.

THE HEN-HARRIER, *Circus cyaneus*.—See p. 102.

THE SPARROW-HAWK, *Accipiter nisus nisus*.—One is recorded from Noss Head on 27th August.

THE WHOOPER SWAN, *Cygnus cygnus*.—On 15th January seven were seen flying east over Vally (O.H.); ten Swans, probably this species, at Lerwick on 17th January, several at Kenmure Marsh (Cadder) on 27th and 28th February, while on 2nd March three adults and three immature birds arrived at Possil Marsh where they stayed till 7th April, when they left at 11.50 A.M. going due north. On 13th and 14th March Swans were migrating at night at Lerwick, while on 18th March another party of one adult and two immature birds arrived at Possil Marsh, leaving again at 5 P.M. on 21st March going east. A single Whooper was seen at Vally (O.H.) on 24th May, and on 24th August two flew over this station. From 16th October to 16th November passage of Swans was noted at our stations in Orkney and the northern mainland; on 29th October two Swans were recorded at Little Ross going north-west and six flying up the Dee on 13th November, while on 18th November a flock of twenty-six Whoopers was seen off Crook Shore (Wigtown Bay). From 23rd November to 4th December there are many records from our Outer Hebridean stations.

BEWICK'S SWAN, *Cygnus bewickii bewickii*.—From 11th to 15th March five were on Possil Marsh (1. 1918, 102).

THE GREY-LAG GOOSE, *Anser anser*.—A flock of five hundred is reported in Wigtown Bay on 19th February, while by 21st July this species had returned to the low ground after breeding at Vally (O.H.). On 10th September a flock of seventeen had arrived in Wigtown Bay, while by 1st October great numbers were at that station. A good deal of movement is recorded between 23rd September and 11th November, chiefly from North Ronaldshay and Galson (O.H.). Under the title of "Geese" or "Grey Geese" northward movement is recorded steadily from stations in all parts of Scotland between 18th March and 21st April; five were seen at Lerwick on 3rd September, and return migration was observed in some numbers from 16th October to 29th November.

THE WHITE-FRONTED GOOSE, *Anser albifrons*.—On 15th January a flock of twenty was seen flying west at Vally, and on 7th May at the same station about 8 A.M. a flock of eighty was observed going west, and another large flock going due north at mid-day. On 27th September a White-fronted Goose is reported from North Ronaldshay, two at Galson late in September, a flock of twenty-

four at Portmahomack on 21st October, some on the Beaully Firth on 18th November, and flocks at Galson on 3rd and 5th December.

THE BEAN GOOSE, *Anser fabalis fabalis*.—Four visited Corsemalzie on 21st December.

THE PINK-FOOTED GOOSE, *Anser brachyrhynchus*.—One is recorded from the Beaully Firth on 18th November.

THE BARNACLE GOOSE, *Branta leucopsis*.—A flock of thirty were seen flying due north at Vallay on 7th May, and by 12th October return movement is noted at the same station. After this, there are records of arrival of Barnacles from Vallay, Galson, and the Beaully Firth throughout October.

THE BRENT GOOSE, *Branta bernicla bernicla*.—A Brent Goose was seen in Largo Bay on 20th January, and a flock of twenty-five at Vallay (O.H.) on 22nd January. The last of the Brents left the Cromarty Firth on 29th May, and nine were seen going south at North Ronaldshay on 13th November.

THE SHELD-DUCK, *Tadorna tadorna*.—The full breeding numbers had arrived at Kingoodie Marshes, west of Invergowrie, by 2nd February, "a full month before their usual time"; six Sheld-duck were seen at Vallay on 19th February, and two at Noss Head on 6th May. On 11th October we have the note "Not one to be seen on the merse-lands (Wigtown Bay), often thousands."

THE MALLARD, *Anas platyrhynchos platyrhynchos*.—Unusually large numbers were seen in Largo Bay on 20th January, and about two hundred had returned to the Tay Estuary on 4th August.

THE GADWALL, *Anas strepera*.—One was shot on Bardowie Loch on 7th January.

THE TEAL, *Anas crecca crecca*.—A flock is recorded on Redmyre Loch on 15th April, and arrivals at Vallay (O.H.) on 14th and 25th September. On 23rd October about sixty were on Loch Chesney and large flocks on the loch at Galson on 15th November and 3rd December.

THE WIGEON, *Anas penelope*.—Had almost all left Vallay by 1st April, while on 18th April about a score were on Threipmuir Reservoir, Pentlands. On 20th July a pair were flushed at the Castle Loch (Mochrum); one was shot on Mugdrum Island on 1st August, arrivals are reported at Vallay on 24th September, and on 1st October thousands were feeding beside the Cromarty Firth.

THE PINTAIL, *Anas acuta*.—A flock of forty are recorded from Wigtown Bay on 19th February, a pair from Possil Marsh on 5th May, and about a dozen on the Dornoch Firth on 21st October.

THE SHOVELLER, *Spatula clypeata*.—A pair are recorded from Redmyre Loch on 15th April and 12th October, a drake there on 25th May and a duck on Loch Chesney (Wigtownshire) on 23rd October.

THE POCHARD, *Nyroca ferina ferina*.—The winter flock on the Tay Estuary dwindled gradually till 17th February, when the last was seen, while a flock was observed on Redmyre Loch on 23rd March, and a pair on Mochrum Loch on 15th May.

THE TUFTED DUCK, *Nyroca fuligula*.—Up to 23rd March drakes predominated largely at Redmyre, but by 15th April the ducks there were twice as numerous as the drakes. Last seen on the Tay Estuary on 25th April, while on 4th May a drake was observed on the Forth at Aberlady. On 27th August a Tufted Duck appeared on Balhousie Reservoir near Largo, while on 12th October all had left Redmyre.

THE SCAUP, *Nyroca marila marila*.—Big flocks are noted in Largo Bay (where there usually are none) on 20th January and 3rd February, and numbers arrived at Little Ross on 11th October.

THE GOLDENEYE, *Bucephala clangula clangula*.—Is reported pretty steadily from east coast stations up to 31st March; a female was seen repeatedly on the Tay Estuary up to 7th May, and an apparently adult male on Castle Loch (Mochrum) on 20th May. On 5th October a Goldeneye was on Morton Loch (N. Fife), and several on the Tay Estuary on 20th October, while great numbers were seen on the Deveron on 23rd December (i. 1919, 50).

THE LONG-TAILED DUCK, *Clangula hyemalis*.—Was last seen at Cullen on 19th March and Boyndie Bay on 29th April, while the earliest autumn records are from Vallay on 16th October and Tarbatness next day.

THE EIDER, *Somateria mollissima mollissima*.—Great numbers arrived at Whalsay Skerries on 20th April, the Isle of May next day, Largo Bay on 5th May, and Lerwick on 14th May. Large flocks are again recorded on 21st September in the Tay Estuary, 26th September at Whalsay Skerries, and 3rd November at North Ronaldshay.

THE COMMON SCOTER, *Oidemia nigra nigra*.—A female was shot at Darsnag Flow (Corsemalzie), quite six miles inland on 29th

March. "She rose out of the heather some 200 yards from water and flew strongly; weather not stormy." On 5th May there were still many in Largo Bay, and great numbers in the Dornoch Firth on 2nd August, while on 29th September some were seen off the Isle of Whithorn.

THE GOOSANDER, *Mergus merganser merganser*.—Eight were observed on the Tay Estuary on 26th January, and a female at Aberlady on 4th May. At least twenty in the Tay Estuary on 20th October, several in the Beaully Firth on 6th December, and great numbers on the Deveron on 23rd December (r. 1919, 50).

THE MERGANSER, *Mergus serrator*.—Last seen in the Tay Estuary on 25th April, a pair at Aberlady on 4th May, and a pair at Noss Head on 8th May. By 20th October several had returned to the Tay Estuary.

THE CORMORANT, *Phalacrocorax carbo carbo*.—First seen on 25th March crossing the moor at Corsemalzie from its inland nesting-place. Last seen in the Tay Estuary on 9th May.

THE SHAG, *Phalacrocorax graculus graculus*.—One was seen on a dam $1\frac{1}{2}$ miles inland at Cullen on 2nd February, and on 10th March a pair returned to nest on the Isle of May.

THE GANNET, *Sula bassana*.—Early records come from the Isle of May on 20th January and Eyemouth on 9th February. On 17th October about a dozen were seen off Tarbatness and one at Pladda on 15th December.

THE STORM PETREL, *Hydrobates pelagicus*.—Two are recorded from Noss Head on 9th February, and one from that lantern at 2 A.M. on 5th September.

LEACH'S FORK-TAILED PETREL, *Oceanodroma leucorhoa*.—See p. 102.

THE GREAT CRESTED GREBE, *Podiceps cristatus cristatus*.—There are a good many records from the Forth and Tay Estuaries up to 5th May. A pair was seen on Possil Marsh on 17th March, and an arrival is recorded at Redmyre Loch on 23rd March. Returns to salt-water are noted by 31st October.

THE LITTLE GREBE, *Podiceps ruficollis ruficollis*.—One arrived at Balhousie Reservoir, near Largo, on 23rd March and its mate two days later; they subsequently bred there.

THE GREAT NORTHERN DIVER, *Colymbus immer*.—Is recorded from Kyleakin up to 5th May, Baltasound on 17th June, and an

immature bird near Wick on 24th July. From 19th October to 17th November there are a good many records of the arrival of this bird round our shores, and on 20th November one was caught on Earnscleugh water, a tributary of the Leader (1. 1919, 29).

THE BLACK-THROATED DIVER, *Colymbus arcticus*.—One in half plumage was seen in Largo Bay on 5th May.

THE WOOD-PIGEON, *Columba palumbus palumbus*.—Large flocks are reported from various mainland stations up to 9th March. Two Wood-pigeons visited Lerwick on 9th April; single birds are noted at the Isle of May on 8th and 13th May and the Island of Noss on 9th May, and some were seen at Baltasound on 17th June, evidently all passage migrants.

THE STOCK-DOVE, *Columba oenas*.—Returns to breeding-places are noted in April.

THE OYSTERCATCHER, *Hematopus ostralegus ostralegus*.—Many Oystercatchers were at the Little Ross lantern on 2nd February and several at the Rhinns of Islay lantern on 4th March, while from the latter date to 25th April returns to breeding-places are recorded from Orkney and Shetland and from inland stations on the mainland. On 23rd June a flock of a dozen were seen in Largo Bay, a big flock on the Dornoch Firth on 17th July, and Oystercatchers were seen on 17th August about ten miles inland, near Beith, where they are rare.

THE DOTTEREL, *Charadrius morinellus*.—On 2nd August a Dotterel visited the Isle of May lantern.

THE RINGED PLOVER, *Charadrius hiaticula hiaticula*.—On 23rd July a flock of twenty-nine were seen flying low to the south, in mist, at Loch Elrig (Wigtownshire).

THE GOLDEN PLOVER, *Charadrius apricarius*.—Much movement is recorded from our southern stations and lanterns from 13th January to 2nd February; about fifty appeared at Noss Head on 2nd March and several rushes are reported from the Little Ross lantern between 2nd and 18th March. On 27th April a flock of about a hundred were seen near Pittenweem, and a flock of twenty-one at Corsemalzie on 24th May, these flocks being probably en route for breeding localities to the north of these islands. By 18th June flocking after breeding is noted at Kirkmichael, and returns to the shore are recorded during July and early August. From 11th September to 4th November a large movement took place, apparently chiefly arrivals of immigrants from overseas; Golden

Plover visited the Pladda lantern on 22nd November and large numbers are reported from this station on 18th December, and North Ronaldshay two days later.

THE GREY PLOVER, *Squatarola squatarola*.—A single bird is recorded from the Dornoch Firth on 21st October.

THE LAPWING, *Vanellus vanellus*.—From 13th January to 11th February much Lapwing movement took place at the lanterns of Little Ross, Pladda, and the Rhinns of Islay, and records come from the Isle of May on 21st and 27th January, and the Noss Head lantern on 25th January. During this period also returns to breeding-places are reported, so the movement may have been chiefly that of our own breeding birds. Another phase of movement is recorded from 1st to 28th March, chiefly from stations in the northern mainland and islands, though the Little Ross lantern and the Isle of May (and L.) also report numbers of Lapwing; some of these may have been passage migrants, while others were, doubtless, taking up their summer quarters in the north of our area. Three Lapwings visited the Isle of May on 14th April, and two on 2nd June, and one was on the Muckle Flugga rock on 24th April. Flocks of thirteen were seen at Penninghame on 29th May, of thirty at Kirkmichael on 9th June, and of fifty at Loch Elrig (Mochrum) on 11th June, and much flocking and many returns to the shore are reported from 11th July to the end of August. Throughout September and October much immigration is reported from stations in the north and east, while from 30th October to 28th November some emigration is noted at our southern stations.

THE TURNSTONE, *Arenaria interpres interpres*.—Is reported from Largo Bay and the Isle of May up to 23rd June, while early returns are noted at Easthaven (Forfar) on 25th July, and Noss Head on 29th July.

THE RUFF, *Philomachus pugnax*.—One was shot on Tiree in August.

THE SANDERLING, *Crocethia alba*.—Some Sanderling were at the Little Ross lantern on 18th March and three in winter plumage in Largo Bay on 5th May. On 17th July a party of about fifteen adults and young, and two other small parties of adults in breeding-dress, were seen in the Dornoch Firth, about a dozen adults and young near Wick on 24th July, and a lot at the Little Ross lantern early on 6th August.

THE KNOT, *Erolia canutus*.—Several were at the Little Ross lantern at 1 A.M. on 20th January, and great numbers there at 1.30 A.M. on 18th March. By 25th July a Knot had returned to Easthaven and many were at the Little Ross lantern on the morning of 6th August.

THE DUNLIN, *Erolia alpina alpina*.—Rushes took place at the Little Ross lantern each night from 3rd to 6th May, and two Dunlin were at Noss Head on 13th May. On 23rd July small flocks were flying south over Loch Elrig in mist, a flock was seen at Easthaven (Forfar) on 25th July, and great numbers were at the Little Ross lantern from midnight to dawn on 6th August.

THE CURLEW SANDPIPER, *Erolia ferruginea*.—Three were at Castle Loch, Mochrum, on 9th August, two were shot near Carscathorn (Kirkcudbright) on 19th September (1. 1918, 267), and one to three were seen at Morton Loch, N. Fife, on several occasions between 29th September and 27th October.

THE PURPLE SANDPIPER, *Erolia maritima maritima*.—Is reported from Lerwick up to 5th April, and Noss Head on 14th May, while three were seen at Broughty-Ferry on 23rd July.

THE COMMON SANDPIPER, *Tringa hypoleuca*.—Is first recorded from Corsemalzie and Melrose on 20th April, Milngavie next day, Beith on the 22nd, and Killermont, Tarholm (Ayr), and Berwick-on-Tweed on 24th April. After this many notes of arrival come up to 8th May. By 13th July return movement is noted at Carnoustie, and steady migration is reported up to mid-August; last seen near Newport (Fife) on 17th August and Beith on 29th August.

THE GREEN SANDPIPER, *Tringa ochropus*.—See p. 102.

THE REDSHANK, *Tringa totanus*.—Several were killed at the Little Ross lantern at 1 A.M. on 20th January, and many returns to breeding grounds took place between 24th February and 23rd March, while a rush occurred at the Little Ross lantern early on 18th March. By 25th July a flock of about thirty was seen at Carnoustie.

THE GREENSHANK, *Tringa nebularia*.—Two are recorded from the Cromarty Firth on 28th June, five flying low to the south, in mist, at Loch Elrig on 23rd July, and one at Broughty-Ferry on that date and 20th September.

THE GREY PHALAROPE, *Phalaropus fulicarius*.—See p. 102.

THE RED-NECKED PHALAROPE, *Phalaropus lobatus*.—A pair returned to their breeding-place on 12th May.

THE BAR-TAILED GODWIT, *Limosa lapponica*.—Three were shot in the Orkneys about mid-December (2. xii. 280).

THE CURLEW, *Numenius arquata arquata*.—Rushes are recorded at the Little Ross lantern each night from 2nd to 6th February, and returns to inland breeding-places took place from 7th to 17th February. A large movement is recorded chiefly from the Little Ross lantern, but in a minor degree from Noss Head, Whalsay Skerries, and the Rhinns of Islay lantern between 4th and 18th March, and a good many Curlew were at the first named lantern on 12/13th April. Flocking is reported from Kirkmichael on 13th June, and movement to the coast is subsequently noted. Great numbers were at the Little Ross lantern during the morning hours of 6th August, and a good deal of movement is reported from coast and island stations up to 27th October.

THE WHIMBREL, *Numenius phaeopus phaeopus*.—Was seen in Luce Bay on 18th April, Vallay (O.H.) on 7th May, and Noss Head on 10th May, after which a good deal of movement is noted up to 21st May. Considerable migration is noted in autumn from stations all over Scotland from 10th July to 15th September, the first and last dates coming from Noss Head.

THE SNIPE, *Gallinago gallinago gallinago*.—One was killed at the Pladda lantern at 4 A.M. on 14th January, and single birds were at the Isle of May on 12th March and 23rd and 26th July. A small arrival is recorded at Vallay (O.H.) on 2nd October, and two or three Snipe at Pladda on 17th October and 4th November.

THE JACK SNIPE, *Limnocryptes gallinula*.—Last seen Corsemalzie on 13th March. Seven were at Loch Chesney (Wigtown) on 23rd October, and single birds at Noss Head on 25th October and Galson on 2nd December.

THE WOODCOCK, *Scelopax rusticola*.—A weather movement to coast and island stations took place in January, and some Woodcock were on the Isle of May on 1st April. A considerable immigration took place between 4th October and 16th November and is recorded from many of our island and some mainland stations.

THE BLACK TERN, *Hydrochelidon nigra nigra*.—See p. 102.

THE SANDWICH TERN, *Sterna sandvicensis sandvicensis*.—Is first reported from Luce Bay on 22nd April, Largo Bay on 5th May, and Noss Head on 14th May. Last seen Noss Head on 28th August, and Largo Bay on 16th September.

THE COMMON TERN, *Sterna hirundo*.—Is noted at Aberlady on 4th May, and Harelaw Dam, Neilston, Tay Estuary, Luce Bay, and Largo Bay next day. Further arrivals are recorded up to 26th May. Autumn movement had begun by 11th August, last seen Tay Estuary on 21st September, and off the Isle of Whithorn on 29th September.

