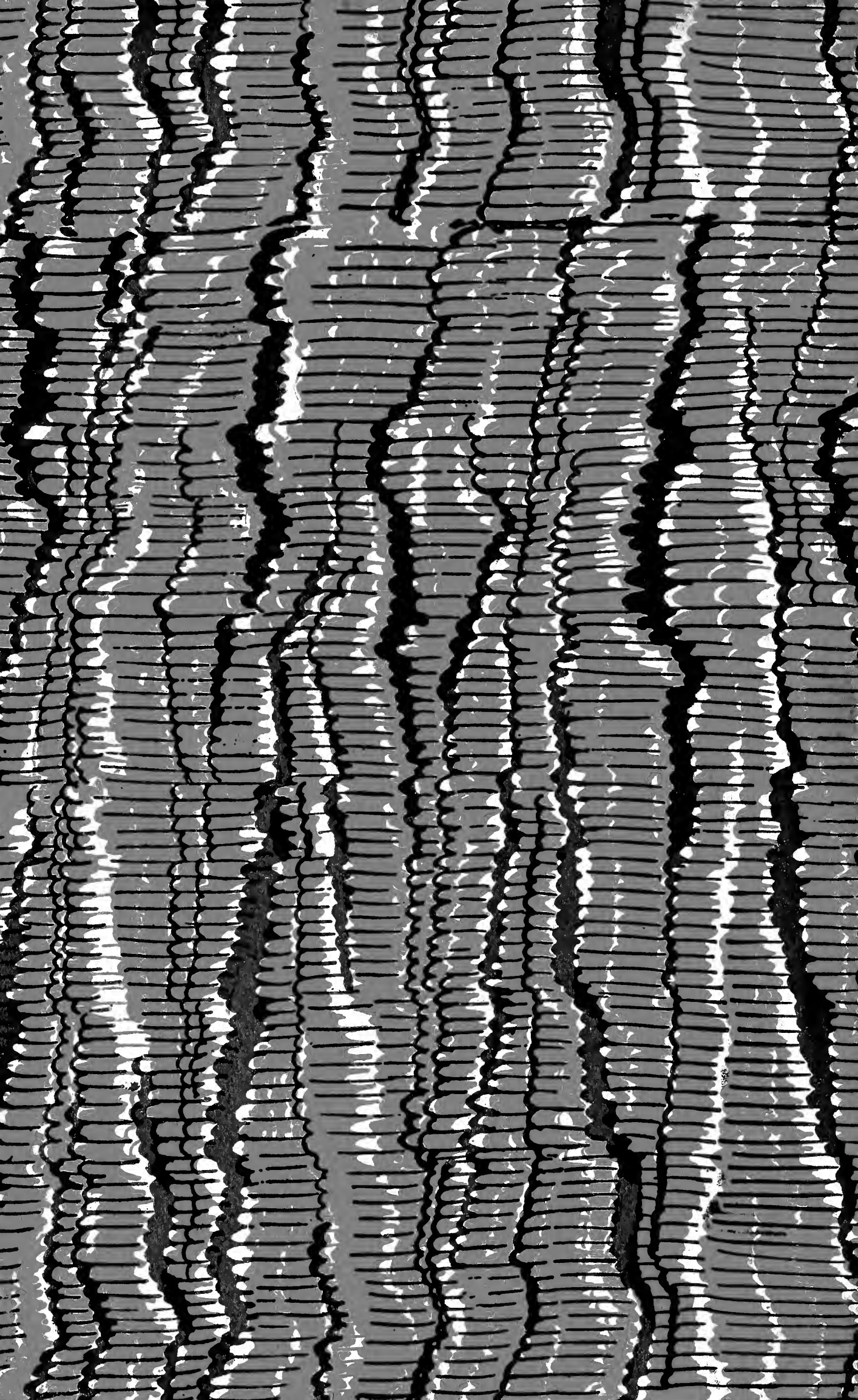
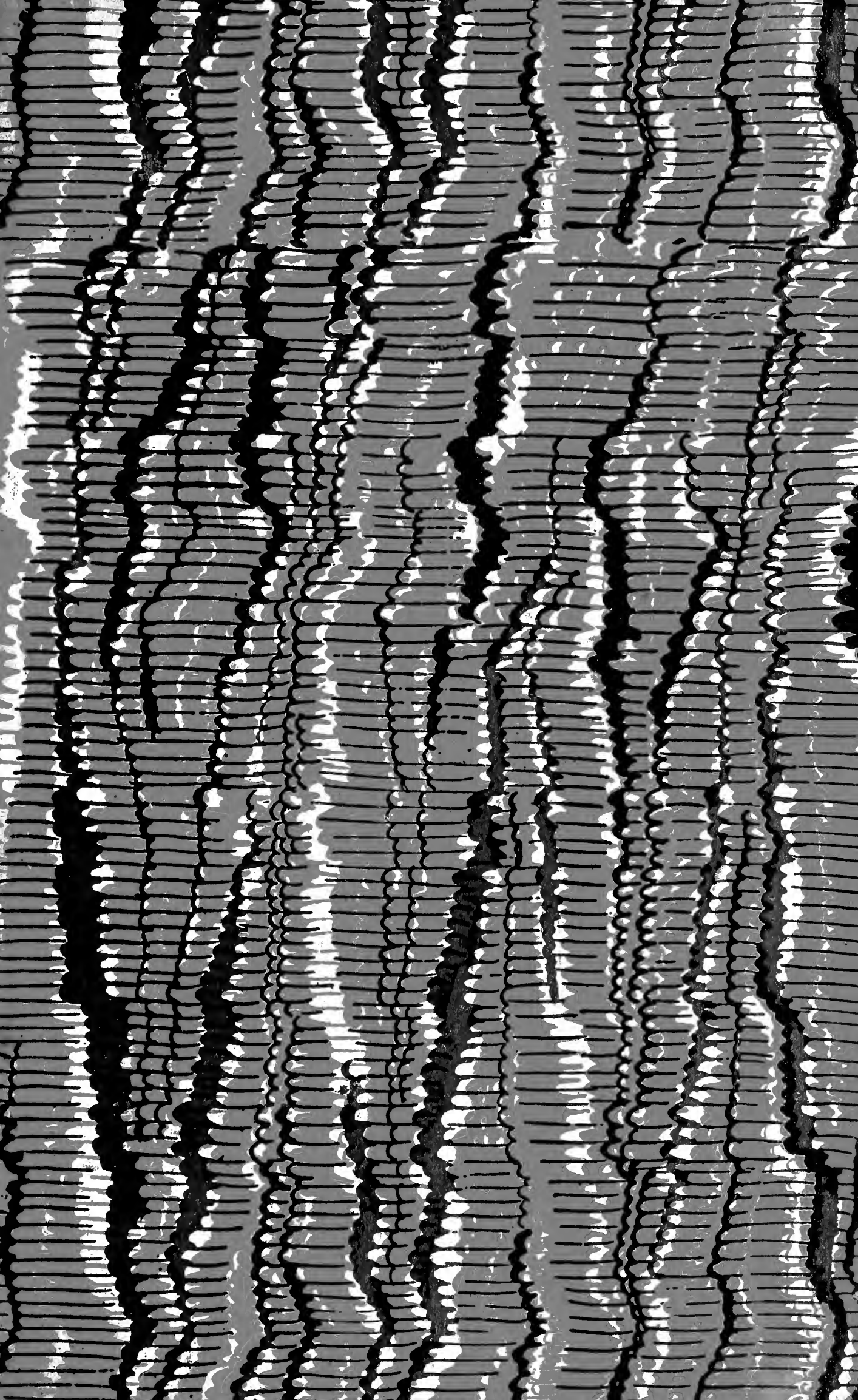


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The Scottish Naturalist

A Magazine devoted to Zoology

With which is incorporated

“The Annals of Scottish Natural History”

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Keeper, Natural History Department, Royal Scottish Museum

AND

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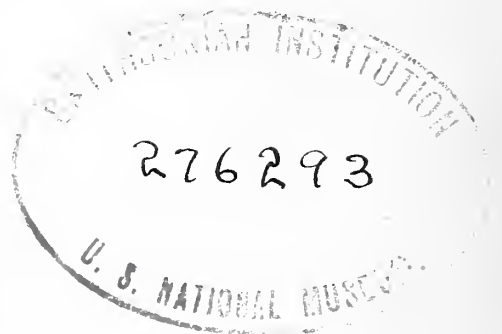
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A GREAT NATURALIST.

DR B. N. PEACH, 1842-1926.

ON 29th January, with the passing of Benjamin Neeve Peach in his 84th year, Scotland lost one of those rare spirits whose insight sends a flash of light across the problems of nature knowledge. He will be remembered for that great survey of the older geological formations of Scotland which he carried out in conjunction with Dr John Horne, and which has made the North-West Highlands the Mecca of geologists from all parts of the world, as well as for many another traverse throughout the length and breadth of Scotland which has been illumined by his clear vision and quick mind. But here I would refer particularly to his work as a naturalist.

The influences of Peach's home and of his formal education set the field for a career as a naturalist. His father, C. W. Peach, by the chances of life an official of the Coast Guard Service and latterly a Customs officer, but at heart a zoologist, made many contributions to the knowledge of fossil and living animals in the widely spread regions, from Cornwall to Caithness, in which his duties lay, and his enthusiasm made an indelible impression upon his son. This early bias was strengthened and directed when young Peach, at the instance of Sir Roderick Murchison, became a student at the Royal School of Mines, London, for here he came under the sway of Huxley, and the influence of that great teacher laid the foundations of a wide

outlook upon animal life, which remained a characteristic of Peach's habit of thought.

The youthful geologist was fortunate in his life's work. On passing with distinction through his course at the School of Mines, he was appointed to the staff of the Geological Survey of the United Kingdom, and was picked out at once for the work he himself would have chosen, the identification of the animal and plant remains upon which the finer correlations of the sedimentary rocks was largely to depend. His transference to Scotland in 1862, and his concentration there upon the many problems of field geology which offered scope for his fine gift of seeing round corners, drew him away temporarily from his palæontological pursuits. But when in 1880 he was appointed, over and above his field work, Acting Palæontologist to the Scottish Survey, he resumed them with vigour, and thereafter a steady flow of contributions to zoological literature came from his pen. Indeed it might be said that when his fellow-workers allowed him a respite from the duties of field geology, he turned at once to his first and abiding love—the world of animals living or extinct. Peach was a zoologist born and bred.

His zoological or palæozoological work groups itself about two centres. As was incumbent upon an identifier of fossil remains, a large part of it consists of additions to our knowledge of the faunas of various Scottish geological formations, or of descriptions of animals previously unknown. He had, early in his days as Acting Palæontologist, seen the wisdom of devolving the vast collections to group specialists, so that when the fishes had been turned over to Dr R. H. Traquair and the plants to Dr Kidston, Peach's own work became limited to invertebrate animals, and amongst these he finally concentrated upon the arthropod groups of Crustaceans, Millipedes, and Arachnoideans such as Scorpions and Eurypterids, the vast majority being described from the Old Red Sandstone and Carboniferous rocks of Scotland.

But even in his systematic work Peach allowed the wider views impressed upon him by Huxley to play no unimportant part. His zoological outlook was very modern, and the structures of a fossil most appealed to

him as keys to the interpretation of the conditions under which the creature lived. Function and structure were inextricably linked in his mind. Thus we have an early communication to *Nature* on "Ancient Air-breathers" (1885); we find constant analogies drawn between the individual rings and joints of his Myriapod species and the corresponding structures of modern forms; or we find him inferring, perhaps mistakenly, from the structures of the Carboniferous *Eurypterus* that it was a land-animal, and that its presence in the coal seams of the Lothians indicated ancient land surfaces.

The second centre about which Peach's zoological studies revolved, developed from this habit of interpreting structure through function. It was the link which united his zoology to his geology, and enabled him, more readily than most, to translate the characteristics of an assemblage of fossil animals into terms of climate and environment. These views he developed before the Royal Physical Society of Edinburgh in several addresses dealing with "the light shed by organic remains on the history of the strata in which they are embedded" (1885); "Scottish Palæontology during the last Twenty Years" (1900); and "Some Points in the Natural History of the Carboniferous Period in East Scotland" (1914). Surely there was never happier union between zoology and geology than in these developing generalisations which make vivid the conditions of an immeasurably distant past.

Peach's merit was recognised by his fellow-workers. He was elected a Fellow of the Royal Society in 1892, was capped LL.D. by the University of Edinburgh, and was awarded various medals by the Royal Society of Edinburgh and the Geological Society of London. The impressions that remain with his friends are of a fine head, arresting presence and jovial temperament, of a vast insight into the workings of nature and generosity in sharing his knowledge with whomsoever wished, of a great mind, whose fertile ideas crowded each other as they rushed in a turbulent stream, and of a large heart, brimming over with good-will and friendliness.

JAMES RITCHIE.

An Albino Year in Kincardineshire.—Apart from the Albino Mountain Hare seen by me on 12th August 1925 and shot on 17th October (see article, p. 11), there are one or two others on the ground. The year 1925 was an albino year with us. We killed one Red Grouse three-quarters white, and another partly white (at Glen Dye), and here (at Fasque) there are some pied Partridges. Neither of these occurs once in twenty years. The keeper reports a pure white Grouse at Glen Dye, but I have not seen it myself.—JOHN R. GLADSTONE, Fasque.

Faroese Snipe and Hornemann's Redpoll at Fair Isle.—A male example of the Faroese Snipe (*Gallinago gallinago faröensis*) was obtained by me here on 23rd December 1925, and a female specimen of Hornemann's Redpoll (*Acanthis hornemanni hornemanni*) on 12th November 1925. Both have been sent to the Royal Scottish Museum, Edinburgh.—JEROME WILSON, Fair Isle.

[The occurrence of Hornemann's Redpoll, a native of Greenland, is of interest in connection with the visit this year of small numbers of the greater Redpoll (*Acanthis linaria rostrata*), also a Greenland bird. This is the first recorded occurrence of this rare Redpoll (Hornemann's) in the British Islands for twenty years; the last met with was in 1905. It may be of interest to give the measurements of the Faroese Snipe, which for a male is a large bird: wing 138 mm., tail 61, tarsus 33, bill 67.5.—EDS.]

Lanceolated Warbler and Short-Toed Lark at Fair Isle.—A male example of the Lanceolated Warbler (*Locustella lanceolata*) was obtained by me here on 24th October, and a male Short-toed Lark (*Calandrella brachydactyla brachydactyla*) on 9th November.—JAMES STOUT, Fair Isle.

[This is the fourth recorded occurrence of this rare Warbler in the British Isles and the third in Scotland.

The typical short-toed Lark has been met with previously on four occasions in Scotland and all in the Northern Isles. The skins are now in the Royal Scottish Museum.—EDS.]

SOME EFFECTS OF HARD WEATHER ON
BIRD-LIFE IN EAST FIFE.

By EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL.

THE prolonged cold spell from mid-November to 26th December 1925, with hard frost and a heavy fall of snow, had considerable effect upon bird-life. Unusual species came to feed at bird-tables and window ledges, in addition to the ordinary visitors, such as Robins, Blackbirds, Sparrows, Chaffinches, Hedge Sparrows, Starlings, and Tits. Redwings began by feeding with the hens and eventually came on to the balcony to the food put out there; they proved very pugnacious, driving the other birds away from the food, even the Starlings had no chance against them. A Fieldfare came to a bird-feed in the middle of Largo village and a female Pied Wagtail appeared regularly on Lahill balcony, and was so tame that she would come into the room, but she disappeared the day before the thaw.

A walk on the shore showed to what hard straits the birds were driven: on 18th December with snow, lying and falling, we have the following note: "A good many Thrushes and one or two Blackbirds and Redwings feeding at the edge of the tide. A Pied Wagtail below Lower Largo, and Skylarks coming in over the Firth from the south-west." Observation was, of course, very difficult in the falling snow, but next day with clearer conditions we were able to amplify the above. We quote from our notes of 19th December: "Four Hoodies on the shore in Largo Bay; one flew out over the sea with a dead Redwing in its beak, hotly pursued by the other three. It dropped its prey, which fell into the sea, and the Hoodies hovered over it, stooping at it and trying to catch it in their claws with legs dropped to their full extent. After a good many unsuccessful attempts, one managed to get it, lifted it off the water, transferred it to its beak and flew off to the rocks with it.

"There were quantities of British Song Thrushes by

the edge of the tide throughout the mile and a half we traversed, the sand and rocks were alive with them, and several small parties came in over the Firth from S.S.W., and pitched so quickly that the next wave washed round their feet. As far as we could see all were of this race, and some were very much exhausted; we watched some eating winkles and saw one furious combat over a snail. There were some Redwings and Blackbirds on the shore, and small parties of Starlings came in over the Firth from S.S.W. Lapwings were feeding in numbers among the stones. It has looked like heavy snow in the Lothians all day." On the 22nd, in addition to the above, there were Skylarks, Chaffinches, and House Sparrows all feeding on the sand by the sea.

It is interesting to note that during this period the large flocks of wintering duck which usually frequent Largo Bay were not present, but the small burns which were still open contained quite an unusual number of Mallard. During this period we picked up several dead Redwings and two dead Starlings. At Lahill, which is a mile and a half inland, every Song Thrush had left during the frost, but on 25th December one came to the feed, and next day there were several about; the thaw came on the 27th.

Curlew have never been known to visit the old grass parks round Lahill House till this year, when several stayed with us for a good many days during the frost, while Lapwings were feeding on the lawn within ten yards of the house. During the last two mild winters, Stockdoves, which nest in the trees in the parks about Lahill, have never left us, last year (1925), they went away as soon as they had finished nesting; to-day, however, 4th January 1926, we see that a pair has returned to one of the nesting trees. On one day only (14th December), a good many Stockdoves were seen in the fields, which rather looks as if they had been travelling. It is always interesting to try to trace the effect of weather conditions on birds and their movements, these have been particularly marked this year owing to the inclement season and we would welcome any data from other parts of the country on this subject.

BIRD NOTES FROM FAIR ISLE.

By Surgeon Rear-Admiral J. H. STENHOUSE.

IN the autumn of 1925 I revisited Fair Isle, remaining there five weeks, from 3rd September to 7th October. Redpolls and Lapland Buntings were present on the island at the date of my arrival, and I was informed by the islanders that both species had come in on 28th August. As the Redpolls were of the Greater race, *Acanthis linaria rostrata*, whose home is in Greenland, it may reasonably be assumed that the Lapland Buntings were also from that country: the weather charts show that westerly winds prevailed at the time of their movements.

The Redpolls were scattered over the island in small parties: their total number was estimated at between thirty and forty. No more than a dozen were ever seen together. If quietly approached, they were very tame and confiding, and there was one favourite haunt of theirs, where some could frequently be watched at a distance of not more than three feet, as they sat preening themselves on withered docks, while others were searching for food among the neighbouring cabbages. None of the males showed any trace of pink on the breast, and amongst them there was one in juvenile dress, a very dark bird, without the red cap and with the chin spot only slightly developed. They were still on the island at the date of my departure, but some of them had by that time joined with the flocks of Twites, which, from a bird-watcher's point of view, were only too plentiful.

The Lapland Buntings did not come into the crofts but frequented rather bare, rocky, high ground near the sea, and consequently could easily have been overlooked. A party of seventeen was, on excellent authority, reported as having been seen on 8th September, but the greatest number seen together by me was seven. After that date searches over the ground they preferred failed to reveal their presence and most had probably left the island. But

a single bird found in the crofts on 21st September, and two others seen on high ground on 2nd October, and found next day amongst the Twites in the crofts, may have been stragglers from the original party, though it is possible they were new-comers from Scandinavia.

There was very little migration from the Continent. A few birds, chiefly Willow-Warblers, came in on 8th September, and with them was a young male Icterine Warbler (*Hypolais icterina*). During calm weather on the 17th, a Yellow-browed Warbler (*Phylloscopus i. inornatus*) arrived, and on the 19th a male Rustic Bunting and another Yellow-browed Warbler. An easterly gale on the night of the 19th brought in more birds; there was no great number of any single species, but there was a good variety: amongst them were a Corn Bunting and a young male Ortolan, the latter the first of that species seen in autumn for about twelve years. After this date there were short spells of east wind on two occasions and notable arrivals then included an adult male Bluethroat (*Erithacus suecicus gaetkei*), a female Rustic Bunting, a Little Bunting, a male Scarlet Grosbeak, and a male Eastern Lesser Whitethroat (*Sylvia curruca affinis*). The occurrence of the Petchora Pipit and of Jerdon's Reed-Warbler (*Acrocephalus agricola*) has already been reported in the SCOTTISH NATURALIST of last year (pp. 141 and 173).

After 26th September the winds were persistently westerly and the only arrival of interest was that of two small parties of four and five Redwings on 3rd October. They were very wild, but two were secured and proved to be of the Icelandic race (*Turdus iliacus coburni*). Though Sharpe described this bird as distinct in 1901, it is only recently that it has been recognised as being a valid subspecies. At a meeting of the British Ornithologists' Club in London in April last year, Dr C. B. Ticehurst drew attention to the distinctive characteristics of the race, and stated that, so far as he knew, no example of this Iceland bird had ever been met with in the British Isles. Though in all probability some remained all the year round in Iceland, yet he felt sure that many migrated and that

they would be found to visit this country. In the May number of the *Bulletin of the British Ornithologists' Club*, Mrs Meinertzhagen recorded that in her possession there was one, which had been obtained in Ross-shire.

As the diagnostic points of this race are not well known it may be of interest to state them here. The Iceland Redwing (*Turdus iliacus coburni*) differs from the typical Redwing (*Turdus i. iliacus*) found in Northern Europe, in being darker on the back and more heavily streaked below on the breast and flanks. In addition it is larger. In the Smalley collection in the Royal Scottish Museum are nineteen Icelandic skins: their measurements as compared with those of continental summer birds are as follows:—

	Iceland Redwing (<i>Coburni</i>).		Continental Redwing (<i>Iliacus</i>).	
	♂ (9).	♀ (10).	♂ (12).	♀ (2).
Wing	119-125	118-125	112-118	116-118
	average 121.7	average 121.6	average,	115.3
Tarsus	31-32	30-31.5	28-29	27.5-29.5
Bill, from feathers	15.5-17.5	15.5-18	14-17	15-16

It will be seen that the Iceland form has a distinctly longer wing and longer tarsus, and that the bill is as a rule longer.

The two birds obtained at Fair Isle were both males, and, judging by the white tips to the secondaries, were birds of the year. They measured as follows:—

Wing	128-124	Tarsus	32.5-32.5
Tail	90-86	Bill	17.5-17.5

The legs of both birds were very dark, being slaty-brown, instead of the usual yellow-brown of the typical birds. An examination of the series in the Smalley collection does not show, however, that this is a constant character, and it may be merely an indication of youth and of sex.

I may add that, in 1923, when at Fair Isle, I observed the arrival on 1st October of a party of about fifty Redwings,

under weather conditions which pointed to their having come from the north-west. They were, however, very wild, and I failed to secure a specimen, but without doubt they were Icelandic birds. I understand that Redwings were recorded as arriving at the Butt of Lewis on the same day, and I believe that future observation will show that these Icelandic visitors make their winter quarters chiefly on the west side of the British Isles.

According to the islanders, the Snipe has bred regularly on Fair Isle since 1923. No eggs have yet been seen, but young in down were found this year. The Golden Plover also bred there this year, apparently for the first time.

It may be of interest to record that a Barn Owl was captured at the South Lighthouse in February 1924. The bird, which has been mounted, is now in the possession of the head lighthouse-keeper, Mr Ingram. It is apparently of the British race (*Flammea a. alba*), of which no example has previously been obtained in Shetland, though one of the continental race (*Flammea alba guttata*) has occurred at Unst (*vide* SCOTTISH NATURALIST, 1916, p. 76).

Great Spotted Woodpecker in Ayrshire.—The arrival of the Great Spotted Woodpecker to the Darvel district of Ayrshire in the spring of 1925 created quite a lively interest for those interested in bird life. It was first heard by one of the workers on Lanfine estate about the middle of April, and from then on till mid May its loud tapping noise was heard nearly every day and the bird itself was frequently observed. No one could inform me whether there were more than one bird, but later in the year my son showed me a fresh nesting hole, unfortunately at that time occupied by a pair of Blue Tits. Whether the Woodpecker made other borings we did not discover.—NICOL HOPKINS, Glasgow.

Common Bittern in Fife.—While shooting in the dusk of the evening of 2nd December 1925, I had the misfortune to kill by mistake a very fine Bittern. The bird which was obtained in the vicinity of Tayport, Fife, has been sent to the Royal Scottish Museum, where it is being mounted for exhibition.—JOHN F. HENDERSON, Newport.

ABNORMAL COLORATION IN SCOTTISH MOUNTAIN HARES.

By JAMES RITCHIE, M.A., D.Sc., F.R.S.E.

APART from the annual change of its coat from brown to white, the Mountain Hare—and I speak of the Scottish race in particular, *Lepus timidus scoticus*, Hilzheimer—shows



Albino Mountain Hare from Kincardineshire, 1925.

extraordinary constancy of coloration. So far as I know, no pure albino example of the race has been described, and I would, therefore, record a beautiful specimen shot by Sir John Gladstone, Bart., of Fasque, and presented by him to the Royal Scottish Museum, where it has been mounted and is now exhibited. It was shot in Glen Dye, on the southern slopes of the Grampians in Kincardineshire, on 17th October 1925. The individual is a pure albino, with pink eyes and without a trace of coloration in the coat.

Even the ear-tips, which in ordinary individuals remain black during the colour change in winter, are white. The specimen is a male, probably a young individual of the year, though it has almost reached adult size. Sir John Gladstone writes that he saw it first on 12th August, when it was much smaller in size, but equally white. He adds that there are one or two others on the ground.

When this paper was in proof, "J. B. R." recorded in *The Scotsman* (20th February 1926) an Albino Mountain Hare, the only one he had ever seen, which he "shot on Ben Wyvis about fifteen years ago; it was on the Castle Leod estate, and at an altitude of about 2500 feet. It had pink eyes, and had not the usual black tips to the ears."

Another albinistic, but not pure albino example, was obtained early in July 1922 by Mr Donald Guthrie on Glen Banchor estate near Newtonmore. He writes that it was "got on this shooting out of a cairn on the high ground. It was about the size of a rabbit three parts grown, pure white with just a tinge of cream colour." The cream colour suggests something less than full albino, and this was confirmed by the eyes, which were of the normal hazel-brown colour. Mr Guthrie, in a long experience, had never seen or heard of a white Mountain Hare, apart from this specimen.

Black or melanistic Mountain Hares, which also are rare, have been more often seen than albinos. In the Royal Scottish Museum there are two examples, both from Caithness: the first was killed at Altnaclay, Dunbeath, on 7th March 1903, the second, presented by Mr D. Keith Murray, at Altnabreac on 1st February 1922. It would seem that in an area of southern Caithness, on the extreme border of the parish of Halkirk and thereabouts, a strain of melanism has crept into the Mountain Hare stock, for at least fifteen specimens have been shot in that region.

For the sake of easy reference, I record these specimens chronologically:—

- | | | | | | |
|-----|--------------|---|---|---|---|
| (1) | 1900 | . | . | . | Braemore, Langwell (S.G.) |
| (2) | 1901 | . | . | . | " " (S.G.) |
| (3) | 3rd February | | | | 1902 " " (<i>Ann. Scot. Nat. Hist.</i> , 1902, p. 250) |

- (4) 7th March 1903 . Achnaclay, Dunbeath (in Roy. Scot. Mus.)
 (5) 1907 " " (S.G.)
 (6) 1st February 1922 Altnabreac, Halkirk (in Roy. Scot. Mus.,
 SCOT. NAT., 1923, p. 124)
 (7 and 8) 1923 . . Needle, Langwell (S.G.)
 (9 and 10) 1924 . . Craggan, Langwell (S.G.)
 (11 to 14) 1925 . . Four examples killed, Langwell (S.G.)

In addition, a 15th specimen, shot at Langwell in 1923, was presented by the Duke of Portland to the British Museum (Natural History). Many of the above records (indicated by *S.G.*) appeared in a letter by Mr Seton Gordon in *The Scotsman* of 23rd December 1925, and Nos. 1, 2, 5, and 7-10 are mounted and preserved at Langwell.

The dates suggest that the black strain is gaining in numbers, for while in the twenty odd years up to 1921 inclusive, 5 black hares are recorded as having been shot, in the three years 1922-25, 10 have been obtained. Further, the Duke of Portland, in a letter to Mr Seton Gordon, stated that "the keepers on his Caithness property never saw a black Mountain Hare until about twenty years ago." Were it a rule in breeding that black was always a dominant colour, it might be assumed that in the increase of black hares in southern Caithness there is evidence of the prepotency of the melanic sport. This may indeed be so, but since black does not always behave in the same way in crossing (a black Black Rat is dominant to a grey Black Rat, but a black Norway Rat is recessive to a grey Norway Rat), it would be rash to form a judgment without more definite evidence.

Apart from the Caithness region, black Scottish Mountain Hares are almost unknown. In December 1925 one was trapped on the Dalchroy Moor, Advie, Morayshire, and was presented to the British Museum (Natural History) by the tenant, Mr M'Corquodale. A second is reported by Mr Charles T. Gordon (*Scotsman*, 16th December 1925 and 2nd January 1926) to have been taken at Cairness, in Lonmay parish, north-eastern Aberdeenshire, in 1885, and to have been sent to the same institution. Mr M. A. C. Hinton of the British Museum, in reply to an

inquiry, writes to me (19th February 1926), that this hare, which was shot at Cairness on 11th December 1885, was mounted and exhibited, and that the donor, Mr A. G. Anderson, stated in a letter accompanying the gift, that he had observed the individual several months before and that a black hare had never before been seen in the district. A third melanic Mountain Hare, shot at Cawdor, Nairnshire, "a few years ago," is recorded by "J. B. R." in the note already referred to (*Scotsman*, 20th February 1926). He adds that, "Mountain Hares are very numerous all over this district, as many as 1000 occasionally being killed in a day; but during the last forty years I have never come across either the black or albino except in the two instances mentioned."

Colour varieties, other than the extremes of black and white, appear to be almost as rare as the latter. A sandy-coloured hare exhibited in the Royal Scottish Museum, shot in Mull on 13th December 1878, is probably not a Scottish Mountain Hare but an example of the buff-coloured sport of the Irish Hare. Its dimensions are more consistent with those of the latter, and it is on record that a few Irish Hares from Wicklow were set free in Mull about 1860-70 (Notman, *Field*, January 1903, p. 53; and Barrett-Hamilton, *History of British Mammals*, p. 329).

A few buff-coloured examples of the Scottish Mountain Hare, however, have been seen. Buckley records such a specimen, "cream-coloured," as having been taken at Torish, Ben Duan, Sutherland, adding that unusual colorations are very rare amongst Mountain Hares (*Ann. Scot. Nat. Hist.*, 1892, p. 158); J. G. Millais says that only one buff variety has come to his notice (*Mammals of Great Britain and Ireland*, vol. iii., p. 37); and Crawshay records a yellow pink-eyed example which turned white in winter (*Field*, October 1891, p. 655).

The suggestion has been made by Mr J. G. Millais (*op. cit.*) that the apparent lack of variability in the colour of the fur of the Mountain Hare may be due not to any real absence of variation, but to the difficulty of distinguishing unusual variations, amongst the constant changes which are

normal to the species, unless the variations be totally distinct from the seasonal colour. He is certain that though they had not been seen, albino examples must have occurred. There may be in this suggestion something to account for the absence of records of variation, but, on the evidence, I prefer to hold to the view that the coat colour of the Mountain Hare (apart from its annual change) is remarkably constant. It must be remembered that the summer coat shows no sign of change till August, and that the white winter coat begins to appear only in September and is seldom completed till late November or early December; so that during August and September, before the winter coat is assumed, there are many sportsmen on the hills who could scarcely fail to note oddly-coloured specimens. And in fact black or albino specimens which have been shot have in several cases been observed previously on the ground. We are bound to conclude that variations have not been observed and recorded because variations are of extremely rare occurrence.

White Curlews.—White Curlews cannot, one would suppose, be very common anywhere; it may therefore be of interest, in connection with Mr H. S. Gladstone's record of those seen in Dumfriesshire (SCOT. NAT., 1924, p. 162, etc.), to state that amongst a good number of the birds (*Numenius arquata*) which I saw running about on the shore at Djibouti (on the African Coast of the Gulf of Aden) on 29th December 1924, was one individual which, as seen through glasses at near range, appeared to be pure white. How interesting it would be if, without destroying it, such a bird could in some way be identified so that its wanderings might be traced.—GEORGE BOLAM, Alston, Cumberland.

Fauna of the Isle of May.—I was interested to read the article on the Isle of May in SCOT. NAT., 1925, p. 175, and think that I can add another bird to the breeding list. When I landed on the island on 4th July 1897 a pair of Green Plovers or Lapwings were seen feeding young ones.

On this date also I saw a fine Hare on the island. At the time I was surprised to see her there, but a few years later discovered what long distances Hares can swim in the sea. From what I have seen, not once but several times, I believe that they swam right across the Firth of Forth from Fife to Haddingtonshire!

In view of the statement that Black Guillemots nested on the island in Jardine's time, I think, but am not quite sure, that I saw one pair flying round during my visit. On questioning the light-keepers concerning this species, they thought that it was quite possible that a few pairs nested there.—H. W. ROBINSON, Lancaster.

Yellow Wagtail breeding in Edinburgh Area.—The Yellow Wagtail (*Motacilla raii*) has been a summer resident in Scotland for many years, and as a breeding species it has been



Photo by]

Yellow Wagtail fledgling, Edinburgh, 1924.

[R. M. Adam.

known in Midlothian for a considerable time. On the evening of 24th July 1924 I found a nest with full fledged young placed on the top of a drill in a potato field within the city boundaries. The parent birds had been under observation by Mr David Hamilton and myself for some weeks, but, so wary were they, we failed to locate the nest with eggs. Visiting the nest on the following morning with my friend Mr R. M. Adam, we found the family had departed overnight, but after some patient watching we secured one of the nestlings and Mr Adam obtained an excellent photograph.—J. KIRKE NASH, Edinburgh.

APPEARANCE OF A CUCKOO BEE, *PSITHYRUS RUPESTRIS*, IN EAST LoTHIAN COINCIDING WITH A RELATIVE SCARCITY OF ITS HOST, *BOMBUS LAPIDARIUS*.

By OLIVER H. WILD, M.B., Ch.B., M.B.O.U.

ON 3rd August 1924, at Aberlady, East Lothian, I obtained a specimen of the male of *Psithyrus rupestris*, a Humble-bee which is a parasite at the expense of *Bombus lapidarius*. Subsequently, I caught two other males. All these specimens were visiting flowers of Knapweed (*Centaurea nigra*). The identification was confirmed by examination of the armature. On 27th August I was rewarded by taking a fine queen of the same species on Buddleia blossom in a garden at Aberlady. During August 1925, I saw many specimens of this species at Aberlady, but its host *Bombus lapidarius*, which in most years can be regarded as a common species seemed rare, only six workers and two drones having been observed.

I am unable to trace any Scottish records of this Cuckoo-bee, *Psithyrus rupestris*. Its host, *Bombus lapidarius*, is a common British species, which was numerous at Aberlady in 1924. It is of interest to note that there is evidence that *Psithyrus rupestris* has become very common in recent years in the south of England. Sladen states ("The Humble-bee," 1912) that "It is plentiful in East Kent where it victimises from 20 to 40 per cent. of the colonies of *B. lapidarius*." In Gloucestershire I first obtained this bee in 1918 by examination of the nests of *Bombus lapidarius*, when I found six out of seven nests of the latter species to be usurped by queens of *Psithyrus rupestris*. In succeeding years four out of every five nests examined in Gloucestershire were infested with this parasite. In 1925 *Bombus lapidarius* seems to be nearly absent from Gloucestershire also, only one specimen of its parasite *Psithyrus rupestris* has been seen.

I think it possible that *Bombus lapidarius* has been nearly exterminated at Aberlady, owing to an extension of range of its parasite *Psithyrus rupestris*. Once the usurper queen of *Psithyrus rupestris* has gained command of a nest by killing the foundress queen of *Bombus lapidarius*, it is obvious that all fresh brood will be that of the intruder. There comes a time when *Psithyrus rupestris* becomes so numerous as to usurp the majority of the *Bombus lapidarius* nests. When that takes place the host species, *Bombus lapidarius*, will for a time become so rare that no nests are available for the nesting requirements of the parasite. Moreover, each species of *Psithyrus* is capable of adapting itself to parasitize only the nests of its own species of *Bombus*, though they are sometimes found as sojourners in the nests of others for a short time. How then does *Psithyrus rupestris* avoid extermination if it has no suitable nests to enter? I believe the answer is—"By extension of its range." Is it possible that *Psithyrus rupestris* has invaded Scotland before, and has had to retire again when the host essential for its maintenance became rare?

I submit this theory with great deference knowing that I have insufficient data to prove my case. Still, observation on the part of naturalists would go far to support or refute the supposition. I have presented specimens of the queen and drones of *Psithyrus rupestris* to the Royal Scottish Museum.

Starling bearing Identification Ring.—I am sending to you the leg of a Starling with ring attached. The bird was killed by a cat at Scalloway on the west side of Shetland on Wednesday the 16th December 1925. The only mark on the ring, "25," gives no indication as to the marker. The occurrence will be unusual if the bird has been marked in the British Isles, but doubtless it is a continental specimen.—G. T. KAY, Lerwick.