THE ARCTIC TERN, *Sterna paradisæa*.—Is first recorded at Noss Head and Craigmore (Bute) on 11th May, Lerwick and Vallay on 17th May, and arrivals at breeding stations are noted up to 25th May. Most had left Whalsay Skerries by 12th August, last seen Noss Head on 28th August, Westray on 1st September, and Lerwick two days later.

THE LITTLE TERN, *Sterna albifrons albifrons*.—Arrived at Vallay (O.H.) on 17th May.

THE BLACK-HEADED GULL, *Larus ridibundus*.—Arrivals at breeding-places are noted from 23rd March to 15th April, and some were on the Isle of May on 19th and 23rd May. By 19th June flocking and return to the shore are recorded from several stations.

THE COMMON GULL, *Larus canus canus*.—Was arriving at its nesting-places by 21st March, though adults were seen in the Tay Estuary up to 12th May.

THE LESSER BLACK-BACKED GULL, *Larus fuscus*.—A bird of this species (subsp?) is recorded from the Tay Estuary on 16th February. What were undoubtedly arrivals of our *L. f. affinis* are reported from Glasgow harbour on 10th March, and from various other stations up to 19th April, while on 30th April two *L. f. affinis* and one *L. f. fuscus* were noted in the Tay Estuary.

THE GLAUCOUS GULL, *Larus hyperboreus*.—Some frequented Lerwick in January and records come from North Unst on 22nd September, Lerwick on 13th October, and North Ronaldshay on 23rd November.

THE ICELAND GULL, *Larus leucopterus*.—Single birds are noted at Reay, Caithness, on 4th January, Noss Head and Lerwick on 12th January, Noss Head on 12th September, 28th October, 9th

November, 2nd and 3rd December off Scapa Flow (z. xii. 190 and xiii. 62), and Galson on 4th December.

THE IVORY GULL, *Pagophila eburnea*.—See p. 102.

THE GREAT SKUA, *Stercorarius skua skua*.—Arrivals are recorded from North Unst on 1st April and Foula on 7th April; last seen at North Unst on 19th September.

THE ARCTIC SKUA, *Stercorarius parasiticus*.—Arrived at Foula on 26th April, and one was seen at Noss Head on 16th May. Two at Port Errol (Aberdeenshire) on 7th September (1. 1918, 274), three off Tentsmuir Point on 21st September, and one off the Isle of Whithorn on 29th September.

THE RAZORBILL, *Alca torda*.—Many were found dead at Aberlady after a gale from the north on 24th January, and some had returned to the Isle of May by 1st April; left their breeding cliffs during the second week of August.

THE GUILLEMOT, *Uria troille troille*.—Many found dead with Razorbills at Aberlady on 24th January, and returns to the Isle of May are noted about mid-March, while up to 7th May "individuals and pairs all in winter plumage" were seen in the Tay Estuary. Leaving their breeding cliffs at the same time as the Razorbills, and on 5th October a Guillemot was found near Carstairs Junction (1. 1919, 28).

THE LITTLE AUK, *Alle alle*.—From 20th January to 3rd February there are a good many records of Little Auks about Largo, and on 24th January after a northerly gale many were found dead at Aberlady. On 24th March one was found newly dead in Largo Bay.

THE PUFFIN, *Fratercula arctica arctica*.—Arrivals are noted from the Isle of May on 1st April, and Whalsay Skerries on 26th April. The Puffins left the cliffs at Noss Head on 13th August, North Unst and Whalsay Skerries on 20th August.

THE CORNCRAKE, *Crex crex*.—First recorded from Tarholm (Ayr) on 19th April, Netherlee (Cathcart) on 25th April, Clarkston and Neilston next day. After this the spread was rapid, and arrivals are recorded steadily up to 20th May from mainland and island stations alike. Last seen Beith on 11th August, while a belated straggler was shot at Possil Marsh on 13th November.

THE WATER RAIL, *Rallus aquaticus aquaticus*.—Single birds are reported from Noss Head on 12th January and 24th October, and from Little Ross on 16th November.

THE COOT, *Fulica atra atra*.—One is recorded from the Isle of May on 23rd May.

THE RED GROUSE, *Lagopus scoticus*.—A Red Grouse visited Noss Head on 15th and 16th January.

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[SEPT.-OCT.]

SOME BIRD NOTES FROM SOUTH UIST.

By DONALD GUTHRIE.

AS I was keeper on South Uist for twenty-two years, from 1883 to 1905, and took a great interest in birds while I was there, I think some of my notes may interest the readers of *The Scottish Naturalist*. South Uist is about 18 miles long by 6 wide; roughly speaking there are close on 300 lochs large and small, as well as many marshes, which make an ideal home for water-fowl and waders. Many of the lochs have ruins of ancient dwellings, some in a good state of preservation, others under water but plainly visible on a clear day, and the zigzag pathway of large stones can easily be seen; the same applies to the marshes. There are large mounds on the Atlantic sea-board which were also inhabited, and the shells are still to be seen lying about on which the people lived. I knew a very strange underground dwelling on a lonely moor, with an artificial tunnel or drain built of flags leading into it; in this case also a great many shells were to be seen. The land in South Uist is, on the whole, of very poor quality, but the Atlantic sea-board, after getting a liberal coating of seaweed every year, grows wonderfully fine barley, rye, and black oats, also first-rate potatoes when the proper seed is used.

The following notes are from observations made during my stay on the island:—

THE RAVEN.—The Raven is truly a native of the

Outer Hebrides, many nesting, often in company with the Peregrine Falcon, in the wild cliffs overhanging the Minch, where it is very difficult to get at them. It is marvellous how Ravens find out a dead carcass; early one morning I saw a large heifer just being blown ashore by a westerly gale. I walked home about a mile, had breakfast and went back, by which time about thirty Ravens had already gathered round the carcass.

A tame Raven we had at Grogarry was a wonderful weather prophet, before a storm, even if the night were fine, we could not keep him out of the kitchen window, but if fine weather was coming on he always slept on the chimney top.

THE CARRION CROW.—This bird is rare in the Hebrides, but I have found its nest once in Barra Sound and once on South Uist hill. It is an inveterate egg poacher and should get no quarter.

THE HOODED CROW.—The Outer Hebrides may be considered the home of this most destructive bird; it stays with us all the year round, but a great influx of migratory birds takes place every autumn, arriving from the north in thousands. We waged continual warfare against the Hoodies, and had the resident birds fairly well in check, as we knew their haunts, but the migratory birds arrived in such numbers you might as well try to stop the tide as contend with them. Our Hoodies nested on cliffs under long overhanging heather, and on small islets on the moorland lochs where they thought they were safe from persecution.

THE JACKDAW.—This bird appeared occasionally in winter in very small numbers, but never stayed long.

THE ROOK.—The Rook is very rare in South Uist, and can only be classed as a visitor. Strange to say, a good many years ago, when that severe gale took place which destroyed so many plantations in Scotland, a flock of about fifty Rooks came to the island and stayed from November to February, roosting in the shrubbery round Grogarry Lodge.

THE STARLING.—Is exceedingly numerous, feeding on

the plains and along the sea coast, especially among the decayed seaweed and sleeping among the tall reeds in the different marshes. They nest in holes in certain rocks on the hills and as colonies on the face of some of the cliffs, also about farm steadings, etc., as on the mainland.

THE FIELDFARE.—This well-known migratory bird arrives here in late October and early November, always along with Redwings and Blackbirds. They swarm all over the fields, sheltering along the old stone walls and leave again in March and April.

THE DIPPER.—This bird is a native of South Uist frequenting the wild lakes and streams, even those that contain no fish of any description.

THE CUCKOO.—Arrives at the beginning of May and frequents the same haunts year after year.

THE SHORT-EARED OWL.—Breeds freely with us and stays all the year round; it nests in long heather in quiet unfrequented corries, very often on the same kind of ground as selected by the Hen Harrier, but occasionally about old ruins, where mice, voles, and rats are abundant. I once found a nest on the north side of Ben More, South Uist, containing an egg, a young bird about three or four days old and another just casting off the down and growing feathers. I went back a few days later, found the egg hatched and the three different sized birds in the nest, where they all stayed until fit to fly. Although I have seen many Owls' nests, I have never seen such irregularity in the young of the same nest.

THE SNOWY OWL.—I have only once seen this handsome bird in the Outer Hebrides, it was procured and is now in Sir Reginald Cathcart's collection.

THE HEN-HARRIER.—The Hen-Harrier is a resident, but most plentiful in the breeding season as few stay during the winter. They nest on the hills in wild unfrequented corries, with long rank heather, they feed chiefly on mice, rats, and voles, occasionally they kill Grouse, but very rarely. They hunt the same ground regularly about the same hour every day, skimming low over the turf dikes, ditches, small marshes and cornfields. Sometimes they kill

young rabbits, skinning them beautifully before eating them, pulling the skin from the snout towards the tail.

THE GOLDEN EAGLE.—Seen here at all seasons, although I have never found its nest, it depends on the rabbits for food as the high hill tops, especially Carrodale, Hecla and Ben More, are green with cairns that are full of rabbits. There are no hares on the island, but the rabbits make a good substitute for what is, in my experience, their principal food on the mainland.

THE WHITE-TAILED EAGLE.—This handsome bird was well known in the Hebrides, but I am sorry to say is now very rare, and to all appearance will soon be extinct. John Lamont, who was keeper in South Uist for fifty years, told me, when he first remembers the island, the eagle nested there freely.

SPARROW-HAWK.—I have only once seen this bird on South Uist.

THE ICELAND FALCON.—The only Iceland Falcon I have seen in the Outer Hebrides was sent to me by a man from Benbecula, but was too far gone to be preserved.

THE PEREGRINE FALCON.—The Peregrine breeds freely on the wild and often inaccessible cliffs overhanging the Minch. This bird takes a terrible toll of Curlew, Plover, Mallard, Wigeon, Grouse and Woodcock, and will even attack the large and powerful Greylag Goose. It is very destructive, killing for killing's sake, especially in autumn and winter. I often thought that it was the old birds teaching the young, as so many were beheaded and otherwise left untouched. The Peregrine is not so destructive to Grouse here as on the mainland, as there are so many other birds to fall back on.

THE MERLIN.—Like the Peregrine this bird is resident here, breeding freely; it is also to be seen in the winter, when it is destructive to Snipe and Woodcock. Once I saw a Merlin knock down a cock Grouse. It nests in long heather, very often on the top of a small rock or boulder, the male is always on the watch, giving a shrill whistling cry to warn the female, and both are very bold in defence of their eggs or young.

THE KESTREL.—The Kestrel remains in South Uist all the year round, depending chiefly for food on the land Voles which are to be found all over the moors. Occasionally the Kestrel will pick up a small Grouse, but it is no match for the old cock Grouse when he is on the watch.

THE CORMORANT.—This bird is common in the Outer Hebrides, nesting on the wild cliffs along the eastern seaboard, sometimes it takes to fishing on the inland lochs, and then is even more destructive than the Merganser, owing to its great size and gluttonous nature. During one winter, many years ago, I found many Cormorants dead or unable to fly right up on the hills by the small streams, and noticed a great scarcity for two or three years after. This is the same with all kinds of birds according to my observations; as soon as any species gets exceedingly numerous there is certain to be a reaction, though this has perhaps been less noticed in other species than in the case of Grouse.

THE SHAG.—The Shag is common along the sea coasts, it seldom goes inland to fish on fresh-water lochs, but if the water is brackish and connected with the sea it swims in with the tide and out to sea with the ebb. Some years it is extraordinarily numerous; the natives sometimes eat it, burying the bird for a few days before cooking it, but even then it is not very palatable.

THE GANNET.—Frequents the Hebrides all the year round, and a great many dead birds are left on the shore after a storm, presumably old birds, unable to weather the terrible seas. The fishermen call the Gannet "the white bird," and it is a great favourite with them, as it always finds the herring shoals, helping them to set their nets in the proper places.

THE GREY LAG GOOSE.—This Goose is par excellence *the* bird among wild-fowl, for size and quality and for the excellent sport they afford. The wariness of the Grey Lag baffles description and I know no bird whose sense of smell is so keen except the Raven. South Uist is their favourite breeding resort; their nesting places are on the small islets on the wild moorland lochs, these being covered with long

heather, bracken, bushes, etc., which makes them ideal nesting quarters for Geese, Duck, and other birds. The Grey Lag lays from five to seven eggs, and the male is always in attendance on the female during incubation and will attack any bird or beast that comes near, routing even the Great Black-backed Gull. When the young are hatched they are taken out immediately to feed on the grass; the female leading and the male behind, guarding the pretty little balls of green and yellow fluff which waddle along between them. Then they are taken to the water, where the same formation is observed. The young grow like magic; in about a fortnight they are long-legged and ungainly, and continue to be so till they are fully feathered, which is not till September, when the broods form into large flocks or skeins. The geese are very easily domesticated. I set seven eggs under a hen and they all hatched out; the young did not breed or roam about much the first year, but the second year three of the females nested and hatched their young. Two bred near the house, but the other disappeared for weeks; then one morning we noticed two geese on the loch with seven young but thought they were regular wild ones, till my wife went out to feed the poultry, when the female took her brood up to feed among the others as if nothing had happened. The gander was a wild one, but by the third day he was feeding along with the hens quite close to my wife.

BEAN GOOSE.—Bean Geese are very rare in the Outer Hebrides, but I have shot one or two in South Uist.

THE WHITE-FRONTED GOOSE.—Is a winter visitor to South Uist, arriving about the middle of October and remaining till April; they feed in wet marshes on certain kinds of roots and weeds. White-fronted Geese are not quite as difficult to stalk as the Grey Lag, as they do not keep a sentry so regularly, but depend very much on small birds to warn them of approaching danger. They have increased extraordinarily in South Uist, the first three years I was there they were very rare, and in a few years' time came in thousands.

(To be continued.)

THE COLLECTION AND PRESERVATION
OF DIPTERA.

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

Concluded from page 61.

PRESERVATION.

The preparation of flies for their permanent place in the collection is an extremely simple process. It consists merely of the three operations of pinning, staging, and labelling. In the pinning of Diptera it is extremely desirable to use the finest pin possible, otherwise the all-important bristles may be seriously damaged or rendered difficult of observation, and for all but the largest species No. 20 of Messrs D. F. Tayler & Co.'s series of entomological pins is the most generally useful. For specimens the size of a Bluebottle and upwards No. 7 of the same makers is quite large enough; while on the other hand for the tiny midges and the like it is necessary to use the finest pins procurable, preferably those of silver wire made for Microlepidoptera. In the writer's experience gilt pins have proved of little advantage, but a carefully enamelled black pin has a neat appearance and prevents the formation of verdigris. The pin should in every case be thrust through the thorax, and either through the dorsal (upper) surface or one of the sides. Certain advantages accrue to each method, but in the writer's opinion the balance is in favour of side-pinning. After a long experience it has been found that pinning the fly through the *left* side, the pin entering the thorax immediately in front and at the level of the attachment of the left wing is the best, generally speaking, the pin emerging at a corresponding spot in the right side. The fly is then carefully pushed up the pin until only about a sixteenth of an inch is left projecting above. The head of the pin (if it has one) may be carefully cut off with a pair of wire cutters, which must be of thoroughly good quality and sharp enough to cut the pin without jolting the insect, otherwise a precious head or limb may be lost in the operation. The flies to be pinned should be strewn over

a folded sheet of clean white blotting-paper, and since this forms a soft pad, while many of the dead flies when emptied out of the killing-bottle fall naturally on their sides, it is an easy matter to pierce them in the proper place without lifting them from the paper, and sufficiently deep to penetrate one or even both sides of the thorax. To hold the pins securely either for the pinning operation or on any subsequent occasion a pair of well-made curved entomological forceps is necessary, while for sliding the insect up the pin a pair of fine straight forceps should also be used, closing them on the pin (but not gripping it) near their points and below the fly. By pushing the pin as it is held in the right hand (by the curved forceps) between the adjacent points of the fine pair, held in the left, the fly is gently and carefully slid up into the desired position, and is then ready for "staging." The staging operation, which is a necessity arising from the use of fine pins (and advisable in all cases, even where the pin is fairly stout), consists in pushing the fly-carrying pin through one end of a small "stage" or carrier of cork or other suitable material, while through the other end is pushed a much stronger pin which is to be taken hold of whenever the specimen is subsequently examined or in any way handled. The mounts are made according to taste, some workers using pith, "polyporus" strips, tracing gelatine or celluloid, but the best and most reliable consist of oblong pieces of cork cut for the purpose from the thin sheets sold as "cabinet cork." The sheets should first be covered on the upper side with dull, white paper, not too thick and not too hard on the surface. A thin printing-paper serves the purpose well, as it is of a soft texture and holds well with good paste. The sheet of cork should have the paper thoroughly well *pasted* down, *not gummed*, and then left under a moderate weight for about twenty-four hours, after which it can be cut by means of a thoroughly sharp flat-bladed knife and a flat ruler into strips of various widths. For the sake of future appearance it is best to adopt a fixed scale of widths, say 8, 10, and 12 millimetres. These strips are then to be cut transversely into narrow pieces, which should eventually measure 8×2 , 10×3 , and 12×4 millimetres

respectively. A boxful of these mounts can be prepared in a very short time, and it is well to have a good supply of the various sizes always ready in advance. The cork stage carrying the fly should be pushed about half-way up a No. 13 pin, and this height should be uniformly maintained, whatever the size of the fly.

After having been staged every specimen should be labelled with the name of the locality and collector, and the date, the label being carried on the pin just below the cork stage. Printed labels may be had to order from the firms advertising such in the entomological journals, but it is not a difficult matter to procure a small brass type-holder and a small quantity of "pearl" or "diamond" type, so that if one is neat-handed one can set up and print any number of labels by hand. Failing printed labels the particulars may be neatly written with a fine (crow-quill) pen and Chinese ink. If the specimens are numerous such an operation becomes rather tedious, and printed labels should be procured whenever possible. But (and let the reader note this carefully) one or other of these methods *must* be adopted, for specimens without data are of little if any value. Many a collection formed at great trouble and expense in the olden days would have had its value to the modern collector increased fifty, nay a hundredfold, had full details been available regarding the capture of the various specimens. In the early period of British entomology it was apparently the fashion to trust to the memory of the proud possessor of a cabinet and its rarities, heedless of the fact that after the decease of the collector an unlabelled specimen loses much of its value and must sooner or later be thrown away as useless. On the other hand a properly labelled specimen always retains a certain value, and may furnish important links in the knowledge of distribution, variation, and other points connected with the history of the species.