[The band, of aluminium, is of the arrow-shaped variety, pointed at the fore-end and forked at the hinder end. It is 23 mm. long, 5 mm. broad, and bears only the number 25.—EDS.]

THE LAND AND FRESH-WATER MOLLUSCA
OF BANFFSHIRE.

By JANE GOWAN.

(*Concluded from No. 156, 1925, p. 186.*)

34. PUPA ANGLICA—
Cullen, 15th Aug. 1917 (J. G.).
35. VERTIGO SUBSTRIATA—
Cullen, 13th Sept. 1917 (J. G.).
36. VERTIGO PYGMÆA—
Sandend, 27th Aug. 1917 (J. G.).
37. SPHYRADIUM EDENTULUM—
Aberlour, 1891, J. C. Smith.
Cullen, 13th Sept. 1917 (J. G.).
38. BALEA PERVERSA—
Dufftown, Nov. 1892 (L. H.),
Tomintoul (L. H.).
Cullen, 10th Sept. 1917 (J. G.).
Boyne, 15th Sept. 1917 (J. G.).
39. CLAUSILIA BIDENTATA—
Dufftown, Nov. 1892 (L. H.).
Tomintoul (L. H.).
Cullen, 17th May 1917 (J. G.).
Aberlour (J. C. Smith).
Boyne, 6th Aug. 1917 (J. G.).
40. COCHLICOPA LUBRICA—
Whitehills, 12th July 1884. P. Burnett's Collection,
Banff Museum.
Aberlour (J. C. Smith).
Ballindalloch, 15th Aug. 1891 (W. E.).
Dufftown, Nov. 1892 (L. H.).
Tomintoul (L. H.).
Cullen, 21st July 1917 (J. G.).
var. *lubricoides*, Ballindalloch (W. E.).
" " Tomintoul (L. H.).

41. *CARYCHIUM MINIMUM*—
 Ballindalloch, Aug. 1891 (W. E.).
 Cullen, 13th Sept. 1917 (J. G.).
42. *SUCCINEA PUTRIS*—
 Whitehills. P. Burnett's Collection, Banff Museum.
 Sandend, 27th Aug. 1917 (J. G.).
43. *SUCCINEA ELEGANS*—
 Whitehills. P. Burnett's Collection, Banff Museum.
 Sandend, 3rd Aug. 1917 (J. G.).
44. *LIMNÆA TRUNCATULA*—
 Banff, 4th June 1887. P. Burnett's Collection, Banff
 Museum.
 Tomintoul, Oct. 1890 (L. H.).
 Inchrory, 1400-1600 ft., 1893 (L. H.).
 Deskford, 17th Aug. 1917 (J. G.).
45. *LIMNÆA PEREGRA*—
 Boyndie, July 1882. P. Burnett's Collection, Banff
 Museum.
 Tomintoul, Oct. 1890 (L. H.).
 Inchrory, 1400-1600 ft., 1893 (L. H.).
 Cullen, 26th May 1917 (J. G.)
 var. *ovata*, Tomintoul, Oct. 1890 (L. H.).
 „ *lacustris*, Portknockie, 18th June 1917 (J. G.).
46. *LIMNÆA AURICULARIA*—
 Inchrory, Glenavon, June 1893 (A. M'Lellan).
 var. *acuta*, Inchrory, Glenavon, June 1893 (L. H.).
47. *PLANORBIS LEUCOSTOMA*—
 Banffshire, no locality stated. Several in case with
P. glaber, *P. albus*, *P. crista* var. *lævigata*—all
 labelled "*P. spirorbis*." P. Burnett's Collection,
 Banff Museum.
48. *PLANORBIS GLABER*—
 Banffshire, no locality stated. In great abundance
 in case with *P. leucostoma*, *P. albus*, *P. crista* var.
lævigata—all labelled "*P. spirorbis*." P. Burnett's
 Collection, Banff Museum.

49. PLANORBIS ALBUS—
 Banffshire, no locality stated. In case with *P. spirorbis*, *P. glaber*, *P. crista*, var. *lævigata*—all labelled *P. spirorbis*. P. Burnett's Collection, Banff Museum.
 Cullen, 13th June 1917 (J. G.).
50. PLANORBIS CONTORTUS—
 Cullen, 13th June 1917 (J. G.).
51. PLANORBIS CRISTA—
 var. *lævigata*, Banffshire, no locality. Several in case with *P. spirorbis*, *P. glaber*, *P. albus*—all labelled *P. spirorbis*. P. Burnett's Collection, Banff Museum.
 Cullen, 24th Aug. 1917 (J. G.).
52. ANCYLUS FLUVIATILIS—
 Boyndie, July 1882. P. Burnett's Collection, Banff Museum.
 Inchrory, Glenavon, June 1893 (L. H.).
 Cullen, 5th May 1917 (J. G.).
 var. *albida*, Inchrory, Glenavon, June 1893 (L. H.).
 „ „ Dufftown. P. Burnett's Collection, Banff Museum.
53. UNIO MARGARITIFER—
 Banff, River Spey, 1890 (J. C. Smith).
 Aberlour, River Spey (L. H.).
 Craigellachie, River Spey, 26th Aug. 1917 (L. Dawes).
54. ANODONTA CYGNÆA—
 Banff, River Spey, 1890 (J. C. Smith).
55. PISIDIUM CASERTANUM—
 Sandend, 27th Aug. 1917 (J. G.).
56. PISIDIUM HIBERNICUM—
 Cullen, 18th Aug. 1917 (J. G.).
57. PISIDIUM NITIDUM—
 Cullen, 24th Aug. 1917 (J. G.).
58. PISIDIUM PERSONATUM—
 Cullen, 15th June 1917 (J. G.).

“G. Gordon,” mentioned in the above list, is the Rev.

Dr George Gordon of Birnie, author of the *Fauna of Moray*, whose collection of mollusca is in the Elgin Museum.

The excellent collection of local land and fresh-water shells in the Museum at Banff is the work of the late Mr Peter Burnett, a foreman cabinet-maker of that town, who devoted his leisure to the study of various branches of natural history. His specimens of shells, carefully mounted and arranged, are contained in a cabinet of his own making which testifies to his skill and taste as a craftsman as well as to his ability as a naturalist.

It is hardly necessary to add that many of the records in this compilation have already appeared in Mr Roebuck's "Census of Scottish Land and Fresh-water Mollusca" (1890), and subsequent papers in this Magazine.

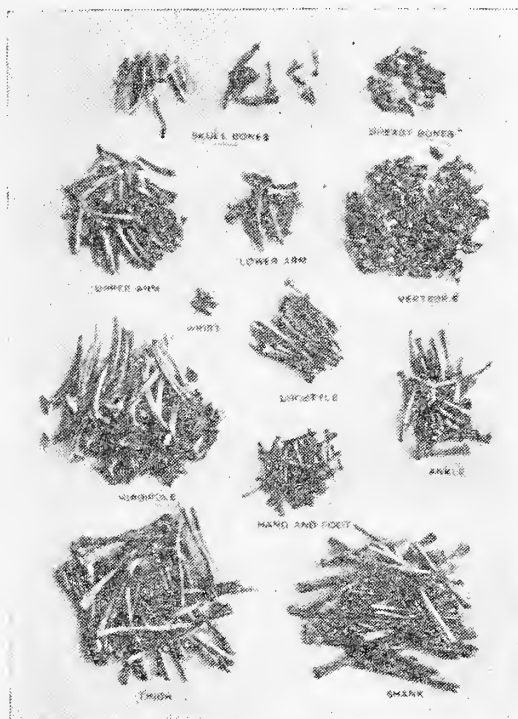
I am greatly indebted to Professor Boycott for providing the materials for the above list; also to Mr John Yeats, Secretary to the Banffshire Field Club, for particulars regarding Mr Burnett.

A Curious Food-Supply of the Common Gull.—When at Corrou, West Inverness-shire, in July 1922, Dr Eagle Clarke visited Loch-na-Lap, 1940 feet above sea-level. He found there a pair of Common Gulls nesting on a small island, and collected two food-casts. There were other casts, but all were composed of similar remains. At a lower level at Loch Trieg, 900 feet, where Common Gulls were more numerous, he also found many casts of exactly the same nature.

The two extremely interesting food-casts of the Common Gull (*Larus canus*), containing the rejectamenta of what seems to have been an unusual diet, were presented by Dr Eagle Clarke to the Royal Scottish Museum, and while they were being prepared and mounted for exhibition, Miss Grace Jacob, B.Sc., made a detailed examination of their contents. It should be stated that when the casts were collected they were placed together in the same box for convenience of transport; but, as they were found, to all appearance they were alike in size and character.

The combined pair of casts consisted of bones of various sizes and of nothing else. The bones ranged in size from 21-22 mm. femora and 23-25.5 mm. tibiæ to small vertebræ about 2 mm. long; and the total number was about 384 (see Fig.). They were all

bones of the Common Frog, *Rana temporaria*. A sorting of the bones led to a very close knowledge of the number of frogs which had formed the meals of which they represented the sole remains, for they included 42 thigh-bones, 42 tibio-fibulæ, 37 ilia, 27 upper and 14 lower arm bones, 15 urostyles, 14 sterna, and many less significant bones, of the wrist, ankle, digits, skull, and backbone. There can have been, therefore, not fewer than 21 frogs in all. Suppose the casts were approximately equal, one must have contained 11, the other 10 frogs. Further, the frogs, though they appear to have been frogs of the year, were by no means tiny; the bones suggest individuals about $2\frac{1}{2}$ inches long with hind legs $3\frac{1}{2}$ inches long.



Bones forming two food-casts of Common Gull.

If a Gull's cast represents the remains of a single meal, as it probably does, then the Common Gull in question must have fared sumptuously upon some eleven well-grown frogs; but we are left in doubt as to whether the second cast represented a second meal of the same Gull, or whether the Gull had shared its discovery of the frog-ground with the second individual.

It is known that Common Gulls are omnivorous, feeding sometimes on carrion, often on small fishes, molluscs, crustaceans, and worms, and rarely devouring such as an occasional young vole; but frog meals must be regarded as an exceptional essay in dieting, probably determined by the unusual abundance of frogs or scarcity of other suitable food.—JAMES RITCHIE.

THE SUBMERGED FOREST AND PEAT OFF VALLAY, NORTH UIST.

By GEORGE BEVERIDGE.

ON the north side of North Uist there is a green island which is called Vallay.

Bàgh nan Craobhag or "Bay of Small Trees" lies to the north of Vallay facing the Atlantic, and here are to be found traces of what must have been at one time a large forest. In my late father's book on North Uist the following passage occurs relating to the above:—

"Upon the northern shore of Vallay, in two small bays nearly a mile apart, the roots and branches of trees may usually still be found embedded within a layer of peat, disclosed here and there through the continually shifting sands.

"This feature is observable down to low-water mark and even slightly beyond that point, and certainly testifies to great changes both in climate and in the relative levels of land and sea. Without pressing any extreme theory, the fact remains that for 40 miles out to St Kilda the ocean is comparatively shallow, nowhere exceeding a depth of about 70 fathoms.

"The Stack of Rockall, some 180 miles west of St Kilda, rises from near the verge of the submerged platform on which the British Islands rest. A few miles to the west of it the sounding line goes down abruptly from 100 to 200 fathoms and thereafter with swift descent down to the abysmal depths of the Atlantic."

"*Camas Mhor* and *Bàgh nan Craobhag* or 'Bay of Small Trees.' At this latter spot the writer has often seen trunks and branches lying in peat at a level about 12 feet below high-water mark. These measured up to a diameter of about 14 inches and apparently represent the birch. It is to be noted that elsewhere the Island of Vallay now contains no peat and is even practically without heather."

The other day I took measurements at *Bàgh nan Craobhag*. The area covered by tree roots and peat is roughly 218 yards by 50 yards. It may extend further than 50 yards towards the sea, but we could not find the peat by

spade work beyond this distance. The actual depth of the peat was $18\frac{1}{2}$ inches. The distance of the peat from high-water mark was 20 yards, but then again it may not have been so much as we could not dig in the sand for rock further up. The area to be seen covered by roots and peat is rocky and not bare sand.

In *Camas Mhor* the area is not so big as is *Bàgh nan Craobhag* nor is it so clearly defined. I have taken no measurements here. Some of the remains of trees in *Bàgh nan Craobhag* are "standing" like the stumps of felled trees, but the majority of roots are lying vein-like on the peat. It is wonderful how fresh the wood is and if dried well would be quite useful for firewood. Scots fir as well as birch is represented in this ancient forest.

Pintail and other Ducks on Duddingston Loch.—During the month of January 1925 a male Pintail Duck was observed on the 18th and again on the 31st. This duck is comparatively rare on the Loch. The different species of duck noted on the latter date are well worthy of record: Mallard, Common Pochard, Tufted, Wigeon, Shoveller, Pintail, Scaup and Red Crested Pochard.

The Scaup Duck were seen several times during the same winter, a male and female being present on 31st January. We have notes of Scaup on Duddingston Loch during 1900 and 1912. The appearance of this marine species on fresh waters must be very rare, but in the cases mentioned there can be no doubt about the identification. Writing in the *Ann. Scot. Nat. Hist.*, 1897-1898, Sir Herbert Maxwell states that Scaup regularly frequent the lake at Monreith.—DAVID HAMILTON and J. KIRKE NASH, Edinburgh.

***Cordulegaster annulatus*, Latr., in Perthshire.**—On 28th July last I captured a fine specimen of this handsome Dragonfly at Comrie in Perthshire, and have since presented the insect to the Royal Scottish Museum.—JAMES BUNCLE, Edinburgh.

[So far as at present known, the distribution of this species in Scotland appears to be mainly Highland, most of the records being from north and west of the Forth area. There are no records from the Southern Uplands and only one old and very doubtful reference to the Edinburgh district. We should much like to hear of its occurrence south of Perthshire.—EDS.]

BOOK NOTICES

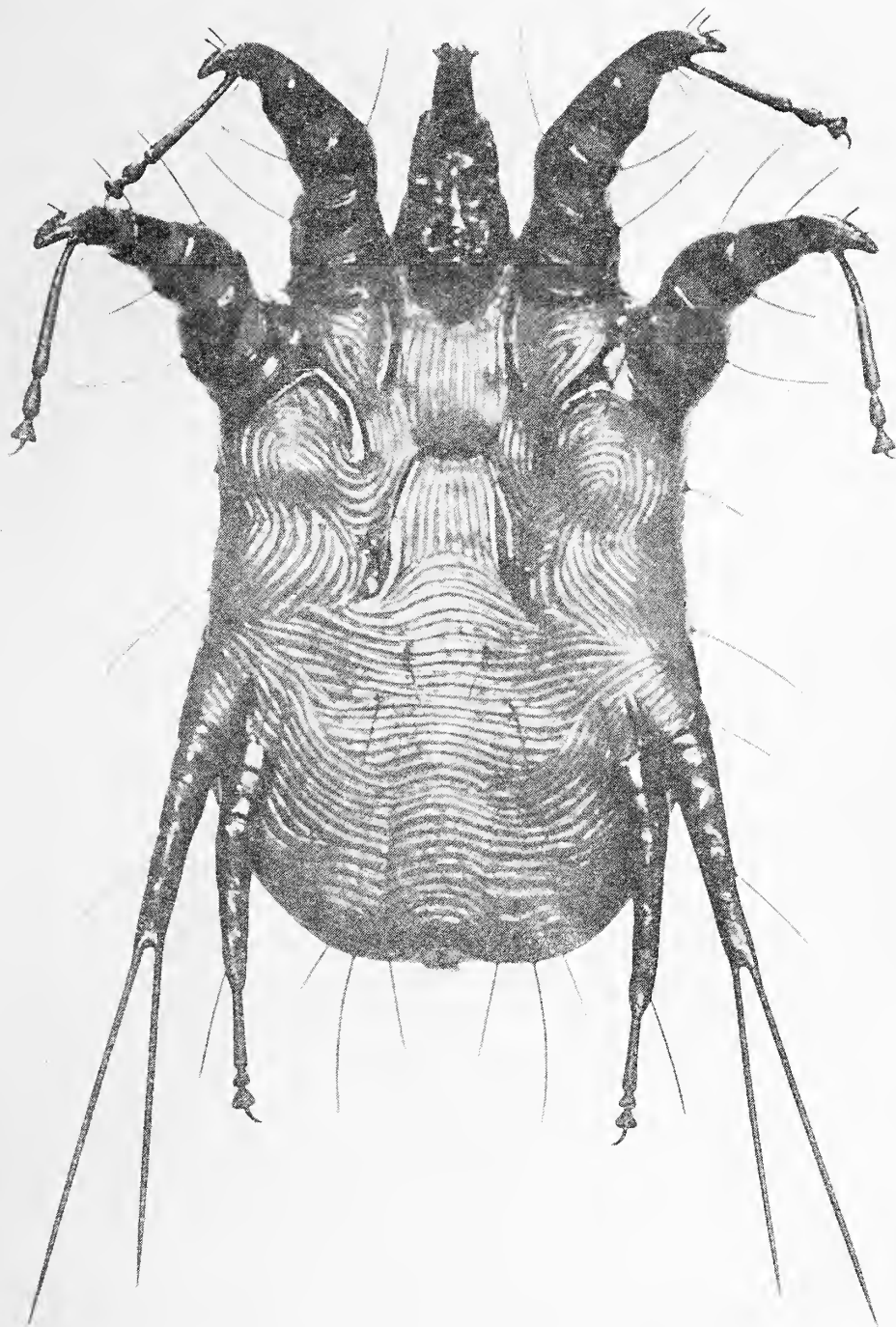
BRITISH BIRDS. Written and Illustrated by Archibald Thorburn, F.Z.S. With 192 Plates in Colour. Vols. I. and II. London: Longmans, Green & Co., 1925. Price of each volume, 16s. net.; of the complete set of four volumes, 63s.

Among the voluminous literature devoted to British birds there are a number of works remarkable for the beauty of their coloured plates—some of the best being the work of Mr Thorburn. Hitherto, however, such monographs have been very expensive, and hence beyond the means of the great majority of those who are interested in ornithology—one of the most popular branches of British natural history. The object of the work under notice is to supply this desideratum. It is decidedly moderate in price, and yet the beauty and accuracy of the plates, which depict the various species in their natural surroundings, is eminently pleasing: indeed they are examples of Mr Thorburn's happiest and best work. The letterpress is concise and appropriate, and affords the necessary information in an epitomised form, regarding the status of each resident and migratory species, its distribution in the British Isles and abroad, its status, distinguishing characters, accustomed haunts, food, habits, nesting and eggs, and song or characteristic notes. The accidental visitors are treated in a like manner, but are not figured. It is a work which should have a place in the library of every country house; and it would form a useful adjunct to a number of important works on British birds which lack the advantage of coloured plates. The work is to comprise four volumes; of which two have already appeared while the remaining two are to be published in the spring and autumn of this year. Each volume will be embellished by 48 coloured plates, depicting all the British resident and migratory birds.

SOME PARASITES OF BRITISH SHEEP. By Wm. C. Miller, M.R.C.V.S. Glasgow: Robert Young & Co., Ltd., 1925. Pp. 106. Price 2s. 6d.

Probably no kind of farm stock in Britain suffers so grievously from the presence of parasites as sheep, and this little work is a practical guide to an important section of these pests—the external parasites. Minute though these insects and arachnids are, the damage done by them, in directly affecting the condition of sheep, in destroying wool, in causing sores readily infected by germs, and in the actual transmission of disease, amounts to a serious total, which has been estimated at £2,500,000. Mr Miller aims at setting out in simple language the salient characters and the habits of the parasites, and gives particular

attention to the means which have been found to be most efficient in destroying them. A series of illustrations, mainly from photographs of the pests, accompanies the descriptions, and one of these is here



The Scab Mite (greatly enlarged).
(From model in Natural History Department, Royal Scottish Museum).

reproduced. In addition to the diseases caused by animals, there are included also short accounts of foot-rot, orf, and lamb dysentery, and a special chapter is devoted to dipping.

THE BIRDS OF HARESHAWMUIR. By E. Richmond Paton. Kilmarnock: The *Standard* Office, 1925. Pp. 125. Price 4s. net.

The estate of Hareshaw lies in the Parish of Fenwick on the high, moorland part of North Ayrshire, 400 to 1000 feet above sea-level, and within its boundaries are found moorland, woods, and lochs. Thus a study of its birds yields a goodly list of species and is instructive in showing, among other things, how many kinds may be recorded in a small area by a competent observer and the variety of species attracted by suitable surroundings. Mr Paton has drawn his material from records of twenty years of bird-watching and so is able to make comparisons between past and present and to show where variations have occurred and what species have increased or decreased during the period. The Yellow Wagtail has decreased as a breeding species, and the Stonechat although nesting locally in parts of Ayrshire is only a "passing migrant" at Hareshawmuir. Autumn passage of both the continental and Hebridean Song Thrush has been observed, a line of migration not hitherto recorded. A book such as this is a valuable addition to our knowledge of the status of birds in the part of the country with which it deals: to the student of distribution such a volume is of great interest, and Mr Paton has done well to keep to the short, concise paragraph in which he treats of each species and sub-species. The stiff paper cover and sketch map are both improvements on the first issue.

THE CLASSIFICATION OF FLOWERING PLANTS. Vol. II. DICOTYLEDONS. By Alfred Barton Rendle, M.A., D.Sc., F.R.S., F.L.S. Cambridge: at the University Press, 1925. 8vo, pp. xix + 636, 279 figures. Price 30s. net.

This volume is a veritable treasure-house of information, beautifully printed, and with a wealth of illustrations, all of which are of exceptional clearness and beauty. Considering that their number approaches 300 and that the majority of them contain three, four, or more separate line drawings most carefully executed, one may realise the amount of information conveyed to the reader by their aid alone. But the text also is of great excellence, giving in concise language an admirable summary of the technical characters, economic properties, geographical distribution and number of genera and species of every group of plants in the Class. We note with pleasure that the old term "Natural Order" has been replaced by "Family," an innovation which, if generally adopted, would bring the usage of the botanist into line with that of the zoologist. Thus "Natural Order Malvaceæ" becomes "Family Malvaceæ," constituting, with three other families, the "Order Malvales." But why not go one step further and change the termination of the Family name into *idæ*, thus conforming exactly to the practice of the zoologist! We can heartily recommend this carefully prepared volume as a most excellent and trustworthy summary of our knowledge of Dicotyledonous plants, and though the price at first sight appears somewhat high, the book is worth the money.

NOTES FROM THE SCOTTISH ZOOLOGICAL PARK

THE KING PENGUINS.

(Continued from 1925, p. 157.)

BARREN EGGS OF 1920.

By the end of that day B had obtained possession of the egg and peace reigned in the enclosure, the other two having apparently lost interest in the matter. E, alone of the others, showed some disposition to associate with B but was always quickly called away by D, who at that time was still moulting. A fortnight later another egg was laid and was in the possession of D and E. These, the reader may be reminded, were the two birds which arrived in the spring of 1917, being then in their second plumage, and therefore between one and two years old. They were accordingly somewhere near the completion of their fifth year when this egg appeared, which accords with the opinion the writer had formed that the King Penguin is not sexually mature until its fifth year. At this time D and E were believed to be a pair, indeed the writer had observed actions which warranted the belief that E—easily distinguished from the others by a deformed claw—was a male and D a female. B incubated the one egg, without assistance from any of the other birds, till the 12th of September—nine weeks from the day it was laid—when it was abandoned and found floating in the water. It was of course infertile. The other egg was taken in turn by D and E, but they seemed to lose interest in it quickly, and in the fifth week it was abandoned. An attempt was made to persuade A and C to adopt it, but they would have nothing to do with it, so as a last hope it was placed in an incubator; it turned out to be addled. No further egg was laid that season.

THE BREEDING SEASON OF 1921.

In the following summer—that of 1921—there came a surprise, and the first indication that the domestic affairs of the penguins were not quite so simple and regular, or so easy to be understood, as one had thought. A and C, who had been apparently bound up in each other for seven years, dissolved their union or, to be accurate, C

dissolved it. At the same time D and E also effected a divorce by mutual consent and C and D paired up together, while E united "himself" with B, leaving A out in the cold. A objected strongly to the new arrangement, and when on the 6th of June an egg appeared in the possession of C and D, A made such vigorous and persistent attempts to obtain possession of it that he had to be banished to a distant enclosure with the "baby" for company. Now the perplexing thing was that both C and D had been regarded, on what seemed reliable evidence, as females. One was at a loss to understand why two females each of which had been already paired with a male bird should associate together, and it was a matter of doubt whether the egg they had would be fertile. That doubt was never settled, for after four weeks' incubation the egg was broken and its contents lost.

On the 7th of June an egg was laid by either B or E and was incubated for the full period of eight weeks. As there was no indication of its hatching it was taken away and opened and found to contain a dead chick fully developed. A and the "baby" were then (on 2nd August) brought back to the enclosure, and another surprise came three days later when A was seen with an egg. Who could have laid it? A was, one felt so sure, a male and an indifferent father and would-be errant husband to prove it, so how could he have been responsible for it? Suspicions in connection with the "baby" faded in the face of its complete indifference, and indeed none of the other penguins showed the least interest in either A or the egg it held. A's character for unreliability in parenthood was maintained, and on the second day the egg was broken in an attempt of its holder to climb a rock. This ended the breeding season of 1921 which, if it produced no new penguins, at least raised some new problems regarding them.

A review of its casualties and those of the previous season seemed to emphasise two principal causes of failure—the tendency of the birds to fight for the possession of an egg and the great danger of breakage, if an egg should fall on the sloping ledges and rocks of the enclosure. It was accordingly arranged that before another breeding season arrived some means should be adopted to eliminate these risks.

NEW ARRANGEMENTS, AND THE BREEDING OF 1922.

A level grass paddock was fenced off, and as soon as the penguins had completed their moult in 1922 they were removed to it. Wire netting divisions were prepared to separate each pair of incubating birds, and as C and D seemed to be paired they were

at once placed in a division by themselves. On the 14th of June D was observed repeatedly bending down to examine its brood flap as if it thought there ought to be an egg there, and C also took part in this inspection. This was regarded as suggesting that D was about to lay and, indeed, the egg appeared within the next twenty-four hours and was in D's possession. The same day C obtained possession of it from D and, as D was excited and restless from the presence of the other three penguins, close at hand but shut off by the wire netting, it was thought advisable to move them back to their own enclosure in order to induce D to settle down to its share of the work. Instead of the desired effect, their removal upset D more than ever, so the experiment was tried of taking D away and putting A with its old mate C. They seemed sufficiently friendly though C kept possession of the egg, and matters went on quietly for a fortnight.

Then came another surprise; A was discovered with an egg! At first one thought it was simply the old egg transferred from C, but it was quickly found that C still had the original egg. Here was a pretty problem! Had C put down the original egg in order to lay another which was immediately transferred to A while C resumed the first one, or was A after all a female and not a male as we had always believed? The first alternative was almost incredible, and if one accepted the second it showed the whole domestic relations of the penguins from an entirely different point of view. Alas! for the touching record of maternal devotion in the rearing of the chick and the frailty of the philandering male, for, if this latest evidence could be trusted, it was the *father* who incubated the egg so carefully and nurtured the chick so tenderly, and it was the wife and mother who showed such careless disregard for her offspring and indulged in little affairs aside with another male, as B now appeared to be.

Meantime A was, as usual, treating the egg carelessly and not covering it properly, so B was brought down and put with A in the hope that the old attraction between them might lead to B adopting the egg. The next day, however, the egg was found lying neglected, so it was taken to the incubator (it turned out afterwards to be clear), and B was sent back to the penguin pool with the others, A being put back with C.

MAY KING PENGUINS BE DOUBLED-BROODED?

In a short time a fresh complication arose, for B and D seemed to be pairing and, on the 1st of August, an egg appeared which, during the first day, was in the possession of D but at night was

transferred to B. Evidently this third egg was laid either by B or by D. The evidence which had been accumulating by this time pointed pretty clearly to A as female, D as female, and C as male, and it was more than probable that B who had shown a desire to mate with both A and D was a male. If these inferences were sound and the third egg had been laid by D, then it would be clear that a female may lay a second time in one breeding season. One hesitated to accept that conclusion upon the indication afforded by D alone, because it had been a matter of remark and of surprise to the writer that during the whole preceding record of the penguins' breeding attempts, the frustration of a first effort had never, so far as one could observe, been followed by a second attempt on the part of the same female during the same breeding season, to produce and rear a chick, as happens in the case of many breeding birds.

Curiously enough, however, the point received confirmation in the course of the next week or two for (on 20th August) A, who had remained in the separate paddock with C, was found with a new egg, the fourth which had been laid that summer. There could be no doubt this time that A laid the egg and scarcely a doubt that she had produced two eggs at an interval of thirty-eight days. The interval between the laying of the two eggs apparently produced by D was forty-seven days.

During all this time C was quietly and patiently incubating the egg first laid, and on the 8th of August the egg was found to be chipped. The chick emerged next day and seemed well developed though it was noticed that it showed little vigour. A careful watch was kept, but the chick was never seen to feed and on the fourth day after hatching it was found dead. The second egg—that which was first laid by A—was then brought from the incubator and placed on the ground in front of C who immediately took it up and incubated it for a further three weeks, when it was examined and found to be clear. In all C carried on a steady incubation for a total uninterrupted period of over eleven weeks.—T. H. GILLESPIE.

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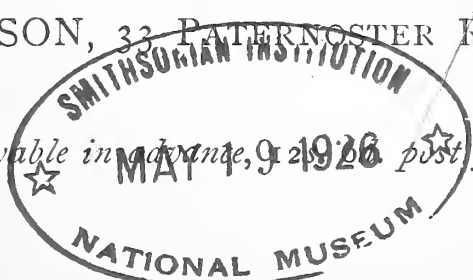
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[MARCH-APRIL



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[MARCH-APRIL

A CENTURY'S CHANGES.

A COUPLE of chance excerpts from a newspaper of a century ago, sent to us by a reader, suggest by contrast something of the changes that have taken place in man and amongst the beasts in the intervening period.

The Observer of 26th February 1826 recorded that "the following is the number of vermin killed by the Right Hon. Lord Gwydyr's vigilant gamekeeper, Mr Richard Burniston, on the hills of Callander and St Fillans, from December 1824 to December 1825:—7 eagles, 4 foxes, 28 Martin cats, 11 badgers, 10 mountain wild cats, 12 polecats, 62 house cats, 13 stoats, 5 weasels, 8 hedgehogs, 105 gledes, 92 ravens, 15 hawks, 190 hoodie crows, 34 magpies, 10 jays, 32 owls, daws, etc.—624 head in all, killed by Stamps. In consequence of the destruction of so many of these ravenous creatures the game is rapidly becoming plentiful on these fine estates."

The list is illuminating. Long before the century had passed, the incessant toll had exterminated from this district of southern Perthshire one-third of its "vermin": the pine martens, polecats, wild cats, eagles, gledes, and jays have gone and the raven is rare. One-third of the species, and those the creatures of which because of their rarity the naturalist would fain have kept a remnant, have been sacrificed, and we can only hope that the resulting plenteousness of game has been worth the sacrifice.

The numbers of the slain also are suggestive. More eagles were killed than foxes, twice as many martens and as many polecats as stoats, more than half as many gledes or kites as hoodie crows, seven times as many kites as "hawks." They suggest that there is no safety in numbers when man has made up his mind to interfere with the balance of wild life. And the small numbers of foxes, stoats, weasels, and hawks, compared with the numbers nowadays, suggest either that these were then less intensively destroyed as vermin, or, and perhaps this is the more likely explanation, that the balance has merely been shifted, and that the weeding out of one set of vermin has given to another set a new opportunity for expansion.

On the same day *The Observer* informed its readers that "in the House of Commons on Tuesday, Mr Martin (of Galway) rose to introduce a Bill for the more effectual prevention of Bear-baiting, Dog-fighting, and other cruel sports. The Bill for which he should move was generally approved throughout the country. He held in his hand a list of fifty-two petitions, presented from some of the most opulent and populous cities and towns of the kingdom praying that an end might be put to these cruel sports. He would, however, specify that it was a particular object to put down that Patrician Establishment, the Westminster Pit, which was the chief in point of atrocity, although his Bill would, of course, extend to other similar establishments. . . .

"The Attorney-General opposed the motion.

"Mr Peel said if Bull-baiting and Cock-fighting were to be prohibited surely Pigeon-shooting ought also to be suppressed. He should have no objection to some general measure for the protection of all animals, but he was afraid that if the measure now proposed was to become a part of the law of the land, instead of affording protection to brutes, it would become an instrument of oppression to human beings.

"The House then divided, when there appeared—Ayes 37; Noes 76; Majority against the motion 59."

The suggestion, by contrast, is that the century has seen a very considerable change in the people's regard for what is called "the lower creation," and that the recognition of the sensibilities of animals has led to an ever-increasing restriction in man's "rights" to deal with them at the whim of his own sweet will.

* * * *

Stranding of Whales in Scotland.—In the revised *Instructions to the Coastguard* just issued by the Board of Trade occurs the following (p. 84): "The stranding of a Whale in Scotland is also to be reported to the Keeper, Natural History Department, Royal Scottish Museum, Edinburgh (Telegraphic Address, 'Royal Scottish Museum, Edinburgh'), and to the Fishery Board for Scotland (Telegraphic Address, 'Fisheries, Edinburgh'), and the Receiver of Wreck is to be informed that a report has been sent direct to the Fishery Board for Scotland as well as to the Museum." A simultaneous report by telegram is to be sent to the Natural History Museum, London (Telegraphic Address, "Nathismus, Southkens, London").

This arrangement will facilitate, where it is desirable, prompt examination of stranded whales, and the inclusion of more detailed accounts of Scottish whales in the annual reports on whales stranded in Great Britain, initiated and carried on by Sir Sidney Harmer, Director of the British Museum (Natural History). As it is desirable that all strandings of whales, porpoises, and dolphins should be recorded in these Reports the Editors of the SCOTTISH NATURALIST would welcome reliable observations upon such occurrences.

* * * *

During March two new natural history journals have made their appearance. The first, edited by Dr E. S. Russell, is an important international periodical published at the instance of the Permanent International Council for the Exploration of the Sea. This *Journal du Conseil* will contain scientific articles bearing on the natural history of the sea and its inhabitants, such as have hitherto appeared

in *Publications de Circonstances*, but a special and valuable feature is the large section given up to reasonably long reviews of recent books and papers dealing with similar subjects. The printing of the *Journal* in Copenhagen has led to a number of misprints in some of the English articles.

* * * *

The second journal, *The North-Western Naturalist*, should afford a much needed outlet for the observations of English naturalists, who, since the disappearance of *The Zoologist*, have possessed no general magazine covering the country's naturalistic activities. The first number contains a wide range of short articles, dealing with zoological, botanical, geological, and meteorological subjects, amongst which may be specially noted Professor Boycott's "A Green Alga parasitic in a Water Snail" and Mr H. F. Barnes's "The Craneflies of Carnarvonshire." We trust that the usefulness of this new monthly will be a surety of its success.

* * * *

The untimely death, in his 59th year, of James Gemmill, M.D., D.Sc., F.R.S., Professor of Zoology in University College, Dundee, is a severe blow to Scottish zoology. He made his name as a researcher by his investigations upon the development of Starfishes, but his account of abnormal developments in fishes, and his more recent studies on insect pests of agricultural importance, all indicated a keen love of original inquiry and a power for planning and carrying out detailed work. In addition he took a leading part in founding the Marine Biological Station at Millport, and served it faithfully through times of hardest stress. His career as a student at Glasgow University was a brilliant one, and as a lecturer in Embryology in his own University and since 1919 as Professor of Zoology in Dundee he was a successful teacher, gifted in inspiring his students with enthusiasm for research.

WHITE WILD GEESE.

By HUGH S. GLADSTONE, M.A., F.R.S.E., V.P.Z.S.

A WHITE Bernacle Goose was seen near Caerlaverock, Dumfriesshire, on 8th December 1923, and it associated with others of its species till the following April, when it presumably went north to its summer quarters. Towards the end of September 1924 it returned and, after being

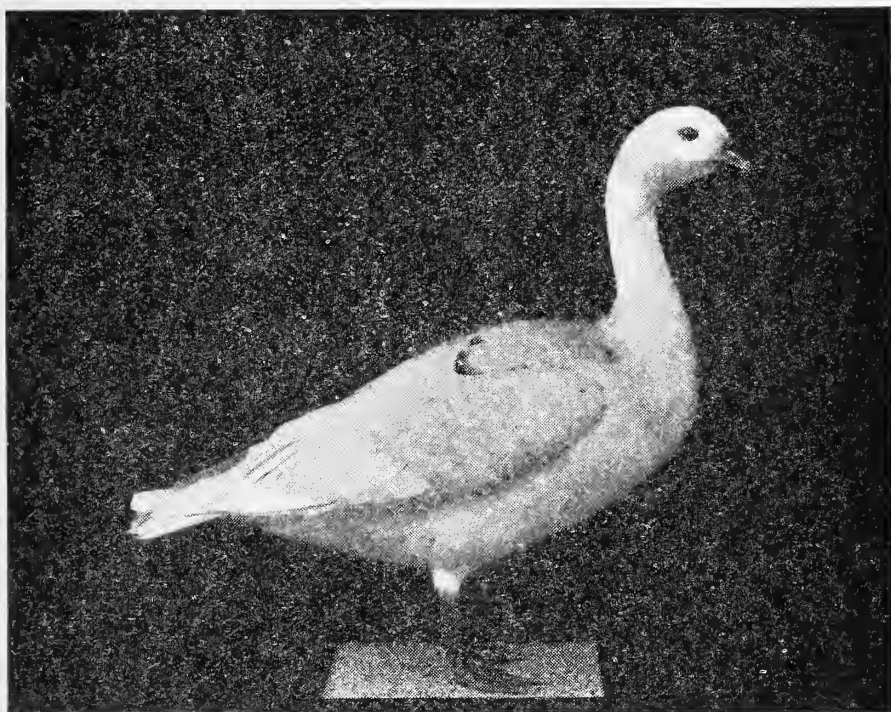


FIG. 1. Bernacle Goose, Solway, 1925.

seen repeatedly, was shot on Bowhouse Merse (Dumfriesshire) on 3rd January 1925 by John Wilson, a local wild-fowler, who sent it in the flesh to me the next day. It proved to be a female, and the accompanying illustration shows better than any description that it is a most beautiful specimen (see Fig. 1).

No systematic attempt appears to have been made by any British ornithologist to catalogue abnormal plumages, but the late Paul Leverkühn (*d.* 1905) published four papers on the subject in the *Journal für Ornithologie*.¹ These papers

¹ *Journal für Ornithologie*, 1887, pp. 79-86; 1889, pp. 120-36, pp. 245-62; and 1890, pp. 168-232.

deal with the museums at Hanover, Hamburg, Copenhagen, Bremen, Göttingen, Kiel, Metz, Strassburg, Colmar, Amsterdam, Leyden, Haarlem and Rotterdam; and it is remarkable that in none of these museums did he find any specimens of abnormally plumaged Geese. I have ascertained that the British Museum (Natural History), the Royal Scottish Museum, the Liverpool Museums, and the Marshall Collection at Taunton do not possess any white or pied Geese nor are there any such varieties in the American Museum of Natural History in New York, nor in the United States National Museum at Washington. Mr H. S. Swarth, the Curator of Birds in the Museum of Vertebrate Zoology in the University of California, Berkeley, U.S.A., has informed me that the collection under his care contains no albino Geese, and that only some seven specimens, in the collection of 254 skins, show any albinistic tendency, and this to a degree of but a few abnormal white feathers in each case.

The private collection of Dr Oddi comprised no such abnormality, nor did that of the late Sir Vauncey Harpur Crewe, Bart., of Calke Abbey, Derbyshire. Mr J. Whitaker, of Rainworth Lodge, Nottinghamshire, who probably possesses the finest collection of white and pied birds—125 species all killed in Great Britain—has not any variety of the Goose family.

Dr Lehn Schiøler has written to me from Denmark that he has never seen a wild Goose which was not of normal plumage, and Mr H. C. Oberholser of the Bureau of Biological Survey, United States Department of Agriculture, Mr F. C. Stuart Baker, author of *The Indian Ducks and their Allies*, and Professor Lönnberg, Director of the Zoological Museum at Stockholm, have written to me in similar terms. Messrs Rowland Ward, the celebrated taxidermists of London, have informed me that they have never had an albinistic wild Goose to set up, nor have Messrs Williams & Son, of Dublin, in sixty years of business.

It is obviously of no value to extend the list of collections which do NOT contain specimens of abnormally plumaged Geese, and, from what has been stated, it will be gathered that white, or pied, wild Geese of any species are exceedingly

rare: domestication is supposed to have produced the white varieties which are seen among our tame species, and these are of no interest here. Possibly there may be specimens of white wild Geese in public or private collections of which I am not aware, but a fairly intensive inquiry into the subject has only elicited the following records:—

1. GREY LAG-GOOSE, *Anser anser* (Linn.).—“A perfectly white wild Goose, shot on a lake in Eastern Algeria, or Tunisia, and bought from M. Blanc in Tunis some years ago,” is now in the Zoological Museum at Tring.¹ (See Fig. 2.)

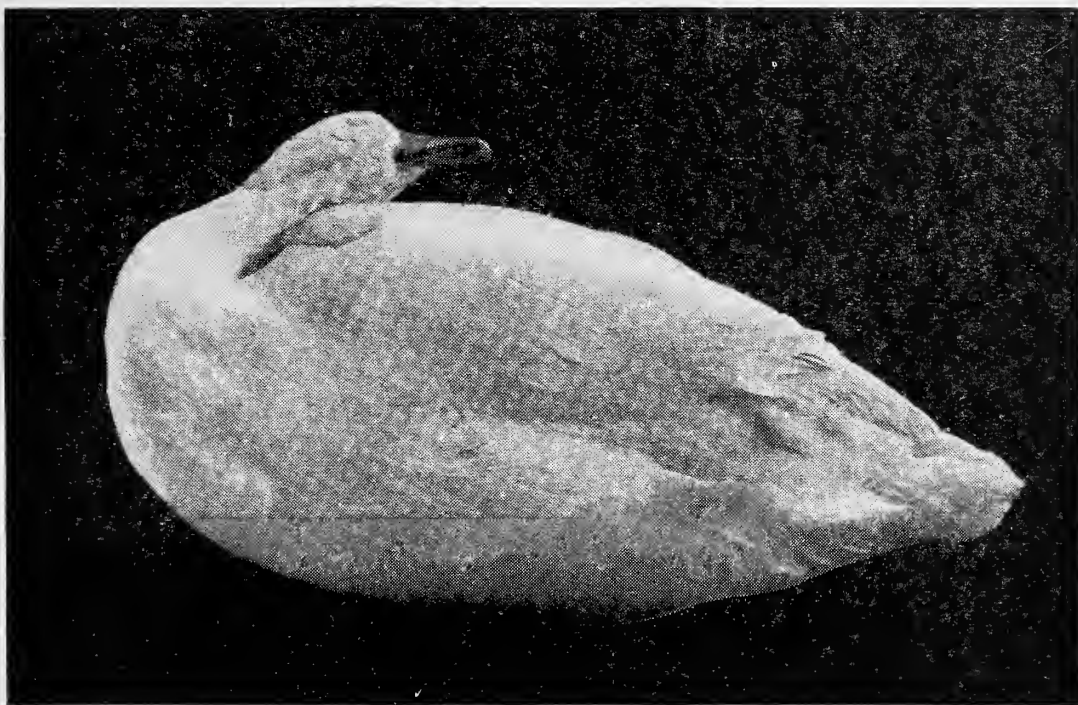


FIG. 2. Grey Lag-Goose, N. Africa.

2. Do. Mr J. G. Millais has given a graphic account of how a white Grey Lag-Goose—the “Goose Queen”—was shot, but not retrieved, by a wild-fowler named M’Innes, near Errol, on the Firth of Tay, about 1890.²

3. Do. A white Grey Lag visited S. Uist annually for many years. No one tried or wished to kill it but, when fighting late one night about 1895-1905, a keeper accidentally shot it.³

¹ Ernest Hartert, *in litt.*, 22nd April 1925, and Lord Rothschild, *in litt.*, 23rd October 1925.

² J. G. Millais, *The Wild-fowler of Scotland*, 1901, pp. 31-33.

³ M. Portal, *in litt.*, 21st April 1925.

4. GREY LAG-GOOSE, *Anser anser* (Linn.).—Dr M. Menzbier has informed me that the only albinistic Goose which he has ever seen in Russia, in fifty years' experience, is a partly albino Grey Lag, which was shot on the spring migration in the estuary of the River Don not far from Rostow. This bird is now in the Zoological Museum of Moscow University, and the prevailing colour of its plumage is grey but interspersed with white feathers.¹

5. Do. Dr E. Arrigoni Degli Oddi has informed me that a male Grey Lag-Goose was bought in the market of Florence on 25th November 1915, which below was pale brown without any black feathers and above entirely white



FIG. 3. White-fronted Goose, Japan, 1916.

except on the wing-coverts and some remigies; the tail-feathers being wholly white. Dr Oddi tried in vain to procure this beautiful bird from the person who was so fortunate as to purchase it.²

6. WHITE-FRONTED GOOSE, *Anser albifrons* (Scopoli).—Dr N. Kuroda has informed me that the only abnormally plumaged Goose that he has ever seen was a bird of this species, which he kept alive for some time. It was captured at Teganuma, Province of Shimōsa, Hondo, Japan, in November 1916. The head of this bird is more white than usual; a large white patch extends from the forehead and

¹ M. Menzbier, *in litt.*, 22nd December 1925.

² E. Arrigoni Degli Oddi, *in litt.*, 16th December 1925.

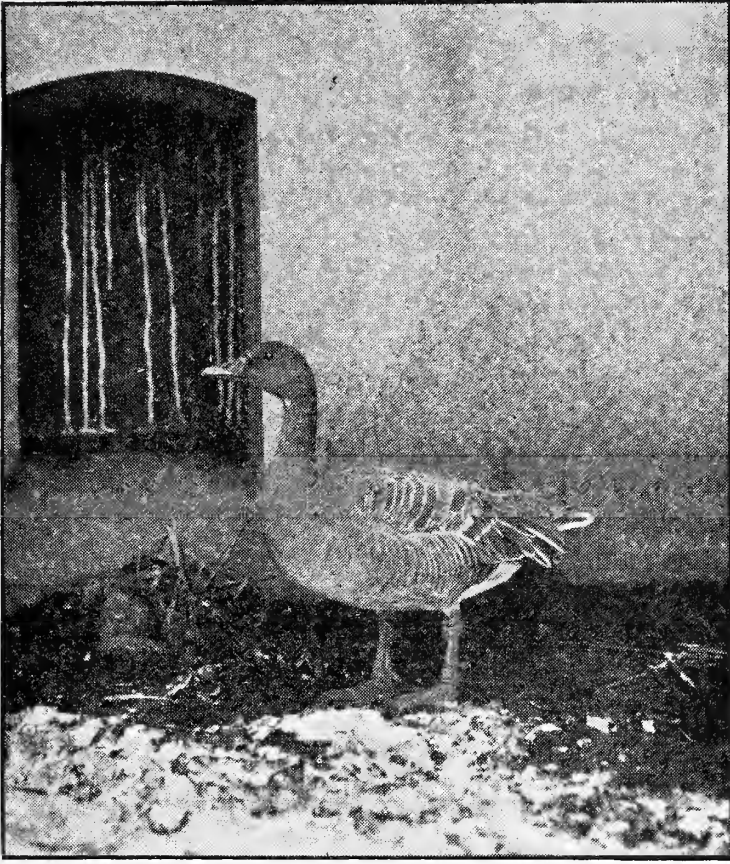


FIG. 4. Bean Goose, Holland.

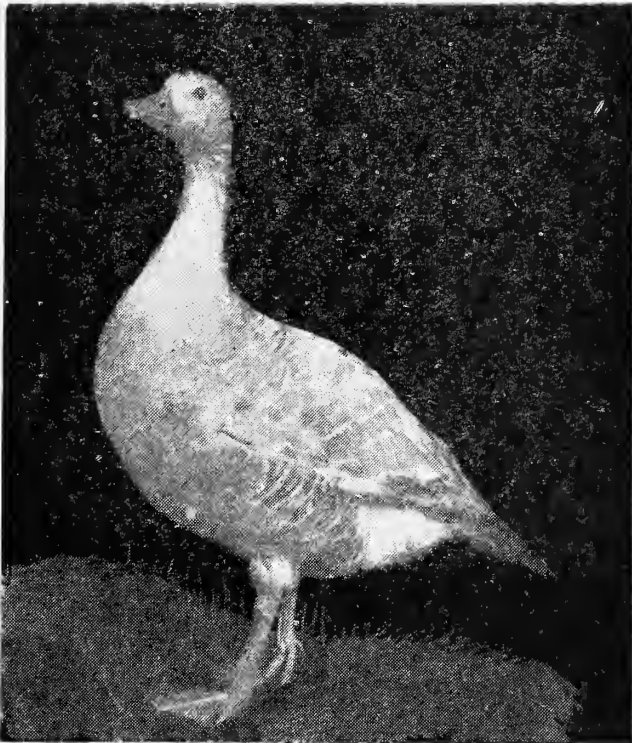


FIG. 5. Bean Goose, Solway, 1917.

the front of the eyes to the top of the head; and white mottlings appear on the occiput, sides of the face, upper hind-neck, fore-neck, chin, and throat.¹ (See Fig. 3.)

7. BEAN GOOSE, *Anser fabalis* (Latham).—Dr F. E. Blaauw has informed me that he has in his possession a live Bean Goose of a pale buff-colour; this bird which is believed to be a female, was caught in a decoy in Holland and is now about twenty years old. It is the only abnormally coloured wild Goose which Dr Blaauw has ever had. When sending me its photograph Dr Blaauw wrote: "In the foreground is some snow, and the wall in the background is light sand-colour. You will notice that all the markings of the feathers are traceable, but the whole plumage is on an abnormally light scale."² (See Fig. 4.)

8. Do. A bird of a light cream-colour with pinkish, instead of yellow, legs and feet, was shot near Carlisle on 31st January or 1st February 1917, and is now in the possession of Miss S. Mounsey-Heysham at Castletown, Carlisle.³ (See Fig. 5.)

9. PINK-FOOTED GOOSE, *Anser brachyrhynchus*, (Baillon).—A bird of this species, described as "washy white," was seen on the Cumberland side of the Solway for some time in October 1911.⁴

10. Do. A cream-coloured bird was shot on 12th October 1912, by Miss S. Mounsey-Heysham on Rockcliffe Marshes (Cumberland), and is now in her possession. This bird was a two-year-old female, and may have been whiter and less cream-coloured in its earlier plumage.⁵ (See Fig. 6.)

11. Do. A white Pink-footed Goose which was seen on the Cumberland side of the Solway in October 1923,⁶ may

¹ N. Kuroda, *in litt.*, 20th November 1925, and *Tori*, vol. i., No. 4 (1917), p. 48.

² F. E. Blaauw, *in litt.*, 6th October 1925 and 20th December 1925.

³ Miss S. Mounsey-Heysham, *in litt.*, 1st July 1925; this bird has been recorded as shot in January 1916: *British Birds Magazine*, vol. x., p. 276.

⁴ M. Portal, *in litt.*, 26th April 1925.

⁵ Miss S. Mounsey-Heysham, *in litt.*, 1st July 1925, and M. Portal, *in litt.*, 26th April 1925. This is the cream-coloured Pink-footed Goose recorded as shot near Carlisle in 1914.—*British Birds Magazine*, vol. x., p. 276.

⁶ M. Portal, *in litt.*, 26th April 1925.

be the same as that reported as frequenting the Holkham Marshes (Norfolk), in the winter of 1923/4,¹ since three days after the disappearance of this bird from the Solway the arrival of a white Pink-footed Goose was noticed at Holkham.

12. BERNACLE GOOSE, *Branta leucopsis* (Bechs.).—Already recorded (the *raison d'être* of this paper) as shot on Bowhouse Merse (Dumfriesshire), on 3rd January 1925, and now in the writer's possession. (See Fig. 1.)



FIG. 6. Pink-footed Goose, Solway, 1912.

13. BRENT GOOSE, *Branta bernicla* (Linn.).—A pure white Brent Goose came to the Moray Firth in the late autumn of 1890 and remained there till the spring of 1891. All the local gunners saw it and many tried to get it but were unsuccessful. It never returned.²

14. Do. An almost entirely white Brent Goose, but in which the primaries had been moulted, was killed on Kolguev on 18th July 1894, when 3300 Brent were killed in a "drive."³

15. Do. A Brent Goose with pure white wings frequented Strangford Lough, Ireland, in the winter of 1924/5.⁴

¹ *British Birds Magazine*, vol. xvii., p. 270 (cp. The late H. N. Pashley, *Notes on Birds of Cley, Norfolk*, 1925, p. 100).

² J. G. Millais, *in litt.*, 23rd April 1925.

³ A. Trevor-Battye, *Ice-bound on Kolguev*, 1895, p. 227.

⁴ J. A. S. Stendall, *in litt.*, 8th January 1925.

16. CANADA GOOSE, *Branta canadensis* (Linn.).—A specimen in the Museum of Comparative Zoology at Cambridge, U.S.A., without date and in bad repair, has the head and neck nearly white, the rest of the plumage normal; it is thought that this bird may have been bred from semi-domestic stock which may have turned albinistic in course of time.¹

[16a. Do. A specimen, in the Museum of Comparative Zoology at Cambridge, U.S.A., which was obtained near Cape Cod, has all the black parts of a light rusty brown and the original brown nearly white; this is an undoubted fake, the specimen having been bleached out by a "German method"].²

17. Do. A male, in the Field Museum of Natural History, Chicago, formerly in the Cory collection, was purchased originally in the Boston market about 1900; the bird is in normal plumage except the head and neck which are mottled black and white in about equal proportions.³

18. Do. A partial albino, shot in Carrituck Sound, N. Carolina, is now in the possession of Mr John E. Thayer, Lancaster, Massachusetts; this is the only albinistic Goose that Mr Thayer has ever seen though he has examined hundreds.⁴

19. Do. A specimen showing some abnormal white feathers on the head and neck is in the collection belonging to the Academy of Natural Sciences, Philadelphia.⁵

20. UPLAND GOOSE, *Chloephaga inornata* (King).—A female, in the Field Museum of Natural History, Chicago, was got at Casa Richards, Chile, on 10th March 1923, by Mr H. B. Conover; "it is practically pure white, though on the breast, in certain lights, faint barring shows corresponding to the usual dark markings."⁶ (See Fig. 7.)

21. BLUE GOOSE, *Chen caerulescens* (Linn.).—Varieties in the plumage of this species would appear not to be uncommon, but whether these are to be regarded as due to partial albinism, or to hybridization with the Snow Goose, or as simply characteristic of old age, it is difficult to determine.⁷

¹ John C. Phillips, *in litt.*, 12th and 25th May 1925.

² John C. Phillips, *in litt.*, 12th and 25th May 1925.

³ W. H. Osgood, *in litt.*, 13th June 1925.

⁴ John E. Thayer, *in litt.*, 8th June 1925.

⁵ Witmer Stone, *in litt.*, 17th August 1925.

⁶ W. H. Osgood, *in litt.*, 13th June 1925.

⁷ A. C. Bent, *in litt.*, 8th July 1925.

22. BAR-HEADED GOOSE, *Eulabia indica* (Lath).—The Curator of the Bombay Natural History Society has informed me that a few years ago there was an example of an albino Bar-headed Goose in the local Zoological Gardens. The plumage of this bird was entirely white except for the two bars on the head which were dull rufous; the quill-feathers were also of the same tint towards the tips. It is not known where this variety was obtained, and the Curator has further informed me that the Society has no specimens of albino Geese in their collection, nor have they any other records of such abnormalities.¹

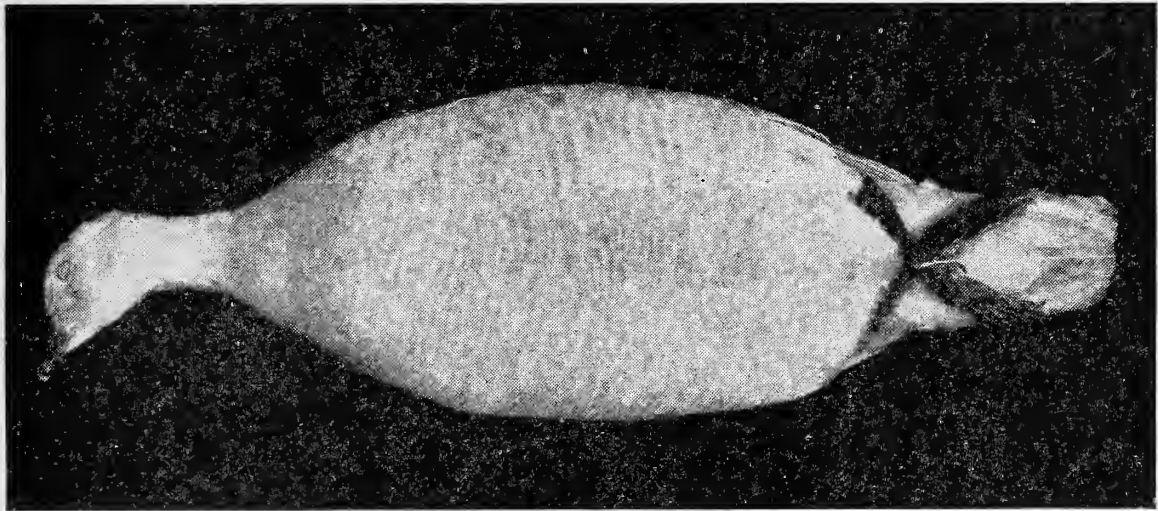


FIG. 7. Upland Goose, Chili, 1923.

23. [Species unknown] described as "Cream-coloured Goose, *Anser alba*," and figured as such by H. L. Meijer.² This bird was shot on 11th January 1841 on the Thames, near the village of Shepperton in Middlesex. It was not preserved, and its species was never ascertained, though it must obviously have been an albino Goose of some sort.

In addition to the authorities I have already quoted and whose assistance I hereby gratefully acknowledge, I must thank Mr W. L. Sclater, Mr F. H. Frohawk, Dr J. Ritchie, Mr Linnæus Hope, the Rev. F. C. R. Jourdain, Mr Frank Finn, and Mr C. J. Carrol who have informed me that they

¹ Curator of the Bombay Natural History Society, *in litt.*, 2nd January 1926.

² *Coloured Illustrations of British Birds and their Eggs*, vol. vi. (8vo), London [N.D.], pp. 51-53, plate 238.

know of no specimens of albino or albinistic Geese other than those I have recorded above. Lord William Percy whose knowledge of ducks and geese is world-wide, has written to me that he has been so fortunate as to see "some half a dozen albino or semi-albino grey Geese (not 'black' Geese)," of these it is probable that three, at least, are included in the list given above.

"What's hit's history; what's missed's mystery," and it will be observed that the only actual specimens now ascertained to be in existence are but fourteen in number. There can be no doubt that albino—or albinistic—Geese are of extreme rarity, and it is surely a very odd coincidence that white examples of three different species should have been obtained within the last fifteen years on the Solway and within a perimeter of only some twenty-five miles.

Black Mountain Hares at Langwell, Caithness.—I have been interested in the article which appeared in the last number of the SCOTTISH NATURALIST on the abnormal coloration in Scottish Mountain Hares. I gave to Mr Seton Gordon all the information I had about the black Hares that have been seen or shot in the Langwell district, and I believe that he incorporated most of it in his letter to *The Scotsman* of 23rd December last, to which reference is made in the article.

Ralph Armstrong, one of the Langwell keepers, is here with me, and at my request has written the following account: "The last two black Hares shot at Langwell, in December 1925, were got about a mile apart. One was much smaller than the other, being only about the size of a Rabbit. I don't think they could belong to the same litter. No one at Langwell or Braemore has ever seen a parti-coloured Hare. It would be almost certain to be observed if such a thing were on the ground."

I shall now give orders to the keepers at Langwell and Braemore not to kill any more black Hares, as I think it will be interesting to see if they increase in the future.—PORTLAND.

Common Porpoise stranded at Granton.—On the 20th of March a male Common Porpoise, measuring 4 feet 9 inches in length, was washed ashore at Granton, near Edinburgh. It had been feeding on large herring which, although partly digested, had evidently been captured but a short time before.—A. C. STEPHEN, Royal Scottish Museum.

PERCENTAGES OF RECOVERIES OF RINGED BIRDS IN GREAT BRITAIN AND HUNGARY.

By H. W. ROBINSON, M.B.O.U., F.Z.S.Scot.

A COMPARISON between the Hungarian bird marking experiments and that of the "British Birds" scheme is of interest as showing the percentage of returns. The total marked over equally long periods only shows 32,732 Hungarian as compared with 145,779 British records. The British specimens were marked between 1909-1924, and the Hungarian between 1908-1923.

	British.	Hungarian.		British.	Hungarian.
Skylark	0.8	0.4	Stock Dove	3.8	9.1
Yellow Hammer	3.1	2.9	Ring Dove	5.1	11.1
Reed Bunting	0.3	11.1	Lapwing	2.6	4.1
Redstart	0.3	1.2	Redshank	5.3	3.4
Bullfinch	1.6	3.8	Woodcock	11.3	2.3
Wryneck	1.7	1.1	Moorhen	1.8	7.2
Starling	5.4	2.6	Heron	14.5	3.3
Great Tit	2.2	5.6	Barn Owl	5.4	28.6
Blue Tit	1.7	6.2	Kestrel	8.5	11.1
Swallow	0.8	1.4	Sparrow Hawk	17.1	1.1
House Martin	0.5	0.8	Black-headed Gull	4.3	4.4
Swift	3.5	18.5			

Under the Hungarian scheme there were 803 recoveries or nearly 2.5 per cent. Competitive comparisons are odious, but it may be of interest to compare the two lists to show the largest number of species marked under each scheme, with their percentage of recoveries:—

British.	Total.	Per cent.	Hungarian.	Total.	Per cent.
1. Song Thrush	16,795	1.1	1. Swallow	7,739	1.4
2. Black-headed Gull	11,969	4.3	2. White Stork	6,668	1.4
3. Blackbird	11,219	2.4	3. Black-headed Gull	3,162	4.4
4. Swallow	10,744	0.8	4. House Martin	2,948	0.8
5. Starling	9,526	5.4	5. Great Tit	1,913	2.2
6. Chaffinch	5,764	1.2	6. Night Heron	1,017	3.9
7. Robin	5,748	3.4	7. Purple Heron	870	4.7
8. Lapwing	5,678	2.6	8. Starling	853	2.6
9. Greenfinch	4,581	0.8	9. Glossy Ibis	720	2.6
10. Lesser Black Back Gull	4,506	4.0	10. Lapwing	651	4.1
11. Willow Warbler	3,474	0.7	11. Squacco Heron	563	3.0

Under the Hungarian scheme eight Spoonbills were also recovered showing a percentage of 6.4, and nine recoveries of Nuthatches showed 16.4 per cent.

It might be mentioned that twenty-three White-tailed Eagles were ringed, the returns showing a percentage of 8.7 and five Lesser Spotted Eagles, the single recovery showing a percentage of 20.0; whilst one Golden Eagle and thirteen Grey-lag Geese provided no returns at all.

Of the grand Hungarian total more than one-third were marked by one ringer, viz., Herr Jakob Schenk, with 11,277 birds, whilst Herr Bela Szeots, sen., marked 4717, Dr Thorias Gyula 1989, and Herr Lajos Bohrandt 1592, three others marking over one thousand apiece. One hundred and forty-three ringers in all took part in this scheme and 157 species were marked. A Purple Heron was recovered in its thirteenth year, and a White Stork and a Glossy Ibis in their tenth years.

The longest distances covered by these travellers were 9000 kilos by two White Storks recorded from South Africa, four years and nine months respectively after marking; 980 kilos by a Lapwing which was found in Algiers a year and a half after ringing; and 900 kilos by a Black-headed Gull which was also wintering in Algiers eight and a half years after it was hatched near Prague; whilst a very juvenile Spoonbill, only three months old, found itself in Naples when recovered.

It is rather interesting to note that in the case of Black-headed Gulls, of which large numbers were ringed in both countries, the percentage of recoveries is practically the same. Of the 11,969 Black-headed Gulls marked under the British scheme, the writer personally placed rings upon 7993, and also upon 2417 of the 4506 Lesser Black Back Gulls, besides marking 2576 Common Terns, 1910 Swallows, and 450 Sandwich Terns.

Availing themselves of a great immigration of Rose-coloured Pastors during last spring, the Royal Hungarian Institute of Ornithology marked 2700 of them with rings, inscribed "Ornith. Közpant, Budapest." Ornithologists in India, Turkestan, Caucasia, and South Russia are asked to look out for birds marked with such rings.

SOME OBSERVATIONS UPON BLOWFLY MAGGOTS.

By W. M. C. MILLAR, M.R.C.V.S.

THE object of these observations was to attempt to discover how long a period elapsed before carrion-breeding flies (Blowflies) were able to discover the carcasses of freshly-killed animals, and how long a period elapsed before maggots were found upon the carcasses.

The practical importance of such an observation may not appear very obvious, but the ulterior motive was to attempt to find out the efficacy or otherwise of a particular form of "maggot-trap." As is well known adult living sheep are frequently the hosts of the larvæ of certain of the Blowflies—especially the Green Bottle Fly (*Lucilia sericata*), the Blue Bottle Fly (*Calliphora erythrocephala*), and less frequently of the Sarcophagidæ, such as *Sarcophaga carnaria*, etc. Normally it is probable that each of the flies prefers flesh—possibly putrescent flesh—for the deposition of its eggs or small larvæ (for *Sarcophaga* sp. at least is usually viviparous), and if concerted attempts were made to provide these flies with breeding places which could be controlled, egg-deposition in sheep could perhaps be diverted to a very great extent. Moreover, if the breeding places are controlled in such a manner as absolutely to prevent the larvæ (maggots) from escaping when fully fed to pupate in the ground, a very considerable amount of the enormous losses to sheep-farmers from the attacks of these insects could be prevented.

It will be advisable to indicate the nature of the maggot-traps to which reference has been made. The carcass of a dead animal or bird is secured; a Mountain Hare or a Rabbit serves excellently, and there can be no objection to the use of these animals, for any special measures for the conservation of their species is highly undesirable. A site in the pasture as near to trees and water as possible is selected, since it is always the case that flies are more

numerous there than elsewhere. A stout branch is stuck into the ground at an angle, and the two hind limbs of the animal are secured to it by string. Immediately under the head of the carcass, which should swing clear of the ground by 2 or 3 feet, is placed an old pail containing 2 or 3 lb. of quicklime, lime and flowers of sulphur, or merely dry slaked lime. In exposed or windy situations it may be necessary to weight the neck of the animal by tying to it a heavy stone, which hangs inside the pail, so that the collected maggots do not drop on to the ground outside the pail through oscillations of the carcass. When everything has been arranged the abdomen of the animal is slit down the middle line, so as to expose the viscera to the air and encourage visits from flies.

Ovigerous female flies are attracted to the carcass, deposit their eggs or larvæ upon it—very often inside the opened abdomen—and the usual results follow. In a short time the whole carcass is converted into a seething mass of maggots, for the presence of even a few maggots seems to attract other flies to the carcass, and these in turn lay their eggs upon it. It appears to take a variable time for the maggots to become fully-fed and reach the stage of pupation, the variation depending upon the weather and the abundance of food. In about four days from the first appearance of the maggots a number of them will be found to have dropped off into the pail, where they are destroyed by its contents.

It should be noted that pails of water have been advocated by some, but they do not prove so effective as those containing lime, since a very considerable number of maggots—floating in consequence of their greasy covering—reach the sides of the pail, crawl up them, and drop over the top on to the soil, where they pupate. Moreover, there are obvious difficulties in keeping water in such a pail during hot weather, when evaporation is rapid and the sheep are thirsty; and the labour required to keep the pail full, say upon a hill hirsell, would be too tedious to make the plan popular. There can be less objection, however, to suspending the carcass over a hill burn, or over a lowland stream, where

TABLE OF OBSERVATIONS.

Animal used :—	I. Rabbit, shot at 6.0 a.m. the same morning.	II. Rabbit, shot previous evening; protected from flies till used.	III. Rabbit, shot in early morning.	IV. Domestic Fowl, destroyed when moribund.	V. Brown Rat, shot previous evening.	VI. Crow, shot same morning.
Date	16th August	16th August	18th August	15th August	14th August	17th August
Time when trap was set	11.0 a.m.	3.0 p.m.	10.0 a.m.	10.0 a.m.	10.30 a.m.	11.15 a.m.
First fly to be seen at trap	11.35 a.m.	(No record)	10.29 a.m., followed by two others at 10.40 a.m.	10.40 a.m.	11.3 a.m.	12.0 noon
Variety of fly	Blue Bottle	(No record)	Blue Bottles	Blue Bottle and Green Bottle	Blue Bottle	Blue Bottle
Date when maggots were first seen	16th August (evening)	17th August	19th August	16th August	14th August (evening)	18th August
Date when maggots were first found in pail	20th August	21st August	25th August	20th August	19th August ¹	21st August
Estimate of number of maggots present when trap was destroyed	600-800	457 (these were counted by hand)	800-1000	800-1000	...	300-400
Date when trap was destroyed	27th August	26th August	30th August	27th August	22nd August	28th August

¹ In the case of this rat the maggots were few because of the visits of a "Butcher bird," or Shrike, to the carcass. It was observed through field glasses picking the maggots from the eye-sockets and mouth of the rat.

the maggots drop into the water and serve as food for trout, perch, roach, etc.

The table indicates some of the results obtained with different baits during the hot summer of 1923, in a few preliminary experiments made with traps such as have been described.

The traps were visited every day, usually once in the morning and during the afternoon, and at each visit the lime was stirred with a stick, so as to present a fresh surface for the maggots to drop upon. Each trap was disposed of by cutting the carcass from the bough so that it fell into the pail, and this was then carried to a freshly dug hole and the whole contents were buried and the soil stamped well down on the top, so as to minimise the chances of any fly which might emerge gaining the surface.

It is hoped to carry out a more careful and extensive series of observations in the future, if possible in different parts of Scotland.

Coloration of Mountain Hares in Mull.—"I would like to supplement the most interesting article by J. R. in *The Scotsman* of 2nd January by mentioning that the pale buff type of hare spoken of by him was not uncommon in Mull a few years ago, these undoubtedly being descendants of the Irish race introduced. There has been a decided change in the coloration of Mull Hares during the past forty or fifty years. In 1878 the majority turned white in winter like true Alpine Hares. Now the white is decidedly the minority. Many may be described as being skewbald in colour; others show no change in winter from summer. Two reasons may be suggested for the change—(1) crossing with the Irish Hare; (2) climatic conditions, Mull being less Arctic than the ordinary inland habitat of the Mountain Hare.—R. M'M." (*The Scotsman*, 23rd January 1926).

CRANE-FLIES OF THE INNER HEBRIDES.

By ALEXANDER CUTHBERTSON.

THE following notes on Crane-flies (*Diptera*, *Tipuloidea*) are based on data obtained during a brief visit (16th to 23rd June 1925) to the Inner Hebrides, in particular the Isles of Iona, Soa, and Lunga of the Treshnish group. The immature stages discovered are discussed at the end of this paper.

LIST OF ADULT CRANE-FLIES (21) OBSERVED.

<i>Anisopus punctatus</i> , F.	<i>Limnophila</i> (<i>Pilaria</i>), <i>discicollis</i> , Mg.
<i>Trichocera regelationis</i> , L.	<i>Pedicia rivosa</i> , L.
<i>Limnobia tripunctata</i> , F.	<i>Tricyphona immaculata</i> , Mg.
<i>Dicranomyia autumnalis</i> , Staeg. (var. dark).	<i>Erioptera fuscipennis</i> , Mg.
<i>Dicranomyia didyma</i> , Mg. (var. dark).	„ <i>trivialis</i> , Mg.
<i>Limnophila</i> (<i>Phylidorea</i>), <i>ferru-</i> <i>ginea</i> , Mg.	<i>Cheilotrichia imbuta</i> (Wied.), Mg.
<i>Limnophila nemoralis</i> , Mg.	<i>Molophilus murinus</i> , Mg. ♀
„ <i>nigrina</i> , Mg.	<i>Gonomyia dentata</i> , de Meij.
„ <i>ochracea</i> , Mg.	<i>Symplectomorpha stictica</i> , Mg.
	<i>Pachyrrhina flavescens</i> , L.
	<i>Tipula lateralis</i> , Mg.
	„ <i>oleracea</i> , L.

FIELD NOTES ON HABITS OF THE CRANE-FLIES.

Isle of Iona.

Crane-flies were rather scarce, and found only after careful search among the shady vegetation beside burns, wet ditches *Juncus* marshes, etc., where they were very characteristic insects.

On the lower slopes of Dun I the common "daddy-long-legs" (*T. oleracea*) was very abundant, emerging from pupæ in soil at the roots of rough pasture-grasses. A small crane-fly, *G. dentata*, occurred among long grass in wet areas near springs, in late afternoons in good weather; and on several occasions it was observed swarming low over long grass in warm, calm dry evenings. *Limnophila nigrina* was especially noticeable on wet mossy patches (*Hypnum*) on slopes of Dun I, several teneral imagines being found crawling on

the moss and one female was observed emerging from a pupal case protruding from the moss. It is interesting to note that *G. dentata* and *L. nigrina* were collected near the summit, presumably having been blown there by high winds. A dung-fly (*Scatophaga*) was observed to dart at a teneral *G. dentata*, and carry it off, holding it by its legs pressed against the underbody.

Swarming beside the moat at the marsh near the Cathedral were the following: the "winter-gnat" (*Trichocera regelationis*), *Erioptera fuscipennis*, and *E. trivialis*; while by sweeping long grasses, rushes, etc., close to the margin of the burn and moat, there were obtained: *D. autumnalis*, *Limnophila nemoralis*, and *Tricyphona immaculata*. *Pedicia rivosa* was seen occasionally flying low over marsh vegetation, and females and newly emerged individuals occurred in midst of dense herbage, in association with *Limnobia tripunctata*, *Limnophila ferruginea*, *L. ochracea*, and *L. (Pilaria) discicollis*. The small yellowish *Cheilotrichia* swarmed above the moat, in company with dancing swarms of several Chironomid-midges (including *Trichocladius variabilis*, Staeg.).