Boxes are of course required for the storing and classifying of the specimens. Here, perhaps, is the most expensive part of a collector's outfit. A finely polished cabinet such as is used to display a Lepidopterist's treasures is not, however, essential for the student of Diptera, and

a series of deal store-boxes, or even at first the insect "cartons," as sold by the dealers, will serve perfectly well. For the beginner a cork-lined cigar box ("50" size) with a well-fitting lid forms an admirable temporary device. At the outset all the specimens collected at the same time and place may be housed in the same box, to await the time when the work of identification is undertaken. Or they may undergo a preliminary grouping into families or even into genera, should the knowledge and experience of the collector enable him to do this. When the opportunity presents itself all the accumulated specimens of a genus may then be worked out at the same time and placed in their permanent position in the collection. A good series of the cheaper temporary boxes, for unclassified or partially classified material should be provided, and here the "cartons" will be found extremely useful. The permanent collection should be kept in the somewhat more expensive (but at the same time *dust-proof*) double-sided corked deal store-boxes, and the use of a series of these boxes affords much advantage over the cabinet, since it is capable of easy expansion at any desired portion by the simple intercalation of an additional box, without the necessity of an extensive rearrangement of specimens. The boxes (of a size to suit the taste of the collector) should be ruled with *pencil* lines into columns and spaced out to hold all our native species; or in lieu of this the species may follow one another in any order, and an index be kept of their position in the boxes until the collection becomes too large and unwieldy for this method of arrangement. The columns may be of any suitable width, but 3 inches may be suggested as convenient, the flies being placed in a row across the column and as many rows of specimens kept as may be desired. The columns should be ruled *transversely to the longer axis* of the box and the flies should be placed with their *heads towards the hinge* in both halves of the box, so that when the box is open the flies in the two sides are in a reversed position to each other, *i.e.*, heads to heads. By this simple device it is only necessary at most to stretch the arm over the *narrowest width* of the box, whatever specimen it is

desired to remove or whatever space it is desired to fill. The risk of damaging specimens with the coat-sleeve, a calamity of frequent occurrence under any other arrangement, is thus reduced to a minimum. With regard to the labelling of the columns it is sufficient to state that the name of the genus should come at the head of the column or portion of column containing its various species, while the species label should be placed below the series of specimens of that species. The generic name should be in capital letters and the label should not be repeated, while the specific name should be in small ("lower case") letters and may, if preferred, be preceded by the initial of the genus. Finally, when arranged, the cartons or store-boxes may be stored on edge on ordinary book-shelves, with a label pasted on the front edge to indicate the contents. Extreme care must of course be observed in handling the boxes, and if freedom from jolting cannot be guaranteed the boxes, and more especially the one-sided cartons, should be kept in a horizontal position, *i.e.*, in piles upon each other, the cartons in every case with the lid uppermost.

In conclusion, a few hints may be given regarding the actual examination of specimens. A good platyscopic lens magnifying 20 diameters is the most generally useful, and will suffice for the identification of nearly all species. For rough classifying a lens of lower power, say 10 diameters, will be found handy, but for the working out of the tiniest species (*e.g.*, Phoridae, Chironomidae, Cecidomyiidae) the ideal instrument is a stereoscopic microscope. It is wonderful, however, what can be done with only a simple hand-lens of the power indicated, and the occasions upon which it is necessary to call in the aid of a compound microscope are seldom indeed. Advanced students who work out details of anatomy, internal or external (chætotaxy, genitalia, etc.), require, of course, the best microscope they can procure, while those who desire to draw for the purpose of illustrating their memoirs require in addition a camera lucida and various other accessories. To enter into details on these points would, however, carry us beyond the scope of the present paper, which is primarily intended for beginners.

For the examination of a specimen with the hand-lens a good light, preferably a window facing north, is essential, while the pin carrying the fly should be stuck into a small bung of cork and held in one hand while the lens is held in the other. To observe details of body-markings and bristle-arrangement it is most advisable to hold the fly with the *tip of the abdomen towards the light*, while for the discernment of wing-neuration, outlines, plumosity of the antennal arista, hairiness of the eyes, and so on, the insect must be held between the eyes and the light (sky or artificial light). To avoid the discomfort of raising the specimen above the level of the eyes, and the throwing back of the head for this purpose, the very simple expedient of laying a small mirror (say 6×3 inches) flat on the table in front of one will be found a great boon. The mirror reflects the light from the sky (and usually the brightest part of it), and one has merely to hold the fly between it and the eyes to get as good a view of the details in question as can be required, and in the most comfortable position possible. When working by artificial light (*e.g.*, gas or electric table lamp) a slight tilting or other adjustment of the mirror is all that is required to secure the same convenient result.

White Snipe and Ruff in Tiree.—A white Snipe was shot here in the last week of January 1919; it was a very pretty bird, pure white, except for two bright marled yellow feathers in the centre of the tail, and two of the same colour on the lower back. The eyes were normal. A Ruff was also obtained in August 1918 out of a reedy bog; I have seen one or two Reeves here before, but they were wading in shallow tarns or pools, whereas this Ruff got up out of a very rough bog with reeds four or five feet high.—PETER ANDERSON, Tiree.

Capercaillie in Montrose.—On Sunday evening (13th April 1919), about 6.45 P.M., what may be termed a very unusual occurrence happened here. A hen Capercaillie was brought to me, freshly killed—in fact it had only just died when I saw it. It was seen to fly against the telephone wires near the post office, and was alive when picked up. Although numerous a few miles from here, it is difficult to account for the bird being down on the coast and in the centre of the town. As we know many birds are killed by the wires, but a bird like a Capercaillie is about the last one would expect in a town the size of Montrose. It was in excellent condition and plumage.—R. W. THOMAS EWART, Montrose.

FURTHER NOTES ON APHIDES COLLECTED
PRINCIPALLY IN THE SCOTTISH HIGHLANDS.

By DOROTHY J. JACKSON, F.E.S.

DURING the summer of 1918 I collected several more species of aphides in Ross-shire, and I also found that some of the species which I had recorded from this county the previous year were equally common in Caithness. As the latter are probably the most northerly records of these aphides I include them in the following notes. Mr F. V. Theobald has kindly helped me with the identification of the species.

Family APHIDIDÆ.

Subfamily APHIDINÆ.

Genus *Macrosiphum*, Passerini.

Macrosiphum dirhodum, Walker. — Alate viviparous females occurred on rose at Stirkoke, Wick, on 8th September, and apterous viviparous females were common at the same time on roses under glass.

Macrosiphum epilobii, Theobald. — Alate and apterous viviparous females, larvæ, and nymphæ were common on the terminal shoots of willow herb (*Epilobium*) in the garden at Swordale, Evanton, on 10th August.

Macrosiphum granarium, Kirby. — I took an apterous viviparous female on oats near Wick on 7th September.

Macrosiphum lactuceæ, Schrank. — Alate viviparous females were abundant on currant and gooseberry at Stirkoke, Wick, on the 9th September.

Macrosiphum millefolii, Fabr. — I found this species thickly clustered on the flower-stalks of *Achillea millefolium* at Beauly, Inverness-shire, on the 17th August. Apterous viviparous females and larvæ were the most abundant, but apterous oviparous females and nymphæ, from which the winged males emerged later, also occurred. I took this species less commonly at Swordale, Evanton.

Macrosiphum pisi, Kalt. — Alate and apterous viviparous females were common at Swordale, Evanton, on broad beans and clover from the end of June to the end of July, and apterous viviparous females and nymphæ on beans and vetch near Wick on the 7th September.

Macrosiphum rosæ, Linn. — Apterous and alate viviparous females were abundant on roses under glass at Stirkoke, Wick, on the 10th September.

Genus *Amphorophora*, Buckton.

Amphorophora ampullata, Buckt.—Larvæ occurred on the under-surface of fern leaves at Stirkoke, Wick, on the 8th September.

Genus *Drepanosiphum*, Koch.

Drepanosiphum platanoïdes, Schrank.—I found apterous viviparous females, larvæ, and nymphæ common on the under-surface of leaves of sycamore (*Acer*) near Wick on the 7th September. They were preyed upon by Cecidomyid larvæ.

Genus *Rhopalosiphum*, Koch.

Rhopalosiphum brittani, Theobald.—This species was common at Stirkoke, Wick, on gooseberry and currant on the 9th September. I took alate and apterous viviparous females and several apterous oviparous females. As the latter form has not been described the following is a description of it, but colour notes from the fresh specimens were not taken.

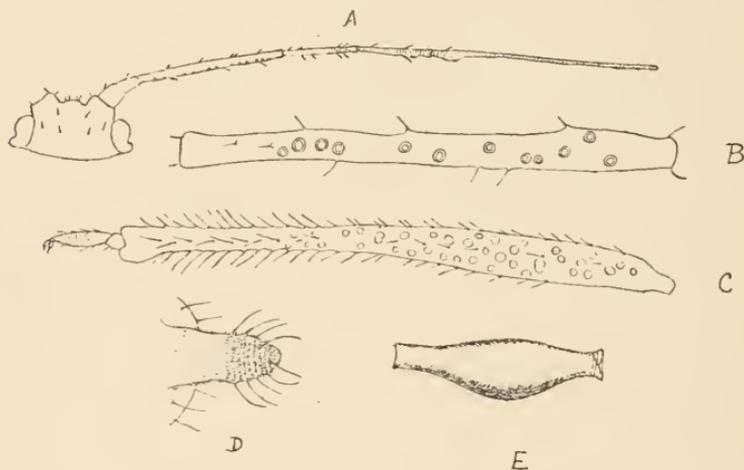


FIG. I.

OVIPAROUS FEMALE OF *Rhopalosiphum brittani*, Theobald.

- A = Head and antenna magnified 31 times.
 B = Third segment of antenna magnified 128 times.
 C = Tibia of third pair of legs magnified 60 times.
 D = Cauda magnified 60 times.
 E = Cornicle „ „

Oviparous female.—Apterous; antennæ more than three-quarters the length of the body, posterior portion dusky, the third segment with ten to twenty sensoria situated more or less in a straight line on the inner side, the antennæ often being so placed in mounted specimens that the sensoria occur exactly on the edge and therefore are less conspicuous. The fourth segment is slightly longer than

the fifth and without sensoria, its posterior half faintly imbricated; the fifth segment bears one sensorium near its apex and is imbricated throughout its length; the sixth segment has a rhinarium with three or four small sensoria below it, and is also imbricated. Cornicles dark, much swollen in the middle, and narrowed at the base and towards apex where they are narrowly reticulate. Cauda dark, equal to more than half the length of the cornicle, thickly covered with transverse rows of very short black bristles, and with four long pale bristles on one side and five on the other. Hind tibiae thickened for nearly three-quarters of its length and with many sensoria; apical portion narrowed, without sensoria, but with longer hairs. Length, 2.0 mm. to 2.3 mm.

Rhopalosiphum lactucae, Kalt.—Alate viviparous females were common on gooseberry in the beginning of August at Swordale, Evanton; but unlike those taken on sowthistle the previous year they exhibited melanic tendencies, the cornicles varying from yellowish brown to black but being more frequently dusky brown or black. Some of the specimens have been killed by the fungi *Empusa (Entomophthora) aphidis*, Hoff., and *Empusa (Triplosporium) Fresenii*, Nowakowski, which Mr A. D. Cotton has kindly identified for me. Apterous viviparous females, larvæ, and nymphæ of *R. lactucae* occurred on sowthistle (*Sonchus*) at Stirkoke, Wick, on 7th September, and I also took an oviparous female on gooseberry at the same time. The following is a description of it, but colour notes were not made from the fresh specimen.

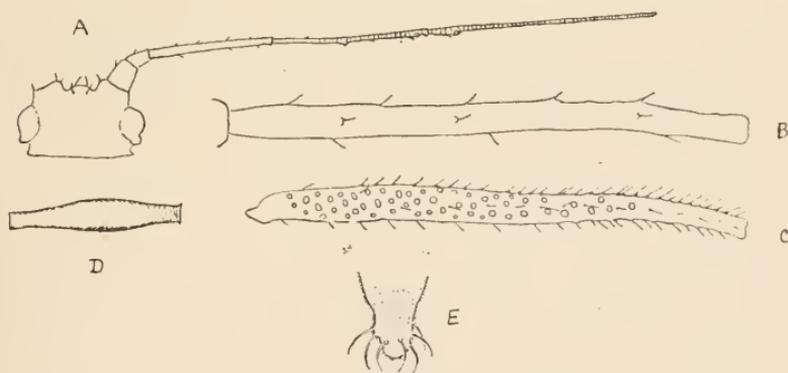


FIG. II.

OVIPAROUS FEMALE OF *Rhopalosiphum lactucae*, Kalt.

- A = Head and antenna magnified 31 times.
 B = Third segment of antenna magnified 128 times.
 C = Tibia of third pair of legs
 D = Cornicle
 E = Cauda

} magnified 60 times.



Oviparous female.—Apterous; antennæ pale, almost as long as the body; third segment without sensoria but with several scattered bristles; the fourth segment is about two-thirds the length of the third and has no sensoria, its apical portion is faintly imbricated; the fifth is slightly longer than the fourth, imbricated, and bearing at its apex a conspicuous sensorium with double contour. The sixth segment is imbricated and has the rhinarium conspicuous with a group of six small sensoria below it. Cornicles pale, more than twice the length of the cauda, slightly swollen in the centre, the apex narrowly reticulate, and with traces of imbrications before it. The cauda is pale, much smaller than that of the oviparous female of *R. britteni*, covered with very short pale bristles in transverse lines, and with three long bristles on one side and four on the other. Hind tibiæ swollen and set with large and small sensoria for more than three-quarters their length. *Length*, 2.0 mm.

Rhopalosiphum persice, Sulzer.—Apterous viviparous females, larvæ, and nymphæ were common on the under-surface of potato leaves at Stirkoke, Wick, on 9th September. The nymphæ developed into winged viviparous females a few days later. Several of the apterous females were found dead on the leaves infected by a fungus which developed also upon other specimens kept under observation. Mr A. D. Cotton has identified this fungus as *Empusa (Triplosporium) Fresenii*, Nowakowski.

Genus *Hyalopterus*, Koch.

Hyalopterus flavus, Kittel (*aquilegiæ*, Koch, and *trihodus*, Walker).—This species was abundant on columbine (*Aquilegia*) in the garden at Swordale, Evanton. In the beginning of July I found only alate viviparous females and the young they had produced, but on examining the plants again on the 19th September I found numbers of apterous viviparous females and nymphæ; from the latter I reared viviparous females. A few Syrphid and Cecidomyid larvæ were preying upon them, but had made small impression on their numbers. This species also occurred at Stirkoke, Wick, where I took a few apterous viviparous females on the 11th September.

Genus *Aphis*, Linnæus.

Aphis adjuncta, Walker.—Apterous viviparous females and young occurred on chrysanthemum in the garden at Swordale, Evanton, on 5th July. They were much parasitised by a Chalcid. I found them also on *Eryngium alpinum* in the beginning of September.

Aphis cardui, Linn.—Numbers of apterous viviparous females and young, together with a few nymphæ and alatæ, were found

thickly clustered near the apex of the terminal shoots of thistle (*Cnicus arvensis*?) at Swordale, Evanton, on 15th August.

Aphis grossulariæ, Kalt.—I took alate viviparous females on gooseberry at Stirkoke, Wick, on 9th September.

Aphis ilicis, Kalt.—I noticed in the beginning of September that many of the holly leaves at Stirkoke, Wick, were curled by the action of this species, and numbers of dead apterous females and a few winged ones were to be found on the under-surface of the leaves. Each aphide was more or less covered with a greenish grey mould from which the legs of the insect projected, and though I searched carefully I could not find a single live specimen.

Aphis myosotides, Koch.—Apterous females and young were abundant on *Myosotis* in the garden at Swordale, Evanton, on 15th July. They occurred on the young flowering shoots, inside the young leaves, and on the under-surface of the old ones, and the growth of the plants was stunted in consequence.

Aphis pruni, Réaumur.—I found nymphæ and alatæ on plum leaves at Evanton on 11th July.

Aphis rumicis, Linn.—Alate viviparous females occurred on leeks at Swordale, Evanton, on 12th August, and I took one at Stirkoke, Wick, resting on a blade of grass on 10th September.

Aphis viburni, Scopoli.—I found alate and apterous viviparous females, larvæ, and nymphæ on *Viburnum* at Stirkoke, Wick, on 10th September.

Aphis achilleæ, F.—This species was originally described by C. J. Fabricius in 1776 in his "Gen. Ins.," p. 302. His description is as follows:—"flavescens, abdomine viridi, antennis pedibusque albidis. Habitat in *Achillea millefolio*. Antennæ filiformis, albidæ. Alæ albidæ. Anus, slytus et cornicula albida. Frequens kilixæ."

As no further description has been made of this insect I here describe it:—

Alate viviparous female.—Head dark brown, antennæ blackish brown, 0.899 mm. to 0.96 mm. long, about three-quarters the length of the body; the third segment imbricated with fifteen to twenty conspicuous sensoria with double contour distributed along it; fourth segment nearly half the size of the third, imbricated, and with four or five sensoria with double contour; fifth segment shorter than the fourth, imbricated, and with a large apical sensorium; sixth segment imbricated, and with rhinarium and two small sensoria below it. Pronotum brownish ochreous, meso- and meta-nota dark brown, abdomen brownish ochreous, legs dingy brownish ochreous, with the apices of the femora and tibiæ dark brown. Cornicles brownish ochreous, short and thick, rather restricted at the base

when viewed sideways, but viewed dorsally with parallel sides only slightly converging to the apex. Cauda brownish ochreous, about the same length as the cornicle but much broader, with three long bristles on each side. Proboscis reaching to the base of the second coxæ. Length 1.3 mm.

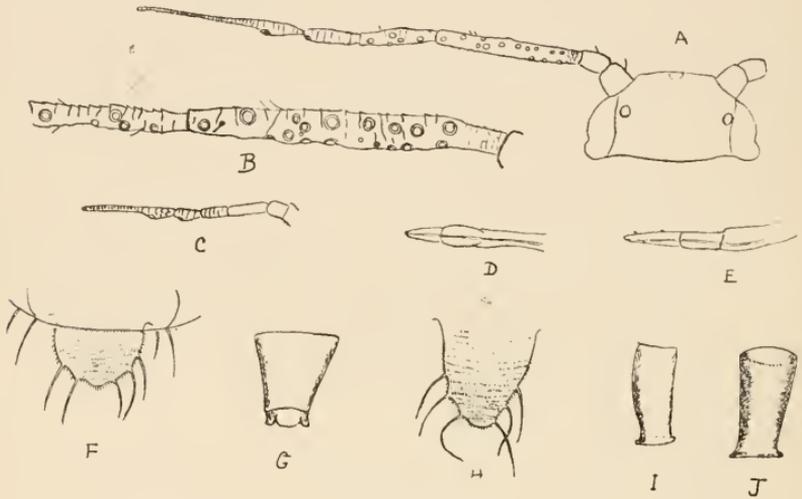


FIG. III.