In a sheltered creek near the golf course, the ubiquitous *Trichocera* was found with *D. didyma* in shaded corners and crevices in the face of cliffs and rocky slopes near the shore. *G. dentata* was swept from long overhanging grass growing on ledges of rock. The Epeirid spider, *Meta merianæ*, Scop., abounded in this habitat, and among its victims were large numbers of the crane-flies here discussed. The writer watched three individuals of *D. didyma* being eaten in as many minutes, the spider leaving only the wings and legs dangling on the web. The capturing of this crane-fly was observed; as soon as the hapless crane-fly blundered into the web and struggled to free itself, the waiting spider dropped upon it, nipped the thorax thus paralysing the insect, "bunched" the legs together, and bound the wings, legs and body together by many silken strands.

In the gardens of the village, Miss Hestor McWilliam collected *Anisopus punctatus*, *Pachyrrhina flavescens*, and *T. oleracea*. *Anisopus* was observed swarming in shade of trees about 8.30 P.M. on 17th, 19th, and 20th June.

Isle of Soa.

On the afternoon of the 18th June, the following notes were made on the Isle of Soa (or Soay). The isle is much exposed, the vegetation is scanty, and there were few insects in evidence at this time.

D. autumnalis was swept from rushes in a sheltered hollow near the little bay where we landed. Later, it was observed crawling on leaves of *Potamogeton* in a pool near by; and also was found under projecting ledges of rock where it was observed to "bob," or "bounce," a habit associated with the act of oviposition. The body was raised and lowered in quick succession, somewhat in the manner of *D. chorea* as described by H. F. Barnes (*Ent. Mo. Mag.*, vol. lx., 1924, p. 71).

D. didyma occurred in large numbers on the dark rock-faces, wet and glistening due to dripping water from hill-slope above. The blackish legs, and dark-spotted wings folded over abdomen, render the insect remarkably inconspicuous as it crawls away, spider-like, from the light when the overhanging herbage is lifted up. Swarming was not observed on this occasion (*vide* notes on Lunga). A few teneral crane-flies were found on the saturated mud, formed by decaying grass, moss, with rock fragments, etc., and one individual *didyma* was observed pale and newly-emerged beside a pupal case in the soil. Similar exuviae of *didyma* were located in this habitat, but no larvæ were discovered.

Isle of Lunga (The Treshnish Isles).

Lunga proved to be a most interesting island. There are a number of small burns with rank vegetation on margins, many hill drains, sheltered hollows in the hills, dark crevices and wet rocky slopes, and several large pools. Evidence of cultivation was seen, and the party was visited by a herd of wild cross cattle.

Trichocera was common among vegetation on rock ledges, in crevices and small caves in the cliffs.

Several small streams on the slope of Cruachan facing Dun-Cruit, supported quite a large number of crane-flies,

midges, Simuliids, and other aquatic insects. *Tipula lateralis* was seen flying in company over the surface of the burn, the female dragging the male in flight, while a female was observed egg-laying in mud near water's edge. Crawling on the mud at the margin were many teneral *Symplectomorpha stictica*. Larvæ and pupæ were found in this mud, and identified by rearing. Associated with *Symplectomorpha* larvæ were several larvæ of a Carabid ground beetle, a Leptid-fly, (rat-tailed) *Ptychoptera* sp., and *Erioptera fuscipennis*.

Erioptera fuscipennis swarmed high over a sheltered burn in late afternoon on 16th June, with it being associated *Symplectomorpha*, and Chironomid-midges of genera *Trichocladius* and *Chironomus*. Only a few *G. dentata* occurred on the slopes of Cruachan among long grass near a marshy hollow.

The chief enemies of crane-flies inhabiting the cliffs and rocks on coast in sheltered creeks were the Lycosid spiders, *Lycosa pullata*, Clerck and *Pirata piratica*, Clk. The victims observed in the webs were: *Trichocera regelationis*, *D. didyma*, and *Gonomyia dentata*.

Staffa.

Visits of about half an hour were made on 16th and 23rd June. The common species at this time was *L. nigrina*, Mg., which occurred with *D. didyma*, and *T. oleracea* on web of an Epeirid spider.

SUMMARY OF HEBRIDEAN CRANE-FLIES.

In an excellent series of papers recording Scottish Diptera, P. H. Grimshaw¹ lists 36 species distributed as follows: Anisopodidæ 3, Ptychopteridæ 2, Tipulidæ: Sub-family Limnobiinæ 23, Tipulinæ 8. In the present paper are added 11 species, 1 to Anisopodidæ, 8 to Limnobiinæ, and 2 to Tipulinæ, bringing the total number of Hebridean Crane-flies to 47.

¹ "*Diptera Scotica*, VI., The Western Isles." SCOT. NAT., 1914, pp. 209-212.

THE IMMATURE STAGES.

It has been deemed advantageous to publish a list of the early stages discovered, description of the material being reserved for a future occasion.

Trichocera sp. (*regelationis*?) Larva: soil under decaying vegetation. Lunga, 16th June 1925, 183.

Ptychoptera sp. Larva: in mud under water in burn on slope of Cruachan. Lunga, 22nd June 1925, 188.

Dicranomyia didyma, Mg. Pupal exuvia: in saturated mud in cracks and crevices in cliff. Soa, 18th June, 186.

Limnophila nigrina, Mg. Pupal exuvia, 20th June 1925, in moss (*Hypnum*) on slopes of Dun I, Iona, 187.

Erioptera fuscipennis, Mg. Larvæ and a pupal exuvia: in moist soil at margin of burn. Lunga, 22nd June, 188.

Symplectomorpha stictica, Mg. Pupa, with larvæ of *E. fuscipennis*. Lunga, 22nd June, 188.

Tipula sp. (*lateralis*, Mg.?). Larvæ: moist soil at water's edge of burn, 16th June 1925, 183.

T. sp. (*oleracea*?). Larva and pupal exuvia: at roots of grasses on Dun I slopes, 20th June 1925, 185.

T. spp. (several). Larvæ, at roots of grasses, collected while searching for nesting sites of Stormy Petrel. Soa, 186.

The bulk of the material discussed in this paper is in the Royal Scottish Museum, two additional dark northern varieties, hitherto undescribed, are in the British Museum, while several interesting aberrations are in the writer's collection.

CONCLUSION.

The Crane-flies known from the Inner Hebrides are characteristic inhabitants of vegetation near sheltered burns, pools, and marshes, their early stages being mostly spent in moist, humus soil. The adults hide under leaves, or at roots of grasses, during windy or rainy weather; and seldom fly far

from their larval habitat. Their chief enemies, as observed in June 1925, are Scatophagid flies, and spiders of the families Lycosidæ and Epeiridæ.

It is pleasant to have this opportunity of thanking my friends, Dr J. N. Marshall and the Rev. J. M. McWilliam, B.A., for making this investigation possible. I am indebted to Mr F. W. Edwards, B.A., of the British Museum, and Dr Randell Jackson of Chester, for assistance in naming the species of crane-flies and spiders studied in this paper. I wish also to thank the authorities of the Royal Scottish Museum for helping with the collecting apparatus.

NOTES

Early Singing of Birds.—Bird song began exceptionally early this season. In the case of the Blackbird one might apply the phrase "exceptionally late," as one bird was heard in the Royal Botanic Garden, Edinburgh, in full song on the 30th and 31st December, and again on the 2nd, 3rd, and 4th January. The Great Tit sang all forenoon on the 4th, also the Mistle Thrush, while Chaffinches were indulging in their characteristic "pink, pink." On the 5th January I heard the Blue Tit and the Hedge Sparrow, and on the 12th the Cole Tit and Robin added their notes to the chorus. The Song Thrush sings in this neighbourhood nearly all the year round, and on 1st February one was singing at 7 A.M. under a full moon. The sudden change to much milder conditions after the severe weather experienced before Christmas seems to have inspired the birds with the feeling of Spring.—J. KIRKE NASH, Edinburgh.

Bean Geese in the Tay Area.—I am interested by Mr Wedderburn's letter under this heading in the November/December issue of the SCOTTISH NATURALIST (1925, p. 168). During many years, in past days, with Inchmartine and Castle Huntly in the Carse of Gowrie as headquarters, I shot considerable numbers of Grey Lag and Pink-Footed Geese. Occasionally I thought I saw Bean Geese, but I was not sure. One day in the late autumn I met in the Carse a professional wildfowler and asked him about Bean Geese. He said that he thought he occasionally shot them and, wishing to verify their presence in the Carse, I asked him to

let me have the next one he got. About a year later, on returning in the afternoon to my house in Dundee, I was told that a mysterious man had left a mysterious bird with the mysterious message that I "would know about it." The bird was a fine specimen of the Bean Goose.—GEORGE BAXTER, Keswick.

Turtle-Dove at Sea.—There died at the Scottish Zoological Park, Edinburgh, on 12th March of this year, a Turtle-Dove, the story of which is of some interest. It was blown on board s.s. *Armadale Castle*, on 15th September 1924, when the ship was about 300 miles off Cape Verde on a northern course, returning to Southampton.

There was a strong west wind blowing at the time with a very high velocity. Four doves followed the boat for some days. The other three disappeared and we all presumed they had become exhausted and had probably fallen into the sea. My wife put out her hand to the one we got and the dove made to alight on it, but the high wind blew it against the boat and it fell to the deck below. We recovered it, however, and succeeded in keeping it until I sent it to Edinburgh. It was very timid and sometimes wild, although we did our utmost to tame it. During the heat wave last summer, I was so sorry for it being in captivity that I let it go on two occasions, but both times it was returned to me, very thin and in a somewhat mauled condition. It never seemed to get food when free; I fed it on canary seed and small wheat. It usually moulted about January to February and perhaps it got a chill on the journey to Edinburgh, where it only survived a few days.—J. R. DUNKELD, Balfon.

Common Gull feeding upon Frogs.—The interesting account of casts of Common Gulls containing only Frog bones, discovered by Dr Eagle Clarke in Inverness-shire, brings to memory a similar occurrence in my own experience. When at Altnahara, in Farr Parish, Sutherland, where there were Common Gulls, I found several little piles of bones neatly arranged on tussocks on the banks of Loch Loyal. My gillie said they were brought there by Otters, but I did not of course believe it. Still, I was not clear as to their identity, so I brought some home and now enclose them.

You will be able to say if they are the bones of frogs.—D. KNIGHT HORSFIELD, Filey, Yorkshire.

[The bones sent by Mr Horsfield are many limb bones and a few ribs and vertebræ of the Common Frog—another instance of the Common Gull subsisting on this unusual diet.—EDS.]

The Continental Song-Thrush (*Turdus philomelus philomelus*) in Bute.—For several years I have noticed that some of the Song-Thrushes which occur in winter in Bute are different in colour and habits from the resident Thrushes. On 3rd December 1925 I shot two of these birds at St Ninian's Bay, and found that they were the Continental Song-Thrush. Surgeon Rear-Admiral J. H. Stenhouse has kindly examined them for me and confirmed my opinion. From observation over a fairly long period I have little doubt that many of the winter Song-Thrushes in Bute are of this sub-species, and also that they remain here during several months. These birds frequent the open fields, and I have never seen them in the gardens, where the resident birds are so common. Apparently they leave Bute early in spring. On 15th March 1926 I searched for them for some hours near St Ninian's Bay, but they had all disappeared. There were no Thrushes in the open fields, and any that I saw near the woods were of the resident form. It is difficult to describe the differences between the two birds as seen in the field. I had been accustomed to describe the Continental birds as darker, while others describe them as paler than our birds. They are certainly duller in plumage, at least the birds that I see on Bute are of a less rich colour. To me the main distinguishing mark is the comparative absence in the Continental birds of the golden tint which appears on the breast of the resident birds. I believe that the two forms I see here could be distinguished correctly nine times out of ten at a distance of twenty yards in good light. Certainly the only two birds which I shot in the belief that they were Continental Thrushes turned out to have been correctly identified. Admiral Stenhouse, however, informs me that he does not believe that all Continental Thrushes can be distinguished in the field from our birds. More specimens will have to be shot to confirm the opinions expressed here.—J. M. M'WILLIAM, Craigmore, Bute.

Movement of Ringed Woodcock.—"A Woodcock, ringed as a nestling at Lynedoch, Almondbank, Perthshire, on 7th May 1925, was shot at Kenure Park, Rush Co., Dublin, on 6th January 1926."—WM. MOLLISON (in *Field*, 11th February 1926, p. 233).

Numbers of Woodcock in Islay.—"Shooting at Islay House, Islay, Argyllshire, five guns shooting eight days killed 533 Woodcock; the best day was 21st January, when 156 birds were bagged. It would be interesting to know if the bag of 21st January has ever been equalled in England or Scotland. In January 1924, 433

Woodcock were killed in the same number of days on this estate, and the best day was 97 birds."—A. B. (in *Field*, 11th February 1926, p. 233). An Editorial note adds that previously the record bag in a day has been 106 Woodcock killed at Lanarth, Cornwall, on 21st December 1920, by seven guns.

Scaup and Whooper Swans at Possil Marsh, Glasgow.

—With reference to the Scaup Duck visiting fresh water, mentioned in the SCOTTISH NATURALIST (1926, p. 25), it may be of interest to record that this species has visited Possil Marsh, Glasgow, on at least three occasions. (1) A female stayed for three days—27th, 28th, 29th April 1916. (I was accompanied by the late Wm. R. Baxter on the 27th); (2) a pair, male and female, noted on 8th April 1923; (3) five noted (three males two females) on 7th March 1926. (Mr John Paterson, visiting on the 10th, saw only one female.)

Since 1918, Whooper Swans have been regular visitors there, in gradually increasing numbers. At present, 14th March, they number twenty-two.—WILLIAM RENNIE, Glasgow.

Cinnamon-coloured Fieldfare.—On 3rd November 1925 I noticed an unusually coloured Fieldfare upon the Isle of May. It has since been obtained and presented to the Royal Scottish Museum. Dr Ritchie sends me the following description: "The paleness of colour of the cinnamon Fieldfare seems to be due to a uniform reduction of the rich dark tints which characterise the normal individual. Thus the normal slaty blue of the head and nape is reduced to a pale drab with just a tinge of the palest slate, whereas the rump, which in normal specimens is a shade lighter than the head, is merely a grey-washed white. The rich brown of the normal back and wings has been reduced to a bright russet and even the shafts of the wing-feathers are white and buff. Similarly the black markings on face, neck, and throat have been modified to a chestnut, slightly darker than the colour of the upper parts, but the beak shows very little modification. The bird was an adult female."—L. M'INNES, Isle of May.

Red-breasted Merganser Nesting in Renfrewshire.—

In the spring of 1925 I found the nest of a Red-breasted Merganser on a fresh-water loch in Renfrewshire, about twelve miles from the sea. Ten eggs were laid and hatched. The nest was of the usual type and on an overhanging bank. This is the first record of this bird nesting in Renfrewshire.—JOHN P. RITCHIE, Johnstone.

A Monster Conger Eel.—"The steam drifter *Melinka*, of Fraserburgh, at present working great-lines out of Mallaig, landed on Tuesday [9th February] a huge Conger Eel, which was caught in the vicinity of Tiree. The fish measured 6 feet 8 inches in length and 2 feet 2 inches in circumference. It weighed exactly 70 lb., and along with a smaller fish of about 2½ stones in weight sold for 34s. by auction on the Mallaig Fish Market. It was purchased by a Sheffield fish merchant. This is said to be the heaviest Conger ever landed at this port"—(*Scotsman*, 19th February 1926).

[The Conger Eel occasionally reaches a very great size. The largest recorded by Day in *Fishes of Great Britain and Ireland* was received in the London market in 1879. It measured 8 feet 3 inches long and weighed 128 lb. Such development is exceptional, and the Mallaig specimen above mentioned is about the limit of Scottish examples yet recorded.—EDS.]

Psithyrus rupestris in East Lothian.—With reference to Dr Wild's observations on this species (*SCOT. NAT.*, 1926, p. 17) it may be well to record that I captured a queen of *P. rupestris* between Port Seton and Longniddry on 11th July 1922; it is the largest specimen in my collection. On the 10th August of the following year I found the male along with males of *Bombus lapidarius* on the flowers of *Carduus nutans*, near the same spot. This fine locality for Aculeate Hymenoptera has in recent years suffered great deterioration from golf and other causes. When I told my friend the late Mr William Evans of my first capture, he mentioned that he had one or two old references to the occurrence of *Psithyrus rupestris* in Scotland, but, as far as I remember, nothing from the Forth area. It would have been interesting if Dr Wild had given his experiences in 1925 with the other common species of *Bombus* such as *B. terrestris*, *lucorum*, and *hortorum*. I am disposed to doubt that the main cause of the scarcity of *Bombus lapidarius* is to be attributed to *Psithyrus rupestris*. The seasons of 1923 and 1924 were in many parts of the country disastrous for aculeates generally, and I venture to give the following quotation from a letter written by Dr Perkins dated 25th June last: "Aculeates are almost extinct in Devon even *Bombi*, and no wonder after two such seasons as we have had here." In my own experience last spring *Bombi* seemed to be much scarcer than usual around Edinburgh. I had no opportunity of collecting in this neighbourhood during the summer.—KENNETH J. MORTON, Edinburgh.

BOOK NOTICES

SAHARA. By Angus Buchanan, M.C., F.R.S.G.S. With numerous Photographs, Sketches, and a Map. London: John Murray, 1926. Pp. xv + 301. Price 21s. net.

Readers who have had the good fortune to see Captain Buchanan's film picture "Crossing the Great Sahara," will find in this volume a permanent memorial of that arduous journey, and others, less fortunate, will discover here a vast body of new information about the peculiar and little known peoples who manage to eke out a livelihood in the innermost places of that great wilderness of sand.

Captain Buchanan is a lively writer, and he tells a graphic story of the hardships of his journey of over 3500 miles through almost waterless country. But he possesses also the scientific spirit, and there is valuable material contained in his fine descriptions of Fachi, "the city of shadows," so frequently the objective of desert raiders that the whole town, constructed for defence, "can be barred and buttressed and placed under lock and key"; of the diminutive salt-pans of mysterious Tigguida and Bilma, which provide a people with their sole means of livelihood; of the desert bandits; of the Bilma salt caravan with its 7000 camels and 1000 attendants; of the veiled and warlike Tuaregs, whose proverbial motto is: "It is wise to kiss the hand that you cannot cut off;" and of many other matters of ethnographical interest.

Not the least of Captain Buchanan's achievements are the additions he has made to our knowledge of the little-known fauna of the desert and Western Sudan. To the habits of the mammals and birds he devotes a couple of chapters. Of mammals he collected in all 64 species or subspecies, and of these 25 were new to science, while of 207 species and subspecies of birds 15 were new, a wonderful record. Many of the mammals were presented by the author to the Royal Scottish Museum, where some of the new forms have recently been placed on exhibition.

"Sahara" is lavishly illustrated by photographs taken by the author, which add to the interest and charm of this fascinating volume.

PALÆONTOLOGY: INVERTEBRATE. By Henry Woods, M.A., F.R.S. (Sixth Edition). Cambridge: at the University Press, 1926. Pp. 424. Price 10s. 6d. net.

This account of fossil invertebrates, which has been an invaluable guide to many successions of students since it first appeared in 1893, retains those distinctive features which ensured its success. It gives a concise summary of the characteristics of each invertebrate group of

animals, and follows this general introduction by succinct descriptions of the distinctive structures and distribution in time of the more important fossil genera, sufficient to enable the collector to identify thus far the majority of his finds. Since the third edition of 1902, which the writer used as a student and has found of constant value for reference since, the book has been expanded by the addition of 64 pages of text and 59 figures. The latter (198 in number) are particularly well adapted to illustrate simply and clearly the characters made use of in identification.

CLOUDS AND WEATHER PHENOMENA: for Artists and other Lovers of Nature. By C. J. P. Cave, M.A. Cambridge: at the University Press, 1926. Pp. x + 31, with many photographs.

Mr Cave, who for two terms has served as President of the Royal Meteorological Society, is well qualified to discuss the scientific aspects of cloud-formation; but he is also gifted with the art of describing with charming simplicity the causes of weather phenomena which must have awakened curiosity in every observant mind. His explanations of the colour of the sky and of the succession of the complex first and second twilight and sunset rays, which make up the sunset coloration, will add to many a fresh interest in these everyday events, and his short accounts of rainbows, halos, coronæ, brocken spectres and mirages are equally illuminating. The greater part of the little book is devoted to a description of the appearance, formation, and altitude of clouds, but the author wisely fortifies the text with a fine series of 47 cloud photographs which have pictorial as well as scientific value.

WHAT EVOLUTION IS? By Professor George Howard Parker. Published in the British Empire by Humphrey Milford, Oxford University Press, 1925. Pp. vii + 177. Price 6s. net.

This little book by the Professor of Zoology in Harvard University is well adapted for the reader, who, lacking a background of technical knowledge, wishes to gain an idea of what evolution is and what it signifies. It indicates the lines of evidence which have led scientific men to believe in the gradual development of higher forms of life from lower forms, and discusses the theories which endeavour to account for the method of that development. The clear print, and the simple, lucid language in which the argument is set out make it a pleasant book to read. It is thoroughly reliable.

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PUBLISHERS' NOTE.

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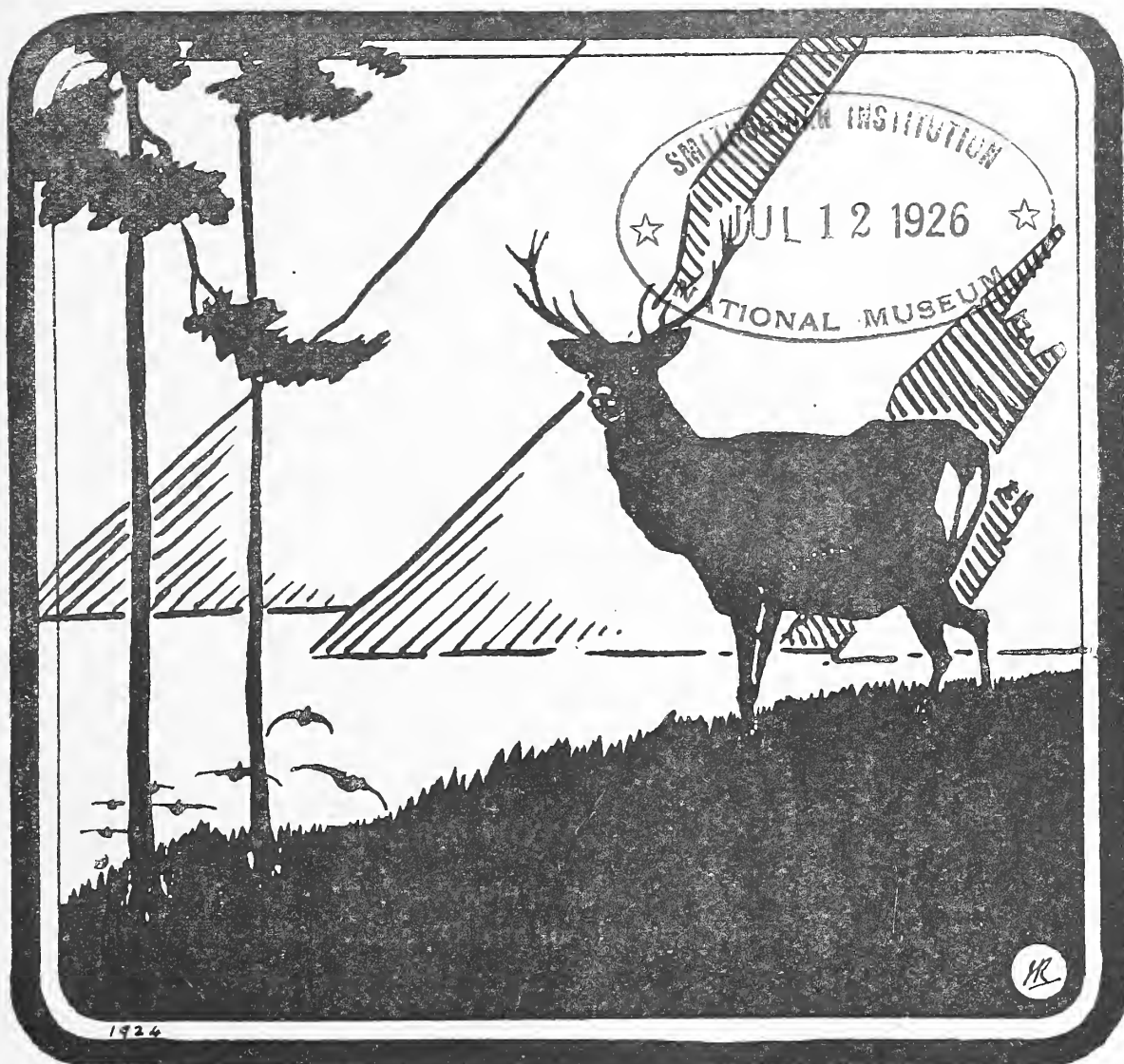
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EVERY NATURALIST SHOULD READ

The following major articles which have appeared in recent numbers of *The Scottish Naturalist* :—

Annual Reports on Scottish Ornithology, including Migration.
Observations on the Hatching of the Field-Slug. (Illustrated.)

The Great Bustard in Scotland.

The Starling in the Forth Area.

Notes from the Scottish Zoological Park :

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Increase of Mountain Hare in Scottish Lowlands.

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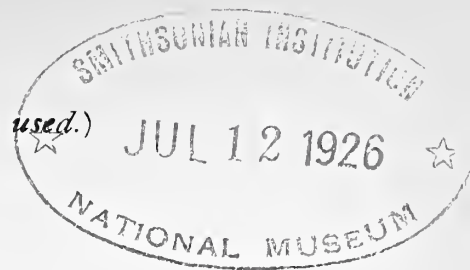
Records of Birds new to Britain.

A Rat Migration.

Abnormal Coloration of Scottish Mountain Hares. (Illustrated.)

As well as numerous shorter notices of interesting events in the
Wild Life of Scotland.

(Authors are responsible for nomenclature used.)



The Scottish Naturalist

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FRESH-WATER FISHERIES IN SCOTLAND.

FROM time immemorial the fresh-water fisheries have contributed to the interest and value of Scotland, and a great deal has been done to conserve the stock of the rivers and to add to the pleasure and success of the angler. In an interesting paper on "The Development of Fresh-water Fisheries," contributed to the *Transactions of the Perthshire Society of Natural Science*, vol. viii., Part II., 1925, Mr William Malloch points out that the creation of pools for holding fish, and of croys and groynes to provide casts, has been carried out on most rivers, and that notable success has followed upon the erection of impounding reservoirs for supplementing the natural flow in the season of low water, on such rivers as the Helmsdale, Thurso, and Grimersta. But there is still much to be done if the fisheries are to be kept at their old standard, and even if the progressive decline which has taken place in modern times is to be checked.

We take the liberty of quoting Mr Malloch's conclusions, which sum up the causes which, in too many cases, have checked the migrations and restricted the breeding grounds of Scottish salmon:—

"The continued decline of our fisheries is a matter of grave concern to those interested in national welfare. As a valuable source of food supply, a means of employment, an important medium of international trade, and a very pleasant form of

recreation, our fisheries are justly entitled to a place in the scheme of national economy. Hitherto, municipalities, local government boards, and company promoters have utterly disregarded fishery interests. Abstraction of invaluable water, creation of impassable barriers, and wholesale pollution of a most virulent kind, have all decimated the fish life on our rivers. Too often and too long our rivers have been treated as a convenient dump for garbage, and a facile channel for refuse and sewage disposal. It is not too much to expect that those responsible for pollution should be charged with its treatment or removal.

“In the case of abstraction of water, compromise and conciliation of apparently conflicting interests is always possible, provided the opposing parties are prepared to negotiate in an amicable spirit. The development of water supply or water power schemes need not be accompanied by the extinction of fisheries. The fishing interests, on the other hand, can well afford to dispense with the devastating effect of floods, when millions of gallons of water go to waste, water which may be of inestimable value to progressive communities. It is, however, very necessary that ‘compensation water’ (so called), should be delivered to the impoverished streams on a more generous scale than is usually given. Where this is impracticable, and inevitable damage arises, it should be possible to compensate the loss by means of a monetary grant to be applied towards the opening up of fresh spawning ground, and improvement of existing facilities within the district affected, or if need be, in the provision of hatcheries.

“Much can be accomplished by mutual goodwill. Hostility and suspicion can only end in disaster, and the weaker party, generally the fishery proprietor, goes to the wall. Few but the wealthiest concerns can survive a costly defensive litigation against provisional orders and private bills promoted by powerful companies. Even a successful opposition may cripple for many years the resources of a prosperous fishery district, and leave it at the mercy of further attacks. Little improvement in our fisheries can be expected until this serious encroachment on the part of outside interests can be checked, and nothing short of a drastic amendment of the present by-laws regarding pollution will remedy the most prolific cause of decline in the productivity of our rivers.”

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The part of the Perthshire *Transactions*, referred to above, contains also a list, by Mr Henry Coates, of the extensive collection of molluscan shells in the Perthshire

Natural History Museum, as well as some interesting notes, by Mr John Ritchie, on occurrences of the rarer creatures in the county. Amongst these are statements that the Osprey "is reported to have bred last year in the county," and that the Wild Cat "seems to be on the increase" throughout the area.

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The movement for the protection of our rarer animals gathers strength, but public opinion must be further aroused if a stop is to be put to the fury of egg-collecting which accompanies the breeding season of some of our finest birds. It is almost inconceivable that a naturalist and observer of Mr Edgar Chance's standing should have aided and abetted a farm bailiff in collecting in Norfolk clutches of Crossbill's eggs, numbering in all twenty-three eggs, an offence for which both participants were heavily fined. But the traffic in rare eggs is widespread, and as we go to press we learn from Mr Seton Gordon that the Golden Eagle's eyrie which he had under observation in the Grampians was robbed of its eggs after the birds had been sitting for three weeks!

Starling Roost in Royal Botanic Garden, Edinburgh.—

During last winter there occurred a remarkable invasion of the Royal Botanic Garden, Edinburgh, by great flocks of Starlings which came there to roost. They first appeared in November and steadily increased in numbers till the end of the year, when they reached a maximum of several thousands. After that the numbers began to diminish, though they were still very abundant right up to the end of February. During the first week of March they entirely disappeared, only the local Starlings remaining. These curiously enough, never mingled with the strangers all the time they frequented the neighbourhood.

The daily arrivals took place in the late afternoons, the birds coming in from all directions, though chiefly, I believe, from the south-west. Each morning, shortly after daybreak, they made off in similar fashion for their distant feeding grounds.

On reaching their nightly rendezvous they first settled on the tall deciduous trees, the bare branches of which were completely lined with them, and all the while the air was filled with the incessant din of their chattering. Every now and then they left their high perches to search for food on the grass, which at times looked black, so numerous were the birds.

When the gardens were closed they descended to the lower trees and finally settled for the night in the dense holly bushes. Wishing to see whether the birds roosted in the centre of the bushes, I concealed myself in a dense clump to watch their movements. They sat on the lower branches of the adjoining trees till dusk came on when they suddenly dropped into the hollies. I fully expected to have birds all around me but they kept high up in the bushes, just under cover of the outer leaves. After they had settled for a while I struck several of the bushes, when the birds rose from them in clouds. In a posthumous article which appeared in the January-February number of the SCOT. NAT., 1925, a very interesting account of Starling roosts was given by the late Mr William Evans. He specially mentions one that existed on Cramond Island for several years, an account of which was also given by the late Mr Chas. Campbell in the *Annals of Scottish Natural History*, 1900. From observations made it appears that these roosts are only occupied for an average period of five years, so unhealthy do the conditions become through occupancy by these vast hordes.—J. KIRKE NASH, Edinburgh.

Scops Owl at Foula, Shetland Isles.—I have sent to the Royal Scottish Museum an example of a small owl handed to me on 10th May by a schoolboy, who stated that he had found it dead on the island. It has been identified as a Scops Owl.—WM. HARRY GREENAWAY, Foula.

[The individual is a female Scops Owl, belonging to the typical race, *Otus scops scops*, which breeds in southern Europe, extending northwards to Switzerland and South France. The species winters in tropical Africa, and the occurrence of an individual in Shetland must be due to a wide overshooting of the mark, on the spring return from Africa to Europe.—EDS.]

REPORT ON SCOTTISH ORNITHOLOGY IN 1925.

By EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL.

INTRODUCTION.

WE are again fortunate in having a comprehensive and valuable series of notes from which to compile this Report. The systematic way in which our recorders keep notes and forward them, year after year, is of immense value to Scottish ornithology. It enables comparisons to be drawn between year and year, the spread of extending species to be chronicled, local increases to be noted, and the general inter-relations between birds and their surroundings and their circumstances to be traced with some degree of accuracy. Mention should again be made here of the good result of the continued observations made on Fair Isle by Surgeon Rear-Admiral Stenhouse, Mr Jerome Wilson and others, and we are grateful for the generous way in which all the data have been placed unreservedly at our disposal. We tender our warmest thanks to all our recorders for their continued and valued support.

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The year under review was an interesting one in many ways: three new birds were added to the Scottish list and many uncommon visitors were recorded. There is still evidence of some extension of breeding range of various species; the abnormally mild weather of the winter of 1924-25 induced some extraordinarily early nesting, after which there was a complete blank in the records and the regular nesting season was somewhat late. The two winters reviewed differed entirely in character; the migration proceeded steadily and, although a great many different species were recorded as moving, there was no enormous rush.

We commend to the notice of our readers the papers dealing with various aspects of bird-life in Scotland which have appeared in the SCOTTISH NATURALIST and *British Birds*. Among these we might mention in the SCOTTISH NATURALIST: The Starling in the Forth Area, The Hawfinch in Scotland, Wilson's Snipe in South Uist, The Food of the Ptarmigan, etc., and in *British Birds*

papers on the Display of the Great-crested Grebe, the Red-breasted Merganser, Eider and Teal, and Notes taken at the Eyrie of the Golden Eagle, and we consider that Mr Richmond Paton's book on *The Birds of Hareshawmuir* is a valuable contribution to the study of distributional ornithology in Scotland.

The following abbreviations are used in this Report:—

- 1. = SCOTTISH NATURALIST.
- 2. = *British Birds* (Magazine).
- 3. = *The Birds of Hareshawmuir*.
- (L.) = Lantern.
- (O.H.) = Outer Hebrides.

BIRDS NEW TO SCOTLAND.

Not since 1921 have so many birds been added to the Scottish list as in the year under review, three new birds having been identified. On 23rd September a Petchora Pipit visited Fair Isle and was secured next day; it is new to the British list, and in fact does not seem to have been recorded in Europe except in Russia (1. 1925, 141).

The Black-headed Wagtail is reported on 14th June from Upper Nithsdale, where a bird was carefully watched through binoculars at short range (1. 1925, 107): this Wagtail has occurred several times in England but this is the first Scottish record. A male of Jerdon's Reed-Warbler was procured on Fair Isle on 1st October, having probably arrived there on 26th September. This bird, too, is new to Britain, the only previous record for Western Europe being at Heligoland (1. 1925, 173).

BIRDS NEW TO FAUNAL AREAS AND UNCOMMON VISITORS.