Aphis achilleæ, F.

- A = Head and antenna of alate viviparous female magnified 60 times.
 B = Third and fourth segments of antenna of same magnified 293 times.
 C = Antenna of apterous viviparous female magnified 60 times.
 D = Proboscis of apterous female magnified 60 times.
 E = " of alate " " " viewed from side.
 F = Cauda of apterous female, magnified 128 times.
 G = Cornicle " " "
 H = Cauda of alate female, " "
 I = Cornicle " " " side view.
 J = " " " " dorsal view.

Apterous viviparous female.—Ochreous yellow; eyes black; antennæ very short, 0.48 mm. to 0.55 mm. long, ochreous, with the apices of the fourth and fifth segments brown; third segment without sensoria; fourth, fifth, and sixth segments imbricated; fifth segment with apical sensorium; sixth with rhinarium. Cornicles pale ochreous, rather short and broad, widest at the base and gradually narrowing to the apex; cauda pale ochreous, short and broad with three long bristles on one side and two on the other. Legs ochreous, with the apices of the tibiæ and the tarsi brownish. Proboscis reaching to the second pair of coxæ. Length, 1.2 mm. to 1.36 mm.

Foodplant.—*Achillea millefolium*, occurring on the flower-stalks.

Locality.—Beauly, Inverness-shire.

Notes.—I took a few apterous and alate viviparous females of this species on milfoil on 17th August. *Macrosiphum millefolii*, Fabr., was swarming on the plants, but *Aphis achilleæ* was not nearly so common.

Genus *Myzus*, Passerini.

Myzus cratægi, Walker.—Apterous viviparous females and young, together with a few nymphæ and alatæ, occurred on the under-surface of the leaves and on the young shoots of hawthorn at Dingwall on 13th July. Cecidomyid larvæ had cleared off many of the colonies of this aphid leaving nothing but the shrivelled brown skins of their victims.

Myzus kæténbachii, Schon.—I swept a number of apterous viviparous females from grass in which clover was growing at Swordale, Evanton, on the 10th July.

Myzus lactucæ, Linn.—I took a winged male on currant at Swordale, Evanton, on 13th July.

Myzus solani, Kalt.—I found apterous viviparous females on the under-surface of potato leaves at Swordale, Evanton, on 30th September.

Myzus whitei, Theobald.—In the beginning of August I found an alate female of this species on gooseberry. It had been killed by a fungus which has been identified by Mr A. D. Cotton as *Empusa Fresenii*, Nowakowski. Alate viviparous and apterous oviparous females occurred on currant at Stirkoke, Wick, on the 9th September.

Subfamily CALLIPTERINÆ.

Genus *Callipterus*, Koch.

Callipterus quercus, Kalt.—Alate viviparous females, nymphæ, and larvæ were present on the under-surface of oak leaves at Stirkoke, Wick, on the 11th September.¹

Genus *Eucallipterus*, Schouteden.

Eucallipterus tiliæ, Linn.—Alate and apterous viviparous females, nymphæ, and larvæ occurred on the leaves of a lime-tree at Stirkoke, Wick, on the 10th September.

¹ This species was erroneously recorded as *Callipterus quercus*, Kalt., in my previous paper on "Notes on the Aphides of Ross-shire," *The Scottish Naturalist*, April 1918, p. 87.

Subfamily CHAITOPHORINÆ.

Genus *Chaitophorus*, Koch.

Chaitophorus aceris, Linn. — Apterous viviparous females and young were abundant on the under-surface of the leaves of sycamore at Stirkoke, Wick, on the 7th September.

Subfamily LACHNINÆ.

Mr H. F. Wilson has kindly identified the following species of Lachninæ. I collected them in various localities in England and Scotland, principally in the summer of 1917.

Genus *Lachnus*, Burmeister.

Lachnus costata, Zett. = *L. fasciatus*, Burmeister. — I took apterous viviparous females, larvæ, and one alate female on spruce-fir (*Picea excelsa*), at Wye, Kent, on 11th July 1917. I also found it abundantly at Crowborough on 26th May 1918. On the 5th October 1917 brown apterous females and brown larvæ, together with pale green larvæ and nymphæ, were abundant on a spruce-fir tree at Beaully, Inverness-shire. The pale green larvæ matured to nymphæ, and the latter emerged in a few days as winged males.

Genus *Lachniella*, Del Guercio.

Lachniella cilicica, Del Guercio. — Apterous viviparous females and larvæ were common on the bark of the older branches of silver fir (*Abies pectinata*) at Rothes, Morayshire, on 26th September 1917. I took this species also at Beaully, Inverness-shire.

Lachniella juniperi, F. — I found apterous females and larvæ on juniper at Wye, Kent, on 1st July 1917. I also observed this species at Swordale, Evanton, from the end of July to the beginning of October, but I noticed no winged specimens.

Lachniella laricis, Walker. — Apterous and alate viviparous females and young occurred on a young larch-tree at Wye, Kent, on 28th June 1917. It was also abundant on the branches of old larch-trees at Swordale, Evanton, in the end of July, and I found it at Rothes, Morayshire, in the end of September.

Lachniella pichtæ, Mordwilko. — Alate and apterous viviparous females, larvæ, and nymphæ occurred sparingly on silver fir (*Abies pectinata*) at Rothes, Morayshire, in the end of September 1917. They were to be found solitarily on the terminal shoots, resting in a slanting position at the base of the needles, with proboscis inserted in the stem. Their colour harmonised well with their surroundings, the deep, dark green of their back being of the same shade as the

upper side of the needles, while their ventral surface, covered with white powdery substance, was identical with the silvery grey of the under side of the needles.

Lachniella pini, Linn.—I found apterous viviparous females and a few alatae common on Scotch fir (*Pinus sylvestris*), at Swordale, Evanton, in the end of July 1917. They occurred principally on the younger shoots. I also took this species at Crowborough on 8th July.

Lachniella pinicola, Kalt = *L. abietis*, Walker.—Common on spruce - fir (*Picea excelsa*), occurring on the young shoots at Swordale, Evanton, in July 1917; also taken at Wye, Kent, in the end of June.

Lachniella pinihabitans, Mordwilko.—This species swarmed on the small twigs of a branch of Scotch fir (*Pinus sylvestris*) at Rothies, Morayshire, on 28th September 1917. They only occurred on the small, needleless branches, and so closely resembled the grey colour of the bark that at first sight they were difficult to detect. Apterous viviparous females were most abundant, but alatae were also present. This species seems to be local, as although I searched many other fir-trees in the neighbourhood I could not find another specimen.

Genus *Eulachnus*, Del Guercio.

Eulachnus agilis, Kalt.—I found apterous and alate viviparous females on the needles of Austrian pine (*Pinus lariceo* var. *Austriaca*) at Crowborough and Wye in the beginning of July 1917. Both green and grey varieties were common at Crowborough. I took this species also on Austrian pine and Scotch fir (*Pinus sylvestris*) at Swordale, Evanton, in the beginning of August, and at Rothies, Morayshire, in the end of September.

Subfamily SCHIZONEURINÆ.

Genus *Eriosoma*, Samouelle.

Eriosoma lanigera, Haussman.—I noticed that the elm leaves at Stirkoke, Wick, were curled by aphid and took a nymph of this species in the end of September 1918.

Subfamily PEMPHIGINÆ.

Genus *Thecabius*, Koch.

Thecabius affinis, Kalt.—On 23rd June I found apterous viviparous females and larvæ densely clustered at the base of the stalks of buttercup (*Ranunculus*) at Swordale, Evanton. Alatae emerged from these on 13th July.

Fulmars nesting at Haskier.—It is interesting to be able to record that the Fulmar is nesting this year (1919) on the Haskier rocks, eight miles north-west of Griminish Point, North Uist. A friend and I went there one day this June as he was keen to see the colony of birds. We only went over part of the large island and found four Fulmar nests with one egg each.—ARTHUR J. CAMPBELL ORDE, Sponish, Lochmaddy.

Tree-sparrows nesting near Glasgow.—A pair of Tree-sparrows nested here this year (1919) in a shed, on the wall under the roof, and I handled one of the young ones which was able to fly a little. I saw another pair building in a Rook's nest.—JAMES BARTHOLOMEW, Torrance, near Glasgow.

The Nightjar in Renfrewshire.—In past years it has been our privilege to have annually one pair of Nightjars (*Caprimulgus europæus*) in this district. Our usual pair returned this year. On 16th June 1919 one of the gamekeepers found a nest with newly hatched young. On the 18th a second nest with young was found quite near the other. I visited these with the keeper on the 20th. He told me that in the area round his house he had located six pairs of Nightjars this season. If Howard Saunders is correct in saying eighteen days are required for incubation, it follows that the first egg in the above nests must have been laid on 28th May. Considering how far north we are, this is a surprisingly early record.—T. THORNTON MACKETH, Kilmacalm.

Quail in Midlothian.—On Monday evening, 7th July 1919, at 7.30, Major Taylor Cameron, 9th Royal Scots, and I heard a Quail (*Coturnix communis*) calling in a field of corn close to the farm of Swanston. We listened to the bird for nearly half an hour, and on re-passing the place an hour later, the bird kept uttering the unmistakable "wee, wee, wee" for a considerable time.—BRUCE CAMPBELL, 10 Greenbank Place, Edinburgh.

Observations on Carrion-crows.—On 22nd May 1919 one of my gamekeepers found a Carrion-crow's nest containing two young ones and shot an old bird. On 24th May he sent his assistant to wait near the nest and he, during the evening, shot three old birds. On 1st June the gamekeeper again visited the nest, found one young bird dead in the nest, the other almost ready to fly, and shot a fifth old bird. This is one of the most remarkable instances of the provision of foster parents which has come to my notice.—HUGH S. GLADSTONE, Thornhill.

ADDITIONS TO THE LIST OF SCOTTISH
COLEOPTERA.

By ANDERSON FERGUSSON, F.E.S.

THE beetles mentioned in this paper are either additions to the Scottish list or were considered doubtfully Scottish by Dr Sharp in his "Coleoptera of Scotland" (*Scottish Naturalist*, 1871-82). They have all been found within the Clyde Faunal Area with the exception of *Hydrobius fuscipes*, v. *chalconotus*, Steph., which was taken in the Forth Area. The nomenclature followed is that of E. A. Newbery and W. E. Sharp's *Exchange List of British Coleoptera* (1915).

Hydrobius fuscipes, L., v. *chalconotus*, Steph.—One specimen of this metallic variety occurred in a peaty pool at Cobbinshaw (Edinburgh) along with the type on 21st July 1911. It has been recorded from various localities in England as far north as Cumberland, and it appears to be rare.

Stenus palustris, Er.—Two specimens, which are referred to this species by Mr E. A. Newbery, were taken at Brodick in Arran (Clyde Islands), in a marshy spot, during September 1914. It has hitherto only been recorded from the Fen Districts in England.

Triarthron maerkeli, Schmidt.—One example of this rare species was taken at Lanark (Lanark) by sweeping long grass in a wood during June 1918. It seems to be principally met with in the south of England, although there is a record of its occurrence in Cumberland.

Scaphisoma agaricinum, L.—A single specimen was taken by beating faggots at Rowardennan (Stirling) in June 1913. Another specimen was found under the bark of a felled birch in the same locality in June 1915, and in June 1916 five were obtained from the same tree. It has been recorded from as far north as the Northumberland district in England, but according to Fowler (*Coleoptera of the British Islands*, iii., 347) it appears to be commoner from the Midlands southwards.

Aspidiphorus orbiculatus, Gyll.—One was taken by sweeping over some rough ground at Rowardennan (Stirling) in July 1915. This is considered a rare insect in England, and the most northerly record of its occurrence there is from Cumberland.

Chrysomela brunsvicensis, Grav. (*didymata*, Brit. Cat.).—This species was taken in numbers during September 1916 upon *Hypericum* at Whiting Bay, Arran (Clyde Islands). Another species of

the same genus, *C. hyperici*, F., occurred along with it on the same plant but far more sparingly. Dr Sharp did not include *C. brunsvicensis* in his "Coleoptera of Scotland," but Fowler (*l.c.* iv., 308) mentions that it has been recorded by Stephens from Forfarshire.

Longitarsus brunneus, Duft. (*castaneus*, Foudr. nec Duft.).—The synonymy of this species and *L. luridus*, Scop., which immediately succeeds it in the British list, is much confused. I think, however, it is clear that the records under *L. brunnea*, Duft., in Dr Sharp's "Coleoptera of Scotland" refer to *L. luridus*, Scop., which is the commonest species of the genus in Britain, and that the true *L. brunneus*, Duft., has not hitherto been recorded from Scotland. Messrs Tomlin and W. E. Sharp, in their paper on the genus (*E. M. M.* xlviii., 2), give no Scottish localities for the insect. At Machrie Bay, Arran (Clyde Islands), I found a single specimen during September 1912 and another in September 1913 which have both been referred to *brunneus*, Duft., by Mr W. E. Sharp.

Longitarsus pratensis, Panz., v. *collaris*, Bed.—This variety of *pratensis*, with infusate thorax and dark posterior femora, occurred along with the type at Machrie Bay, Arran (Clyde Islands), in September 1912 and September 1913. It has not previously been noted from Scotland, but probably occurs wherever the type is found.

Polydrosus mollis, Stroem. (*micans*, F.).—This weevil was recorded, in Murray's *Catalogue of the Coleoptera of Scotland* (1853), from Edinburgh, Dalkeith, Roslin, Lanarkshire, near Hamilton, and Berwickshire, but Dr Sharp (*Scottish Naturalist*, vi., 141) stated that the species was unknown to him as Scottish, and that he was inclined to suspect an error of determination. It has been found not uncommonly upon young trees of various kinds at Lanark (Lanark) during the summer-time since 1914, and specimens have been seen by Mr Newbery.

Apion curtirostre, Germ. (*humile*, Germ.), v. *medianum*, Th.—This variety is much smaller than the type, with the rostrum shorter and thicker and the elytra more inflated behind (Newbery, *E. M. M.* xlix., 227). A few examples were swept along with the type at Machrie Bay, Arran (Clyde Islands), during June 1916. It is probably quite common.

Rhynchites harwoodi, Joy.—Two examples were beaten off old birches at Machrie Bay, Arran (Clyde Islands), during June 1916, and other two were taken, also off birch, in the same locality during June of the following year. Mr Newbery (*E. M. M.* liii., 80) states that he has always taken *R. harwoodi* and *tomentosus*, Gyll., to-

gether, but *tomentosus* did not occur with *harwoodi* in Arran, nor has it been recorded from any other locality in the Clyde Area. *R. harwoodi* has hitherto only been recorded from localities in the south of England.

Anaspis garneysi, Fow.—One specimen was taken off hawthorn blossom at Balmaha (Stirling) in May 1914. The most northerly record for this species in England is from Cumberland.

I have to thank my friends, Mr E. A. Newbery and Mr W. E. Sharp, for their kind assistance in the determination of most of the species dealt with in this paper.

Mallard, Wigeon, and Lesser Black-backed Gull in North Uist.—On reading Lieut. Beveridge's concluding observations on the "Birds of North Uist" (*ante*, p. 17), I notice one or two statements which interest me, and on which I crave indulgence to enlarge.

In writing of *Anas boschas*, Lieut. Beveridge states that he has been informed that Sir Arthur Orde, Bart., introduced, by turning down, several birds of the smaller foreign Mallard. I know quite well the race to which he refers the small Mallard which visits us from parts of Europe during winter. On the north-west coast of England, we did not look for them until the beginning of December, and I have shot many of them; they are quite recognisable on the wing, they fly faster, and, as Lieut. Beveridge remarks, they weigh under 2 lbs. So far as my investigations go, this small race of Mallard has a very restricted range and is confined as a breeding species to Scandinavia, from whence it visits us in winter. It is not only less in size and weight but has a smaller and narrower beak (length 51-53 mm., width 19-20 mm.) and a shorter wing (270-273 mm.) than the large race found in Britain, America, Canada, Iceland, and apparently India (from measurements recently supplied to me by Capt. C. B. Ticehurst, R.A.M.C., taken from freshly killed birds). All the birds belonging to this large race, including our British Mallard, are absolutely indistinguishable in size:—Beak, length 57-59 mm., width 23-25 mm., wing 290-304 mm.; and when we kill one of the large race here in winter there is nothing to show us whether the bird is a foreigner or a home-bred bird. I therefore consider the word "foreign" is misleading as regards the bird to which Lieut. Beveridge refers, which is obviously the small race from Scandinavia. It would be very interesting to know how Sir Arthur Orde secured the birds he

turned down; perhaps they came from one of the few east coast duck decoys still worked. That Lieut. Beveridge has shot the small race of Mallard in North Uist is not, to my mind, proof positive that they were descendants of the birds turned down; they were quite as likely to have been genuine migrants.

Mareca penelope.—I should not like to accept, as even probable evidence of breeding, the fact that Wigeon were seen, and one, an adult ♂, procured in August. I have shot Wigeon in England, both in North Lancs and Norfolk, in August, which I am satisfied had not bred in the immediate neighbourhood where they were killed, but were early migrants from farther north.

Larus fuscus.—Lieut. Beveridge does not draw any distinction between our own western pale-mantled form of Lesser Black Back (*Larus fuscus affinis*) and the more eastern European black-mantled bird (*Larus fuscus fuscus*), but quite irrespective of this, I doubt his statement that the Lesser Black Back is a *resident* in North Uist, or any other part of Great Britain for that matter; the bird is a summer breeding migrant to our coasts, and retires south in August, September, and October, returning at the end of February, and in March and April. You *may* see individual Lesser Black Backs here in winter; if so, they are examples of the European black-mantled form *Larus fuscus fuscus*, and are distinctly rare.—F. W. SMALLLEY.

The Fulmar Petrel at Foula Isle during Winter.—Desirous of procuring some rough idea of the number of Fulmars found at Foula Isle during Winter, I set out on 2nd January 1919 to the east side of the island. The day was not the best for observing, being sunless and cold, while a stiff breeze blew from the north-east which made the sea choppy. Starting at Durga-Ness, I slowly skirted the brow of the cliffs in a southerly direction for little over half a mile, then found I had proceeded far enough for my purpose. Careful enumeration of the birds was no easy matter, for while those settled on the cliffs were easily dealt with, many kept skirting along them north and south, others again kept flying in circles, then finally I added to my total a few groups swimming on the sea lose by. Within the half mile I counted 500 Fulmars. It should be borne in mind that the east side of the Isle is a pigmy in comparison with that on the west, and it is on the latter side that the immense numbers of Fulmars dwell. The bird appears to be as plentiful at its habitat in the month of January as in June, plus, of course, the young in the former month.—WM. HARRY GREENAWAY.

Hawfinch nesting in Dumfriesshire.—On 4th July 1919 I identified a young but fully-fledged Hawfinch which had that day been picked up dead in the grounds of the Crichton Royal Institution, near Dumfries.—HUGH S. GLADSTONE, Thornhill.

Wigeon nesting in Ross-shire.—For the last six years I have spent a few weeks of the month of June in the mountainous part of Ross-shire, not far from the “divide” but in the Moray basin, and near the source of the Farrar, affluent of the Beauly, Orrin, Meig, and Bran, affluents of the Conon. It may be interesting to note that I found the commonest nesting species of duck in the district to be the Wigeon (*Mareca penelope*).—D. MACDONALD, Glasgow.

CURRENT LITERATURE.

SHEEP AND NATURAL CONDITIONS IN SCOTLAND.—Dr James Ritchie traces the results which have followed upon the introduction of sheep to Scotland and the great increase of sheep breeding. With the aid of historical references he indicates the varied influences which have affected forests, vegetation in general, and the native fauna of the land. In the last connection he shows how, directly and indirectly, sheep have in some cases, such as those of the Red and Roe Deer and of the larger birds of prey, been the cause of great restriction in range and reduction in numbers or even of extermination; while in other cases, such as that of the Green-bottle Fly, sheep have given rise to an extended and extending distribution.—*Scot. Journ. Agric.*, April 1919, p. 190.

SHEEP-BREEDING AND NEW VARIETIES OF WOOL.—Prof. Cossar Ewart gives the results of his experiments in the crossing of various breeds of sheep, and dwells especially upon the influence of crosses on the economic qualities of the wool, and upon the suitability of the cross-breed for food purposes. The wool of Southdown-Soay crosses was found to be “superior in every respect to that of their parents,” and “admirably suited for the manufacture of high-class cloths”; and the quality and quantity of the coat of a Southdown-Blackface cross was such as to fetch before the war the price of three fleeces of pure-bred Blackface sheep of like age. The paper is well illustrated.—*Scot. Journ. Agric.*, April 1919, p. 159.

GREAT TIT—ITS ECONOMIC IMPORTANCE.—The general sense of naturalists has long been against the opinions of gardeners and fruit-growers as to the economic significance of the Great Tit. The

latter have considered visits to fruit-buds as evidence of evil-doing, and have condemned Tits in general. Dr W. E. Collinge (*Country Life*, 29th March 1919) shows from an examination of the food content of thirty-two specimens collected in 1917-18, that the visits to fruit-buds are all in favour of the fruit grower since the Tits are on the search for insect food. Of the total bulk of food 77 per cent. was found to consist of animal matter, 23 per cent. of vegetable matter. "Of the former 66.5 per cent. is composed of injurious insects, 4 per cent. of beneficial insects, 5.5 per cent. of neutral insects, and 1 per cent. of spiders. The bulk of the vegetable food consists of wild fruits and weed seeds," only 3 per cent. of fruit pulp, 1.5 per cent. of buds and scales, and 1.5 per cent. of wheat. To summarise: "66.5 per cent. of the food is beneficial to the fruit grower and the gardener, 23.5 per cent. is neutral, and only 10 per cent. injurious."

ECONOMIC VALUE OF THE BLUE TIT.—In the article referred to above, Dr Collinge also discusses the nature of the Blue Tit's food. Very strong circumstantial evidence has been cited against it. One correspondent wrote: "We have shot dozens, for they are a dreadful enemy to our fruit and peas." From this correspondent Dr Collinge obtained three specimens which presumably had been observed "in the act of opening peapods." The three stomachs were "packed with the caterpillars of a small moth, numerous aphides, and fragments of dipterous flies, but of vegetable matter there was no trace whatever." Examination of the food content of fifty specimens gave the following volume percentages: 79 per cent. animal matter (78 per cent. injurious insects, 1 per cent. spiders), 21 per cent. vegetable matter, of which only 6 per cent. was fruit pulp, 2 per cent. blossom buds, 2 per cent. wheat, and 8.5 per cent. weed seeds and wild fruit. So that on the whole 78 per cent. of the Blue Tit's food is useful destruction, 10 per cent. had better have been left alone, and 12 per cent. is neutral.

A RARE DRAGON-FLY, *Stomatochlora arctica*, Zett., in Argyll.—Several specimens of the above species were seen or captured by K. J. Morton and J. W. Bowhill on 17th June in Glen Nant, Argyll, a locality which, since it is farther south than Glen Lochay in Perthshire, must be regarded as the southern known limit of this species in Britain.—*Ent. Mo. Mag.*, Aug. 1918, p. 185.

INSECT PESTS OF PLUMS AND APPLES.—Two recent leaflets of the Board of Agriculture and Fisheries discuss special insect pests

of plum and apple trees. In the first leaflet (No. 308) the damage caused by several species of Plum Aphides (*Aphis pruni*, *Hyalopteris pruni*, and *Phorodon humuli*) is described, the life-history of the insects is summarised, and methods, such as lime, sulphur, and nicotine washes, are suggested for keeping the pests under control. The second leaflet (No. 319) describes Apple Capsids (*Plesiocoris rugicollis*) as among the most dangerous pests of the apple. In natural conditions this species is widely distributed throughout the country on willows and sallows, but its invasion of orchards is still limited in extent. The piercing of the outer layers of twigs, leaves, and fruit by the bugs in their efforts to reach the plant sap within, causes local damages which may check the growth of the leaves, kill the young twigs, and reduce as well as render unfit for market the fruit crop. A nicotine spray applied a week before the opening of the blossom is the surest remedy.

LEPIDOPTERA OF RANNOCH.—Rev. J. W. Metcalfe gives an account of the Lepidoptera of Rannoch as he found them during a month's sojourn in June and July 1918. The captures are discussed according to their local habitats—heather-moor, meadow, black wood, foothills, birch wood, or mountain-side—so that the paper is a useful guide to the possibilities of the Rannoch area. (*Entomologist*, December 1918, p. 262.)

In the *Entomologist* for April and May 1919 (pp. 83-88 and 106-112) J. J. Lister, F.R.S., F.E.S., writes "On some North-Country Species and Forms of Lepidoptera." The Scottish locality selected for investigation was Loch Rannoch and its immediate neighbourhood. The visit extended from 4th July to 12th July, and the article gives details of the capture of *Cynonympha tiphon* var. *laidion*, Bork., in two or three localities around the loch at an elevation of about 1700 feet above sea-level. *Erebia epiphron*, *Aricia medon* var. *artaxerxes*, *Polyommatus icarus* (interesting forms of the female), *Argynnis aglaia*, and *Brenthis selene* were also taken, and a specimen of *Euwanessa antiopa* reported to have been seen at Kinloch Rannoch on 6th July. Several species of Geometrid Moths are recorded, but nothing of outstanding importance is included.

NYSSIA LAPPONARIA IN INVERNESS-SHIRE.—In the *Entomologist* for June 1919 (p. 141) R. A. S. Redmayne, M.B., records the capture, on 21st April, of four males of this species of moth at Invergarry. According to the author of this note (and also so far as our own information goes) the species has hitherto been recorded only from the county of Perthshire.

“SINGING” OF *SYRPHUS RIBESII*.—In the *Ent. Mo. Mag.* for January 1919 (p. 18) A. E. J. Carter has an interesting note on the “singing” of the fly *Syrphus ribesii* L. while at rest. Observations were made by Mr Carter in his garden in the late summer of 1917 and again in 1918. So far as he could ascertain, the “singing” was confined to *S. ribesii*, since he also paid close attention to other species of the genus, such as *S. luniger* Mg., *S. balteatus* Deg., and *S. corollæ* Fab. The sound is apparently only produced by the males, and apparently it had no attractive influence on the opposite sex, but in the words of the author “was an expression of the insect’s joy in life.” The brighter the sun, the more active the insects were, and the more they “sang.”

In the February number of the same journal a further note appears on this subject (p. 33). E. F. Wallis writes to the effect that the wings of these flies are really vibrating rapidly while the singing noise is being produced, but this is only noticeable on very close observation. The effect to the eye is that the wings suddenly appear out of focus when the song is commenced, but immediately upon its cessation the outline of the wings becomes suddenly sharp and distinct.

HIVE BEES.—Two papers on Bees have a place in the *Scot. Journ. Agric.* for April, the first by Mr J. Anderson dealing with Beekeeping, and the second by Dr J. Rennie and Miss E. J. Harvey discussing experiments devised in order to discover the range of infectivity of Isle of Wight disease. The results of the experiments suggest “that infection takes place most readily through contact with sick bees, and that this may occur in the early stage of the adult condition, before the bee has commenced to forage.”

ON “FILOGRANA,” A COMMON MARINE POLYCHAET WORM.—In discussing the history, distribution, structure, and general import of *Filograna*, Prof. W. C. McIntosh gives many Scottish records, and shows to what extraordinary extent variation may occur in even a limited area. On the same site he has found individuals with and without opercular coverings to their tubes, with and without enlarged tips to the branchiæ, with and without eyes, with few anterior bristles and hook rows, and with many, and so on. This range of variation leads him to believe that the *Filograna* individuals spread throughout the whole globe, belong to one species “endowed with a capacity for variation almost unequalled in the animal series” (*Ann. Mag. Nat. Hist.*, Jan. 1919, p. 125).

BOOK NOTICES.

PROCEEDINGS OF THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, 1918-19. London. Price 4s.

Judging from the hundred and twenty odd pages which make up its latest Report the members of this Society have, in spite of war conditions, shown a remarkable activity and keenness for outdoor science during the session. The meetings and field excursions were held regularly, and the former were characterised by innumerable exhibits of interesting varieties of Lepidoptera and a great variety of insects of all orders too numerous to be detailed here, but too important to be passed over by the student of distribution. The major articles in the volume include the Annual Address of the President (Mr Stanley Edwards) on Economic Entomology, and papers on the Tortricina, the genera *Cerostoma* and *Spilosoma*, variation in *Epinephele tithonus* and *Ematurga atomaria*, the colours of Orthoptera, etc., by various members.

MANUAL OF VEGETABLE-GARDEN INSECTS. By Cyrus Richard Crosby and Mortimer Demarest Leonard. New York: The Macmillan Company, 1918. 8vo, pp. 391. Price \$2.50.

This is one of the "Rural Manuals" edited by L. H. Bailey, of which eleven have now appeared. It forms an excellent epitome of the life-histories of the numerous species of insects which attack our growing vegetables, and at the present moment, when so much attention is being paid to the cultivation of small allotments, it will prove an extremely useful and handy guide to the thousands who have recently taken up seriously the task and hobby of raising good food-crops at or near their homes. Although the volume is primarily intended for gardeners and others in North America, yet it may be pointed out that out of the 195 species dealt with no fewer than 49, or nearly 25 per cent., are natives of Europe, having been introduced at various dates into the New World, and hence directly concern the British farmer and allotment-holder. Details are fully but precisely given regarding the distribution, habits, life-history, damage, and methods of control of almost every species.

The book is well printed, with an abundance of excellent illustrations and a comprehensive index. We can cordially recommend it to the notice of our readers and such of their friends as are interested, directly or otherwise, in the all-important question of our vegetable food-supply.

AN A B C OF COMMON BIRDS.

This little book, of sixty-four pages, is published at sixpence by the Royal Society for the Protection of Birds and, as it measures less than $3\frac{3}{4} \times 5$ in., can easily be carried in the waistcoat pocket. It only claims to "give a short and simple description of the commonest birds of the country from which they may be identified by the non-scientific person,

together with notes on the food they eat that may be considered as 'pro' and 'con' the interests of husbandman, gardener, or gamekeeper, and also their local names." A great deal of general information is given in very small compass and at this time, when the economic importance of birds may be said to be on trial, the booklet may be welcomed as dealing very fairly with the eighty species enumerated.

H. S. G.

BIRDS AND THE WAR. By Hugh S. Gladstone, M.A., F.R.S.E., F.Z.S., etc. Price 5s.

Captain Gladstone has given us a charming little volume on this subject: it is divided into five sections, I. The Utility and Economy of Birds in the War; II. Sufferings of Birds in the War; III. Behaviour of Birds in the War Zone; IV. Effect of the War on Birds; V. Conclusion, which comprises what is really a roll of honour of British ornithologists. The author has collected a vast amount of information from scientific publications, as well as from the daily press, and has welded it together into readable form. We note, with interest, that he holds that migration was not seriously affected by the War. This entirely coincides with our own experience, and we cordially support Captain Gladstone in his assertion. Too many writers have found an easy way out of all their difficulties by assigning any rather unusual occurrence to the "War" when a little research into the meteorological conditions would have furnished the correct answer to the problem. The book is light and pleasant reading, and we think it is an excellent thing that the facts therein contained should have been collected together and published in book form so soon after the close of hostilities.

A PRACTICAL HANDBOOK OF BRITISH BIRDS. Edited by H. F. Witherby, F.Z.S., M.B.O.U. Parts I. and II. Price 4s. per part.

This, the beginning of what promises to be a valuable addition to the literature of the British avifauna, has been written largely by the same ornithologists who wrote the Hand List of British Birds published in 1912. Their new work is compiled on very much the same lines but is wider in its scope, including under each species a description of all stages of plumage, characters and allied forms, field characters, breeding habits, food, distributions, and migrations. A great deal of information on each of these subjects is compressed into each paragraph, and the book should prove a most useful one. Perhaps its greatest value will be in bringing up to date and rendering accessible to field workers the descriptions and distribution of the British and allied subspecies recently differentiated, and the plates of immature and winter plumages should also be helpful. For beginners, too, the illustrations of the method of measuring the various parts of the birds, the scale of millimetres and inches, and the glossary of terms will be of great assistance. We shall look forward with interest to the future numbers of this handbook.

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[NOV.-DEC.

THE FIELD MOUSE OF FOULA.

By MARTIN A. C. HINTON, British Museum (Natural History).

I HAVE to thank Dr Eagle Clarke for allowing me to study some Field Mice collected on the island of Foula chiefly by Mr W. H. Greenaway. Foula lies out in the Atlantic sixteen miles west of the nearest point of the Mainland of Shetland. It is three miles long and one and a half miles wide, with an area of a little more than five square miles. Rising from the sea in lofty cliffs, which swarm with sea-fowl during the breeding season, its highest point attains an altitude of 1372 feet.

As is now well known, Field Mice of the *Apodemus sylvaticus* group have been differentiated into a considerable number of insular forms as the result of segregation in the Shetlands, Hebrides, and St Kilda. It is no matter for surprise, therefore, to find that the Field Mouse of Foula has some peculiarities of its own which entitle it to recognition as a distinct sub-species at least. On the whole its characters make a nearer approach to those of *A. fridariensis* than to those of any other species. *A. fridariensis* from Fair Isle was originally described as a sub-species of *sylvaticus* by Kinnear; but later Miller accorded it full specific rank. The present writer has described a sub-species, *A. f. grantii*, from Mid Yell, Shetland. It is proposed to treat the Foula Mouse as a second sub-species, for which the name *A. f. thuleo* is suggested.

Apodemus fridariensis thuleo, subsp. n.

HABITAT.—The island of Foula (the Ultima Thule of Tacitus).

MATERIAL EXAMINED.—Fourteen skins, twenty-two in spirit, and a skeleton; collected by Mr W. H. Greenaway and the Rev. J. Robertson.

TYPE.—An adult female, collected November 1917; original number, 5.

DESCRIPTION.—In general external appearance this animal closely resembles *A. f. fridariensis* but differs in its smaller size and larger hind-feet.

Size small, the head and body measurement being scarcely greater than in *A. sylvaticus* and therefore considerably less than in *A. f. fridariensis*. The tail is about equal to the head and body in length when all the specimens in adult pelage are averaged; but it is slightly shorter relatively in the larger or older specimens. The hind-foot is very large, its absolute size being as great as in *A. hirtensis* (the St Kilda Field Mouse), while its relative size is larger than in any other British form. The sole-pads are small as in *fridariensis*.

In colour the Foula Field Mouse agrees exactly with typical *fridariensis*. The flanks are dark, the lateral line of demarcation being regular and sharply defined. The ventral surface is of a dull bluish white, without any trace of a buffy suffusion. Normally there is no trace of a pectoral spot. The tail is strongly bi-coloured, dusky above, white below. Dorsal surfaces of feet white.

A direct comparison of the skulls suggests a closer affinity between *A. f. thuleo* and *A. f. grantii* than between the former and true *fridariensis*. The bullæ are as small, and the masseteric plate projects as little anteriorly as in *A. f. grantii*; while the brain-case appears to be still broader, rounder, and more depressed than in the latter sub-species. In the mandible the coronoid process is very feebly developed as in each of the two sub-species of *fridariensis* hitherto known; but its angular process shows no trace of the remarkable elongation characteristic of *f. grantii*.

The measurements confirm these impressions derived

from mere inspection; in addition they show that the skull of *A. f. thuleo* has some small peculiarities of its own. The absolute size of the skull is about as in *f. grantii*; the occipito-nasal length, interorbital width, nasal length and width, and the length of the anterior palatal foramina, are dimensions which tend to be smaller relatively than in either of the other two forms of *fridariensis*; on the other hand, the zygomatic breadth, cranial width, and post-molar length tend to increase in relative value. The rostrum is relatively wider than in *f. fridariensis*, narrower than in *f. grantii*; the masseteric plate is relatively narrower than in *f. grantii*, much narrower than in true *fridariensis*; the length of the tooth-row is nearly as in *f. fridariensis*, distinctly shorter relatively than in *f. grantii*.