In 1925 there is again a large array of species to come under this heading. A Rose-coloured Pastor visited St Kilda on 9th July (1. 1925, 148) and one was got at Invergowrie on 5th October (1. 1925, 180); this species had not been before recorded for the Outer Hebrides. On 6th May a female Golden Oriole was found dead at Gatehouse,

Kirkcudbrightshire (I. 1925, 100), while Greenland Redpolls arrived on Fair Isle on 28th August and remained there at least till 3rd October (I. 1926, 7). A female specimen of Hornemann's Redpoll was got on Fair Isle on 12th November (I. 1926, 4), and one or two Northern Bullfinches were at the same station on 19th, 21st, 29th and 30th October, 4th and 9th November. There are interesting notes of Scarlet Grosbeaks on Fair Isle, single birds being recorded on 26th September (I. 1926, 8), 20th to 23rd October, 29th October, 16th and 21st November. Ortolan Buntings were reported from the Isle of May on 7th, 8th, 9th, and 11th May, and from Fair Isle on 7th and 19th May, 19th September (I. 1926, 8), and 20th to 23rd October, while a male Rustic Bunting visited the latter station on 19th September and a female on 21st September (I. 1926, 8). Fair Isle records Little Buntings, single birds in each instance, on 29th September (I. 1926, 8), 16th October, 9th, 11th, 14th, and 17th November, and Lapp Buntings at frequent intervals from 28th August to 14th November, as many as seventeen having been seen on 8th September (I. 1926, 7): a Lapp Bunting was noted at Buddon Ness on 14th September, this being a first record for Tay, and one at Hyskeir, on 19th September, is the second record for the Inner Hebrides. On 9th November a Short-toed Lark was got at Fair Isle, the fifth known occurrence in Scotland; a Wood-lark visited Hyskeir on 17th May, a first record for the Inner Hebrides, and one was seen near Dunkeld on 17th June (2. xix. 129). Shore Larks were reported from Fair Isle on 18th October, 7th and 16th November. From 6th to 11th May, Blue-headed Wagtails frequented Fair Isle, and one is said to have occurred at Elliot, Forfarshire on 17th September. The species has not before been recorded from Tay. A Grey-headed Wagtail was reported on Fair Isle on 8th May and one on the Isle of May on 11th May, while a Crested Tit (subsp.?) was observed at Airdrie (Lanarkshire) from 9th to 15th February, there being no previous record of the species for this county (I. 1925, 46). On 11th November a Waxwing was seen at Selkirk (*Scotsman*, 17th November 1925), and a Red-

breasted Flycatcher was noted at Fair Isle on 20th May, there being only one previous record of the species for spring in Britain. Yellow-browed Warblers, single birds (I. 1926, 8), in each case, were reported from Fair Isle on 17th, 19th, and 20th September and 24th November and a Lanceolated Warbler from the same station on 24th October, this being a third record for Scotland (I. 1926, 4). An Icterine Warbler visited Fair Isle on 8th September (I. 1926, 8), and a Siberian Lesser White-throat was got there on 3rd October (I. 1926, 8). Black Redstarts were reported from the Isle of May on 7th, 8th, and 9th May, Fair Isle on several occasions between 20th October and 16th November, Mull of Galloway on 6th November (I. 1925, 179), and Hyskeir on 21st and 22nd November. Fair Isle records of single Norwegian Bluethroats came for 8th May, 23rd and 25th September (I. 1926, 8), while a Hoopoe was shot at Reston, Berwickshire on 18th September (I. 1925, 158), and a Roller was seen for three weeks from 15th September at Fasnakyle, Inverness-shire (2. xix. 177). The status of the Green Woodpecker in Scotland badly needs elucidation; in May one was reported to have been seen at Megginch, Perthshire, by several people, and Lord Scone, who sends the record, tells us that one was seen at Scone in October 1912 and another found dead at Megginch in winter 1923. On 19th July one was heard at Blairquhan, Ayrshire, by Mr Richmond Paton (2. xix. 99). Two little Owls were shot at Eaglesham, Renfrewshire, in March or April, and in the latter month a Montagu's Harrier came to an untimely end near Loch Ken, Kirkcudbrightshire. Bitterns were noted from the Lake of Menteith in December, Tayport, Fife, 2nd December (I. 1926, 10) and Charterhall, Berwickshire, 19th December to 24th January 1926. In early September a Garganey was shot out of three seen near Mugdrum Island (Tay); on Duddingston Loch a Red-crested Pochard was seen up to 8th February, while a Smew was shot in Montrose Basin on 6th March (I. 1925, 57) and another on the River Eye, Berwickshire, on 15th December. A Red-necked Grebe visited the Isle of May on 23rd

September; a Wood Sandpiper occurred on Fair Isle on 8th May, and one at Vallay on 19th October is a first record for the Outer Hebrides (I. 1925, 179). Green Sandpipers, single birds in each case, were noted at West Foulden, Berwickshire, on 31st July, Fair Isle on 5th September and 28th October, and Boreray (O.H.) on 23rd November, while a Black-tailed Godwit visited Monifieth Bay on 9th September. On 1st September a Great Snipe was twice seen at Longcroft and one near Lauder on 17th September. A young Sabine's Gull was recorded near Dalmeny on 24th January (I. 1925, 22), a Little Gull arrived at Elliot, Forfarshire, on 25th September and "seemed to remain all winter," while a Buffon's Skua visited the Isle of May on 19th September.

EXTENSION OF BREEDING RANGE.

We have several interesting records of extension of breeding range in 1925. The first of these is that of the Snow Bunting, which was found nesting in the mountains on the west side of Loch Treig, West Inverness-shire; the nest was 2000 feet above sea-level and contained five eggs (I. 1925, 148). White Wagtails bred near Oban this year. Mr John Bain, writing on 2nd August, reported a pair which nested a short distance out of the town; he also found a White Wagtail mated with a Pied Wagtail, which had a nest in a small disused quarry. This is the first record of the breeding of the White Wagtail in Argyll and the Inner Hebrides (I. 1925, 152). There are a good many notes which show the spread of the Great Spotted Woodpecker throughout Scotland. Records of its occurrence came from Darvel, Ayrshire, where the male bird was seen and heard various times in the latter half of April and first half of May; the nesting hole was seen in a beech tree 7 feet from the ground (I. 1926, 10). A pair were seen all spring and summer at Durris House, 18 miles west of Aberdeen, and other records came from the woods of Ballogie in the parish of Birse, from Forglen in Banffshire, and from Carrbridge, Inverness-shire. Fulmars are extending their breeding range in Caithness; they were seen in 1925 on

Duncansby Head and St John's Point (2. xix. 134), and Golden Plover bred on Fair Isle for the first time in 1925 (1. 1926, 10). A very important record is that of the breeding of the Greenshank in the Lowlands, a nest was found on high ground; it was unfortunately deserted, but it is to be hoped that the birds will return and nest in the future (1. 1925, 107). The fact that they have been seen about the same part for several years looks as if it were a real extension of range and not only sporadic breeding.

INCREASE AND DECREASE OF SCOTTISH BREEDING BIRDS.

Magpies were reported to be more numerous this year (1925) west of Edinburgh, and Jays about Ruskie (South-west Perth), while Goldfinches continued to increase all over Wigtownshire and were also increasing in Perthshire, in one part of which they were described as fairly common. Bullfinches were more numerous in Peeblesshire; there was an extraordinary increase in the number of Reed Buntings in the parishes of Methven and Logiealmond, and they were also numerous at Corsemalzie. Tits, which became scarce in the Tay area owing to severe weather conditions in 1917, were improving, particularly the Great Tit, which at Scone has now recovered its normal numbers. The Blue Tit is steadily gaining ground there, the Cole-Tit increasing but still rather scarce, the Long-tailed Tit has distinctly improved this year, and Tree-Creepers are increasing after being nearly wiped out in 1917. At Scone, too, there is a considerable increase in the numbers of the Goldcrest, which "has still a long way to go to reach the 1917 standard, when it was very common"; in East Fife the species is becoming more plentiful owing to the increase of coniferous plantations. Spotted Flycatchers were more numerous than usual at Scone, where a considerable local increase of Sedge Warblers has been noticed during at least the last two years and this Warbler was numerous at Corsemalzie. Stonechats are still increasing at the last station; Swallows were plentiful at Glenorchard and are recovering their numbers at Broughty Ferry, while at Largo more Swallows, House Martins and

Swifts were present this summer than in 1924. Kingfishers are increasing on the Dee, Aberdeenshire, Great-spotted Woodpeckers at Stobo, Peeblesshire, and Barn Owls at Hareshawmuir, Ayrshire.

Sheld-duck are becoming much more numerous on the Torrs Sandhills, where they were very scarce owing to careless rabbit-trapping. Teal are increasing in Methven and Almondbank district, and Shoveller all over the country round Corsemalzie; while Eider are now firmly established and becoming more numerous on the islands near the entrance to Loch Fyne, Clyde (I. 1925, 95). Oystercatchers and Redshanks are still increasing "as inland breeders" about Corsemalzie. Lapwings are becoming more numerous at Moncrieffe and about Ruskie (South-west Perth), Woodcock in these two localities, Scone and Airdrie (East Fife), and Curlew at the last named. There were ten to twelve nests of the Black-headed Gull at Marfield Loch, Pentlands, where none has nested for some years, and at the gullery at Rosebery there was "a great increase in the number of nests—scarcely room for any more." Common Gulls were more numerous in Perthshire and Great Black-backed Gulls at Corsemalzie. Corncrakes were very plentiful at Aberdeen, and there was a very marked and welcome increase in the number of Blackgame at Corsemalzie.

Turning now to the notes of decrease in numbers of breeding birds, we have no records of serious change, with the exception of the Golden Eagle whose numbers are decreasing in practically all its breeding places owing entirely, as far as we can discover, to the wicked greed of collectors. Except for this very important and interesting bird the only notes we have are of local variations in numbers. For example, at Corsemalzie, no Long-tailed Tits were seen in the nesting season, and Tree-Pipits, Willow-Wrens, Spotted Flycatchers and Whinchats were scarce; fewer Spotted Flycatchers than usual were seen about Aberdeen, and not a trace of Chiffchaffs at Scone, where there were several pairs from 1917-21. Sedge Warblers were scarce at Spitalhaugh, Peeblesshire, this year, and Swallows, House Martins and Swifts at Corsemalzie and

Burntisland, House Martins at Kirkcaldy and Swifts in some parts of Perthshire. There was a general scarcity of duck on Kilconquhar Loch, while Mr Gordon tells us that he could not find a duck's nest of any kind on the Castle Loch, Mochrum, where Mallard, Teal, Pochard and Tufted Duck all bred, nor did the Great-crested Grebes nest there this year; the Coots have also left and Waterhens are much scarcer. The failure of the reeds, to which he refers, is no doubt the reason for the desertion by some of the species mentioned, but he thinks that a good deal is owing to the increase of the Great Black-backed Gull. The Lapwing is fast disappearing as a breeding bird in Mull; very few Golden Plover nested at Corsemalzie, no Woodcock were seen there, and they were less numerous than usual in Mull. Blackcock and Grouse are also decreasing in number in Mull, while Corncrakes were very scarce at Corsemalzie and Glenorchard.

SUMMER AND NESTING.

After a mild winter and some abnormally early breeding records, the early spring of 1925 was cold, and nesting was late in beginning, but the very fine weather in the late spring and summer ensured a successful breeding season as a whole. Ravens were nesting in an almost inaccessible position in the neighbourhood of Dunning this year, and at Scone there were an unusual number of second broods of Starlings, while Garden Warblers are noted from Spitalhaugh, Peeblesshire, a district in which they are not common. Mr Thornton Mackeith recorded a wealth of bird-life at Ruskie (Perthshire), where he saw Willow Warblers, Sedge Warblers and Whitethroats in abundance, one Wood Warbler, and more Cuckoos than he ever remembers seeing anywhere. He also found numbers of Curlew nesting and Lapwings "in great abundance." Unusual numbers of small birds spent the summer at the garden at Balchrystie, Fife; Linnets, Pied Wagtails, Spotted Flycatchers and Willow Warblers, all nested in the garden and Swallows in the summer-house. A Blackbird in Dumfriesshire built six nests in a cow-shed, all finished and lined, "while a platform

of moss and other building substances extended for about two feet beyond the sixth nest" (2. xix. 97). A pair of Stonechats bred on Ailsa Craig this season. Two Nightjars were killed in the Duns district of Berwickshire, one was shot on the Blackadder and another injured by flying against a motor near Polwarth, while three nests were found in Grange Wood, Berwickshire. The Great Spotted Woodpecker bred at Altyre, the Great Crested Grebe at Loch Spynie, and Little Grebes were found in Perthshire nesting at an altitude of 1400 feet. A pair of Sheld-duck nested in the bay to the east of Barnsness Lighthouse, near Dunbar, and Fulmars were about the Bass Rock all summer, but have not yet come up on the ledges. In "early summer" Dunlins, nests and eggs were found on the Lammermuirs, and a young Snipe, in down, was found on Fair Isle. A number of Woodcock nested in Grange Wood, Berwickshire, and eighteen nests were found "without looking for them" by a keeper near Ruskie. Sandwich Terns were very numerous at one of their east coast nesting places, and the largest number of Common Terns we have ever known there bred on the Isle of May; they hatched out well, but many of the young died. Great numbers of Puffins were breeding on the outlying islands of the Treshnish Group. A covey of fifteen Grouse was on the Airds of Crossmichael Moor on 13th August, where it had been seen all summer.

There were one or two abnormally early records of nesting in January, which was very mild: at Lahill on the 11th two young Starlings were seen being fed by their parents, and on the 12th, there, a newly-fledged Stockdove was caught on the lawn (1. 1925, 1.). On the 18th, Coots, at Duddingston Loch, had built a platform among the reeds and one bird was tugging at more reeds for material, "operations appeared to be suspended for a period," and it was not until 1st March that two nests there were reported well advanced. Starlings were going in and out of their nesting hole at Balchrystie, East Fife, on 26th January, and House Sparrows were nesting at Moncrieffe on 28th January. Not a single note of nesting in February has been received; on 1st March

a newly-fledged Thrush was seen at Gilston, East Fife, and a Blackbird was building in Edinburgh. This month there were isolated records of nests and eggs of our early breeding birds: the first Lapwing's eggs were seen at Hareshawmuir on the 21st, at 500 feet, and at Corsemalzie on the 27th, and the first Long-eared Owl's egg at Darvel on 28th March, but no number of nests were reported anywhere till April, the March records being much fewer than usual.

With April came records of the nesting of all our common birds. On the 8th a Blackbird at Torrance, Stirlingshire, had two young, and on the 9th two pairs of Stockdoves were nesting at Hareshawmuir. On 13th April a Tawny Owl's eggs were nearly hatching at Corsemalzie; the nest was in an old Squirrel's drey in a spruce and a dead Goldfinch and Hedge Sparrow were found in it. A Redshank had an egg at Hareshawmuir on the 16th, and next day a Dipper's nest was found on a rafter of a boathouse at St Mary's Loch, and a Lapwing's nest with five eggs at Hareshawmuir; three nests with five eggs were found there that year. On the 19th two eyries of the Peregrine were seen in Peeblesshire, on the 20th a Shoveller's nest with eleven eggs was found on Rossie Muir, Forfarshire, and next day a Ringed Plover "walked off" a nest with four eggs on the shingle on Alticig shore, and a Woodcock in Forfarshire had a full clutch. On 23rd a Curlew at Alticig had four eggs, and on the same day, at Mochrum Loch, twelve nests were found in the Heronry, from several the young had flown, the rest had large young and one had three large young, dead, and an addled egg. A Grey Wagtail's nest and eggs were found at Hareshawmuir on the 27th. Both at Mochrum Loch and in North Uist the Gulls were very late in having eggs, not one was found at Mochrum Loch on 23rd April, and the Cormorants were just beginning to build, (with the exception of two well-built nests with three and four eggs); but on 8th May, when Mr Gordon returned to the Loch, he found Black-headed, Common, Herring and Greater Black-backed Gulls all nesting, and Cormorants nesting busily. On the same day, in the Outer Hebrides, only one Gull's egg was to be seen, but on the Treshnish Islands, on 9th May, many Greater Black-backed Gulls had full clutches.

With May came a marked improvement in the weather conditions and the number of records of nesting greatly increased; space does not permit of more than a summary of those sent, but they include all our ordinary Scottish breeding birds. On 9th May a Golden Plover's nest with seven eggs was found at Fair Isle, on the 10th a Common Sandpiper had four eggs at Hareshawmuir. A Gold-crest had a nest and eggs at Ladysbridge, Selkirkshire, on the 17th, on 7th June the young were half fledged, and they were flown on 20th June. On 12th May, Redstarts were nesting in the arbour in the manse garden at Lauder, and a Hedge Sparrow's nest with one Cuckoo's egg hatched at St Fillans (2. xix. 74). All the cliff birds were late in laying on the Isle of May: the first Shag's egg was seen on the 17th and the first Kittiwake's on the 22nd; on the former date Common Gulls had eggs in Perthshire, one nest having four eggs, "evidently the produce of two hens," two eggs being much lighter in colour than the other two; the same species, in Sutherland, did not have eggs till 5th June. On 24th May three young Woodcock, just able to fly, were seen at Barr, Ayrshire; Arctic Terns settled on the rock at Hyskeir on 28th May, the first eggs (2) were found on 5th June, and next day all the Terns left. A Reed Bunting had a nest with young on a small islet on a loch in Sutherland; both parents travelled at least a quarter of a mile over the water with food. On 28th May a nest of the Red Grouse was found on the estate of Davo, Fordoun; it contained six eggs, all were creamy-white in colour, with faint, pale reddish-brown markings (1. 1925, 107), and during this month a Stockdove nested on the top of one of the stone piers of a foot-bridge over Yarrow Water (1. 1925, 108).

On 1st June a pair of Golden Eagles were mobbed by nesting Hoodie Crows till the Eagles turned and gave chase; one young Eagle was in the eyrie on the 7th; on that date a nest was found in Selkirkshire containing four eggs of the Curlew and one of the Pheasant, and on the same day Common Sandpipers hatched in Dumfriesshire after twenty-two days' incubation (2. xix. 53). Next day

about fifteen pairs of Greater Black-backed Gulls were seen on Handa, only one pair having a nest (1, 1925, 147). On the 9th a Red-breasted Merganser's nest with ten eggs was found on inland water in Renfrewshire (1. 1926, 61), and two Merlin's nests were found at Hareshawmuir, each with three hard set eggs, within 400 yards of each other, all other sites being neglected.

By July most of the nesting is over and the notes refer chiefly to young birds seen, but on 1st July a Spotted Flycatcher's nest with two fresh-laid eggs was found, in ivy, on a house at Ruskie. A Willow Warbler at Lahill had a nest in a Forsythia on the terrace wall about 4 ft. 6 in. from the ground; the young flew on 6th July. In the last week of the month a Capercaillie hatched out a clutch of seven eggs at Lynedoch, Almondbank, 350 ft. above sea-level. With August came a few additional records of young birds: a Yellow-Hammer at Dunure, Ayr, had newly hatched young on the 4th, while on the 13th, at Halmyre, Peeblesshire, Whitethroats and Sedge Warblers were feeding young in the nest. A fresh egg of the House Martin was found below a nest at Largo, Fife, on the 5th September, and the last notes of young of this species in the nest are from Johnstone, E. Renfrewshire, on 2nd October, and Gilston, E. Fife, on 5th October. A Greenfinch, at Glenorchard, had a nest with young on 13th September; on 2nd October two young Wood Pigeons, just out of the nest, were shot at Hareshawmuir, and on the 8th Swallows were feeding fully-fledged young at Lahill, E. Fife. Dabchicks had young at Glenorchard on the 23rd, while the last note for the season is of a House Sparrow "carrying feathers and bits of wool to the eaves of the house" at Vallay, North Uist, on 9th November.

WINTER.

The winter of 1924-25 was chiefly notable for its exceeding mildness, which had considerable influence on the bird-life of the country. Reference was made to this in our last Report when reviewing the last part of 1924. The mildness continued in January, and we have a good

many notes which show that partial migrants, such as Meadow Pipits, Pied and Grey Wagtails, etc., stayed about their summer haunts all winter. Waders, too, remained in the uplands. Thus Dunlins are reported from Lauder in January and Lapwings from other inland localities even as far north as Caithness. It is difficult to estimate numbers of winter visitors; there was no frost to concentrate them in the milder parts, and they were so scattered throughout the country that no great numbers are recorded from any one locality. Duck were scarcer than usual in some parts, but this was probably due to the same reason. Whoopers and Bewick's Swans are "much more numerous in Mull than they were a few years ago." Grey-lag Geese were very numerous in the Carse of Tay, where Pink-footed and Bean Geese are also recorded.

The winter of 1925-26 differed entirely in character from that of 1924-25, in that it was very cold with much frost and snow. This, of course, made the birds depart from their usual habits in search of food; many died and many which, under normal conditions, would not have done so, came near houses and into towns. Blackbirds wintered in large numbers in East Fife, by far the greater number being cocks. Duck were very numerous round the coasts and in the estuaries and rivers, and on the whole our winter visitors seem to have been present in considerable numbers. A curious accident caused by the storm is reported from Teasses, Fife, where seven Wrens were found, in an old tree root, smothered under the snow. There were several records of Bitterns this winter.

RINGING.

We cannot do more than give a brief summary of the returns of ringed birds, and for full particulars would refer our readers to the papers in *British Birds*. As is our custom we notice first those birds ringed in Scotland and recovered at a considerable distance; this year we have but two. A Gannet ringed on Ailsa Craig as a young bird on 11th July 1923 and recovered in the North Sea, 50 miles west of the Helder, North Holland, 30th April 1925 (2. xix. 172), and

a Common Sandpiper ringed in Islay, Inner Hebrides, as a young bird 16th June 1923, reported at Danzé, near Vendome, Loir et Cher, France, in late April 1925 (2. xix. 173). Winter movement to Ireland is shown by a Cormorant ringed at Castle Loch, Mochrum, 14th June 1919, and recovered in Co. Mayo 18th February 1925 (2. xix. 16). This record is interesting, too, in showing that a bird can carry a ring for many years without injury. Two Lapwings, one ringed at Torrance 24th May 1922, the other at Gartmore, Stirlingshire, 19th June 1924, were both reported from Co. Clare; the former in January, the latter in February 1925 (2. xix. 17). Southward movement in winter within the country is shown by a Song Thrush ringed at Aberargie, Perthshire, 1st May 1924, reported from Rock Ferry, Cheshire, 19th January 1925 (2. xix. 14), and an Oystercatcher ringed at Loch Leven, Kinross, on 24th June 1924, recovered at Fleetwood, Lancs., 7th February 1925 (2. xix. 17). Among other records may be mentioned a Raven ringed in Glen Afton, Ayrshire, on 16th April 1924 as a young bird, reported from Dunscore, Dumfriesshire, in May 1925 (2. xix. 165); a Blackbird ringed as a nestling at Scone, 16th May 1925, reported at Anstruther, Fife, 1st July 1925 (2. xix. 168); a Sparrow-hawk ringed at Craigallian, Dumbartonshire, as a young bird 26th June 1923, reported from Airthrey, Bridge of Allan, 27th June 1925 (2. xix. 171); an Oystercatcher ringed Kirkbride, Cumberland, 10th July 1924, reported Solway Firth, Dumfriesshire, 3rd January 1925; a Curlew ringed at Dalston, Cumberland, as a young bird, on 3rd June 1924, reported from Stranraer, Wigtownshire, 12th January 1925; and another ringed at Aberfoyle, 11th June 1925, reported Dumbarton Castle on the Clyde, 1st August 1925 (2. xix. 17, 18, and 173). A Guillemot ringed on Ailsa Craig, as a young bird, 15th July 1923 and reported from Beer, Devon, 9th May 1925 (2. xix. 174) concludes this list. There were many returns of birds caught at the same place after a period of years, and Chaffinches, Redbreasts and Hedge Sparrows were reported as returning to the trap repeatedly; one of the last, ringed at Bridge of Earn on 1st October 1924, was caught twenty-four times between

that date and 30th March 1925 (2. xix. 15). Four House Martins ringed at Glen Esk, Forfarshire, in 1924, all returned to the same place in 1925, two being found dead in their nests, one on the same side of the house on which it was ringed (2. xix. 171).

PLUMAGE.

A House Sparrow was seen at Barry, Forfarshire, on 25th September, which was pure grey-white all over, and a cinnamon-coloured bird, of this species, has nested at Longcroft, Berwickshire, for three or four years. Its eggs are pure white. A cream-coloured Skylark was reported from Fair Isle, and one with the whole of one wing white and another with secondaries of one wing white were seen at Hyskeir. A curiously pale Fieldfare occurred on the Isle of May on 3rd November (1. 1926, 61); a speckled male Blackbird seen at Kirkcaldy last year (1. 1925, 86), was again reported there in the second week of October, another "with tail half white" was reported near Largoward, East Fife, in February, and one, pied, with head almost white, from Clockmill, near Duns. A beautiful white Barnacle Goose was shot on Bowhouse Merse, Dumfriesshire, on 3rd January 1925 (1. 1926, 37); a Cormorant with white shoulders was on the Isle of May on 12th May, while, at the same station, on 29th September, we saw one with gleaming white breast and belly, the back not quite so dark as in the fully adult bird, but the white of the under parts was much purer and more striking than is usual in immature plumage. A Golden Plover, with white wings, was reported from Arbroath on 28th July, and a female Pheasant, assuming male plumage, was shot at Balcaskie (East Fife), on 16th January.

To be continued.

THE TROUT AS A NATURAL ENEMY OF CRANE-FLIES.

By ALEXANDER CUTHBERTSON.

(*Studies on Clyde Crane-flies.*)

THERE are many references to Crane-flies being eaten in larval, pupal, and adult stages by Trout (*Salmo fario*, L.), but little precise information is available in the literature. The writer in the present paper gives, in detail, results of an examination of trout stomachs in Ayrshire, and adds data from the Upper Clyde, kindly supplied by Dr John Lindsay of Glasgow.

Trout from Twirrel Burn, Tourgill, near Largs.

On 7th June 1924 Mr M'Kellar caught, by using worms as bait, eighteen trout (*S. fario*) at about 600 to 700 feet in the Twirrel Burn on the hill-slopes of Tourgill. Much to the writer's delight, the stomachs contained some Crane-fly material; but owing to our meagre knowledge of the early stages, several interesting larvæ and pupæ remain unknown. The identification of the material has been effected by comparison with known immature stages in the writer's collection. The numbers after the species indicate the number of occurrences in the fifteen stomachs containing Crane-flies.

Adults :—

<i>Limnophila</i> sp. (<i>nemoralis</i> , Mg.), body and wings . . .	1
<i>Tricyphona</i> sp. (<i>immaculata</i> , Mg.), wings . . .	2
<i>Tipula</i> spp. (<i>lateralis</i> group), bodies and wings . . .	3
Also considerable insect remains.	

The Immature Stages—Larvæ :—

<i>Limnophila</i> (<i>Pæcilostola</i>) <i>punctata</i> , Schrk.	2
<i>Pedicia rivosa</i> , L., a small individual	1
<i>Dicranota</i> sp. (<i>bimaculata</i> , Schum.)	1
<i>Tipula</i> spp. (<i>vittata</i> , Mg., and <i>lateralis</i> group)	10
Unknowns—4.	

Pupæ :—

<i>Limnophila</i> sp. (<i>nemoralis</i> , Mg.)	.	.	.	.	1
<i>L. (Pæcilostola) punctata</i> , Schrk.	.	.	.	.	2
<i>Erioptera</i> sp. (<i>fuscipennis</i> , Mg.)	.	.	.	.	1*
Unknowns—3.					

(*Also ? remains of 2.)

This material is in the writer's collection of Immature Stages.

Associated with the above were earthworms, phalangids, and click-beetles including *Athous niger*, L., *Limonius cylindricus*, Payk. (also eight larvæ referred to this species), May-flies and Stone-flies (*Nemoura* sp.). I am indebted to Mr K. G. Blair of the British Museum for the identification of the beetles here mentioned.

Field Notes at Twirrel Burn.—On 8th and 9th June the writer visited the places where the trout, discussed above, were caught. The burn had been in spate for several days. The following notes were made at several places in the glen and on the hillside near the sheep-fank. The Crane-flies occurring on the banks of the burn and among the long grass were: *Ptychoptera albimana*, F.; *Limnobia nubeculosa*, Mg.; *Limnophila nemoralis*, Mg. (many); *Idioptera trimaculata*, Mg.; *Tricyphona claripennis*, Verr.; *T. immaculata*, Mg.; *Pedicia rivosa*, L.; *Dicranota bimaculata*, Schum.; *Erioptera fuscipennis*, Mg.; *E. trivialis*, Mg.; *Tipula vittata*, Mg.; *T. lateralis*, Mg. (Lack.). Newly-emerged imagines of *Ptychoptera*, *Pedicia*, *Tricyphona*, and *T. lateralis* were found on the saturated soil at margins near the water's edge. Larvæ from this soil were placed in rearing boxes, and adults of *Limnophila nemoralis*, *Tricyphona immaculata*, *Pedicia rivosa*, *Dicranota bimaculata*, and *T. vittata* emerged.

Trout from the River Clyde above Crawford.

The fish-food supply of the River Clyde above Crawford was investigated by Dr Lindsay in the months of August and September 1923, 1924, 1925. The stomach contents of fifty trout were carefully analysed. Of these, forty-five had been taken with the floating artificial fly. These contained only three Crane-flies (*Tipula* sp.). The other five trout, taken

with worms as bait during a flood, contained seven Crane-fly larvæ (*Tipula* sp.).

Field Notes and Observations near Crawford.—The drainage area of the Clyde above Crawford is sufficiently distinctive to suggest a definite faunistic territory. Extending to 60 square miles it consists of moorland, with less than 20 acres under cultivation and with no woods. The larger Crane-flies are conspicuous and abundant in the district, viz., *Dolichopesa albipes*, Strom., *Tipula lateralis*, *T. vittata*, and *T. scripta*, Mg. They may be seen alighting on the river, resting for a spell and rising again. On some occasions trout are indifferent to them; at other times they take them eagerly.

A statistical survey was made in the shallow parts of the river, in all about 140 square feet being examined. Only six Crane-fly larvæ (referred to *Tipula montium*, Egg., being green-coloured, marked dorsally with brown) were found in gravel and sand under pebbles, a very small number compared with 416 nymphs of May-flies and Stone-flies, and 113 caddis-larvæ also found here. This larva seems to be abundant locally in some parts of the river.

With a view to estimating the drifting fish-food, a muslin net (made on the model of the beam-trawl with a mouth expanse of 12 × 6 inches) was set in rapid currents, and was in operation for 584 hours in different parts of the river's course. Only five Crane-fly larvæ were taken in this way, as compared with 1952 nymphs of May-flies and Stone-flies, and 37 caddis-larvæ.

Trout from Reservoirs and Lochs.

A number of trout stomachs from reservoirs at Burncrooks (Kilpatrick Hills), Millport (Cumbrae Is.), and other localities was examined by the writer, but no Crane-fly material was found. Several trout from the reservoir of the Wishaw Water Works contained only one Crane-fly (*Tipula*). (Lindsay MS.)

Comparison with Other Regions.

Abroad, little exact information is available. Alexander (1920) briefly discusses the subject, and records the use by

anglers of bait consisting of larger species of *Eriocera* and semi-aquatic species of *Tipula* larvæ, viz., *T. abdominalis* (Say), *T. caloptera*, Loew. He states (pp. 726-727) that "fragments of adult flies are often found in the stomach contents of fish, notably species of trout, being individuals that had fallen into the water or were captured while newly transformed."

Summary.

Sometimes, at least, Crane-flies form a large part of trout-food in hill burns, larvæ, pupæ, and adults being taken especially in rainy weather in spring. Crane-flies are often blown upon the water by wind, and frequently may be seen "dipping" to the surface as if ovipositing. The early stages, so far recognised, are chiefly of species inhabiting the moist soil at margins of burns, or the sand and gravel in shallow parts of the rivers.

Reservoir and loch trout seldom prey on anything but adult Crane-flies.

Phillipps (1924, p. 389) makes the interesting suggestion that, as the Salmonidæ are derived from an ancestral form which existed about the Cretaceous period, and whose habitat was the ocean, the trout have gradually ascended rivers and streams and acquired a liking for, and need of, insects as food.

Acknowledgments.

I am indebted to Messrs J. Donaldson, A. Graham, and J. M'Kellar for submitting trout stomachs for examination; to Mr K. G. Blair, and to Dr John Lindsay for the favour of including his MS. notes, and for the great interest he has shown in this study.

REFERENCES.—Alexander, C. P. (1920), "The Crane-flies of New York," Part II., *Biology and Phylogeny*, Cornell Univ., Memoir 38, Agri. Exper. Station. Phillipps, W. J. (1924), "Food Supply and Deterioration of Trout in the Thermal Lakes District," *N. Z. Trans.*, New Zealand Inst., vol. lv.

ON AN UNUSUAL CLUE TO THE IDENTITY OF A SPECIES.

By JAMES WATERSTON, D.Sc., Assistant-keeper, Dept. of Entomology,
British Museum (Nat. Hist.), London.

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IN a previous communication to THE SCOTTISH NATURALIST (July-August, 1922, pp. 101-104) on the Ischnocera (Mallophaga) occurring on our British grouse, I made the remark that quite unnecessary difficulties had been raised in interpreting the name *Pediculus lagopi*, L. The object of the present paper is to discuss the meaning and validity of this name and to shew its proper application.

The question of the formal validity of *P. lagopi*, L., need not detain us long. The original description gives in detail about a dozen more or less distinct characters besides a host connection, so that the name is available for use if it proves to be interpretable. Before discussing the definition itself we can narrow the problem somewhat by considering the hosts to whose parasites it might apply. Linné's original statement is that *P. lagopi* is a *Lagopus* parasite, and to this of course we must ultimately return in any decision arrived at, but subsequent writers have erroneously assumed that *Lagopus* and *Lyrurus* harbour the same Ischnocera, which has complicated the discussion. It so happens, however, that each of these host genera has a *Goniodes* sp. and a *Lagopæcus* sp. peculiar to itself, and as for various reasons the names of the *Goniodes* sp. and *Lagopæcus* sp. on *Lyrurus* spp., and of the *Lagopæcus* sp. on *Lagopus* spp. are satisfactorily fixed, it merely remains to decide whether *Pediculus lagopi* is synonymous with any of these or is to be used for the *Goniodes* on *Lagopus*.

The original description of *Pediculus lagopi* may now be analysed. It runs as follows:—

“Corpus depressum, utrinque obtusum. Abdomen antice angustatum, pone dilatatum, figura fructus *bursæ-pastoris* aut *veronicæ* capsulæ, cinctum margine nigro

introrsum serrato. Caput absque thorace notabili adfixum, utrinque obtusum lateribus emarginatum."

There can be no reasonable doubt that this description as a whole indicates a *Goniodes*. The salient points noted are: the lateral emargination of the head, which is very distinctly separated from the thorax; the narrowness of the abdomen anteriorly, contrasted with its posterior breadth: also its inner marginal "serrations," caused by the proximal or admedian branch of the lateral bands shining through the integument.

The botanical reference, at first sight a little obscure, provides, in reality, a clear and curious clue to the generic identity of Linné's insect. In Fig. 1*a*, there is drawn the

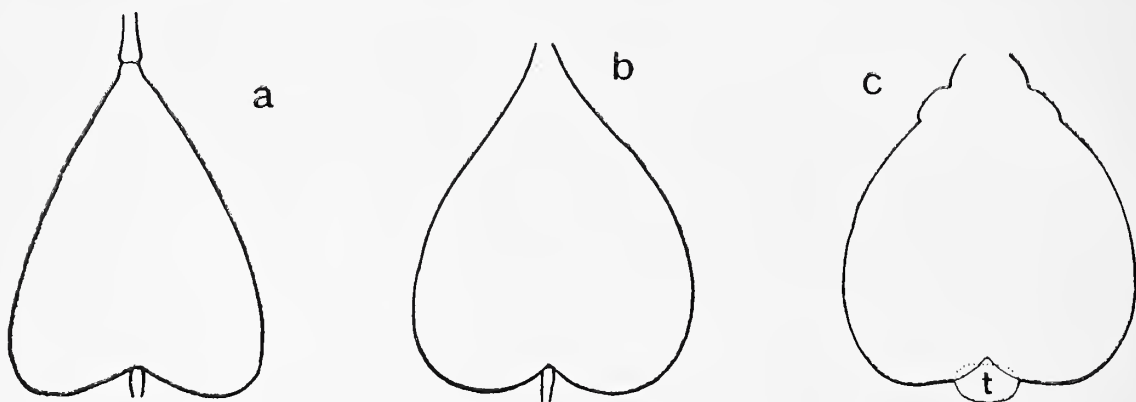


FIG. 1.—Illustrating the Comparison made by Linné.

fruit capsule of the Shepherd's Purse (*Capsella bursa-pastoris*, L.) at an early stage shortly after the petals have fallen and before the pistil has quite withered off. The capsule has attained about its maximum expanse and has a characteristic cordiform facies, but the seeds have not yet ripened within it. In Fig. 1*b*, the corresponding phase in our common Brooklime (*Veronica beccabunga*, L.) is illustrated, while Fig. 1*c*, gives an outline of the thorax and abdomen (δ) of the *Goniodes* which occurs on every species of the genus *Lagopus*. The justice of Linné's comparison must be evident at a glance. Fig. 1*c*, is drawn from a specimen mounted in balsam, in which the inconspicuous last segment (t) is flattened out. The genitalia are retracted. In life, however, this segment is frequently borne upturned with the genitalia subexserted (the apices of the paramers protruding)

which accentuates the resemblance already remarked upon. *The available evidence therefore indicates conclusively that "Pediculus lagopi" is to be interpreted as a Goniodes, and since but one species of this genus occurs on the host genus the application of the name is automatically fixed.*

As regards the hosts Linné says, "habitat in Lagopis" *i.e.*, *Lagopus* spp., and he gives as a popular name for his parasite "Le pou de la gelinotte blanche." The name "gelinotte blanche" has been used both for Willow-Grouse (group of *Lagopus lagopus*) and Ptarmigan (group of *Lagopus mutus*), but the argument is unaffected from whichever host Linné described his species. I have been unable to find evidence for the existence at any time of type material of the species whose synonymy is briefly as follows:—

GONIODES LAGOPI (L.)

"Pediculus lagopi," Linné, *Syst. Nat.*, Ed. X., p. 614, sp. 36, 1758.

"Pediculus lagopi," Linné, *Fauna Suecica*, p. 340, No. 1167, 1746.

"Pediculus lagopodis," Gmelin, J. F. in Linné, *Syst. Nat.*, Ed. XIII., Vol. i., sp. 2920, 1790 (emend. of lagopi.)

"Goniodes tetraonis," *auct plur.*, nec. Linné (1758.)

"Goniodes heterocerus," Piaget (1881) (in parte) nec Nitzsch in Giebel (1874.)

The two latter names are synonymous and apply only to the *Goniodes* of *Lyrurus*.

Erythristic Eggs of the Skylark.—When at Fair Isle in September 1925, I was given a beautiful clutch of four reddish eggs of the Skylark; they had been found on the island about the beginning of the previous May. The eggs measure in millimetres: 24 by 16.25, 23.25 by 16.5, 23 by 16.1, and 23 by 16.8: the average being 23.3 by 16.4. Jourdain in Witherby's *Practical Handbook* gives the average dimensions of eggs of this bird as 23.2 by 16.8: it will be seen that in size this clutch approaches very closely to the mean measurements. In colour three of the eggs are rather lighter than the usual red eggs of the Tree-Pipit,

while the fourth egg is lighter still. Erythristic eggs of the Skylark are exceedingly rare, and the occurrence is therefore considered worthy of being placed on record. The eggs are now in the Royal Scottish Museum.—J. H. STENHOUSE, Joppa.