The following tables of measurements furnish material for exact comparison with other British members of the *sylvaticus* group:—

I. EXTERNAL MEASUREMENTS.

| MALES. | | | | | | FEMALES. | | | | | |
|-------------------|-----------------|----------------|-------|------------|--------|-------------------|-----------------|----------------|-------|------------|------|
| No. | Date. | Head and body. | Tail. | Hind-foot. | Ear. | No. | Date. | Head and body. | Tail. | Hind-foot. | Ear. |
| <i>Skins.</i> | | | | | | <i>Skins.</i> | | | | | |
| 1 | Oct. 1917 | 96 | .. | 24·2 | 16 | 5 | Nov. 1917 | 101·5 | 102 | 26 | .. |
| 4 | Nov. 1917 | 95 | 94 | 25·5 | .. | 6 | Nov. 1917 | 93·5 | 90·5 | 24·7 | .. |
| 7 | Nov. 1917 | 87·5 | 92 | 26 | (juv.) | 8 | Nov. 1917 | 103·5 | 88 | 24·7 | .. |
| 9 | Dec. 1917 | 97 | 91 | 25 | 15 | B | Nov. 1917 | 98 | 98 | 25 | 16 |
| 11 | Nov. 1917 | 100 | 93 | 26 | 15·5 | 10 | Dec. 1917 | 104 | 94·5 | 25·3 | 15·5 |
| 12 | Nov. 1917 | 98 | 96 | 25·5 | 15·5 | 13 | Nov. 1917 | 91 | 92 | 25 | 14 |
| 15 | Nov. 1917 | 90 | 88·5 | 25 | 15·5 | 14 | Nov. 1917 | 90 | 90 | 25 | 14 |
| <i>In spirit.</i> | | | | | | <i>In spirit.</i> | | | | | |
| .. | April 9, 1917 | 89 | 92 | 23 | 15 | .. | April 1917 | 81 | 82 | 23 | 15 |
| .. | Nov. 9, 1917 | 86 | 97 | 24 | 15·5 | .. | Nov. 1917 | 86 | 83 | 24 | 15 |
| .. | Nov. 9, 1917 | 77 | 83 | 23·5 | 16 | .. | Nov. 1917 | 96 | 96 | 23·5 | 16 |
| .. | Nov. 9, 1917 | 84 | 96 | 25 | 15 | .. | Nov. 1917 | 80 | 81 | 23·5 | 14 |
| .. | Nov. 9, 1917 | 83 | 78 | 24 | 15 | .. | Nov. 1917 | 77 | 77 | 23 | 13·5 |
| .. | Nov. 1917 | 82 | 82 | 23 | 15·5 | .. | Nov. 1917 | 82 | 81 | 22·5 | 13·5 |
| .. | Nov. 1917 | 86 | 92 | 25 | 15 | .. | Nov. 1917 | 81 | 86 | 24 | 16 |
| .. | Nov. 1917 | 85 | 84 | 24 | 15 | .. | Nov. 1917 | 91 | 98 | 24 | 16 |
| .. | Jan.-Feb. 1918 | 94 | .. | 25 | 15·5 | .. | Jan.-Feb. 1918 | 87 | .. | 24 | 14·5 |
| .. | Jan. 1918 | 86 | 87 | 23·5 | 15 | .. | Jan.-Feb. 1918 | 90 | 94 | 24 | 16 |
| .. | Mar.-Apr. 1918 | 98 | 95 | 24·5 | 16·5 | .. | | | | | |
| .. | Mar. 1918 | 88 | 95 | 23·5 | 15 | .. | | | | | |
| <i>Skeleton.</i> | | | | | | <i>Skeleton.</i> | | | | | |
| 2 | Oct. 1917 | 101 | .. | 25·2 | 16 | .. | | | | | |
| .. | Average of 20:— | 90 | 90·2 | 24·5 | 15·4 | .. | Average of 17:— | 90 | 89·5 | 24·2 | 14·9 |

2. CRANIAL MEASUREMENTS OF *APODEMUS FRIDARIENSIS THULEO*.

Part I.—Absolute (in millimetres). Part II.—Measurements reduced to condylo-basal length=100. Part III.—Minimum, maximum, and average values of condylo-basal length (absolute) and other measurements (relative) in the subspecies of *fridariensis*.

| Skull No. | 2. Worn out. | 4. Half worn. | 7. Worn out. | 11. Half worn. | 15. Mod. worn. | 5. Much worn. | 6. Worn out. | 10. Half worn. |
|-----------|--------------|---------------|--------------|----------------|----------------|---------------|--------------|----------------|
| 1 | 25 | 94.2 | 24.9 | 24.7 | 23.8 | 24.2 | 24.6 | 24.9 |
| 2 | 27.2 | 26.2 | 26.8 | 27 | 26.1 | 26.5 | 26.6 | 27.1 |
| 3 | 14.1 | .. | .. | 13.8 | 13.2 | 13.3 | 13.9 | 13.9 |
| 4 | 4 | 4 | 4 | 4.1 | 4.1 | 4.1 | 4 | 4.1 |
| 5 | 12.2 | 11.6 | 12 | 11.7 | 11.7 | 11.8 | 12.1 | 11.9 |
| 6 | 8.5 | 8 | 8.2 | 8.6 | 8.1 | 8.2 | 8 | 8.1 |
| 7 | 11.8 | 11.7 | 11.7 | 11.7 | 11.2 | 11.4 | 11.5 | 11.8 |
| 8 | 6.5 | 6.5 | 6.5 | 6.7 | 6.4 | 6.5 | 6.5 | 6.6 |
| 9 | 9.9 | 9.5 | 9.8 | 9.8 | 9.5 | 9.7 | 9.6 | 9.8 |
| 10 | 2.6 | 2.6 | 2.5 | 2.7 | 2.6 | 2.5 | 2.4 | 2.6 |
| 11 | 18.5 | 13 | 13.6 | 13.4 | 12.5 | 13.2 | 13.5 | 13.5 |
| 12 | 7.4 | 7.1 | 7.2 | 7.1 | 6.9 | 7.2 | 7.6 | 7.5 |
| 13 | 5.7 | 6 | 5.9 | .. | 5.7 | 5.7 | 6.3 | 5.8 |
| 14 | 2 | 1.8 | 2 | .. | 2 | 2 | 1.8 | 2 |
| 15 | 4.8 | 4.6 | 4.7 | .. | 4.5 | 4.4 | 4.5 | 4.7 |
| 16 | 2.6 | 2.4 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |
| 17 | 3.0 | 3.8 | 3.6 | 3.7 | 3.6 | 3.6 | 3.7 | 3.8 |

| PART I. | | PART II. | |
|---------|------|----------|------|
| 1 | 100 | 100 | 100 |
| 2 | 109 | 104.5 | 108 |
| 3 | 55.9 | 55.4 | 56.4 |
| 4 | 16.6 | 16.9 | 16.5 |
| 5 | 48.1 | 48.6 | 48.7 |
| 6 | 34 | 34.8 | 33.8 |
| 7 | 47.2 | 47 | 47.4 |
| 8 | 26 | 26.9 | 26.8 |
| 9 | 39.6 | 39.7 | 39.9 |
| 10 | 10.4 | 10.9 | 10.3 |
| 11 | 54 | 54.6 | 54.9 |
| 12 | 29.6 | 28.7 | 29.7 |
| 13 | 22.8 | .. | 23.1 |
| 14 | 8 | 7.4 | 8.3 |
| 15 | 19.2 | 19 | 18.2 |
| 16 | 10.4 | 9.9 | 10.4 |
| 17 | 14.4 | 14.5 | 14.9 |

| PART III. | | PART III. | |
|-----------|--------------|-----------|---------------|
| 1 | 25.8 to 25 | 25.4-25.7 | 23.3 to 25.1 |
| | 24.5 | 25.55 | 24.37 |
| 1 | 100 | 100 | 100 |
| 2 | 108 to 109.5 | 109-110.5 | 109.5 to 112 |
| 3 | 54.9 to 56.5 | 55-54.5 | 54.1 to 57 |
| 4 | 16 to 17.2 | 16.1-17.1 | 16.2 to 17.6 |
| 5 | 47.8 to 49.2 | 47.2-48.7 | 46.1 to 50.2 |
| 6 | 82.5 to 84.8 | 83.4-82.7 | 82.7 to 84.9 |
| 7 | 46.8 to 48.8 | 47.2-48.7 | 46 to 47.3 |
| 8 | 26 to 27.2 | 26.7-26.1 | 25.5 to 27 |
| 9 | 39 to 40 | 41.7-40.5 | 39.4 to 40.5 |
| 10 | 9.75 to 10.9 | 10.2-11.3 | 10.4 to 11.5 |
| 11 | 52.5 to 54.9 | 54.3-54.4 | 53.1 to 54.8 |
| 12 | 28.7 to 30.9 | 29.5-29.2 | 27.4 to 30.4 |
| 13 | 22.8 to 25.6 | 24.4-25.8 | 24 to 25.5 |
| 14 | 7.2 to 8.4 | 7.1-7.8 | 6.9 to 8.15 |
| 15 | 18.2 to 19.2 | 17.7-18.7 | 19.1 to 21 |
| 16 | 9.9 to 10.7 | 13.2 | 10.4 to 11.15 |
| 17 | 14.4 to 15.7 | 14.6-15.6 | 15 to 16.7 |
| | 15 | 15.1 | 15.6 |

A. fridariensis.*fridariensis*.*gronitii*.*thuleo*.

(2).

(7).

PART III.

PART I.

PART II.

PART III.

List of measurements recorded in preceding table :—

- | | |
|---|--|
| 1. Condyllo-basal length. | 10. Nasal width. |
| 2. Occipito-nasal length. | 11. Palatal length. |
| 3. Zygomatic breadth. | 12. Diastema. |
| 4. Interorbital width. | 13. Length of anterior palatal foramina. |
| 5. Cranial width. | 14. Width of anterior palatal foramina. |
| 6. Cranial depth, in middle. | 15. Rostral breadth. |
| 7. Post-molar length ; condyle to m. 3. | 16. Width of masseteric plate. |
| 8. Condyle to front surface of bulla. | 17. Cheek-teeth, coronal length. |
| 9. Nasal length. | |

3. COMPARISON OF EXTERNAL MEASUREMENTS.

| | Absolute (in millimetres). | | Relative (Head and body = 100). | | | | | | |
|--------------------------------------|----------------------------|-------|---------------------------------|------|---------|------|------|------|--|
| | H. & B. | T. | HF. | E. | H. & B. | T. | HF. | E. | |
| <i>A. fridariensis thuloo.</i> | | | | | | | | | |
| Average of 9 adult males . . . | 96·5 | 93 | 25·1 | 15·7 | = 100 | 96·5 | 26·1 | 16·3 | |
| „ 10 „ females . . . | 95·8 | 94·2 | 24·7 | 15·3 | = 100 | 98·5 | 25·8 | 16 | |
| <i>A. fridariensis fridariensis.</i> | | | | | | | | | |
| Average of 6 adults . . . | 109·5 | 103·2 | 24·1 | 16·1 | = 100 | 94 | 22 | 14·7 | |
| <i>A. fridariensis grantii.</i> | | | | | | | | | |
| Average of 10 adults . . . | 101·5 | 91·8 | 24 | 16·2 | = 100 | 90 | 23·6 | 15·9 | |

Nearly all the material upon which this contribution is based was collected by Mr W. H. Greenaway at the request of Dr Eagle Clarke, and the latter desires that these services should be fully and gratefully acknowledged. Mr Greenaway found the Mice, which are termed "Hill Mice" by the inhabitants, on rough ground from the foot of the hills up to 1000 feet above sea-level, and remarks that it is surprising how they survive the storms and trials of the Foula winter.

Number of Young in Stoat's Family.—On 8th May 1919 I found a Stoat's nest in a tree-root. I returned in an hour and shot the female carrying away a young one. I then got the nest dug out and it contained ten young ones. There were, therefore, at least eleven in the litter and the female may have carried away one young one before she was shot. In Bell's *Quadrupeds* the size of a litter is given as about five, and in Lydekker's *Handbook to the British Mammalia* as five to eight.—JAMES BARTHOLOMEW, Glenorchard, Stirlingshire.

[There are records of as few as two and as many as twelve and thirteen, but the usual number of young is from five to eight.—EDS.]

Behaviour of Birds under Abnormal Conditions.—Now that the War is happily over, we feel we may place on record what we noticed of the behaviour of birds here, during the Zeppelin raid on Edinburgh on the 3rd of April 1916. Even at this distance (23 miles) the noise of the guns and bombs was very great, and the concussions caused the windows and doors to shake and rattle. Great disturbance was evident among the birds during this bombardment; the Tawny Owls, which had been perfectly silent, began to hoot loudly, Partridges were to be heard calling in the fields all round, Pheasants uttered their characteristic crow, while the Gulls on the shore kept up an incessant clamour. As the bombardment died down, so did these noises in the night, the birds apparently resuming their interrupted slumber as soon as sufficient quiet reigned. Mr Evans has kindly informed us that at Comiston, immediately to the south of Edinburgh, the Rooks rose from their nests in a body, cawing vociferously, and the Pheasants in the neighbouring woods “crowed” all through the raid. We might, perhaps, also mention the fact that all through the War, whenever there was gunfire in the neighbourhood, the Pheasants crowed loudly; this has, of course, often been recorded, but it interested us to notice that they never got accustomed to the gunfire, but called as loudly at the end of the four and a quarter years as they did at the beginning. Another thing we have noticed during the last four years is, how much more frequently the Tawny Owls hooted in the daytime than they did before. Here, the hooting of an Owl in the daytime is believed to be a forerunner of disaster, but we wonder whether distant detonations, perceptible to the wonderful ears of the Owls, though too far off to reach our duller senses, might be the cause. *Loud* gunfire did not invariably make the Owls call as was the case with the Pheasants, but since the end of the War we have but rarely heard Owls hoot in the daytime. Dr Charles Davidson (*Nature*, 1st February 1917, p. 439) says that Pheasants showed great signs of unrest over wide areas, both during the Jutland Battle and during an explosion in a munition factory. We were very much interested in his remarks on the subject in view of what we ourselves had observed, but could not publish our notes because the exact locality of the raid had not then been stated officially. It is not only unusual sounds which cause birds to call in this way; for instance, an eclipse of the sun may have this effect. During the partial eclipse on 21st August 1914, we heard Curlew calling loudly and continuously, this ceasing when the shadow passed.—EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL, Largo, Fife.

THE STARLINGS OF SHETLAND, FAIR ISLE, AND ST KILDA.

IN a recent issue of *Novitates Zoologicae* (vol. xxv. pp. 327-337), Dr Hartert reviews the various forms of the Common Starling (*Sturnus vulgaris*) and adds several new sub-species, making the total number of races now recognised to be nineteen in number. Among the new forms is *Sturnus vulgaris zetlandicus*, the Starling of the Shetland Isles; but the peculiarities of the Starlings which are natives of Fair Isle and St Kilda are also described.

In his preliminary remarks, Dr Hartert tells us that "the Starlings are one of the most difficult genera of Passeres with regard to their sub-species. Some have a very wide distribution and are enormous migrants, while others are fairly local and resident, and their plumage varies very much according to season and age."

The Starling of Shetland, he finds, comes nearest to that of the Faroe Isles—the *S. faroensis* of Fielden—from which it differs in having the "bill not so wide and long, though wider (only sometimes longer) than in *S. v. vulgaris*. First primary not so broad as in *faroensis*. Wings 131, 131, 132, 133, 134, 135, 136, 137, 137.5, 138 mm. (In twelve adult *faroensis* wings 133-136, in 200 *vulgaris* only 128-132, exceptionally up to 134 mm.) Juv. as a rule, as dark as those of *faroensis*, much darker than those of *vulgaris*. . . . Mr Ogilvie Grant (*Bull. B. O. Club*, xxxiii., p. 63) first called attention to the dark colour of the Shetland Starlings, but he said the adult ones did not differ from common British Starlings." Mr Ogilvie Grant's remarks were criticised by Dr C. B. Ticehurst in the *Scottish Naturalist* (1915, pp. 3-4), where he demonstrated that some of Mr Grant's distinguishing characters were not confined to Shetland birds. It will be observed that so far as the plumage of adults is concerned Dr Hartert claims no peculiarity for *S. zetlandicus*.

Dr Hartert's remarks on the native Starlings of Fair Isle and St Kilda are also interesting. Those of Fair Isle—an island midway between the Orkney and Shetland

groups, being about 26 miles distant from either—are regarded as puzzling. Of the four adults examined, he finds that “some have bills as in *zetlandicus*, others as in *vulgaris*, also the wings vary, measuring ♀ 126.5, ♀ 128, ♂ 137, ♂ 131. Of the four young in full juvenile plumage one is of the darkest colour (as dark as young *faroensis* and *zetlandicus*), another as light as young *vulgaris*, the two others darker than usual *vulgaris* but not quite so deeply coloured as the first; three more are in full moult and difficult to judge, but evidently rather dark, though not of the darkest type. One must therefore say that these birds are on the whole intermediate between *vulgaris* and *zetlandicus*.”

The St Kilda Starlings examined were “most of them in moult, and I could only measure four with confidence which have wings from 127 to 135 mm., while the bills vary as in the Fair Isle specimens, as does also the first primary. I have not seen specimens in full juvenile dress, but the head, neck, and part of the back in a moulting one appear to be dark, as in the intermediate Fair Isle ones. Therefore it seems that here, too, we have not yet a fixed race, possibly for similar reasons as on Fair Isle, *i.e.* comparatively recent immigration.” They were first mentioned as natives of St Kilda in 1758.

Racial forms which are based upon bill and wing measurements which overlap those of other races are unsatisfactory in one important respect, namely, that should they occur beyond their *patria* it would be impossible to distinguish them from *individuals* of other forms which present similar dimensions. In this connection it may be mentioned that the measurements of the wings of 53 Starlings killed at the Eddystone lighthouse on the night of 12th/13th October 1901 ranged from 123 to no less than 136.5 mm., and thus the largest closely approached the maximum dimensions of Dr Hartert's Shetland race, and far exceeded the same author's measurements of the typical bird; yet one would hesitate to claim that we had here evidence in favour of *zetlandicus* being, even occasionally, a migratory bird. Nor should too much importance be awarded to the dark colour of the first plumage—the only

plumage peculiarity of both the Faroese and Shetland races. Similarly coloured birds have been obtained in areas far removed from these northern islands, namely, at Kew in Surrey, and at Spean Bridge in West Inverness-shire (23rd June 1903); and it is probably at present more prevalent than is suspected. It would seem that in its first plumage the Starling is dichromatic, and that while the dark phase is more frequent among the birds of the northern archipelagoes of Faroe and Shetland than elsewhere, it is not confined to them. On the other hand, since the brown phase occurs in Fair Isle, which ranks as the southmost of the Shetland group, there can be little doubt that it also occurs among the birds on the other islands of the archipelago, which are only a few miles farther north and in sight of it.

An interesting fact deserves to be mentioned concerning these insular Starlings, namely, that although they are sedentary (they are not known to quit their native isles), yet their wing measurements are in excess of those of the typical form, vast numbers of which bi-annually undertake extensive migratory journeys between their summer quarters and their winter retreats. As a rule the wings of birds peculiar to islands are shorter and more rounded than in those species or forms which are more widely distributed.—W. E. C.

Great Spotted Woodpecker in Argyll.—In July 1919 Sir Archibald Campbell sent me for preservation a female example of *Dryobates major*, which had unfortunately found its way into a trap at Minard on the 15th of the month. In response to a request for further information, Mr Rae, who has been keeper there for over twenty-five years, tells me that he has never seen the bird there before, but he thinks it may have nested in some old birches near the place where it was accidentally trapped. This bird is new to the avifauna of Argyll and Western Scotland generally, as a summer and presumably a resident species.—CHARLES KIRK, Glasgow.

The Status of the Redshank in the Outer Hebrides.—Referring to the above species on p. 227 of the B.O.U. list (1915) we find the following remarks:—"A resident, generally distributed during the breeding season, though less common in the Shetland Islands and in Wales, and rare in the Outer Hebrides."

This reference seems slightly confusing as to the Outer Hebrides, and is apt to mislead. I would like to adduce some facts with a view to amending the above, and in order to pursue the subject, let us turn to other and older works:—

- I. Yarrell (2nd edition), 1845, makes no mention of the species in the Outer Hebrides.
- II. Harvie-Brown and Buckley, *Vert. Fauna, Outer Hebrides*, 1888, p. 135:—"Recorded as occurring only in the winter in 1830. Seen, however, in pairs at Taransay, in June, and at Vallay in August, and shot on Berneray in May 1841, but no nests found. Occurred at Mhorsgail, and at or near Stornoway in 1879; and Mr Greenwood found it in the Hebrides, but not in great numbers. We cannot recall ever having met with the species in the Outer Hebrides in summer, not even during visits specially made to the localities mentioned by MacGillivray."
- III. Saunders (2nd edition), 1899, p. 615:—" . . . while in the most of the Outer Hebrides it is chiefly an autumnal visitor."

From personal experience *T. totanus* is found to be common and resident (though breeding in no great numbers); during the latter half of August a considerable increase may be noted, but these fresh arrivals depart during February or March of the following year. From April to mid-August the bird is still very numerous; a day seldom passes without its being noted, and so we cannot label the species other than "common." Thus I, II., and III. are almost entirely out of harmony with the present conditions. Yet I can well imagine the Redshank to be scarcer in Lewis, Harris, and Barra, owing to those localities being less suited to the bird's habits, than Benbecula and North and South Uist.

Thus we may safely say that the present status of *T. totanus* in the Outer Hebrides has greatly changed since the middle of last century. That the species has fluctuated in numbers from time to time might also be suggested; for instance, during last February and March the Redshank was considerably less in evidence than during the corresponding months of former years.

Propos of this type of change I may here mention that the Dunlin (*Tringa alpina*), formerly a common spring migrant, has become comparatively scarce during that season. This tends to show existing conditions still less in agreement with p. 222 of the B.O.U. list than my initial comparison.—F. S. BEVERIDGE, Dunfermline.

SOME BIRD NOTES FROM SOUTH UIST.

By DONALD GUTHRIE.

Continued from page 150.

THE BRENT GOOSE.—Brent Geese are rare in Barra, South Uist, and Benbecula, the only three I have seen in the Outer Hebrides were shot in South Uist.

THE BARNACLE GOOSE.—Barnacle Geese arrive in the Hebrides about 15th October and leave almost to a day on 1st or 2nd May; on arriving at the islands they come from the south, flying low along the Atlantic sea-board. My idea is they fly south far out at sea and then, when about Barrahead, turn north to settle on their favourite haunts; they come in from the sea very often at dusk. White-fronted Geese, on the other hand, arrive from the north-east, year in, year out. It is exciting work stalking a large gaggle of Barnacle Geese as they make a continual cackling noise which makes one fear they are on the point of rising; they are easier to kill than other kinds of geese as their feathers are easier to penetrate. It was very interesting to watch the Barnacle Geese congregate into one huge flock during the last days of April preparing for their spring migration; I have seen a large plain covered with geese in the evening and by next morning not a single goose was to be seen, even wounded geese disappeared mysteriously. They left almost for certain on or about 1st or 2nd May, that is if not harassed by shooting too much during the spring. During frost Barnacles take to the sea-strands but return to the fresh water when possible at dusk and during the night. In hard frost one winter I went to an open sheet of water at the mouth of a large drain a little before dusk and hid myself in a large stone butt. In a very short time Teal began to come, then Snipe and a few Woodcock walking along the sides, then Wigeon, Goldeneye, Scaup, Pochard, Mallard, Tufted Duck, and a few Pintail, so that the sheet of water was covered. Just as the moon began to shine brightly the Barnacle came, in hundreds, some settling on the ice, some on the water, others on the

shore. Next a flock of Grey Geese and then Whooper Swans, settling on the ice and walking majestically towards the water all anxious to quench their thirst. The Swans soon began to feed, diving their heads and long necks into the water and bringing up their favourite weed; round every Swan swarmed the Wigeon and Teal to partake of the food the Swans brought to the surface. I lay so long watching them that I could scarcely walk, but managed to crawl away without disturbing the pretty scene.

THE CANADA GOOSE.—Seven of these geese appeared one winter, when we were fortunate enough to procure two specimens though they were extremely wary, scarcely leaving the little hill-tops.

THE SHELD-DUCK —This handsome bird is very numerous in the Hebrides both on the Atlantic and the Minch sea-boards; many stay all the year round, but they are most numerous during the nesting season. On the western sea-board they lay their eggs in rabbit holes not far from the sea, where they take their young immediately, but on the Minch side they have their nests, as a rule, in peaty banks split open by the summer heat. Once I found two nests, both with the full complement of eggs and having the same entrance, branching off a few yards in. It is very amusing to see them dance, we had eight young at one time hatched under a hen and when hungry they would come to the doorstep and begin their little performance, like soldiers learning "left-right," arching their necks the while, this being their method of squeezing the tiny worms out of the ooze on the seashore. Another time we had four young Sheldrake which disappeared towards the end of autumn; three months later we were greatly surprised to see three draggled-looking Sheldrake walk into our kitchen and begin their performance in front of the stove. It was a severe snowstorm, so they stayed with the poultry until the thaw set in, when they disappeared, never to return.

THE MALLARD.—South Uist is specially adapted for Wild-duck, and Mallard are very common there all the year round. They nest chiefly on the islands in the lochs, some, however, breed on the hills, bringing their

broods down the streams into the marshes on the low ground. During the transit many of the young are lost, as the Mallard seems quite content if one of her young follow, leaving the others perhaps behind a stone wall or low turf dyke. In fine weather the great majority of the Mallard went out to the Atlantic during the day and flew in again at dusk.

THE GADWALL.—This duck arrived in late October and stayed on to April, but as far as I could see never nested. In their habits they are very like the Wigeon and Pintail, if unmolested they become very confiding, feeding in shallow bogs on their favourite lochs quite close to people working in the fields.

THE TEAL.—Teal are common, both as a breeding bird and migrant; they gather into large flocks during the winter, betaking themselves to the sea lochs on the Minch side, where they obtain good shelter; they also frequent the inland waters.

THE WIGEON.—Wigeon arrive in October and leave in early April, some years a few stay all summer but I never saw or heard of one nesting. They frequent the shallower lochs where their favourite weed abounds and keep company with the wild Swans, which help them greatly in getting the weed from the bottom.

THE SHOVELLER.—The Shoveller is far from common, but a few breed; as a rule, they keep company with the Wigeon. They keep to the shore, although going inland to nest, which they do in long dry grass and rushes, always near a marsh, where they can take their young for safety.

THE PINTAIL.—In the Hebrides, Pintail are not numerous, they are more plentiful in Benbecula in the winter than in South Uist, where, however, a few nest. Both the male and female look after the brood and they take them right on to the middle of the lochs at the least sign of danger, quite different from the Mallard.

THE POCHARD.—A small flock of Pochard frequented a small pond near my house every winter; as we never interfered with them they got very tame.

THE SCAUP.—A pair of Scaup nested near Grogarry, South Uist, but the species is chiefly a winter visitor being very numerous at that season. When fighting they move

in one huge lot and one can never get more than two shots at them.

THE TUFTED DUCK.—The Tufted Duck frequented the Hebrides in hundreds in the early eighties, then for a few years got very scarce; after a time they began to get more numerous again and curiously enough began nesting in South Uist. They make their nest on little grassy islands in quiet corners and on the mainland near a pond under a bush or long rushes.

THE LONG-TAILED DUCK.—Common on the Atlantic side in winter but seldom or never found on the Minch; after a hurricane on the Atlantic, storm-driven birds are occasionally found on the inland lochs.

THE EIDER.—The Eider is very common, often going a considerable distance inland to nest, even to the moors among the heather; others nest in the long bent grass, not far from the seashore. This species was very much on the increase, more being seen every year. It is known in the Hebrides by the name of "Heisker big duck," the belief being that the first ducks came off a vessel wrecked on Heisker long before the Monach lighthouse was built.

THE COMMON SCOTER.—Is very common on the Atlantic coast, seldom or never coming inland.

THE GOOSANDER.—The Goosander is very rare in the Outer Hebrides; I never saw its nest there, in fact it was only seen on rare occasions.

THE MERGANSER.—This duck is very numerous in the Hebrides and may be classed as a true native, nesting all over the islands. They lay from ten to twelve eggs and their nest is often made under a peaty bank, something like the Sheldrake, but as far as my observations went they did not lay their eggs so far underground. The Merganser is very destructive to fish of all kinds and under no conditions should they be allowed to frequent valuable trout lochs or streams. Sometimes towards the end of autumn, flocks containing hundreds may be seen in the creeks and bays of the Minch, and often frequent the trout lochs, where they cause great havoc.

RED-NECKED PHALAROPE.—This beautiful little bird

comes to the Hebrides as a summer visitor. At one time we knew of as many as forty pairs, but I fear very much their numbers are now less, as that bane of bird life, the egg-collector, found out their haunts.

THE WOODCOCK.—The Woodcock is an abundant winter visitor to the Outer Hebrides, arriving about mid-October and staying till late February or early March. They frequent the deep wild ravines and sides of mountain streams, where good heather covert and overhanging rocks afford all the shelter they require; in fine weather they are found all over the open moor among the Grouse and afford capital sport, especially in November and early December, when the migratory Snipe are all over the moor along with them. After the exceptionally severe winter of 1897-98, Woodcock were never so numerous, as all birds suffered severely, especially those living by suction. The "Cock" frequented the same haunts year after year, in fact the same holes on a stormy day. They are very shy birds especially when migratory, and should always be allowed to settle for at least a fortnight in their winter quarters before being shot at; the same ground should not be disturbed often as no bird is so easily scared. The Peregrine and Merlin follow the birds from the far north and exact a terrible toll, especially when they are tired on landing.

THE SNIPE.—Breed all over the low-lying moors and green grazing ground between the "Machrie" and the moor, and numbers of migratory Snipe arrive in October. There is very good Snipe ground all over Barra, South Uist, and Benbecula.

JACK SNIPE.—These arrive in October and the number migrating to the Hebrides every year is marvellous. How they manage to weather the storms of the North Sea is a mystery to me, they seem so weakly.

THE DUNLIN.—Stays all the year round and nests freely on the plains near the Atlantic shores.

THE REDSHANK.—This bird is very common in the Outer Hebrides, especially during winter and spring, but is not so numerous in the nesting time, as many leave the islands to breed elsewhere.

THE GREENSHANK.—The Greenshank is very rare in South Uist, and I never saw its nest there although I was told it bred in the islands.

THE CURLEW.—I never saw anything approaching the huge flocks of Curlew which arrived in the Hebrides by the end of July and stayed till April; it can only be described as a winter visitor as I never saw or heard of its nest. Owing to the Curlew feeding so much among the sea-weed its flesh is very rank and fishy, and no bird got so hard up during frost, even worse than the Snipe or Woodcock.

THE WHIMBREL.—Is only a visitor to the outer islands, arriving in late April and May; it was called by the natives "may fowl," and in the old days was looked on as a great asset by native sportsmen. They were quite tame on arriving and only stayed for a few weeks. I never saw their nest.

THE GOLDEN PLOVER.—The Golden Plover was very numerous in South Uist, but very few stayed to nest which was strange as the nesting grounds seemed ideal. Many migrants arrived in September, and one day, early in October, I was fishing on a long narrow loch running east and west, and the numbers of Golden Plover which passed me that day were beyond anything I have ever seen. They crossed the loch about the middle, coming from the north-east and going off due south, in lots of a score or more, all day without ceasing. Next day none were to be seen.

THE LAPWING.—This well-known bird is a thorough native of the Hebrides, staying all the year round and nesting in thousands. They are much tamer than in other places as they are rarely if ever molested.

THE OYSTERCATCHER.—A numerous resident everywhere in the Hebrides.

(To be continued.)

ORTHOCLADIUS, SPP., BREEDING IN THE SEA.

By RICHARD ELMHIRST, F.L.S., Superintendent of the Millport
Marine Biological Station.

IN a recent conversation Mr H. M. Fox (Ray Lankester Investigator on Marine Insects at the Plymouth Laboratory) suggested I should publish a short account of observations on marine breeding insects, particularly Chironomids, in the Clyde area.

SPECIES I. *Orthocladius sordidellus*, Ztt.

The larvæ of this species occur frequently amongst *Enteromorpha intestinalis* and are generally found inside the hollow fronds of the *Enteromorpha*. The habits of this larva have been described by Mr T. H. Taylor in *Trans. Ent. Soc. Lond.*, 1904, pp. 521-3.

The larvæ occur in brackish and salt water and may be reared in fresh, brackish, or salt water. The pupal stage lasts about two days in summer but longer in cold weather. Emergence of the imago takes a few minutes, and the imago can fly within a similar time. Flies emerged 21st August 1914, mated 11 A.M. 22nd, and the female deposited a mass of ova by noon. The ova are about .24 mm. \times .12 mm., rather irregularly placed in a tube within a thick gelatinous covering generally curved and about 4 mm. \times .5 mm.

On summer evenings the flies occur in large flights about the shore and are attracted by the lights of houses. Early in August this year I collected a number of them associated with *Culicoides pulicaris* on a wall near a gas bracket. I have seen *Ceratinostoma ostiorum*, Hal., devouring an egg-laying female *O. sordidellus*. Bats feed along the shore when the flies are abundant.

SPECIES II. *Orthocladius*, sp. ?

The larvæ occur chiefly amongst *Polysiphonia fastigiata* but also amongst *Zostera* and other weeds, at all tidal levels; they have also been taken in the surface tow-net, but these

specimens undoubtedly came from weeds drifted off the shore. This larva I take to be the species erroneously described as a worm, *Campontia cruciformis*, by Dr Johnston in British Non-parasitical Worms, 1865. The life-history is similar to that of the preceding species. The flies, 2 mm. long, are yellowish with brown markings on the thorax.

A third species of Orthocladus larva with characteristic blue markings occurs in a brackish pool which is at present dried up. A Culicid and a Chironomid with four anal gills were found in a brackish pool in 1914.

I am indebted to Mr P. H. Grimshaw for the identification of the flies.

Hawfinch in Dumbartonshire.—On 5th August I received from Colonel Sir R. C. Mackenzie a male Hawfinch (*Coccothraustes coccothraustes*), a bird of the year, which was caught in a fruit net at Camiseskan, Dumbartonshire, two days previously. This species is, I believe, a new bird for the Clyde area.—CHARLES KIRK, Glasgow.

Nesting of the Pied Flycatcher and Garden Warbler in Ross-shire.—On the 22nd of May 1919, as my son and a ghillie were coming along the Blackwater River in the parish of Contin, East Ross, they heard the singing of a bird which they did not recognise. Two days later I visited the spot, heard the bird and saw it—a male Pied Flycatcher. The bird sang for a long time and then suddenly became silent; this happened each time I observed it. On the 25th, after watching the male for three hours, we found the nest in a hole in a birch-tree 12 feet from the ground; the male had sat where the nest was several times, but we did not see the female till she flew out of the hole. Though the Pied Flycatcher breeds in small numbers in Southern Scotland it is most uncommon in the Highlands, and I know of only one other breeding record in the Moray Area, namely in East Inverness in 1912. The nest found in East Ross, therefore, extends the birds' breeding range in Scotland considerably north of any previous record. I have also to report the breeding of the Garden Warbler in the same parish, in the garden of the lodge in which I was living. The nest was found on 24th May 1919, and on the 29th it had four eggs. I had seen the bird there the previous summer, and heard it singing as early as 5 A.M., but failed to find the nest. This is the first time the Garden Warbler has been found breeding in Moray.—D. J. BALFOUR KIRKE, Burntisland.

Unusual Nesting-place of Grey Wagtail.—A pair of Grey Wagtails nested this year (1919) in the porch at Poltalloch, Argyllshire. This is at present lined with Thuya trees in pots, in one of which the nest was built, about 5 feet from the ground. The female struck the glass door of the house and was killed, but the male took charge of the young which flew safely a few days afterwards.—G. W. MALCOLM, of Poltalloch.

Albino Spotted Flycatcher.—On 17th July 1919, a pure white young Spotted Flycatcher was captured in Dumfries, and after being kept three days in a cage, where it died, it was sent to me.—HUGH S. GLADSTONE, Dumfriesshire.

Pied Flycatcher in Aberdeenshire.—On 8th May 1919 a Pied Flycatcher (*Muscicapa atricapilla*) in male plumage was received at Aberdeen University from the Newburgh district. I have not personally met with the species locally until this occasion, and Sim (*Vertebrate Fauna of Dee*, 1903) gives only a few scattered records.—A. LANDSEBOROUGH THOMSON, University of Aberdeen.

The Whinchat as Imitator.—To *The Scottish Naturalist* for 1916, p. 282, I contributed some observations on the Whinchat imitating the Swallow's notes. To these I would like to add further instances of the Whinchat's powers as imitator.

Near Giffnock, on 22nd May 1917, within the space of twenty minutes or so, I heard from a single bird good renderings of the Pied Wagtail's call-note, the Sand-Martin's chatter, the ratchety note of the Wren, the song of the Corn-Bunting—especially the jangling part at the end—and the call of the Common Redshank, though not so loud as when uttered by the Redshank itself. On the same evening I had a second Whinchat under observation, which, as it flew with fluttering or quivering wings from a beech-tree to the telegraph wires, sang a finch-like song, a curious compound of the songs of the Goldfinch and the Chaffinch. These, with what I could recall from previous experience, accounted for imitations of the notes of at least eight different species, and, of course, the Whinchat has its own little song and notes as well.—JOHN ROBERTSON, Glasgow.