Uncommon Coloration of Song-Thrush's Eggs.—On 7th April 1926, I found a Song-Thrush's nest in a whin bush on the farm of Peasiehill, near Arbroath. There was an unusual quantity of material in the nest, mostly dried rushes and grasses. The brooding bird was sitting very close, and incubation seemed far advanced. The four eggs were of a pale greenish-blue colour with a few small rusty spots at the larger end.—DOUGLAS G. HUNTER, Arbroath.

Great-Spotted Woodpecker breeding in Sutherland.—A pair of Great-Spotted Woodpeckers have nested and successfully reared five young birds at Bal Blair, Invershin, Sutherland, this spring. When I discovered the nest on 29th May, the young birds were already almost able to fly, and fluttered from the nesting hole to the ground on my approach. This would seem to be very early for this bird so far north, since even in southern England the nesting period is about the third week in May. The Great-Spotted Woodpecker seems to be increasing in the north of Scotland. The birds have been seen and heard several times during the last few years, but I have never found the nest so far north before.—E. G. PATERSON, Invershin.

A further record of Gulls and Frogs.—To the notes which have already appeared in this Magazine (1926, pp. 22 and 59), another record of the feeding of the Common Gull upon Frogs must be added. On 6th June, while walking over the shoulder of Breabag, Inchnadamph, in western Sutherland, I noted a pair of Common Gulls, and on a knoll on which these were resting found several food-casts largely composed of the bones of common Frogs. Young Frogs were plentiful in the neighbourhood, which is remarkable for the number of large swallow-holes which indent the surface of the moor and frequently contain deep pools of peat and water.—JAMES RITCHIE.

Range of Eider Duck.—For the first time an Eider Duck's nest has been found in the neighbourhood of Kyle of Lochalsh, Ross-shire. Several were observed disporting themselves in Kyle Bay when mating.—J. T. HENDERSON, Kyle of Lochalsh.

TWO SAND-DWELLING NEMERTINE WORMS NEW TO BRITAIN.

Notes from the Millport Marine Laboratory, No. 3.

By RICHARD ELMHIRST, F.L.S.

FROM time to time when digging in the sandy bays on Cumbrae island or on the Ayrshire shore opposite, I have found pieces of a Nemertine cut by the spade. Such parts are usually pinkish or reddish, but always incomplete. However, this spring an effort was made to ascertain the precise species concerned.

Several hours digging produced four worms which proved to belong to two distinct species—*Lineus coccineus* and *Amphiporus langiægeminus*, both of which are described and figured by Burger in "Fauna und Flora des Golfes von Neapel, xxii., Nemertinen, 1895." Regarding the distribution of these species he says (pp. 639 and 558) "known only from Naples," and confirms that distribution in "Das Tierreich, Nemertini, 1904." It is noticeable that both these sand-dwelling species, the habit being unusual in Nemertines, are eyeless and makers of mucous tubes.

Lineus coccineus, Burger.—Long, round, without definite markings, eyeless, head spear-shaped; colour rose tint, occasionally almost brick-red, with faint pale or whitish mid-lateral lines, head pale almost white. Found near l.-w.m. Balloch Bay, Cumbrae, and in Hunterston Sands, buried 4 to 6 in. deep in the sand. Makes a fairly resistant mucous tube.

No complete specimen obtained yet; the worms are always cut by the spade and occasionally only the proboscis is found. Length of proboscis 20 cm., so probably the complete worms would be somewhat longer.

Amphiporus langiægeminus, Burger.—Slightly flattened, noticeably tough; head rather clearly marked off from the body, eyeless. Reddish-brown or yellowish-brown; head sepia with six whitish lines, a dorsal pair, a ventral pair, and single lines laterally; proboscis indicated by a median dark streak; size up to 10 cm. long.

This is a remarkably firm Nemertine, and is so tough and resistant to pressure that one cannot ascertain details of the proboscis by flattening.

Burrows by first driving its head into the sand and then forcing its way down by strong peristaltic waves. Also makes a mucous tube.

Found in Kames Bay, Cumbrae, and Hunterston Sands, 4 to 8 in. deep.

NOTES

Lesser Rorqual (*Balænoptera acutorostrata*) at **Buddon-Ness**.—A specimen of this animal, mistakenly recorded in the daily press as a "Bottle-nose Whale," was stranded at Buddon-Ness Lighthouse, Dundee, on the 13th March, and was alive when first found. Here I examined it three days later. It was a female possessing all the characters of the Lesser Rorqual, notably the distinctive pale band of colour on the flippers. It measured 11 feet 11 inches in length, and was evidently a young specimen, since the species may attain a length of 30 feet.

The Lesser Rorqual is one of the whalebone whales, which live on the minute floating organisms in the sea. These are filtered from the water by means of the fringed plates of whalebone with which the mouth is fitted. This is the only British species in which the plates and fringes are white or yellowish-white, although the plates themselves may be suffused with blood at the base, which gives them a pink appearance.

The species has not been very commonly recorded from the Scottish coast, although in certain years several individuals have been found. The Scottish records since 1913, when Sir Sidney Harmer commenced his survey of the strandings of British whales, have been as follows:—

1913	.	.	.	3	|	1918	.	.	.	4
1916	.	.	.	2	|	1919	.	.	.	1
1917	.	.	.	1	|	1922	.	.	.	1

Of these, all but one have been found on the east coast, and four have come from the neighbourhood of the Tay estuary, an area which seems to be specially favoured by this animal. While the present record is in March, it is interesting to note that all

the former occurrences, with the exception of one at Aberdeen in January, have fallen within the months from July to October.—A. C. STEPHEN, Royal Scottish Museum.

Nesting of Two Male Swans.—While rambling by the side of a Renfrewshire loch in the spring of 1923, I came across a pair of Mute Swans with a nest. I photographed the nest first with the bird sitting on it, and after forcing the bird to leave its nest, I was surprised to find no eggs in it. However, I went back in a week's time and the bird was sitting with its mate close by and still there were no eggs in the nest. As the nest was close to a railway where several workmen were engaged, I at first thought



Communal nesting of two male Swans.

they had been taking away the eggs, but on my next visit still no eggs were to be found and the birds were still at the nest. I visited it several times after this, and to my surprise I found that two male Swans had built the nest, which was of the usual type, a huge pile of reeds, twigs, and similar available material. I photographed both male birds together, the sex being easily determined by the large knob at the base of the bill which is absent in female birds. Naturally this explains why no eggs were to be found. I believe this is the only photo on record of such a thing, but in the year 1885 Mr J. Whitaker reported that two females had lived in the same way; in this case five eggs were laid which never hatched (*Zoologist*, 1885, p. 263). — JOHN P. RITCHIE, Johnstone.

[Such a case of the amicable nesting of two male birds, which in normal conditions at the breeding season would display strong enmity, must be very unusual. A possible explanation may be that although both birds appear to be males, since they show the secondary characters of that sex, one may really be a female which has assumed male characters. There are now many examples on record amongst birds, particularly domestic poultry and game birds where the sexes are easily distinguished, in which it has been shown that old age or the development of disease in the ovaries has induced the appearance of male characters in a female bird. The crowing hen is a case in point.—EDS.]

Sperm Whale in Firth of Forth in Prehistoric Times.—

In recent times the Sperm Whale has not been known to enter the Firth of Forth, though three ancient records are mentioned in the late Mr Evans's *Mammalia of the Edinburgh District* (p. 12). They are—one Sperm Whale stranded at Limekilns in 1689, a second at Cramond in 1701, and a third at the same place in 1769. The slaughter of the Sperm in southern oceans in the great days of the whale fishery, and in modern days may well have reduced to small dimensions the numbers of outcast bulls which find their way to northern seas. In May of the present year Mr Adam Stoddart, Leith, found on the beach at Portobello, and brought to the Royal Scottish Museum, a tooth of an aged Sperm Whale. At the place where the tooth was found, near the Marine Gardens, excavations have been in progress in connection with the building of a promenade. The tooth showed signs of having been imbedded for long in one of the layers excavated, for its cavity was filled with a clayey sand, its outer layers have a tendency to break off in concentric laminae, and its mass on drying has become penetrated by deep radial cracks.

Assuming then that the tooth belongs to one of the layers of the raised beach at this point, it represents a Sperm Whale which entered the Firth of Forth when the sea level stood considerably above that of the present day. Many whales must then have disported in the extensive waters of the Forth, for Mr Morris recently enumerated remains of twenty individuals which have been discovered in the old sea beach which now forms the margin of the Carse of Stirling (SCOT. NAT., 1925, p. 137). Several of these skeletons represent Finner Whales of different species, but none has been identified as that of a Sperm Whale, a species of which the Portobello tooth is the first prehistoric record from the Firth of Forth.—JAMES RITCHIE.

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PUBLISHERS' NOTE.

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EVERY NATURALIST SHOULD READ

The following major articles which have appeared in recent numbers of *The Scottish Naturalist* :—

Annual Reports on Scottish Ornithology, including Migration.
Observations on the Hatching of the Field-Slug. (Illustrated.)
The Great Bustard in Scotland.
The Starling in the Forth Area.
Notes from the Scottish Zoological Park :
 The King Penguins. (Illustrated.)
Sunspots and Animal Plagues (Illustrated).
The Hawfinch in Scotland (Illustrated).
Increase of Mountain Hare in Scottish Lowlands.
The Food of the Ptarmigan.
New Facts about the Hive Bee.
Mixed Plumages in a Brood of Hybrid Crows.
Human Transport and Wild Life. (Illustrated.)
The Whale Remains of the Carse of Stirling.
Records of Birds new to Britain.
A Rat Migration.
Abnormal Coloration of Scottish Mountain Hares. (Illustrated.)

As well as numerous shorter notices of interesting events in the
Wild Life of Scotland.

(Authors are responsible for nomenclature used.)

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MOTHS AND MELANISM.

AN interesting and suggestive historical summary of the various theories which have been advanced to account for the many dark and melanic varieties of Lepidoptera which occur in the British Isles and elsewhere has recently appeared in the *Proceedings of the South London Entomological and Natural History Society*. The article is by Robert Adkin, F.E.S., and occupies some 15 pages in the volume for 1925-26, with an accompanying map showing the distribution in Britain of a Geometrid Moth, *Amphidasis betularia* and its well-known black form *doubledayaria*. It appears that about the middle of last century melanic forms were beginning to occur rather frequently in districts where, owing to the increase of manufactures, the atmosphere was becoming more smoky, and in consequence the walls, fences and stems of trees on which the moths rested were becoming darker. It was therefore assumed that by the process of natural selection the lighter and more conspicuous individuals would be gradually eliminated and replaced by those of darker hue. This theory seemed to be a just and sufficient one at first sight, but when melanic forms were taken in places far removed from these dingy localities it was thought that the "natural selection" theory did not fully explain the phenomena. Buchanan White found many dark forms occurring in Scottish areas, and suggested that in addition to natural selection climate might have some direct influence. A few years later Cockerell put forth the view that "a moist atmosphere might hold in solution gases which a dry atmosphere would destroy or not absorb. If

this is so, is it not conceivable that something of this kind may have a hand in the production of melanism"? This theory, with the corollaries that at high altitudes rainfall is excessive (as on mountain sides) or in dense forests humidity great, was favoured by many entomologists, and eventually, in 1891, a book of 66 pages was published by Tutt, in which the whole subject was carefully reviewed in detail.

But a still more interesting suggestion has appeared more recently, to the effect that the darkening of the adult insect is *directly* due to the nature of the food eaten by the Caterpillar. This idea is founded upon the fact that near large towns and near the sea a deposit occurs on the foliage which is necessarily consumed with it. Connected with such a theory is the conclusion held in some districts that the darkening of the insect is "a condition antecedent to the extinction of a species." Thus, as one author (quoted by Adkin) puts it: "This poisonous filth the larvæ are bound to consume with their food, and from this cause it may be that sufficiently disturbing conditions may arise as to bring about the extirpation of some species without interfering with their colour, while in others the darkening processes are but stages in the same fatal process." Many details regarding the distribution of various species are given in Adkin's very suggestive paper now under notice, but these are far too numerous to epitomise in this place. The recent investigations of Dr Heslop Harrison on the effect of manganese salts derived from factory smoke are briefly referred to, as is also certain experimental work which would suggest that a larva is "capable of secreting matter which will ultimately form the pigment of the imaginal scales, such matter no doubt being obtained from the food consumed by the larva." Altogether the subject is a fascinating and important one. Careful investigation is still needed and well worth while, for any light thrown upon the causes of the darkening of Lepidoptera would reflect helpfully upon the subject of melanism in the higher forms of life. The ultimate cause or causes of the production of a black Geometrid Moth and a black Mountain Hare may, for all we know to the contrary, be identical!

REPORT ON SCOTTISH ORNITHOLOGY IN 1925.

By EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL.

(Continued from p. 84.)

HABITS, ETC.

On 19th May several Carrion Crows were seen mobbing a Tawny Owl, resting, awake, in a fir-tree, and a young Rook shot at Tayfield (Fife), in August, had "met with a strange accident, for the point of the lower mandible had penetrated the skin of the breast in such a way that it could not be withdrawn." The bird was much emaciated, but still able to fly. (I. 1925, 158). Rooks, at Lahill, were seen several times in November flying into an old Scots fir-tree and going off with the cones in their beaks. On 13th April we have the following note from East Fife: "Continually finding Starling's eggs lying about the golf course and garden. When blown they seem to have *very* little yolk. Placed Starling's eggs in nests of sitting Blackbirds and Thrushes but they did not hatch out." A Starling at Scourie, in June, was heard imitating the Curlew's cry to perfection every evening "in roost." No Curlews were seen in the district. Thousands of Starlings roosted at Lahill in the winter of 1924-25 and the following notes were made: 16th *January*—"Have been watching the Starlings—thousands—which roost in the laurels in the west park. Large numbers come in from the east, and when leaving in the morning and going to the east they vary their line of flight according to the direction of the wind. If the wind be west they pass directly over the house, if the wind be north they pass to the south of the house, if the wind be south they pass to the north of the house." The laurels in which they roosted were about 500 yards due west of the house. This species is reported feeding its young on the buds of the Common Nipplewort at Largo Fife in June (I. 1925, 152). An interesting note of Pied Wagtails hatching and rearing Blackbirds

came from Roxburghshire in June (1. 1925, 168), and on the Isle of May a British Gold-crest was found stuck on a burr of the Common Burdock, from which it had considerable difficulty in freeing itself. Lord Scone reports a "surprising tendency" in local Willow Warblers to nest in bushes; he found seven nests in bushes this year. A Willow Warbler at Balchrystie nested in the boxwood which edges the garden path; the whole nest was lifted out by the gardener "when tidying up" and put in a wheel-barrow. It was, however, noticed and replaced in the old position, when the bird returned to it, laid the rest of the clutch and hatched and reared her brood. A Blackbird built in an orange-box, stuck up in a hen-run in Largo, and reared out two broods in the same nest, and one was heard at Kilmacolm in April which "mimics the milkman's whistle daily instead of its usual song." Another record of mimicry is that of a Whinchat at Lauder in July "mimicking Chaffinch, Corn-bunting and Greenfinch." One Redbreast trying to drown another is reported by Mr H. S. Gladstone (1. 1925, 96), and an interesting instance of the strength of the homing instinct in Hedge-Sparrows is given by Captain A. H. R. Wilson, who carried a bird of this species distances up to three and a half miles from which it returned to its home at once (2. xix. 24). Nesting habits of the Dipper are described in the same Magazine (p. 25). Swifts, at Selkirk, on 21st June, were observed in the gloaming, low down, apparently hawking for moths, skimming the grass much in the same manner as Swallows skim a pond or loch. A Cuckoo began a raid on Magpie Moth Caterpillars on gooseberry bushes, at Johnstone, on 13th May, coming almost daily till 17th June. It climbed about among the twigs and nibbled each caterpillar before swallowing it; it also pursued various winged insects amongst the trees. It had a plaintive cheeping note. Interesting observations on the lifting powers of the Golden Eagle have been made in several parts of the country, as these have already been published, we shall only refer our readers to the original letters (2. xix. 291). Two Peregrines at the Bass Rock had a fight, "when one went down and landed on the sea and

had a good wash," and the Common Gulls, at a loch in Perthshire, on 18th May, left their nesting loch and flew round a Buzzard until it went off. Commander G. Hughes-Onslow reports an interesting case of polygamy in Sparrow-Hawks at Alton Albany, Barr, Ayrshire (1. 1925, 95), and Whooper Swans at Glenorchard, in January, were seen "turning over on their backs in the water and kicking with their feet in the air"; the same habit was noticed among the Whoopers at Possil Marsh. The black-eyed Gannet is still on the Bass Rock, but has changed its nesting place; while a Wood Pigeon, shot near Methven on 7th February, had its crop full of potatoes, "of which half a dozen were of the size of walnuts" (2. xviii. 318). Young birds of this species, at Hareshawmuir, on 9th October, had their crops full of beans, for which "the parents must have travelled four miles." Four Lapwings at Johnstone on 11th August were running in a circular patch of short grass where a haystack had stood, the surrounding grass being too long for their liking; and Curlews were mobbing Jackdaws on the Pentland Hills on 19th May. During the drought, in July, a Woodcock came nightly to feed in a newly-watered flower-bed, just below the dining-room window, at Livingston, Kirkcudbright. More than one Common Tern was seen at Aberlady, in May, "diving for fish from a perch on a hand-rail of a foot-bridge over the Esk." A Black-headed Gull, in a nesting colony in Renfrewshire, was seen to alight and stand for some time on a frond of bracken, and Herring Gulls took corn from the stooks at Cambo, E. Fife (1. 1925, 180), while a young Pheasant, near Largo, killed and ate a half-grown Field Vole (1. 1925, 152), and a female Capercaillie was killed by flying against a shop window in Glasgow on 26th November.

MIGRATION—SUMMARY OF MOVEMENTS.

January.

January was an open month free from frost and snow, and some species which usually leave our inland localities were recorded there in the first part of the month. The

chief movements in the second half were those of Skylarks, *Turdinæ* and Lapwings. For the first fortnight and from the 29th to the end of the month the winds were mostly westerly or south-westerly; during the rest of the month the wind was south-easterly.

February.

During the first half of February there were westerly winds rather strong in the first week, and there was little movement with the exception of the return of some partial migrants to their Scottish nesting places. In the latter half of the month the winds were variable and chiefly light. There was some wader movement, more returns of partial migrants to their breeding places within the country and, at the end of the period, some departure of winter visitors.

March.

The wind in March was mostly from some northerly quarter and there was a good deal of movement during the month. This was perfectly normal and consisted chiefly of further returns of partial migrants, departures of winter visitors, and the arrival of early summer visitors.

April.

Up to 23rd April the wind was variable, thereafter till the end of the month it was from some quarter between north-west and north-east. The movements were very normal—arrivals of summer visitors, intensifying as the month progressed, while there were still a few records of partial migrants returning. Winter visitors were leaving us and a few passage migrants passed along our shores.

May.

In the first week of May the winds were south-west to south-east and the movements continued; there were some uncommon visitors. The second week, with variable light winds, chiefly south-west to south-east, brought a big arrival of summer visitors, some uncommon visitors and passage

migrants and departure of winter visitors, notably Fieldfares.

Thereafter, with continued light variable winds, the movements lessened, until by the end of the month there was nothing to be noted but passage of waders to nest overseas.

June.

Throughout the month there were light westerly winds, a few waders were passing to breed overseas in the first half, and the beginning of flocking of our own breeding birds after nesting is recorded.

July.

July was characterised by light winds and warm weather and the movements followed a perfectly normal course. These were chiefly of our own breeding birds through the country, but there are notes of departures of Swifts and Cuckoos and some arrivals of overseas waders.

August.

The winds were light and chiefly between south and west, except in the third week when they were mainly easterly. Throughout the month waders were arriving from overseas, Swifts were leaving, and there was a good deal of movement through the country. Very early records come of Fieldfares, Greater Redpolls and Lapland Buntings, and there was an unusual rush of Manx Shearwaters to the Hyskeir lantern.

September.

In the first week the wind was westerly, in the second it was chiefly northerly, and variable thereafter till the end of the month. There is a good deal of migration recorded but no rush. Arrivals of duck beginning in the second week and of other winter visitors beginning in the third week were among the most important movements. There were also departures of summer visitors, a certain amount of passage migration and a good many uncommon visitors recorded.

October.

Northerly and westerly winds and normal light migration characterised the first half of October. Then the wind backed into the east, was chiefly in that quarter for the rest of the month and a very big arrival took place. This was mainly of winter visitors, but a certain amount of passage migration took place, while a fair number of uncommon visitors were seen.

November.

The first week of November was cold, winds were chiefly east and north-east and the movements continued in a lesser degree. Variable winds characterised the second week and the records include some very late summer migrants, one or two uncommon visitors and some movement of winter visitors. The last half of the month was cold and frosty and slight movements continued.

December.

Up to the 14th little movement was recorded; from this date till 26th a weather movement caused by the severe conditions took place. Notes from Ailsa Craig and Hyskeir seem to show emigration, probably to Ireland.

NOTES ON THE MOVEMENTS OF BIRDS IN 1925,
ARRANGED UNDER SPECIES.

RAVEN, *Corvus corax corax*.—Three were noted at Hyskeir on 27th March and one on 31st, and sixteen together at Vallay (O.H.) on a carcass on 16th May. Three at Ailsa Craig on 24th September, and two there on 21st December.

HOODED CROW, *Corvus cornix cornix*.—One was seen at the Bell Rock on 26th January, two at Corsemalzie on 12th March; last seen Lahill 2nd April, and one at Killantringan on 11th May. Arrivals were noted at the Bass on 2nd September and 16th October, the Bell Rock on 20th October, and Largo Bay on 9th November.

ROOK, *Corvus frugilegus frugilegus*.—On 19th January a Rook visited Hyskeir, several were at Fair Isle on 3rd March and 14th

April, and again from 19th to 25th October, and "many" there on 26th October.

JACKDAW, *Colæus monedula spermologus*.—A Jackdaw was at Hyskeir on 19th January, two at the Bass on 13th March, and one at Ailsa on 26th April. Single birds at Fair Isle on 19th October, Ailsa (L.) on 20th/21st October, and Hyskeir on 11th November.

JAY, *Garrulus glandarius rufitergum*.—One or two were seen at Glenorchard (Stirlingshire) in October, and one at Monreith (Wigtownshire) on 11th November.

STARLING, *Sturnus vulgaris vulgaris*.—About twenty were recorded from the Bass on 12th February, and up to 8th April a good deal of movement is noted from this station, Bell Rock, Ailsa, and Hyskeir. On 15th/16th May a few were at the Isle of May lantern, and flocking after nesting was reported from 21st June onwards. By 26th August return migration was noted at the Isle of May, five at Hyskeir on 3rd September, and a large flock at the Bass on 29th September. From 12th October to 22nd November much movement was recorded, chiefly from Hyskeir and Ailsa, but some from the Bell Rock and other stations. A big weather movement took place from 19th to 29th December.

ROSE-COLOURED PASTOR, *Pastor roseus*.—See p. 71.

GOLDEN Oriole, *Oriolus oriolus oriolus*.—See p. 71.

HAWFINCH, *Coccothraustes coccothraustes coccothraustes*.—On 6th March one was found dead at Dupplin (Perthshire), about 10th May one at Kames (Eccles Parish), and on 24th June one was found badly hurt at Scone, while a young one was reported near Inchtute (Forfarshire) on 1st August.

GREENFINCH, *Chloris chloris chloris*.—A Greenfinch visited the Isle of May on 16th May. On 17th September, three going N.E. about noon were encountered in the middle of the Firth of Forth off Gullane, and one was on the Isle of May on 25th September. From 26th October right up to the end of the year considerable movement was reported from Fair Isle and Hyskeir.

BRITISH GOLDFINCH, *Carduelis carduelis britannica*.—Early in the year there were a good many records from Solway, and several from Selkirkshire, three birds near Inverarity (Forfarshire) on 22nd March, and one on Ailsa on 3rd May. In August one or two were seen about Johnstone, six near Paisley on 4th September, one at Lauder

on 23rd November, near Pitlochry on 25th December, and a pair at Cockburnspath in December.

SISKIN, *Carduelis spinus*.—A few were reported near Selkirk on 4th and 18th January and 22nd February. A few visited Fair Isle from 23rd to 25th September and on 30th and 31st October, numbers were noted in Selkirkshire on 8th and 29th November and 27th December, and a few at Duns on 22nd November.

TWITE, *Carduelis flavirostris flavirostris*.—Movement took place at Ailsa and Hyskeir from 14th March to 14th April, and again at these stations from 3rd September to 21st December, while on 7th and 8th October the species visited the Bass.

MEALY REDPOLL, *Carduelis linaria linaria*.—Noted frequently at Fair Isle from 2nd September to 24th October and on 11th and 12th November, single birds at Hyskeir on 16th and 20th September and 20th October, and at Broughty Ferry on 21st December.

GREENLAND REDPOLL, *Carduelis linaria rostrata*.—See p. 72.

LESSER REDPOLL, *Carduelis linaria cabaret*.—A flock of thirty-two was seen at Clutag (Wigtownshire) on 28th March, one near the Munsy (Forfarshire) on 27th September, and many at Dowalton, in snow, on 14th December.

HORNEMANN'S REDPOLL, *Carduelis hornemanni hornemanni*.—See p. 72.

LINNET, *Carduelis cannabina cannabina*.—Single birds were at the Ailsa lantern on 14/15th March and the Isle of May on 11th May. Movement was recorded from a good many stations in September and October, four were at the Bell lantern on 16th November and arrivals were recorded from Fair Isle on 30th November and 2nd December. A weather movement took place at Hyskeir and Fair Isle from 19th to 26th December.

NORTHERN BULLFINCH, *Pyrrhula pyrrhula pyrrhula*.—See p. 72.

SCARLET GROSBK, *Carpodacus erythrinus erythrinus*.—See p. 72.

CROSSBILL, *Loxia curvirostra subsp.?* A young male was found dead at Manderston (Berwickshire) on 20th October and three were seen at Blackadder on 5th December.

CHAFFINCH, *Fringilla cœlebs cœlebs*.—A few were recorded from the Bass on 10th and 14th February, Fair Isle on 8th and 13th

April, and Ailsa on 7th, 14th and 15th May. On 4th October two Chaffinches visited Ailsa, and a big movement was reported from this station, Hyskeir, Fair Isle, and the Bell Rock from 18th October to 30th November. From 14th to 21st December a weather movement was noted at a good many stations.

BRAMBLING, *Fringilla montifringilla*.—Last noted in spring at Fair Isle on 13th April. First return was recorded from Fair Isle on 10th September, and arrivals were noted after this up to 25th November. A small weather movement at Ailsa and Hyskeir from 19th to 21st December.

HOUSE-SPARROW, *Passer domesticus domesticus*.—A small flock passed the Isle of May on 16th May.

TREE-SPARROW, *Passer montanus montanus*.—A flock of thirty was seen at Liberton on 29th March. On 16th May two arrived on the Isle of May, forty there on 19th, and fifty on 21st May, but by 22nd May only six remained. One was on the Bass on 8th October and "a number" near Selkirk on 22nd November.

CORN-BUNTING, *Emberiza calandra calandra*.—Small numbers were recorded at Fair Isle on 13th January and 2nd March, and one at Ailsa on 14th and 21st May. At Fair Isle again on 21st September and in November and December; one was found dead at Inverurie (Central Aberdeenshire) on 18th October, and one was on Hyskeir on 21st November.

YELLOW-BUNTING, *Emberiza citrinella citrinella*.—Single birds were noted at Ailsa on 25th February and Fair Isle on 18th March; a flock of twenty-one at Corsemalzie on 3rd April, two at Fair Isle on 8th April and one there on 20th April. From 22nd October to 19th December small numbers were noted at Fair Isle and on 20th November and 14th December on Ailsa, while a flock of fifty were seen at Glasserton (Wigtownshire) on 25th November.

ORTOLAN-BUNTING, *Emberiza hortulana*.—See p. 72.

RUSTIC-BUNTING, *Emberiza rustica*.—See p. 72.

LITTLE-BUNTING, *Emberiza pusilla*.—See p. 72.

REED-BUNTING, *Emberiza schœnichus schœnichus*.—Arrivals were reported at West Ferry (Forfarshire) on 22nd March and Duns on 23rd April, and a few were at Fair Isle on 7th May and one there on 11th May. One or two were seen about Buddonness in September, one at the Isle of May on 20th September, one at Fair Isle on 3rd November and two there on 6th November.

LAPLAND-BUNTING, *Calcarius lapponicus lapponicus*.—See p. 72.

SNOW-BUNTING, *Plectrophenax nivalis*.—Last seen Hyskeir on 27th March and Ailsa on 25th April. First reported on Fair Isle on 1st September, Hyskeir and the Isle of May on 20th September, and Aberlady on 1st October; thereafter a good deal of immigration was noted up to 19th November. This species took part in the big weather movement of 14th to 22nd December.

SHORT-TOED LARK, *Calandrella brachydactyla brachydactyla*.—See p. 72.

WOOD-LARK, *Lullula arborea arborea*.—See p. 72.

SKYLARK, *Alauda arvensis arvensis*.—During the first three months of the year and up to 12th April a good deal of movement was noted at Ailsa, Hyskeir, the Bass, and the Bell Rock, while on 27th March Skylarks were coming in from the east at Balcomie (E. Fife). Three were at the Bell lantern on 4th May, some at Ailsa on 7th, and single birds at the Isle of May on 13th, 14th, and 16th May.

During September much passage, chiefly to south or south-west, was recorded from Dunfermline, Buddonness, Mochrum, Largo, Arbroath, Bell Rock, and Isle of May, the Bass, and Hyskeir, and in October and November lesser movements chiefly from our lighthouse stations. A big weather movement was recorded from 14th to 22nd December at Hyskeir, Ailsa, Bell Rock, and Largo.

SHORE-LARK, *Eremophila alpestris flava*.—See p. 72.

TREE-PIBIT, *Anthus trivialis trivialis*.—First recorded from Halmyre (Peeblesshire) on 20th April, Scone on 25th, and Loch Goil on 30th April: thereafter up to 17th May a good deal of arrival was noted. Passage migrants visited Fair Isle on 7th, 8th and 9th May. Last seen Tummel Bridge on 12th August, Hyskeir on 3rd and 5th September, and Fair Isle 21st to 26th September.

MEADOW-PIBIT.—*Anthus pratensis*.—On 28th February fifteen together were seen at Corsemalzie, arrivals at Balcomie (E. Fife) on 12th March and Hyskeir on 19th and 27th March. During April a good deal of movement was reported and single birds at Hyskeir on 13th, 25th and 27th May. From 18th August to 30th September much departure took place, this being chiefly noted from stations in Southern Scotland and Hyskeir.

PETCHORA PIPIT, *Anthus gustavi*.—See p. 71.

BLUE-HEADED WAGTAIL, *Motacilla flava flava*.—See p. 72.

GREY-HEADED WAGTAIL, *Motacilla flava thunbergi*.—See p. 72.

BLACK-HEADED WAGTAIL, *Motacilla flava feldegg*.—See p. 71.

YELLOW WAGTAIL, *Motacilla flava rayi*.—Was first noted at Cambuslang on 26th April, Hareshawmuir next day (3.122), Rutherglen and Muirend on 28th April. Two visited Ailsa on 8th and 10th May. On 14th September three were seen near Westbarns (E. Lothian), a pair near Troon next day and a few at Alticig (Wigtownshire) on 24th September.

GREY WAGTAIL, *Motacilla cinerea cinerea*.—Single birds reported at Lahill on 6th January and Largo Bay on 1st February, a pair at Loch Ryan on 28th March, one at Fair Isle on 9th April, arrivals at Hareshawmuir on 9th and 14th April, and a female on the Isle of May on 17th May. Autumn movement was noted from 24th August to 29th September, and single birds at Fair Isle, Largo, and Monreith in November, and Oban on 2nd December.

WHITE WAGTAIL, *Motacilla alba alba*.—Passage was first reported from Hyskeir on 3rd, and Vallay (O.H.) on 7th April, and thereafter from western stations and Fair Isle up to 26th May. By 8th August return movement was noted at Fair Isle, and White Wagtails were on passage there till 30th September, as well as at stations on both east and west coasts. On 11th October a male was reported at St. Abbs, passage along the shore at Arbroath next day, and single birds at Hyskeir on 19th October and 19th November.

PIED WAGTAIL, *Motacilla alba lugubris*.—From 18th February throughout March returns to breeding quarters were reported from many parts of Scotland. Pied Wagtails were noted on Fair Isle on 3rd, 7th and 27th April, and “a number” on Ailsa on 29th April. From 29th August to 30th September a lot of movement took place; two Pied Wagtails visited the Bass on 13th October, and “parties” were passing Largo on 21st October. Single birds were noted on 29th November at Lahill, 4th December at Ailsa, 18th and 24th December at Largo.

CRESTED TITMOUSE, *Parus cristatus subsp.?*—See p. 72.

GOLDCREST, *Regulus regulus*.—What were probably movements of the typical *R. r. regulus* took place at Fair Isle on 7th April and 18th to 23rd October. Considerable migration was reported from 26th August to 6th October from the Isle of May, Buddonness,

and the Bass, probably referable to our *R. r. anglorum*, as may be one at the Ailsa lantern on 10th November.

GREAT GREY SHRIKE, *Lanius excubitor excubitor*.—One was found hurt at Hunthall, Fogo Parish, on 1st April.

RED-BACKED SHRIKE, *Lanius collurio collurio*.—Single birds visited Fair Isle on 9th and 22nd May and two males and a female were on the Isle of May on 20th May.

WAXWING, *Bombycilla garrulus*.—See p. 72.

SPOTTED FLYCATCHER, *Muscicapa striata striata*.—First recorded from Duns on 4th May, Corsemalzie on 9th, and Scone on 12th May. Subsequent arrivals were noted up to 26th May. By 26th July autumn movement through the country had begun and continued throughout August. Last seen Largo on 7th September, West Ferry on 9th, and Corsemalzie on 26th September.

PIED FLYCATCHER, *Muscicapa hypoleuca hypoleuca*.—Single birds were noted at Aberfeldy in May, Duns on 3rd May, Isle of May on 8th, 19th, 20th (2) May, Fair Isle on 9th and 11th May, and Loch Ken (Kirkcudbright) on 18th June. In autumn, Fair Isle records came on 24th August, 9th to 11th September and 17th to 20th September, and the Isle of May records one on 18th September.

RED-BREASTED FLYCATCHER, *Muscicapa parva parva*.—See p. 72.

CHIFFCHAFF, *Phylloscopus collybita collybita*.—Arrivals were reported on 6th April at Bowhill House (Selkirkshire) and Corsemalzie, on 13th April at Gourock and Dundonald, and 17th April at Loch Fad.

SCANDINAVIAN CHIFFCHAFF, *Phylloscopus collybita abietinus*.—Chiffchaffs at Fair Isle on 24th September, 20th to 26th October, 3rd and 9th November doubtless belonged to this race.

WILLOW-WARBLE, *Phylloscopus trochilus trochilus*.—First noted at Corsemalzie on 9th April, West Foulden (Berwickshire) on 15th, Selkirk and Halmyre (Peeblesshire) on 19th April. After this much immigration is reported, till by 5th May most of our breeding birds seem to have arrived. Passage is recorded at the Isle of May and Fair Isle from 7th to 27th May, at the Bell Rock on 20th and Ailsa on 21st May. By 27th July autumn movement had begun and departures continued up to mid-September, the last mainland record being at West Ferry on 23rd September. Passage migrants

are noted at Fair Isle from 21st August to 26th September, Isle of May to 30th September, and Fair Isle from 18th to 26th October and on 4th November: some of these may have been the northern *Ph. t. eversmanni*.

WOOD WARBLER, *Phylloscopus sibilatrix sibilatrix*.—Arrivals are reported at Corsemalzie on 28th April, Darvel on 6th May, Craigallian (Stirlingshire), Selkirk and Tynninghame on 9th and Isle of May on 19th May.

YELLOW-BROWED WARBLER, *Phylloscopus humei præmium*.—See p. 73.

GRASSHOPPER WARBLER, *Locustella naevia naevia*.—The only record for the year is from Beith on 9th May.

LANCEOLATED WARBLER, *Locustella lanceolata*.—See p. 73.

JERDON'S REED-WARBLER, *Acrocephalus agricola*.—See p. 71.

SEDGE-WARBLER, *Acrocephalus schænobænus*.—First recorded from Possil Marsh and Summerston (Clyde) on 3rd May, Muirend next day, Tynninghame and Hareshawmuir (3. 122) on 7th May: after this arrivals at breeding sites are noted to 17th May. A passage migrant visited Fair Isle on 6th May, passage is reported from the Isle of May from 7th to 20th May, and a female on Hyskeir on 20th May. Last seen in autumn at West Ferry (Forfarshire) on 8th September, Ravenstone Loch (Wigtownshire) on 12th and Loch Elrig on 14th September.

ICTERINE WARBLER, *Hippolais icterina*.—See p. 73.