Golden Eagle in North Uist.—Thanks to Mr Anstruther-Gray's kind information, I can now record the Golden Eagle, within recent years, from the neighbourhood of Lochmaddy.

Whilst stalking on North Lee (6th October 1913) my informant, along with several others, observed a single bird, which, having settled within 150 to 200 yards, was in full view—his telescope,

and the bird's proximity, making any mistake as to its identity impossible.

This, I gather, is the latest authentic example from the district.—
FRED S. BEVERIDGE, Dunfermline.

The Whooper Swan in Ross-shire in June.—The occurrence of the Whooper Swan (*Cygnus musicus*) anywhere in the British Isles in the month of June is sufficiently rare to make the following visit of the species worthy of record. On 5th June 1919, at 9 A.M., I was proceeding to fish on Loch Beannachavan, a loch on the Meig, one of the upper affluents of the river Conon, when I was greatly surprised to see thereon a Whooper Swan that had unquestionably arrived overnight. It remained on the loch until the morning of the 13th, paying visits in the interval to neighbouring smaller hill lochs, and no evidence was shown that its power of flight was in any way impaired. The plumage was that of an adult bird, but the upper mandible did not have quite the lemon-yellow tint of the mature bird, being rather of a creamy yellow, thus showing traces of immaturity. I may state that the hills in the neighbourhood were covered with mist on two days previous to its arrival, and that the bird was very shy of allowing a near approach when I was on foot, but appeared to be less scared of a vehicle.—
D. MACDONALD, Glasgow.

Wild Swans observed in the Western Highlands in Summer.—During a visit to Western Inverness-shire in June 1919, Mr T. G. Laidlaw and myself were greatly surprised to observe on several occasions two adult Whooper Swans (*Cygnus musicus*) on Loch Trieg. At first only one was seen which stayed a day or two, and then left. On the 26th it returned accompanied by another. These on and off visits continued down to early July, when our residence in the district came to an end. During these sojourns the birds frequented a broad belt of weedy shallows on the west side of the loch, which afforded them the only suitable feeding ground.

On making inquiries of the keepers, we learned that the two birds arrived at Loch Trieg in the late autumn of 1918, and were seen there at intervals during the winter and early spring. In April one of them disappeared, and the two were not seen in company again until late in June. Both were strong on the wing and visited other lochs in the neighbourhood, some at high altitudes, which offered suitable feeding haunts. This was all we could learn regarding the birds.

We found the birds somewhat wary, inasmuch as they betook

themselves towards the centre of the loch on our approach, and frequently uttered their characteristic notes, *whoop, whoop*. We had several opportunities of examining the birds under most favourable conditions, and by the aid of binoculars observed that the yellow of their bills was fully developed as regards its intensity, and was not "creamy yellow," as in the case of the bird seen in Ross-shire some 40 miles farther north by Mr Macdonald, as recorded above. Both birds were strong fliers, and hence there seems to be no reason, if they were originally immigrants from overseas, why they should not have returned in the early spring to their native sub-arctic haunts. It would be of great interest to know more of the history of these Highland Wild Swans, and it is to be hoped that further information may be forthcoming regarding them.—WM. EAGLE CLARKE, Edinburgh.

Common Scoter on Duddingston Loch in May.—On 5th May 1919 I saw a male Common Scoter (*Edemia nigra*); it was resting on the water, near, but not among, some Coots. I had a good view of it with a field-glass and watched it for some time.—JOHN CURRIE, Edinburgh.

The Great Crested Grebe in Scotland.—In Misses Baxter and Rintoul's article in your last number, the Great Crested Grebe is given as a rare visitor to the Orkney Islands. This may have applied some years ago, but for some years prior to 1909 it was known as a regular visitor to Lochs Stennes and Harray on migration, and although one or two sometimes remained until well on in the spring, I know of no evidence of their nesting.

The date given for Cobbinshaw Reservoir, Midlothian, is 1907, but I feel sure that there was a pair there in the summer of 1905, and also another pair in the same year on Pressmennan Loch in East Lothian. Duns Castle Loch in Berwickshire also, I think, had a pair either in 1905 or 1906, for I remember going up there one evening to see them. They were already established on the Drummond Castle Loch in 1906, but whether nesting in any of these places I cannot say. I think that I am also right in saying that the bird has been seen on Duddingston Loch, Midlothian.

The Red-necked Grebe also occurs in Orkney on the spring migration, as I mentioned in the *Scottish Naturalist* (1909), p. 185.—H. W. ROBINSON, Lancashire.

[We are much indebted to Mr H. W. Robinson for the above interesting information. In endeavouring to trace the spread of the Great Crested Grebe as a breeding species in Scotland, we only dealt with definite records of the finding of the nest or young of

these birds on the various lochs. The presence of Great Crested Grebes on a loch in summer is not sufficient evidence of their breeding there, as has many times been proved.—E. V. B. and L. J. R.]

Black-tailed Godwit in Forfarshire.—On 3rd September I had an opportunity of observing a fine specimen of the Black-tailed Godwit on the seashore at Elliot. I watched the bird very closely with the aid of a binocular from 12.30 to 1.30 P.M. Though at first rather shy, it eventually allowed me to approach within 25 yards or thereby. Having apparently just arrived from overseas, it fed very eagerly on certain small marine creatures borne up the sand by the shallow waves. Occasionally it bored its long bill with a screw-like motion into the sand in search of worms, its head being entirely immersed in the operation. After feeding, it bathed in several inches of water, then very methodically preened its plumage, and thereafter went to sleep for ten minutes, standing the while on one leg with its beak inserted in the feathers of its back. On awakening it picked up a few more morsels then resumed its journey southwards, flying low over the water, its flight resembling that of the Curlew. As recorded in the *Report on Scottish Ornithology* in 1916, I saw a specimen of this bird on 7th September 1916 at the same place and at the same hour of the day. It went through exactly the same proceedings.—DOUGLAS G. HUNTER, Rosebrae, Arbroath.

Woodcock and Young.—I have been watching a Woodcock's behaviour with her young with considerable interest of late. The first nest with four eggs was destroyed, and this is her second effort, which accounts for the lateness of the date. The best view I have had of her was this morning (5th July 1919), before breakfast. My retriever flushed her in some long grass in the bog-garden, and she flew past me, only a few feet away, with legs hanging straight down, the thighs pressed close together, and the tail spread out and pointing downwards. She pitched on the grass walk a short distance ahead, and when on the ground looked as if she were brooding or hiding her chick. She let me approach quite close when she rose and flew further down the path. Her flight was exactly like that of a partridge or grouse with a broken back—low and undulating and in a very upright position. Three times I got close to her on the ground—close mown grass path—but never a young one did I see. All the time she kept up a loud screech. Her very laboured flight and the extraordinary position of the legs and thighs were what struck me most, and no one ever had a better view of a Woodcock.—JAMES M'L. MARSHALL, Bleaton Hallet, Blairgowrie.

Colias edusa and its var. helice in the Edinburgh District.—The hot weather we had at the end of May and throughout June seemed to me to give promise of a good butterfly season, so every week I went to a favourite hunting-ground of mine on the coast of East Lothian. While collecting there on 14th June 1919 I met another entomologist¹ who told me he had seen what he thought was a Clouded Yellow (*Colias edusa*) that day about half a mile from where I was. At first I was rather incredulous, but on reflection reasons for giving more credence to the report occurred to me. So on 21st June I again went down to the locality, and to my delight saw a Clouded Yellow. I did not catch it, however, as it was in full flight and I was unable to chase it quickly owing to the nature of the ground. About an hour later I atoned for this by netting a fine specimen of *C. edusa* var. *helice*, the white variety of the female. Its identity has been confirmed by the Editors of this Magazine. Again on 4th September I saw and chased a fine male *edusa*, but as it took refuge behind a clump of sweet briar about 4 feet high and several yards wide, I unfortunately did not get it.—IAN G. W. HILL, Edinburgh.

[It is interesting to note that in 1877, the year of the big immigration of *Colias edusa*, specimens were obtained in the same locality (Longniddry Links). Cf. *Proc. Berwicksh. Nat. Club*, vols. viii. and ix.—EDS.]

Colias edusa in Forfarshire.—While walking over the extensive coast sand hills lying between Monifieth and Carnoustie on 31st August 1919, the day being warm and bright, I was surprised to see some half dozen specimens of this beautiful butterfly flying up and down a long sheltered hollow lying quite near the sea-border of the sand hills. A specimen settled near me, and seemed to be in fine condition. They were again seen a week later, when a male was under close observation for some time. I am not aware if this species has been noticed in this county before. Meyrick, I see, records it from "Britain to the Clyde (rarely stragglers further north)."—A. E. J. CARTER, Monifieth.

Boarmia gemmaria in the Forth Area.—There being apparently no published record of the occurrence of *Boarmia gemmaria*, Brahm (*rhomboidaria* Hb.), in the Forth district, I may state that it has occurred in my garden at Morningside, in the southern suburbs of Edinburgh during the last two summers. Between the 25th and 28th of July this year five were captured and as many more seen, and on 15th August a worn specimen came into

¹ Mr K. J. Morton, F.E.S.—EDS.

the house. These all belong to the smoky-grey variety known as var. *perfumaria*. In 1918 Mr J. W. Bowhill showed me a specimen he had recently taken in his garden in the Grange district of Edinburgh, and Miss Balfour tells me she has taken the species at Whittingehame in East Lothian; while I believe I have seen a specimen from West Fife in Dunfermline Museum.—WILLIAM EVANS, Edinburgh.

The Kentish Glory Moth on Deeside.—A Kentish Glory Moth (*Endromis versicolor*) was found on a fir-tree on the east side of Birsemohr Loch, near Aboyne, on the evening of 17th April 1919, by Mr Christie, Millbank, Birse Aboyne. It was sent to the Royal Scottish Museum.—JANE GOWAN, Cullen.

[Though Kentish Glory Moths have been already recorded from Aberdeenshire, the above is of interest.—EDS.]

Caterpillars of the Pale Mottled Willow Moth in Flax.—When visiting the station where the flax is deseeded, at Silverburn, near Leven, I was interested to notice large numbers of caterpillars among the refuse which remained after the deseeding process. The caterpillars had evidently been living in the flax, and I was struck by their marvellous vitality in coming, unhurt, through the various operations necessary for deseeding. These comprised crushing between rollers and passing through the winnowing machine; it was among the small stones, broken husks, and other debris that the caterpillars were found. A good many of them were caught and reared and proved to be caterpillars of the Pale Mottled Willow (*Caradrina cubicularis*). Wheat stacks and pea haulms are known to be sometimes infested by this caterpillar, but I can find no previous record of it in flax.—GEORGE RUSSELL, Lundin Links.

Aspidiphorus orbiculatus, Gyll., in Scotland.—In dealing with this beetle in the paper on additions to the list of Scottish Coleoptera (*Scottish Naturalist*, 1919, 167), I omitted to mention that it had previously been recorded by Andrew Murray in his "Catalogue of the Coleoptera of Scotland" (1853), as occurring in moss in Berwickshire and at Kirkpatrick-Juxta in Dumfriesshire. For some reason or another it was not included in Dr Sharp's "Coleoptera of Scotland," but the Stirlingshire record has the effect of re-establishing it as a Scottish species.—A. FERGUSSON, Glasgow.

Staphylinus cæsareus, Ceder., in Main Argyll.—This fine *Staphylinus* is decidedly scarce in the Clyde area, and I was accordingly glad to find a beautiful specimen running across the road in Glen Goil, Lochgoilhead, during September 1915.—A. FERGUSSON, Glasgow.

Halyzia 16-guttata, L., and Coccinella conglobata, L., in Main Argyll.—One example of the scarce ladybird, *H. 16-Guttata*, was taken by beating birches in Glen More, Lochgoilhead, during September 1915. In the Clyde area it has only previously been found at Luss (Dumbarton) by the Rev. J. E. Somerville. *C. conglobata*, another scarce species of the same group, occurred in Glen More at the same time on Hazel. Curiously enough it has also been recorded from Luss, where two specimens were taken by Mr A. A. Dalglish in 1900. The only other Scottish record for this species is from Aberfoyle (West Perth), where Mr Evans found two specimens, one on oak in May 1896, and the other in September 1897.—A. FERGUSSON, Glasgow.

CURRENT LITERATURE.

THE FOOD OF THE BULLFINCH.—Dr Collinge, on evidence gathered from an examination of 484 adult Bullfinches and 34 nestlings collected in four Midland counties of England, condemns the Bullfinch (*Country Life*, 3rd May 1919). He finds that “practically the whole of the food consumed is vegetable matter,” and that “of the total bulk found in these birds 41 per cent. consisted of cultivated fruits, 15 per cent. of wild fruits, and 44 per cent. of weed seeds.” This makes up the full 100 per cent.; yet, curiously enough, although almost half of Dr Collinge’s adult birds (228 out of 484) were collected in April and May, and although a main antipathy of gardeners to the Bullfinch is due to its destruction of blossom buds in the springtime, Dr Collinge appears to have found no trace of such vegetable matter at all. From replies to queries he has learned that the Bullfinch is increasing in numbers, that for half the year it is “most destructive” in fruit orchards, and that fruit-growers would welcome any measure that tended to reduce the numbers of the bird.

DERONECTES DEPRESSUS AND D. ELEGANS.—An interesting paper on *Deronectes depressus*, Fab., and *D. elegans*, Panz., two British Water-beetles, appears in the *Annals and Magazine of Natural History* for April (pp. 293-308 and pls. vii.-viii.). The author is Frank Balfour-Browne, who, after a careful examination of a long series of specimens, comes to the conclusion that the species named are distinct but closely related. Both forms have hitherto been included by British authors under the name

D. depressus, but they may be separated by the difference in the shape of the thorax in both sexes, by the different curvature of the anterior tarsal claws of the male, and by the difference in the breadth of the apex of the ædeagus. The distribution of both species in Britain is discussed in considerable detail.

THE "EGG-BURSTER."—In the *Annals and Magazine of Natural History* for April (pp. 372-376) F. W. Edwards draws attention to the presence in the larvæ of several diptera, belonging to different families, of a curious organ known as the "egg-burster." It consists in general of a chitinous disc armed with a small pointed peg, situated on the head of the larva but only present in the first stage, *i.e.*, before the first moult takes place. This apparatus, whose function is to pierce and cut the egg-envelope and thus facilitate the exit of the grub, has only hitherto been observed among diptera in the family Culicidæ (Gnats), but Mr Edwards has discovered it also in *Simulium*, *Chironomus*, and two genera of Mycetophilidæ (Fungus-gnats). In other orders of insects the egg-burster has long been known, assuming a variety of forms.

FRIE-FLY (*Oscinis frit*) IN SCOTLAND.—In the July number of the *Scottish Journal of Agriculture*, Dr James Ritchie gives illustrations of the amount of damage to oats caused by the Frie-fly in the south of Scotland, and summarises recent investigations bearing upon methods of combating this pest.

HORSE BOT-FLIES IN BRITAIN.—In view of the increase of Bot-flies due to the unusual bunching of horses in paddocks and fields during the war, and because of the possible spread of Bot-flies and bot-diseases in Britain through the dispersal of infected horses, Dr James Ritchie gives a short illustrated summary of habits of the flies, of their effects upon horses, and of measures which have been recently adopted with effect in preventing and curing bot-disease (*Scot. Journ. Agr.*, 1919, p. 354).

DIPTERA AT ABERFOYLE.—In a note in the *Entomologist's Monthly Magazine* for October 1919 (p. 233), A. E. J. Carter records the capture of the following Diptera during the past summer: *Oxycera dives*, Liv., and *Physocephala nigra*, Deg., at Aberfoyle; *Symphoromyia crassicornis*, Pz., at Balquhidder; *Therioptectes micans*, Mg., *T. distinguendus*, Verr., *Hæmatopota crassicornis*, Whlbg., and *Chrysops relictæ*, Mg., at Loch Voil (the last-named also at Loch Lubnaig); *Isopogon brevirostris*, Mg., *Polietes hirticrura*, Mde (both sexes), and *Hydrotæa pilipes*, Stein, at Callander.

BOOK NOTICES.

BIRDS BENEFICIAL TO AGRICULTURE. By F. W. Frohawk, M.B.O.U. Pp. vi. + 47. London: Trustees of the British Museum. Price 2s.

This fresh addition to the Economic Series of pamphlets issued by the British Museum (Natural History) comes at an opportune moment, when the effects of the disastrous warfare against small birds in this country begin to wear off, and the man behind the gun has to be reminded that in the case of birds "they that be with us are more [far more] than they that be against us." Mr Frohawk calculates that of the birds which regularly inhabit Britain, "120 species may be regarded as decidedly beneficial to agriculture generally." Of these he describes 44, and depicts 22 in his own graphic and accurate way. In addition to short accounts of the specific characters of the selected birds, of their times of migration, of nesting and feeding habits, he has contrived to add a general introduction on the relationship of birds to injurious insects and to agriculture generally. The pamphlet lays the proper stress on the activities normal to most of our birds and will be appreciated by naturalists as well as by farmers; but a stronger insistence on and examination of the detailed relationship of each bird to agriculture, would have brought it better into line with the remainder of the Economic Series.

J. R.

THE SEASHORE: ITS INHABITANTS AND HOW TO KNOW THEM. By Forster Robson. Pp. 111 (illustrated). London: Holden and Hardingham. Price 1s. 6d. net.

This small book is intended to guide children and their parents to some slight knowledge of the commoner animals, seaweeds, and flowers likely to be met with on a holiday by the seashore. The intention is good; and many will, no doubt, find here information which in its freshness and variety will add to the enjoyment of an afternoon on the rocks. But while the information, which naturally is elementary, is on the whole accurate, there are several mistakes, as when the Ship Worm is said to be attached by a "sucker-like mouth" at the end of its "neck," or when the simple structure of a Hydroid is attributed to Sea-mat individuals, or when the "Long Worm" (Lineus) is described as "tape-like." The letterpress also shows careless workmanship; misprints are frequent—there are three different spellings of the word Coralline, and none is correct; the description of the colour of the Weaver has been forgotten, some of the figures such as the "Sea Urchin" and the "Worm-pipe Fish" are very poor, while the figure of an unrecognisable Hydroid is labelled with the unrecognisable name "Sinu." A little more attention would have added to the usefulness of the book.

J. R.

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