GARDEN-WARBLER, *Sylvia borin*.—Arrivals were noted on 10th May at Selkirk, 14th at Isle of May, and 15th May at Pollok (Clyde). After this there were a good many records of arrival of our breeding birds up to 23rd May. Two Garden Warblers visited the Bass on 8th September, passage migrants were on Fair Isle from 15th to 26th September, and Hyskeir on 23rd and 24th October.

BLACKCAP, *Sylvia atricapilla atricapilla*.—An arrival was reported at Duns on 17th May. Passage migration took place at Fair Isle between 4th and 11th May, and one was at Vallay (O.H.) on 20th June. Return passage was noted at Fair Isle on 24th August and 17th to 25th September, and at the Isle of May on 18th September.

WHITETHROAT, *Sylvia communis communis*.—First recorded from Elrig Glen (Wigtownshire) on 21st April, Bardowie, and Giffnock (Clyde) on 3rd May. Thereafter the spread was rapid till by 17th May the bulk of the breeding birds had reached their summer quarters. Passage migrants were noted at Fair Isle from 5th to 22nd May, and Whitethroats at the Isle of May during the same period, and the Bell lantern on 6th May, may also have been passage migrants. By 14th August movement south was reported: last seen, Largo 12th September, Halmyre (Peeblesshire) next day, the Isle of May on 27th September and Fair Isle on 28th September.

LESSER WHITETHROAT, *Sylvia curruca curruca*.—Small numbers were recorded at Fair Isle from 6th to 9th May and the Isle of May from 8th to 10th May. In autumn frequently noted at Fair Isle between 10th September and 9th October, and on the Isle of May from 18th to 20th September.

SIBERIAN LESSER WHITETHROAT, *Sylvia curruca affinis*.—See p. 73.

FIELDFARE, *Turdus pilaris*.—Movement of Fieldfares "passing east all day" was recorded in East Fife in 17th March, and from this time onwards much departure took place. Last seen at Halmyre (Peeblesshire) on 11th May, Hareshawmuir next day, Balsarroch (Wigtownshire) on 14th, and the Isle of May on 20th May. Extraordinarily early records of return came from Forfarshire on 10th August and Kirkcaldy on 30th August, but the regular movement did not set in till 28th September, when four appeared on the Isle of May. After this there were steady notes of arrival throughout October and up to 21st November. A weather movement was reported from 20th to 24th December.

MISTLE-THRUSH, *Turdus viscivorus viscivorus*.—Two were at the Hyskeir lantern early on 16th March. Flocking was noted in August, movement to the west at West Ferry on 25th September and Buddonness on 30th September, and single birds on the Isle of May on 24th, 27/28th (L.) and 28th September and 2nd October.

CONTINENTAL SONG-THRUSH, *Turdus philomelus philomelus*.—One was at Hyskeir on 23rd January, and a great arrival at Lahill on 19th February which passed on quickly may have been of this race, and two Continental birds were noted there on 8th March. From 7th to 10th May one or two of the typical form were on the Isle of May. By 11th September return movement had begun at Fair Isle, and a bird of this race was shot and others seen at

Hareshawmuir (Ayrshire) on 17th September (3. 44). After this arrivals were recorded up to 8th November, and this form took part in the weather movements of 14th to 24th December.

BRITISH SONG-THRUSH, *Turdus philomelus clarkei*.—From 25th January to 17th March returns of our native breeding birds to nesting quarters were reported, and some movement at our southern lanterns probably refers to this sub-species, while British Song-Thrushes visited Hyskeir off and on to 13th April. By 3rd September movement was apparent and was recorded steadily up to 25th October from southern lanterns and mainland stations, as well as Hyskeir. A big weather movement was noted between 14th and 28th December.

REDWING, *Turdus musicus*.—A lot of Redwing movement was recorded from many parts of Scotland during March and the first week of April. Last seen Gilston (E. Fife) on 10th April and Fair Isle on 9th May. The first autumn records came from Fair Isle on 11th September, Isle of May on 28th, and many at Halmyre (Peeblesshire) on 30th September. After this a big arrival took place, lasting up to 14th November and reported from many stations. A distinct weather movement was noted between 18th and 29th December.

RING-OUZEL, *Turdus torquatus torquatus*.—Arrivals were noted in the Greenock Hills on 20th April and Selkirkshire on 26th April. Ring-Ouzels were at Fair Isle on 7th May and the Isle of May from 8th to 10th May, and again on 18th September on the Isle of May, and Fair Isle on 22nd September and 20th to 23rd October. A late bird was seen at Grange Wood, Berwickshire, on 16th November.

BLACKBIRD, *Turdus merula merula*.—From 13th March to 15th April some movement of Blackbirds was recorded from Hyskeir (and L.), Ailsa L., the Bell Rock, the Bass and Fair Isle. In autumn many records came from 17th October to 29th November of movement at Fair Isle, Largo, Bell Rock, Hyskeir and Ailsa. Blackbirds took part in the weather movement of 14th to 24th December.

WHEATEAR, *Ænanthe ænanthe ænanthe*.—First recorded from Luce Bay on 29th March, Hyskeir on 3rd April, Halmyre (Peeblesshire) on 4th and Kilmacolm on 5th April. After this much arrival took place throughout April, and Wheatears were passing the Isle of May up to 14th May. Autumn movement was

noted at the Bell Rock as early as 5th July, and throughout August and September many records came of the southward trek. Last seen, Isle of May on 2nd October and Hyskeir on 24th October.

GREENLAND WHEATEAR, *Ænanthe ænanthe leucorrhœa*.—Northward passage of this race was noted from Hyskeir and the Isle of May from 7th to 21st May, three on Corsewall shore on 15th May and two at Elie (E. Fife) on 17th May. Return passage was reported from 16th to 30th September from Buddonness (Forfarshire), Hyskeir, and the Isle of May, and the last for the season at Hyskeir on 22nd October.

WHINCHAT, *Saxicola rubetra rubetra*.—April records came from Mochrum (♀) on 21st and Loch Goil on 30th, Lauder on 1st May and Bardowie on 3rd May, with further notes of arrival at breeding places up to 10th May. Whinchats were passing the Isle of May up to 20th May, Hyskeir to 25th, and Fair Isle to 27th May. Southward movement was evident by 29th July and continued steadily through August and the first half of September. Last seen, Darvel on 16th September, Isle of May on 20th, and Fair Isle on 24th September.

BRITISH STONECHAT, *Saxicola torquata hibernans*.—A pair were on Fair Isle on 9th April and one on Ailsa 5th and 7th May. Southward movement was noted during September, two at Fair Isle on 28th October, two near Lochmaddy on 27th November, and three at another locality in this neighbourhood on 28th November.

REDSTART, *Phœnicurus phœnicurus phœnicurus*.—A very early arrival was noted at Fair Isle on 8th April: further notes came from Duns on 22nd and Strathblane on 29th April and thereafter from other breeding places. Passing the Isle of May up to 15th May, Hyskeir to 20th and Fair Isle to 27th May. By 25th July southward movement was going on and records of this came up to mid-September; from 17th to 22nd September and 20th to 23rd October several were on Fair Isle and a very late bird there on 3rd November.

BLACK REDSTART, *Phœnicurus ochrurus gibraltariensis*.—See p. 73.

NORWEGIAN BLUETHROAT, *Luscinia svecica gætkei*.—See p. 73.

CONTINENTAL ROBIN, *Erithacus rubecula rubecula*.—This race was noted at Buddonness on 3rd April and Fair Isle on

8th April. Return movement took place at the latter station from 22nd September at intervals to 8th November, "many" being there from 20th to 23rd October and 3rd to 8th November.

BRITISH ROBIN, *Erithacus rubecula melophilus*.—On 8th, 10th, and 14th May a British Robin was seen on the Isle of May and return movement was noted at the same station from 18th September to 2nd October. The sub-species of the following is not noted, one at the Bell Rock on 31st March, Hyskeir on 2nd April; a few at Ailsa on 24th September and 19th October; some at the lantern there on 10th November and many at the same station on 19th December.

HEDGE-SPARROW, *Prunella modularis* sub-sp.?—One, was on Hyskeir on 24th May, a few on Ailsa on 24th September and on the Isle of May from 27th September to 2nd October. From 14th October to 16th November a few were on Hyskeir and one or two, no doubt of the typical form, on Fair Isle from 12th to 14th November.

WREN, *Troglodytes troglodytes troglodytes*.—One or two were reported on Ailsa on 24th September and the Isle of May from 29th September to 2nd October. Hyskeir was visited by Wrens, probably this race, from 18th to 24th October, 16th and 17th November and 19th December.

SWALLOW, *Hirundo rustica rustica*.—Early records came from Possil Marsh on 11th April, Kilmacolm on 13th, Darvel, Capenoch and St Andrews on 15th April. After this there were many notes of arrival at breeding places all over Scotland up to 7th May. Swallows were passing the Isle of May up to 21st May, Fair Isle to 7th June, and Hyskeir to 17th June. Throughout August and September much movement and many departures were reported; last seen, Johnstone on 4th October, Selkirk on 5th, Edinburgh on 8th, Largo on 20th and Elie on 23rd October, while a very late bird was seen at Balchrystie, near Colinsburgh (E. Fife) on 13th November.

HOUSE-MARTIN, *Delichon urbica urbica*.—First noted at Kilmacolm on 13th and Edinton (Berwickshire) on 17th April; numbers at Tynninghame on 24th and Hareshawmuir the same day (3. 122). Arrivals at breeding sites continued to be reported up to 17th May. Passing the Isle of May between 10th and 21st May, two at Ailsa on 20th and several at Fair Isle on 26th May. Autumn movement was reported as early as 16th August, and from this time to 9th October many records came of movement

and departures. Last seen, Largo on 19th October, Barr (Ayrshire) on 21st October, and near Carterhaugh (Selkirk) on 8th November.

SAND-MARTIN, *Riparia riparia riparia*.—An early note came from Darvel on 5th April, but the main arrival fell between 17th April (St Boswells and East Linton) and 8th May by which time most of our breeding birds seem to have been in. A few were reported from Fair Isle from 5th to 11th May and Sand-Martins were passing the Isle of May up to 17th May. Departures took place in August and early September, last seen West Ferry on 5th September, Largo on 11th September, and Fair Isle (2) on 18th October.

SWIFT, *Apus apus apus*.—First reported at St Boswells on 27th April, Duddingston on 3rd May, Selkirk and the Bell Rock next day, and our breeding birds seem to have arrived by 17th May. Much departure was recorded during the second half of July and August; last seen, Scone on 4th September, Fair Isle on 12th, Duddingston on 13th, and Isle of May on 17th September, while a very late straggler was noted at Arisaig on 9th November.

NIGHTJAR, *Caprimulgus europæus europæus*.—Reported from Kilchattan Bay (Bute) on 30th April, Elrig (Wigtownshire) on 15th May, and Kilmacolm on 25th May. Last recorded at Corsemalzie on 15th September.

HOOPOE, *Upupa epops epops*.—See p. 73.

ROLLER, *Coracias garrulus garrulus*.—See p. 73.

GREEN WOODPECKER, *Picus viridis virescens*.—See p. 73.

WRYNECK, *Jynx torquilla torquilla*.—The only one recorded was at Fair Isle on 8th May.

CUCKOO, *Cuculus canorus canorus*.—First noted at Capenoch on 20th April, Kilmacolm on 23rd, West Foulden (Berwickshire) next day, Cardross on 25th, and Contin (Ross-shire) on 26th April. Thereafter much immigration up to 12th May. The last adult recorded was from Hareshawmuir on 28th July, and the last young bird from Newtonmore on 19th August.

LITTLE OWL, *Athene noctua vidalii*.—See p. 73.

SHORT-EARED OWL, *Asio flammeus flammeus*.—One was on the Isle of May on 19th and 20th May, and single birds were reported from Balkissock (Ballantrae) on 19th August, Isle of May on 28th September, Corsemalzie on 14th October, Hyskeir on 1st November, and Fair Isle next day.

MERLIN, *Falco columbarius aesalon*.—Single birds were noted at Fair Isle on 6th April and 19th May, Hyskeir from 8th to 10th April and on 14th May, and Hareshawmuir on 24th April. About 12th August one visited the Isle of May, and single birds again visited Fair Isle on 5th and 7th September, and Hyskeir on 17th and 29th October and 11th November.

KESTREL, *Falco tinnunculus tinnunculus*.—Single birds were on the Isle of May on 9th May and from 18th to 24th September, and two were on Ailsa on 21st December.

GOLDEN EAGLE, *Aquila chrysaetos chrysaetos*.—One was seen at Langass (North Uist) on 22nd September.

ROUGH-LEGGED BUZZARD, *Buteo lagopus lagopus*.—A bird of this species was on Fair Isle on 12th and 14th September.

COMMON BUZZARD, *Buteo buteo buteo*.—Single birds were seen near Colinsburgh on 25th August, Lahill on 9th October, and Elie on 10th October, and a pair at Dowalton (Wigtownshire) on 21st November.

MONTAGU'S HARRIER, *Circus pygargus*.—See p. 73.

HEN HARRIER, *Circus cyaneus cyaneus*.—A male was seen near Lauder in autumn, and one at Vallay (O.H.) on 3rd September and 12th October.

HERON, *Ardea cinerea cinerea*.—One at Ailsa on 20th May, and one or two at Fair Isle and Hyskeir periodically between 8th August and 14th October.

BITTERN, *Botaurus stellaris stellaris*.—See p. 73. One at Shambellie, Kirkcudbright, 7th December.¹

WHOOPEE SWAN, *Cygnus cygnus*.—There were a good many records of Whoopers during the first three months of the year; last seen, Castle Semple Loch on 2nd April, Inverkeilor (Forfarshire) on 14th, and near Kingussie on 27th April. Arrivals were reported at Fair Isle on 3rd October, Castle Semple Loch on 19th October, and East Fife on 5th November. Thereafter a good many were noted to the end of the year.

BEWICK'S SWAN, *Cygnus bewickii bewickii*.—On 5th January four passed over Oban Bay, seven were on Castle Loch, Mochrum, on 24th February, eight near Selkirk on 20th March, and a male

¹ This note arrived too late for inclusion on p. 73.

at Fair Isle on 17th April. The only autumn record was of three at Hyskeir on 9th November.

GREY-LAG GOOSE, *Anser anser*.—This species was reported going down the River Dee (Kirkcudbrightshire) from 27th July on. A flock at Luce Bay on 24th September, several hundreds at Mugdrum Island (Tay) on 20th October, one shot at Fair Isle on 28th October, and enormous flocks in Luce Bay during the first week of November.

Much movement of "Grey Geese" was reported from early March to mid-May, and twenty-five "Wild Geese" on the Lake of Menteith on 27th May. During October there were many notes of return to our land.

WHITE-FRONTED GOOSE, *Anser albifrons*.—Two flocks were seen at Vallay (O.H.) on 2nd January and nine on Loch Lennons (Wigtownshire) on 22nd March.

BEAN-GOOSE, *Anser fabalis fabalis*.—Five Bean-Geese were on Quhillart Moor, Corsemalzie, on 13th January, eight on North Uist on 28th February and one on the shore of the Tay opposite Mugdrum Island on 11th March. Seen at Hareshawmuir (Ayrshire) on 23rd September (3. 123) and 9th October, and seven at Mugdrum Island on 20th October.

BARNACLE-GOOSE, *Branta leucopsis*.—Many Barnacles were about Vallay all April, last seen at Hyskeir on 8th April and the Treshnish Islands on 10th May. Three were seen at Buddonness (Forfarshire) on 25th September, "settled" at Vallay on 19th October, and small numbers visited Hyskeir on 8th November and 19th December.

BRENT-GOOSE, *Branta bernicla bernicla*.—Nine were at Vallay (O.H.) on 18th January and one at Fair Isle on 8th May. Return movement was reported at Vallay on 23rd October and one was shot on Fair Isle next day.

SHELD-DUCK, *Tadorna tadorna*.—Flocks were seen in Luce Bay on 14th and 29th May, and a Sheld-Duck on Loch Shalloch (Ayrshire) on 22nd May.

MALLARD, *Anas platyrhynchos platyrhynchos*.—Flocks were still in the sea off Buddonness on 24th March and many Mallard were on the marshes below Balavil (Kingussie) on 27th April. From 12th September to the end of October much movement was noted from all parts of Scotland.

TEAL, *Anas crecca crecca*.—Many were on the Balavil marshes on 27th April and three at Fair Isle on 6th and 7th May. Autumn movement was noted in Largo Bay as early as 14th August, and thereafter a good deal was recorded from Fair Isle, Isle of May, East Fife, and Hareshawmuir up to the end of October.

GARGANEY, *Anas querquedula*.—See p. 73.

WIGEON, *Anas penelope*.—On 27th April a big pack and a good many pairs were seen on the marshes below Balavil, three on the Castle Loch, Mochrum, on 29th April and a pair at Bowhill (Selkirkshire) on 3rd May. Arrivals were reported at Fair Isle on 17th August, Vallay on 20th August, and Hareshawmuir on 7th September, and much movement was recorded up to 6th November.

PINTAIL, *Anas acuta acuta*.—A pair were on Loch Chesney on 15th January, a male on Duddingston Loch on 18th and 31st January (i. 1926. 25), and three on Bardowie Loch on 11th February. A few were at Fair Isle on 13th and 17th October and five on River Eden (Fife) on 29th October.

SHOVELER, *Spatula clypeata*.—At Duddingston Loch, Shovelers were seen up to 12th April and three at Torrs Sandhills (Wigtownshire) on 29th May. Numbers on Castle Semple Loch on 8th October, two at Glenorchard on 26th October, and several at Dowalton Swamp (Wigtownshire) on 14th December.

RED-CRESTED POCHARD, *Netta rufina*.—See p. 73.

COMMON POCHARD, *Nyroca ferina ferina*.—Arrivals were noted at Moncrieffe Loch, Perthshire, on 13th February and about eighty at Kilmacolm on 22nd February. Returns were reported at Castle Semple Loch on 19th October, Kilmacolm on 10th November, and Duns Castle Loch on 15th November.

TUFTED DUCK, *Nyroca fuligula*.—Arrivals at Moncrieffe Loch were reported on 13th February and a good deal of movement of small numbers steadily up to 17th April. Autumn movement was recorded from 9th October to 18th November.

SCAUP, *Nyroca marila marila*.—One or two Scaup were reported on Duddingston Loch on 25th and 31st January (i. 1926. 25) 1st and 8th February. One was shot at Fair Isle on 10th October, a small flock was seen at St Andrews on 29th October, many on Luce Sands on 6th November and 27 on Monreith Lake on 18th November.

GOLDEN-EYE, *Bucephala clangula clangula*.—Last recorded Castle Loch, Mochrum, on 22nd April, Vally (O.H.) on 19th May, and an immature bird at Cullalo Loch, Fife, on 30th June. Arrivals were noted at Buddonness on 14th September, Fair Isle on 21st October, and Duns Castle Loch on 25th October.

LONG-TAILED DUCK, *Clangula hyemalis*.—Very large flocks were seen at Balcomie (E. Fife) on 27th March and 14th April—last seen St Andrews 9th May. Autumn arrivals were recorded at the Isle of May on 29th September, Fair Isle on 19th October, and Vally on 5th November.

COMMON SCOTER, *Oidemia nigra nigra*.—Seen off the Wigtownshire coast up to 14th May. Six were off Carnoustie on 2nd August and large numbers were noted from mid-October onwards.

VELVET SCOTER, *Oidemia fusca fusca*.—Seen off Longniddry on 10th April. A great many in Largo Bay on 21st October and enormous numbers in St Andrews Bay about the same time.

GOOSANDER, *Mergus merganser merganser*.—Two on Bardowie Loch on 11th February, a female on Kilconquhar Loch (E. Fife) on 7th March, and a pair on the Lyne (Peeblesshire) on 20th March. A dozen were in the sea off Buddonness on 16th September, five on Castle Loch, Mochrum, on 24th December, and three on the River Dee (Kirkcudbrightshire), on 29th December.

RED-BREASTED MERGANSER, *Mergus serrator*.—One was at Hyskeir on 8th April, four on Fair Isle on 20th April, and six adult pairs on Loch Ryan on 14th May. Had returned to Buddonness by 8th September, Fair Isle on 9th, and Hyskeir on 20th September, while on 21st October great numbers were in Largo Bay.

SMEW, *Mergus albellus*.—See p. 73.

CORMORANT, *Phalacrocorax carbo carbo*.—One was on the Lake of Menteith on 10th May, and on the same day a Cormorant was flying round Threipmuir Reservoir in very heavy mist. An immature bird visited a loch at Hareshawmuir on 8th September, "the second noted here" (3. 84).

STORM PETREL, *Hydrobates pelagicus*.—Single birds were recorded from the Bass lantern on 25th September and the Bell Rock on 9th December.

MANX SHEARWATER, *Puffinus puffinus puffinus*.—Three were off the Isle of May on 21st May. About a dozen visited the

Hyskeir lantern early on 19th August, and the next two nights a rush to this lantern took place, "hundreds" being noted between 9 P.M. and 12 on 20th August. There were hundreds of Manx Shearwaters in the Firth of Forth on 17th September.

GREAT CRESTED GREBE, *Podiceps cristatus cristatus*.—Reported in the sea off our coasts up to 24th April, but returns to breeding lochs were noted in March and up to the beginning of May. Had begun to frequent the sea again by 26th August.

SLAVONIAN GREBE, *Podiceps auritus*.—One was in Loch Ryan (Wigtownshire), on 28th March, two in Largo Bay on 21st October, and one off Broughty Ferry on 30th December.

RED-NECKED GREBE, *Podiceps griseigena griseigena*.—See p. 73.

GREAT NORTHERN DIVER, *Colymbus immer*.—Last seen off Vallay on 24th April, "many still in the Firth of Lorn and Sound of Mull" on 10th May, and one in Luce Bay on 14th May. One was seen in Largo Bay on 23rd October.

BLACK-THROATED DIVER, *Colymbus arcticus arcticus*.—Several in winter plumage and one in breeding dress were off the East Neuk of Fife on 27th March and one at Corsewall on 15th May. One off Fidra on 17th September, and two on the Dunfermline Town Loch on 6th December (I. 1925. 168).

RED-THROATED DIVER, *Colymbus stellatus*.—Last seen Firth of Forth on 14th April. Two were on Loch Shalloch (Ayrshire) on 21st July, and one at Buddonness on 30th September.

WOOD PIGEON, *Columba palumbus palumbus*.—A "huge flock" was seen at Balchrystie (E. Fife), on 1st April, and one or two Wood Pigeons on the Isle of May on 12th, 16th, 18th, and 22nd May. On 24th September one visited Fair Isle, there were a lot of very immature birds at Derrie in the woods on 8th October, and between 22nd October and 20th November big arrivals were recorded from Ayrshire, Berwickshire, Fife, and Wigtownshire.

STOCK-DOVE, *Columba ænas*.—A Stock-Dove was on Fair Isle on 7th April, and many appeared in the fields about Largo on 14th December but passed on at once (I. 1926. 6).

TURTLE-DOVE, *Streptopelia turtur turtur*.—A male visited Hyskeir on 22nd May, and in early June one was seen several times in Mull, while two were on Fair Isle on 7th June. One was noted near Coldstream on 10th September and a bird of the year at Golspie (Sutherland) on 26th September.

OYSTERCATCHER, *Hematopus ostralegus ostralegus*. — Notes of passage to inland breeding grounds came from 19th February onwards and records of arrival at these during March. A flock of 32 at Loch Ryan on 14th May. Shoreward movement was reported from 13th July to 20th August, twenty were at the Hyskeir lantern from 9 P.M. to 12 on 20th August, and Oystercatchers were passing the Isle of May from 3 to 5 A.M. on 21st September. Huge flocks were seen at St Andrews on 29th October.

RINGED PLOVER, *Charadrius hiaticula hiaticula*. — A few arrived on Fair Isle on 25th February, and this species was "going north all day" at St Andrews on 28th February. On 14th May a flock of eleven was seen at Loch Ryan, seven or eight were at Hyskeir lantern late on 20th August, and this Plover was in the rays at the Isle of May lantern on 17/18th September.

GOLDEN PLOVER, *Charadrius apricarius*. — Returns to breeding grounds of our Southern Golden Plover (*Ch. a. apricarius*) were recorded during February and three at the Hyskeir lantern early on 16th March may have belonged to this race. During April a good deal of movement was recorded from the Outer Hebrides and Fair Isle, probably emigration of the Northern form (*Ch. a. altifrons*), and a flock of 80 going north at Hareshawmuir on 12th April probably belonged to this sub-species. By 15th July our own birds were moving through the country, and in August immigration from overseas seems to have begun; thereafter much movement was reported up to 13th November, but it is not possible to say to which race it should be referred. A weather movement took place from 15th to 28th December.

GREY PLOVER, *Squatarola squatarola squatarola*. — Four were seen near Troon on 15th September and single birds at Buddonness on 21st September and 2nd October, Largo Bay on 9th and 12th (2) November, and Monifieth Bay on 15th December.

LAPWING, *Vanellus vanellus*. — A certain number of Lapwings were recorded during January in localities where they are usually summer visitors. Returns of breeding birds were reported from mid-February to 26th March, a good many notes from Hyskeir during March, and a few at Fair Isle up to 6th April. Late migrants occurred on Fair Isle on 9th and 27th May and 29th June, and on Hyskeir on 22nd and 23rd May and 30th June. In the south of Scotland flocking had begun by 4th June. Local movements were recorded during July, but the main movement fell

between 18th September and 29th October, and was noted at both island and mainland stations. A pronounced weather movement took place between 14th and 28th December.

TURNSTONE, *Arenaria interpres interpres*.—Recorded commonly on our coasts till mid-May, most left Hyskeir on 23rd May, but stragglers were noted there to 7th July, and Turnstones were reported at Fair Isle on 15th July, East Fife on 25th July, and Hyskeir (200 to 300) on 7th August.

RUFF, *Philomachus pugnax*.—Single birds were reported at Baleshare Island (O.H.) on 25th August and Fair Isle on 9th September.

SANDERLING, *Crocethia alba*.—Flocks were reported on Luce Sands on 23rd April and 29th May, East Lothian on 6th August, Fair Isle on 19th August, Buddonness on 21st September, and River Eden (Fife) on 29th October.

KNOT, *Calidris canutus canutus*.—This species was recorded at Balcomie (E. Fife) on 27th July, East Lothian (14) on 6th August, and Fair Isle on 4th September, and there were many other notes of arrival during September.

DUNLIN, *Calidris alpina*.—A flock of 300 in winter plumage were seen in Aberlady Bay on 11th April, and returns to breeding grounds of *C. a. schinzii* were reported during the latter half of that month. A few were noted at Fair Isle till 11th May, and Hyskeir till 3rd June, and a flock of eleven on Luce Sands on 29th May. From 2nd July to 2nd December there were constant notes from our island stations of small numbers of Dunlin on the move.

CURLEW SANDPIPER, *Calidris testacea*.—The only record was of a single bird at Fair Isle on 4th September.

LITTLE STINT, *Calidris minuta*.—One appeared at Vallay (O.H.) on 11th June.

PURPLE SANDPIPER, *Calidris maritima maritima*.—Last seen Corsewall on 15th May, Isle of May on 17th May, and Hyskeir on 5th June. Returns took place at Hyskeir on 7th August, the Bell Rock on 9th September and Fair Isle on 30th September.

COMMON SANDPIPER, *Tringa hypoleuca*.—Arrivals were recorded at Eaglesham on 10th April, Stobo (Peeblesshire), and Lake of Menteith next day, Corsemalzie on 15th, and Contin (Ross-shire) on 17th April. Thereafter there were notes of arrival up to 1st May and of what were probably passage migrants at Fair Isle, Isle of

May, and Ailsa. Southward movement was apparent by 18th July, last seen, East Fife, Tummel Bridge, and Hyskeir on 17th August and Fair Isle on 24th August.

WOOD SANDPIPER, *Tringa glareola*.—See p. 74.

GREEN SANDPIPER, *Tringa ochropus*.—See p. 74.

GREENSHANK, *Tringa nebularia*.—Single birds were seen at Buddonness on 24th March and 3rd April, in Mull in the last week of April, and two at Hyskeir on 14th May. On 2nd July three visited Hyskeir, and there were some notes of small numbers from there in August. Southward movement took place during September, and the last for the season (3) were seen at the Edenmouth on 29th October.

RED-NECKED PHALAROPE, *Phalaropus lobatus*.—Returned to one of its breeding grounds on 2nd June.

BAR-TAILED GODWIT, *Limosa lapponica lapponica*.—Last seen, East Lothian 9th May, and three "in fine plumage" on Luce Sands on 14th May. On 2nd July one was at Balcomie (E. Fife), several in East Lothian on 6th August, and about a dozen near Troon on 15th September. After this there were records from other localities.

BLACK-TAILED GODWIT, *Limosa limosa limosa*.—See p. 74.

WHIMBREL, *Numenius phaeopus phaeopus*.—First recorded from Mull on 1st May and Vallay (O.H.) on 5th May, and a good many other stations noted Whimbrel passing during this month. From 7th June one or two Whimbrel hung about Hyskeir till 20th August; several were on Fair Isle on 29th June, one at Ailsa on 17th July, and one at Balcomie (E. Fife) on 27th July. A good many notes came of movement during August; last seen Hyskeir 18th September, and Buddonness 25th September.

GREAT SNIPE, *Capella media*.—See p. 74.

SNIPE, *Capella gallinago gallinago*.—A small movement was recorded between 18th and 22nd February, and there were one or two notes from Hyskeir and Fair Isle between 19th March and 29th April. By 3rd July autumn movement was already apparent; the early movements seem to have been chiefly those of our own birds, but during September, October, and the first half of November there were also arrivals from overseas. A weather movement was noted between 21st and 26th December.

FÆRCE SNIPE, *Capella gallinago færænsis*.—One was got on Fair Isle on 23rd December (I. 1926. 4).

JACK SNIPE, *Lymnocyptes minimus*.—In February numbers were recorded in the marshes between Perth and Dundee. Last seen, Corsemalzie 10th March and Gilston (E. Fife) 10th April. Early arrivals noted were at Fair Isle on 19th and Hyskeir on 20th September, Isle of May and Killantringan lighthouse on 28th September, and further immigrations in October. They were again very numerous about the Tay Estuary in November and December, and were reported from Hyskeir and Fair Isle on 21st and 22nd December.

WOODCOCK, *Scolopax rusticola rusticola*.—Migrants visited Fair Isle on 11th April. From 14th October up to the end of the year much movement was recorded from stations all over Scotland but chiefly in the north and east, which looks like immigration from overseas.

SANDWICH TERN, *Sterna sandvicensis sandvicensis*.—First noted in Largo Bay on 5th May; last seen, Isle of May on 30th September and Buddonness on 2nd October.

COMMON TERN, *Sterna hirundo hirundo*.—First recorded on 10th May from Aberdeen and near Scone, with further arrivals to 16th May. Last seen, Isle of May on 30th September.

ARCTIC TERN, *Sterna macrura*.—Arrivals were noted at Lochmaddy on 8th May, Vallay on 10th and Hyskeir on 19th May. Last seen, Fair Isle on 4th September and Brodick Bay, Arran, "six, southward bound" on 9th September.

LITTLE TERN, *Sterna albifrons albifrons*.—Arrived Vallay (O.H.) on 16th May, and five were at the Hyskeir lantern at 4.30 A.M. on 20th August.

SABINE'S GULL, *Xema sabini*.—See p. 74.

LITTLE GULL, *Larus minutus*.—See p. 74.

SCANDINAVIAN LESSER BLACK-BACKED GULL, *Larus fuscus fuscus*.—Single birds were seen on the Isle of May on 16th, 17th, and 21st May and 22nd September.

BRITISH LESSER BLACK-BACKED GULL, *Larus fuscus affinis*.—Arrivals were noted at Glasgow Harbour on 11th March, Erskine Ferry on 17th and Newton Stewart on 20th March. On 6th December two Lesser Black-backed Gulls (sub-sp.?) were seen on the Dunfermline Town Loch.

GLAUCOUS GULL, *Larus hyperboreus*.—Single birds were reported from Hyskeir on 15th January, Cambo (E. Fife) on 23rd February, and Fair Isle on 8th April and 26th October.

ICELAND GULL, *Larus glaucoides*.—Single birds were seen on 10th and 24th January near Dalmeny (1. 1926. 22), Hyskeir on 9th February, Sound of Mull on 6th March, Isle of May on 22nd and 23rd September, and Elliot (Forfarshire) on 12th October.

POMATORHINE SKUA, *Stercorarius pomarinus*.—Three shot on Solway near Rigg of Gretna after a severe storm, 28th January.

ARCTIC SKUA, *Stercorarius parasiticus*.—A pair arrived at Vallay (O.H.) on 19th May, three were near the entrance to Loch Long (Clyde) on 28th May, and one off Ailsa on 2nd June. By 2nd July two were off the East Neuk of Fife, and there were many records from east coast stations during August and September. One at Ardnamurchan on 14th October and one at the Bell Rock on 22nd November.

BUFFON'S SKUA, *Stercorarius longicaudus*.—See p. 74.

BLACK GUILLEMOT, *Uria grylle grylle*.—Two were seen near Ailsa on 9th February, and one there on 21st April, while two visited the Isle of May on 12th May.

LITTLE AUK, *Alle alle*.—In January one was seen about Mull and three at the Bell Rock on 19th November.

SOUTHERN PUFFIN, *Fratercula arctica grabæ*.—First noted at the Bass on 27th March, numbers at Fair Isle on 11th April, first at Treshnish on 17th April and big arrivals at breeding places up to mid-May.

CORNCRAKE, *Crex crex*.—On 24th February a Corncrake was shot at Sandwick, Orkney (1. 1926. 58). Arrivals were recorded from Kincardine on Forth on 17th April, Corsemalzie on 24th and Hareshawmuir on 30th April (3. 122) and thereafter many notes came up to mid-May and on 7th June a Corncrake was on Hyskeir. Last seen at Mochrum on 1st October, Reston (Berwickshire) on 17th October and Arisaig on 8th November (*Scotsman*, 16.11.25).

WATER RAIL, *Rallus aquaticus aquaticus*.—Single birds were reported from Tayfield (N. Fife) on 6th January, Derrie (Mochrum) on 18th February, and Selkirk on 22nd February, Barr (Ayrshire) on 9th October, Fair Isle on 18th and Arbroath on 30th October, Burnmouth and the Isle of Luing (Inner Hebrides) on 17th November, Mull on 3rd December, and Fair Isle and Sandsting (Shetland) on 26th December.

QUAIL, *Coturnix coturnix coturnix*.—Single birds occurred at Lahill (E. Fife) on 8th September and Portpatrick on 10th September.

SPIDERS AS NATURAL ENEMIES OF CRANE-FLIES.

By ALEXANDER CUTHBERTSON.

(*Studies on Clyde Crane-flies.*)

THE following is a list of Spiders which have been observed by the writer to prey upon adult Crane-flies entrapped by webs spun among low undergrowth in open woodlands, and in corners and crevices of rocks and cliffs. The habits of spiders of the genus *Zilla* are here discussed in detail.

LYCOSIDÆ.

Pirata piratica (Clk.).

Lycosa palustris, L.

L. pullata (Clk.).

EPEIRIDÆ.

Meta merianæ, Scop.

M. segmentata (Clk.).

Zilla atrica, Koch.

Z. x-notata (Clk.).

Epeira diademata (Clk.).

In a recent paper on the Crane-flies of the Inner Hebrides the writer has recorded the Lycosid spiders listed above as natural enemies of some Crane-flies, including *Dicranomyia autumnalis*, Staeg., *D. didyma*, Mg., and also *Meta merianæ*, Scop., which preys upon *Trichocera regelationis*, L., *D. didyma*, Mg., *Gonomyia dentata*, de Meij., and others.

The Epeirid spiders, *Meta merianæ*, Scop., and *M. segmentata* (Clk.) as observed in the Isle of Cumbrae (Clyde), feed largely upon Crane-flies frequenting the banks of burns. The spiders spin webs under projecting ledges of rocks near burns, under bridges, and like situations. The Crane-flies found on the webs included: *Ptychoptera lacustris*, Mg., *Idioptera marmorata*, Mg., *Adelphomyia senilis*, Hal., *Dicranota bimaculata*, Schum., *Erioptera fuscipennis*, Mg., and *Tipula lateralis*, Mg.

*Observations on Spiders in Garscadden Wood,
near Drumchapel.*

The following field notes were made during the autumns of 1923-1925 at a mixed wood near Drumchapel (Glasgow district). The spiders *Zilla atrica* and *Z. x-notata* spin

webs upon low branches of trees, and among undergrowth consisting of shield fern, wood sage, umbellifers, bramble and long grass (*Aira*) especially in open parts of the wood. In mornings and early afternoons they hide under leaves of vegetation. Many visits to this locality resulted in the finding in the spiders' webs of the following Crane-flies: *Trichocera regelationis*, *T. annulata*, Mg., *Dicranomyia chorea*, Mg., *Rhipidia maculata*, Mg., *Limnophila ochracea*, Mg., *Empeda nubila*, Schum., *Molophilus appendiculatus*, Staeg., *Ormosia uncinata* (Mcq.), Meij., *Rhypholophus hæmorrhoidalis*, Ztt., *R. varius*, Mg., and *Tipula irrorata*, Mcq. (three females, probably accidental, though the abdomen of one was eaten in part).

The method of capture and feeding was observed on many occasions. Briefly, this is what usually happened. As soon as the Crane-fly struggled in the web, the waiting spider instantly dropped to the captive, "nipped" with strong chelicerae the thorax at the pleurae, and when the struggles ceased, the binding process began. This consisted in passing a number of silk strands around the bunched-up legs, and also around the folded wings and abdomen. Finally, the Crane-fly was dragged to the "den" above, or else securely fastened near by. The only two Crane-flies observed to break away from the web before the arrival of the spider were *Trichocera regelationis* and *Tipula irrorata*, leaving several legs dangling on the webs. The majority of the flies observed on webs were either newly emerged from pupae inhabiting "leaf-mould" or humus surface soil of the woods, or else ovipositing females which had been caught while fluttering among low herbage. The large numbers of wings and legs testified to the efficiency of the spider-webs.

Bilising's (1920, p. 243) description of the habits of *Epeira gigas*, Leach, agrees with the above notes on the genus *Zilla*, and the habits appear to be general in Epeiridae.

Comparison with Other Regions.

In America, Alexander (1920, p. 727) has recorded spiders of the families Lycosidae, Attidae, Thomisidae, and

Epeiridæ, as natural enemies of New World Crane-flies; while Bilsing found thirteen spiders of the families Lycosidæ, Attidæ, Agelenidæ, and Epeiridæ preying on four species of Crane-flies. The Crab-spider, *Xysticus ferox*, Htz., has been observed eating the "daddy-long-leg," *Tipula angustipennis*, Loew., by Mr J. R. Malloch.

Acknowledgments.

I am glad of this opportunity to thank Dr Randell Jackson of Chester for naming the spiders; and also to thank my friend, Mr H. Britten, F.E.S., of the University Museum, Manchester, for the kindly interest he has taken in the study.

REFERENCES.—Alexander, C. P. (1920), "The Crane-flies of New York," Part II., *Biology and Phylogeny*, Cornell Univ., Memoir 38, Agri. Exper. Station. Bilsing, S. W. (1920), "Quantitative Studies in the Food of Spiders," *Ohio Journ. Sc.*, vol. xx., pp. 215-60.

BOOK NOTICE

ROMANCES OF NATURAL HISTORY. By J. J. Simpson, M.A., D.Sc.
Cardiff: William Lewis (Printers) Ltd. Pp. 108 and 34
Illustrations. Price 3s. 6d.

This little volume is founded upon a series of ten minute "broadcast" chats sent out from the Cardiff Station and dealing with various subjects of popular interest. Upon the whole the chapters are well and accurately written, but there are evidences of hasty writing and proof-reading, and some of the errors that have missed correction are rather serious. For example, on p. 82, the word "Aphides" is used for the family name of the Bees, and on p. 80 (second line from bottom) a quotation is rendered ludicrous by the omission of an *e*, so that "motion" appears instead of the obvious "emotion." On p. 79 there are two misprints—"chiliceræ" and "trachæ" and on p. 36 the specific name of the case-making Clothes Moth is mis-spelled. Exception must be taken to the statement on p. 70 that the spiracles "lead into coiled tubes called tracheæ." The tracheæ themselves are *not* coiled, but they have a coiled or spiral lining! Lastly, on p. 72, the account of the formation of the puparium of the House-fly is quite misleading. These blemishes are, however, easily removed, although somewhat marring what is otherwise an excellent and informative little book.

NOTES

Scaup Duck in Royal Botanic Garden, Edinburgh.—On the morning of 23rd November Ranger Lugton requested me to identify a duck which he had captured among some bushes a few days previous. It had apparently lost its way and been injured through striking against overhead wires or the branches of trees during the dense fog which prevailed at the time. It proved to be a female Scaup and was placed in a duck house in company with an ordinary domestic duck. It has apparently thriven for the last two months on the bread scraps and miscellaneous food supplied to its companion. It seems extraordinary that this entirely marine species should be able to exist under these conditions.—J. KIRKE NASH, Edinburgh.

Common Pochard breeding in Midlothian.—The extension of the breeding range of the Common Pochard in Scotland has been much slower than that of the Tufted Duck. This is probably due to the fact that the breeding situations of this species are much more restricted. From our experience it is only found on lochs bordered with beds of reeds, rushes and coarse herbage, among which the nest is placed almost on the water's edge.

For many years past, large flocks of this species have frequented Duddingston Loch during the winter months, and within recent years we have noted a few remaining into the late spring, which suggested the possibility of the Pochard becoming a breeding species before long. It therefore gives us much pleasure to be able to record the presence of two broods on the loch this season. On the 23rd May we observed a Pochard Duck with a brood of nine, and another female close beside them. At the time we were somewhat uncertain whether they constituted two families, as they were all close inshore and somewhat mixed up among the dense reeds. Later on, however, we saw the entire brood under the care of one bird and we also noted another pair of Pochard. From their behaviour we concluded the female had just come off her nest for a brief respite.

On the 31st of the month our surmise was confirmed, as we then observed her piloting her one-or-two-days-old brood of five along the edge of the reeds on the south side of the loch. As many readers are aware, Duddingston Loch was constituted a bird sanctuary last year, but up to the present time protection has been quite inadequate, and it is all the more interesting that two broods of this species have been successfully reared under such adverse conditions.

Doubtless the inaccessibility of the nests among the dense reeds proved their salvation.

This is the first occasion, so far as we are aware, on which the Pochard has nested in Midlothian.—DAVID HAMILTON and J. KIRKE NASH, Edinburgh.

Pochard Breeding in S.W. Scotland.—I can find nothing in print to show that the Pochard (*Nyroca ferina ferina* (L.)) breeds in the south-west of Scotland. It will be of interest to note, therefore, that I have discovered this Duck breeding both in Ayrshire and Renfrewshire this year. I have covered much ground lately in search of information for *The Birds of Ayrshire*, which is to be produced shortly. On one small loch on fairly high ground, two drakes and one duck with two young were seen. On another large sheet of water, there were at least 30 to 40 drakes in the month of July. On this loch one duck with a brood of five was noted, while there were two more broods observed, too far out to be certain of identification.—E. RICHMOND PATON, Hareshawmuir, Ayrshire.

White Curlews.—As White Curlews are rather rare, I was interested to read the paragraph on White Curlews (p. 15), for I saw a pied one at the sale of the late Sir Vauncey Crewe's collection at Stevens's on 23rd February. It was rather dirty white in colour and, like the majority of the late Baronet's collection, had no data with it. It was bought by the well-known collector of varieties, Mr J. B. Nicholes, who informed me that he already possessed an albino of this species and also a red variety. The white one was from the collection of Mr H. Blake-Knox and was shot in Co. Antrim in 1866 (*Zoologist*, 1886, p. 454). Two most beautiful birds, of which I have photographs, are in the collection of the well-known Irish collector Mr C. J. Carroll. One of them is snow white but has dark flights and eyes, although feet, legs, and beak are pink. It was shot in Co. Kildare on 21st November 1924. The other is also a very beautiful bird, but is slightly spotted and streaked with very dark brown, the eye also being dark. It was killed in Co. Mayo, 26th March 1925. Mr J. Whitaker, another noted collector of varieties, has one with a pure white breast, purchased from the Bond collection many years ago, and another most curious variety shot in Scotland in March 1906 in Caithness. He has sent me a rough water-colour sketch of this bird and it is indeed a wonderful variety, being albino-melanic, for, whilst most of the back and part of the head are white spotted with black, all the rest of the bird is almost melanistic, being of such a dark chocolate colour to be almost black, even the

legs, feet, and beak being of this colour. Curiously enough the eye in this specimen appears to be pink as in a true albino.

Pure white Curlews were shot in Co. Donegal in 1870, and on the shores of the Dornoch Firth, Scotland, in December 1899 (*The Field*, 30th April 1910). The Scottish bird was pure white, and although the beak and legs were of a pale flesh colour, the eyes were dark.—H. W. ROBINSON, Lancaster.

Bittern in Berwickshire.—A Common Bittern was observed in a wood on the estate of Charterhall, Fogo parish, on 19th December 1925, and was seen at intervals up till about 20th February 1926, when it seems to have taken its departure.—ALLAN A. FALCONER, Duns.

The Goatsucker, or Nightjar, in Orkney.—Of so rare occurrence is the appearance of the Goatsucker or Nightjar (*Caprimulgus europæus*) in Orkney, that its record this year may be of interest. On 20th May I received an adult male, which was found in a quarry on the farm of Bigbrake, Twatt, Birsay. The weather was very cold at the time, and from its position in the quarry, I concluded it had died from exposure. It was useless for setting up. On the 15th June I received another specimen of the same bird, which had been caught in a loft, on the farm of Lopness in the Island of Sanday. Evidently it was disabled, being almost dead when I received it, and it died later. This was also an adult male.—JAMES G. MARWICK, Vice-President, Orkney Natural History Society, Stromness.

[The Nightjar arrives in Britain on its northwards emigration, generally in late April or early May. It would appear that these birds had overshot their normal breeding area and had reached Orkney where the species is known only as a casual wanderer.—EDS.]

Cordulegaster annulatus Latr. in Dumfriesshire.—On the 13th July last I captured a large Dragon-fly which was at rest on a gate at Moniaive. Upon taking it to the Royal Scottish Museum it was identified by Mr Grimshaw, who stated that the occurrence of the species in Dumfriesshire constituted a new record for the county. At his request I therefore send particulars for publication in the pages of THE SCOTTISH NATURALIST.—JAMES B. YOUNG, 29 Lauriston Gardens, Edinburgh.

[The specimen has been presented by Mr Young to the Royal Scottish Museum. Its wings are somewhat damaged, but since it is the first Dumfriesshire specimen of *C. annulatus* it has been thought desirable to preserve it.—EDS.]

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PUBLISHERS' NOTE.

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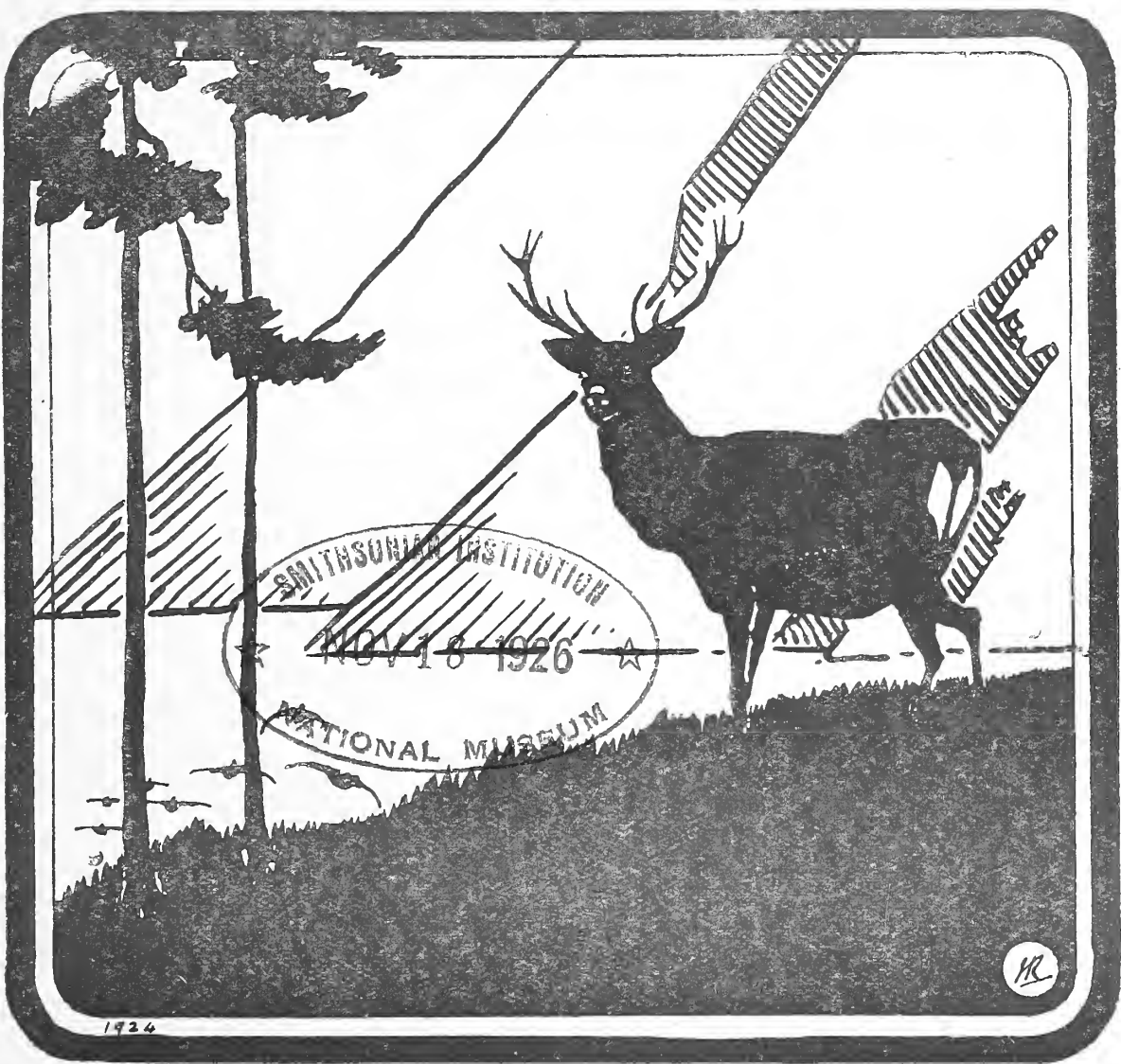
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The Scottish Naturalist

A Magazine devoted to Zoology

With which is incorporated

“The Annals of Scottish Natural History”

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EVERY NATURALIST SHOULD READ

The following major articles which have appeared in recent numbers of *The Scottish Naturalist*:—

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Records of Birds new to Britain.
A Rat Migration.
Abnormal Coloration of Scottish Mountain Hares. (Illustrated.)

As well as numerous shorter notices of interesting events in the Wild Life of Scotland.

(Authors are responsible for nomenclature used.)

The Scottish Naturalist

No. 161.]

1926 [SEPTEMBER-OCTOBER

THE POSITION OF WILD-FOWL.

THE position of Wild-fowl, and particularly of Ducks and Waders, has recently caused concern to ornithologists in various European countries, so much so that the question of common protection between nations was raised at the International Ornithological Conference at Copenhagen during the present summer. A British delegate to that conference, Dr Percy R. Lowe, the senior officer in charge of the bird collection in the British Museum, and a member of the English Advisory Committee on Wild Bird Protection (to the Home Office) has since dealt with the subject in a manner at once convincing and authoritative.¹

From a British point of view it is reassuring to learn that Dr Lowe's pamphlet does not show that our home-bred wild-fowl are decreasing, nor does he find much to complain of as regards the regulations in force as regards killing or taking them. He urges, however, that the close-time for Mallard should be from 15th February to 11th August and not from 2nd March to 31st July as at present. The *Wild Birds Protection Bill*, now before Parliament, suggested that the close-time for birds in general should be from 1st March

¹ *The Present Status of the Wild-fowl of Europe, with special reference to those of the British Isles.* Published by the International Committee for the Protection of Wild Birds (British Section), British Museum (Natural History), 1926, pp. 20.

to 11th August, but this was recently altered in the House of Lords so far as concerns "Wild-Duck," to the present period now in force. Whichever may be the dates ultimately authorised it seems most desirable that they should be one and the same for all wild-fowl (*Anatidæ*, *Limicolæ*, etc.), since uniformity in close-time is essential if the Act is to be properly enforced. Dr Lowe's suggestion that the close-time for Mallard should commence on 15th February may deserve attention but in any case, as we have pointed out, he makes no complaint as to the diminution of our British wild-fowl, and therefore it would appear arguable that there cannot be much wrong with our present close-time: so why alter it? Incidentally it may be added that under the *Wild Birds Protection Bill*, already referred to, powers are given to the Secretary of State to make alterations in the close-time if, after inquiry, he sees fit.

Dr Lowe gives some instructive figures when dealing with the question of "Birds imported, in cold storage or in fresh condition." He points out that the number of Ducks now imported under the increased facilities of steam transport and cold storage greatly exceed the total number formerly taken within the area of the British Isles even at the time when passage migrants and winter visitors far exceeded the present numbers visiting these islands. The sportsman, not only the ornithologist, must often have been shocked to see rows of foreign Blackgame, Pheasants, and Partridges exposed for sale in poulterer's shops in the spring, or even later, when these species are nesting in our own country. Even more commonly wild-fowl can be seen so exposed for sale, and it would surely not be too much to enact that it should be made illegal to expose for sale for human consumption any bird—game-bird or otherwise—fifteen days after the date of its legal close-time in this country.

The use of decoys in Great Britain has fallen into desuetude in many places and in any case is controlled by the close-time in force. On the Continent it would appear to be different, and Dr Lowe urges that the taking of Ducks during the spring migration should be restricted. He points out that otherwise there is grave fear that the

natural breeding grounds in the north of Europe will be so depleted of their breeding stock as to lead to speedy disaster at the present rate of diminution.

The question of special legislation as regards the shooting of water-fowl from motor-propelled craft is one which calls for consideration nowadays in every European country. Dr Lowe stresses this point as giving a new, and unfair, advantage to the gunner. Shore-nets, erected so as to capture flying birds, cannot be claimed to be sportsmanlike and are indiscriminate in the destruction which they cause: they are not extensively employed in Great Britain and there seems no reason why their use should continue to be legal.

Since it has long been illegal to shoot game (Grouse, Blackgame, Partridges, and Pheasants) in Great Britain and Northern Ireland on a Sunday, it is difficult to understand why serious objection should be made to the proposal to give similar protection to all birds. Under the Wild Birds Protection Act of 1896 many counties in Scotland and England have now issued orders making Sunday shooting illegal, and Dr Lowe does not accept the statement of those who oppose the protection of wild-fowl on Sunday by raising the political cry of interference with the poor man's sport and the professional's trade.

This is but a very brief notice of a pamphlet which should be read by all those who desire a sane protection of birds. It might, perhaps, be added that it is the immediate outcome of the International Congress of Ornithologists at Copenhagen in May 1926, where Dr Lowe moved a resolution calling attention to the fact that the future status of the wild-fowl of Europe was being seriously jeopardised by commercialisation and lack of organised international control in the methods by which vast numbers of these birds are annually killed and marketed. The resolution was carried, and it was further decided that delegates from other European countries should draw up similar reports to that now published by Dr Lowe (as representing Great Britain) and submit them to Professor Lönnberg of Stockholm, whose Government had first raised the question of the need for international action in regard to the protection of Wild-Duck in Europe, with a view to

holding an International Conference on the subject at an early date.

It is nothing more than a coincidence that there should be at present before Parliament a new *Wild Birds Protection Bill*. This is mainly a consolidating Act, but it is satisfactory to know that, for the most part, it carries out the views advocated by Dr Lowe in his pamphlet. It could not be expected that this Bill should deal with game-birds, but it would certainly have been a welcome addition if a simple clause had been inserted making it illegal to expose for sale for human consumption any wild bird fifteen days after the close-time. Perhaps it is not yet too late to hope for some such amendment, and thereafter a similar enactment, as regards game-birds, might follow. Such a close-time would surely not only rejoice the sportsman and placate the bird-lover but would also render but bare justice to the birds themselves which, after all, provide many of us with sport and more with food.

H. S. G.

THE LABRADOR FALCON—A NEW BRITISH IMMIGRANT.

By E. RICHMOND PATON, B.A.(Cantab.), F.Z.S., M.B.O.U.

ON 25th July 1926, an immature female Labrador Falcon (*Hierofalco obsoletus*, Gmelin) appeared on the Island of Stroma, in the Pentland Firth. Thus a new bird was added not only to the British but also to the European avifauna. It descended on a promontory and was captured by the light-keeper, Mr Norman McLeod. In describing the arrival of this bird, he says that it swooped down where two little children were playing. Being frightened they ran into the lighthouse, whereupon Mr McLeod went out and found that the bird had managed to drag itself, in a dazed condition, into a small shed. He kept it alive for four days, feeding it upon rabbits, birds, and boiled fish; fresh fish it refused to touch. It died, however, on 29th July, and was sent to Messrs Charles Kirk, taxidermists of Glasgow, on the following day. The specimen has been added to the bird collections in the Royal Scottish Museum.

This bird was examined by me early in August, soon after it was mounted. Owing to its four days in captivity the tips of the primaries and the tail feathers were much frayed. I have no reason, however, to suspect that this was an escaped bird. Allowing for the abrasion of the feathers, the wing measurement was not less than 16 inches, while the total length was $23\frac{1}{2}$ inches; the latter measurement being taken before the bird was mounted.

It can be seen at a glance that this bird is far darker than the darkest juvenile *Falco rusticolus rusticolus*, Linnæus, or *Falco rusticolus islandus*, Brünnich. Describing it generally, the back is dark bluish-black, with a distinct lavender bloom; the breast and under parts being almost obscured by blackish-brown drop-shaped spots. The head and mantle are blackish-brown, the wing coverts sepia-brown. On the lower scapulars very small indistinct white transverse lines can be seen. The moustachial stripe is noticeable but

indistinct. While these heavy dark spots nearly cover the upper part of the breast, the markings on the lower parts incline more to sepia, almost obliterating the yellowish-white under-colouring. The nape is mottled with white. The rump and tail are lighter in colour than the back, the outer feathers of the latter being more distinctly barred than the centre ones. The legs and feet are slatey-grey and the claws black. It is noticeable that there is a cluster of small pale-coloured feathers between the centre and outer toes of each foot. The bill is bluish-horn, darker at the tip, inclining to flesh-colour at the base, while the cere is blue. The superciliary ridge is pale chrome with a greenish tinge; the irides dark brown.

This form of Northern Falcon was first separated by American systematists. It is the *obsoletus* of Gmelin, and *labradora* or *labradorus* of Audubon (*F. labradora*, Aud., Folio pl. 196). Most ornithologists now recognise the distinctness of the representative forms of these Northern Falcons; amongst these may be mentioned Howard Saunders, Bowdler Sharpe, and the Committee of the British Ornithologists' Union. The late H. Kirke Swann, however, came to the conclusion that there is only one species and that it is practically circumpolar. He refers to this bird as a melanistic variety, also using the term "phase" in referring to the melanistic and albinistic forms.

In his *Synopsis of the Accipitres* (second edition), Mr Kirke Swann, in describing the Greenland Falcon, says: "The name, *obsoletus* of Gmelin, it should be stated, has seven pages priority over *candicans*, but is based on the melanistic variety, and is, for that reason, best discarded in favour of *candicans*."

Agreeing, however, with the majority of ornithologists, in recognising these separate forms, I make the suggestion that it would be more convenient to distinguish this bird under the name of *Hierofalco rusticolus obsoletus*. Coues has seen specimens which have been perfectly dark with no markings whatsoever.

This Falcon is described as being most common in Labrador, occurring also in Greenland. It migrates into



[From painting by E. Richmond Paton.]

Scottish example of Labrador Falcon (*Hierofalco rusticolus obsoletus*).

The first specimen recorded from Britain.

the United States in the winter time, ranging south as far as Maine, and appears casually elsewhere.

It has been suggested that the fogs, which envelop the coast of Labrador, have reflected themselves during the course of time upon the colourings of this Northern Falcon.

Walrus in Shetland.—“Writing from Sumburgh Head Lighthouse, Shetland, the other day, one of the keepers informed me that he saw a Walrus in that neighbourhood last week. His note proceeds: ‘I saw a Walrus just below the lighthouse the other day. How he came to be there, dear only knows. What a size he was! Just like a big horse. We could see his two big tusks quite distinctly. He was about three hundred yards from the lighthouse. It was the first that I ever saw about here.’ My friend has a powerful telescope, and he can be relied upon to give accurate information as to what he saw. The Walrus is essentially an animal of the Arctic Seas, and it certainly was out of its latitude when basking about Sumburgh Head.”—J. G. M. (In *Scotsman*, 16th Oct. 1926).

[Subsequent letters in *The Scotsman* indicate that the Walrus, first seen about 1st October, had remained for some weeks in the locality. For former records of the Walrus in Scotland, see SCOT. NAT., 1921.—EDS.]

Goosander Nesting in Dumfriesshire.—In my *Birds of Dumfriesshire*, 1910, pp. 298-99, I referred to a statement that this species had bred in the county *circa* 1888-94, but that the evidence then forthcoming did not seem sufficient to substantiate the allegation. I have just heard from the gamekeeper at Hetland (in Ruthwell parish), that at the end of April and beginning of May 1926 he frequently saw two pairs of Goosanders on the River Annan, and that on 17th July he saw one old female with six young ones on the Kirkwood part of the river and, at an earlier date, saw the other old female with ten young ones on the Murraythwaite portion of the same river. In answer to my request, the gamekeeper above mentioned sent me a young bird for identification which he shot near Murraythwaite on 4th September, and it is undoubtedly a young male Goosander of the year.—HUGH S. GLADSTONE.

BIRD NOTES FROM EIGG.

By CHARLES G. CONNELL, B.L., W.S.

FROM time to time there have appeared in print accounts of the bird-life of the Island of Eigg, the second in size of the group known as the Small Isles, of which the remaining islands are Rum, Canna and Muck. William Evans published an account, partly the result of personal experience and partly a compilation of records, in the *Proceedings of the Royal Physical Society* of 1885. Following on that there appeared Harvie-Brown's *Fauna of Argyll and the Inner Hebrides* in 1892, and Mr Kirke-Nash contributed a further notice to the *Zoologist* in 1914, as the result of a visit to the island in the previous spring. I have also been provided, through the kindness of the observers, with a list compiled by Mr Nash on that occasion, and some notes of observations made by the Rev. J. M. McWilliam when he visited the island along with Dr O. H. Wild in May of 1910.

In July of this year I spent some ten days in a tent on the island, and during that period collected some notes of the local bird-life, which may have some interest when compared with previous records. I should mention that, during my stay, I had the company on several occasions of Mr McLeod, the keeper, and from him I received every assistance.

The total list of birds observed amounted to fifty-six species, as follows (those in italics having been proved to breed): *Song Thrush*, *Blackbird*, *Dipper*, *Wheatear*, *Stonechat*, *Whinchat*, *Robin*, *Whitethroat*, *Willow-Warbler*, *Hedge-Sparrow*, *Goldcrest*, *Wren*, *Meadow-Pipit*, *Rock-Pipit*, *Pied Wagtail*, *Swallow*, *Swift*, *House-Sparrow*, *Chaffinch*, *Greenfinch*, *Yellow Hammer*, *Starling*, *Raven*, *Hoodie-Crow*, *Rook*, *Skylark*, *Buzzard*, *Kestrel*, *Heron*, *Cormorant*, *Gannet*, *Eider*, *Red-breasted Merganser*, *Red-throated Diver*, *Rock Dove*, *Pheasant*, *Corncrake*, *Tawny Owl*, *Ringed Plover*, *Golden Plover*, *Curlew*, *Peewit*, *Oystercatcher*, *Snipe*, *Redshank*, *Sandpiper*, *Arctic Tern*, *Common Gull*, *Herring-*

Gull, Lesser and Greater Black-backed Gulls, Kittiwake, Razorbill, Guillemot, *Black Guillemot*, *Manx Shearwater*, *Puffin*. The keeper also reported the following: Cuckoo, Peregrine (one pair breeding), and in winter, Snow-Bunting (a new record), Woodcock, Geese, and Wild-Ducks.

The only birds of which there do not appear to have been previous records are the Pied Wagtail, Greenfinch, and Snow-Bunting. Various changes have, however, occurred in the status of several other birds, and of these the following may be particularised. The only previous mention of the Dipper is by Mr Harvie-Brown, who remarks that it "may be resident." As we saw young birds of this species on a small burn, the surmise can be confirmed as regards the present day. The Goldcrest was found nesting in 1885 and to-day; probably owing to the growth of the plantations on the east side of the island it can even be considered numerous. The extension of woodland also accounts for the presence of a heronry near the mansion-house: in other days, Herons appear only to have nested on the north-west cliffs. The same fact probably explains the numbers of the Greenfinch, a species not included in previous lists.

Starlings appear to be fewer than when Mr Nash visited the island, but Wheatears, on the other hand, appear to have increased and occupy the island in extraordinary numbers, and Whinchats also are numerous. The Pied Wagtail is not specifically mentioned by Harvie-Brown as inhabiting Eigg, nor is it referred to in later accounts. We saw several round the coast, including young birds, and a roosting colony at Laig burn, which must have contained upwards of forty birds. In 1913 there appear to have been more Swallows breeding on the island; this year there was only one pair at Kildonan. On the 5th July a solitary Swift was observed flying along the Beinn Buidhe cliffs, the only previous note being of one seen at Laig in 1891.

Birds of prey would seem to have increased considerably, a tendency exhibited in many parts of the Western Isles after the respite afforded by the years of the War. According to the keeper, and we saw ample evidence to

confirm his figures, the following were breeding this year: One pair each of Peregrines and Ravens, seven pairs of Buzzards, several Kestrels, and innumerable Hoodie-Crows. When the Rev. Mr McWilliam visited the island he found deserted nests of Peregrine and Buzzard, and Mr Nash records two pairs of Buzzards, one of Falcons, and only a few Hoodies.

A large number of the island birds are maritime species. There were upwards of five pairs of Eiders in Galmisdale Bay, and two Red-breasted Mergansers had broods of eight and nine newly-hatched young. Lying on the rocks by the shore one was afforded an opportunity of studying these young birds. Probably both families were not more than a day or two old, and when the tide was in the females piloted their broods—black and white balls of down—along the sea-weed covered rocks, where the young were apparently able to obtain food for themselves. The mother was never seen to feed the young, but confined her attention to keeping them together with a low grunting “quack” or leading a rush over the water in what appeared to be a hunt for flies. On these occasions the young, active swimmers and divers at any time, developed the speed and action of mechanical toys, literally paddling over the top of the water, darting this way and that in the excitement of pursuit. On the appearance of danger the mother gave a louder anxious grunt, her long neck erect, her attitude filled with alarm, and at once the family was off, paddling furiously for the open water. One afternoon a whole family left the sea for a siesta on the rocks, the young ensconced on their parent’s back, or searching inquisitively for food, until the tide rose and they floated off to explore the coloured sea-weed waving in the deep pools.

Of the Corncrake (last century said to be very common, and more lately described as “quite common”) we had evidence only in two places. On the other hand we observed several Golden Plover on the moors and Ringed Plover (in 1913 said to number never more than one pair) at both ends of the island. Snipe, Curlew, and Sandpiper also appear to have increased, the former being quite numerous on Kildonan

Farm. A small flock of Lapwings frequented the same area.

Common Gulls were found breeding on Castle Island, one of the nests containing one egg on the 7th July, rather a late date, while an adjoining nest held three newly-hatched young. Black Guillemots were common and were observed carrying food in the direction of the cliffs on the coast, but no more evidence was obtained of their breeding quarters. Puffins were breeding to the number of several hundreds on the Gruelin cliffs, this being the first record for Eigg. Harvie-Brown says that up to 1888 he was not satisfied that Puffins bred, although he had been informed that they did so, and Mr Nash found them on an adjacent island. In 1910 and 1913 Herring-Gulls were reported nesting on Bidein Boidheach, and this year there were upwards of twenty nests, but some considerable distance to the west.

A pair of Red-throated Divers was observed by Mr Nash on Loch Beinn Tighe, and as I saw one bird on the same loch and two the previous evening on the sea, there is a possibility that the bird may breed. Last century it was said to be common in winter.

The most notable omissions from the birds observed this year include the Corn-Bunting, Twite, Shag, Cuckoo, and Grouse. The last two, however, were reported in some numbers. I sought diligently for Tits but found none. As regards the Corn-Bunting, they were originally very abundant. Mr Nash states that he "met but few," and after inquiry I could find no trace of their presence.

These short notes appear to show that during the last forty or fifty years the bird-life of this Western Isle has remained fairly constant. The smaller number of crofts has accounted for a decrease in the species frequenting arable land and the growth of the woodlands has attracted several arboreal species. These changes, and the fact that the human population is now reduced to about 150, may account for the increase in birds of prey, the killing of which has only this year been resumed.

A few words in conclusion may be said about the Shearwater. We visited its nesting haunts both on the

Cleadale cliffs and on the Beinn Bhuidhe side and found the cliff tops in suitable places honeycombed with holes, in most cases too long to be reached without cutting away the turf. In one gully, which we descended on the 5th July, McLeod produced from one hole an egg from which the young one could be heard calling, and from an adjacent nest a well-developed young bird was taken and photographed. At some of the nests, which were sometimes disclosed by feathers or down clinging to the vegetation, there were old birds, and one which was extracted tumbled down the cliff face for some distance before gliding out to sea. Another bird flew away without difficulty.

While crossing to the island from Arisaig we passed scores of Shearwaters in flight, and every evening from the island, commencing about 8 o'clock, we observed a long procession of birds passing northwards up the Sound of Eigg. Large groups could also be distinguished on the sea and these took flight on the same route. McLeod thinks these birds were Shearwaters from the open sea collecting for the evening flight to the nesting quarters, but further observation on the identity and destination of the birds is required. There is no sign of activity at the colonies during daytime, so I went up the cliffs at Cleadale on the 9th July about 10.30 p.m. (summer time). The sea darkened as the sun sank over the Atlantic, the mountains of Rum became capped with heavy clouds and a damp mist descended over the higher cliffs. No sign of activity in the colony was noticed until after 12 o'clock when we heard a slight wheezing sound emanating from some of the holes. Soon after we heard hoarse calls of "Cock-cock" in the mist, and from that time, at intervals, birds dashed high overhead from the sea and descended to their nests, where they could be heard chuckling and croaking. In May and June the noise is said to be continuous, but on this occasion it was sporadic and small in volume, although long after I had left the cliffs, and was walking over the island, the hoarse calls of the *Fachachs* could be identified. The usual habit of the birds is said to be a concerted rush to the nests, but I had no experience of this. At one time the islanders killed the

birds and salted them for winter food, an oily and unpalatable meal, and I was told that an unwritten law forbade any islander to approach the nests until an appointed day. Then the whole island, young and old, set to work to scour the dizzy and treacherous cliffs, and in a single day cleared the accessible portions of their living food-store.

I would add that my visit to Eigg was made possible by the kindness of the proprietor, the Right Hon. Walter Runciman, P.C., M.P.

Eagles in the Highlands.—Several times recently public attention has been called to the alleged diminution in the number of Eagles in the Highlands. Of that danger, however, there need, in my opinion, be not the slightest fear; indeed in three Highland counties there are complaints, not by sportsmen, that the Mountain Eagle is becoming too numerous and taking too heavy a toll of lambs. From letters regularly received by me from deerstalkers and keepers, not to mention my own personal observation, there is not the slightest doubt *Aquila chrysaëtus* is much more than merely holding its own in Scotland. Previous to 1921 I was under the impression, like many other naturalists, that five was the largest number of Eagles ever seen together—it is not a sociable bird. In that year, however, Mr Osgood H. Mackenzie of Inverewe, wrote: “We have had far too many Eagles in our country of late, and when one can see seven in the air at once, it is about time to thin them out.” Mr Duncan Robertson, head stalker, Corrou forest, wrote me on 18th May last: “Well, about the Eagles—on the 21st September 1925, while proceeding eastwards from the lodge with a stalking party we saw nine Eagles coming west, spread out. One of the party said there were ten, but I counted nine. In 1919 I saw seven together on the same ground. In view of this it seems absurd to speak of the Eagle being in danger of extinction at any rate in certain localities.”—ALEX. INKSON McCONNOCHIE, F.Z.S.,
1 The Parade, Kilburn Priory, N.W. 6.

THE WILLOW-TIT IN LANARKSHIRE.

By WALTER STEWART.

BRITISH ornithologists were at first loath to believe that the brownish-black capped Tit, which we in Scotland had so long known as the Marsh-Tit, really belonged to a different specific group, the Willow-Tits. These form a separate Holarctic species, with numerous sub-species, none of which however, was suspected to exist within the British Isles, the typical form being American.

This discovery was made by Pastor Kleinschmidt and Dr Hartert, who found, mixed up with the skins of Marsh-Tits in the British Museum, two skins from Hampstead which were undoubtedly Willow-Tits (*vide* Hon. W. Rothchild, *British Birds Mag.*, vol. i., pp. 44-47). Here it is stated that "the principal differences between the Willow-Tits and the Marsh-Tits are, firstly, that the feathers of the crown and forehead are in the former longer and more loosely constructed, while in the latter they are shorter and more compact. The edges of these feathers in the Marsh-Tit are glossy-black, thus causing the whole crown to be glossy and much blacker than that of the Willow-Tit, which is of a dull brownish-black or sooty-black; secondly, in the Marsh-Tit the tail is almost square, while the Willow-Tit has it distinctly graduated; lastly, also the notes of the birds are said to be different."

Since the publication of the above paper, in 1907, we have carefully studied this bird in several parts of Scotland, but mainly in Lanarkshire; always, we must confess, with the vague and, as it turned out, vain hope that one day we would find and identify a true Marsh-Tit with its glossy-black head. Seemingly it is unknown in Scotland, except for one straggler seen at Duns Castle in Berwickshire by Mr T. G. Laidlaw (*SCOTTISH NATURALIST*, 1921, p. 86). Yet, south of the Borders, both species are found in many districts, the English Marsh-Tit being regarded as a good sub-species.

From several skins of Marsh-Tits which we have procured from different parts of England and compared with Willow-Tits (living and dead), we think the following additional differences can be made out, although they may not be constant over a large series of skins: (1) bodily the Willow-Tit seems the smaller bird, (2) its tail is slightly longer and the feathers more pointed, and (3) its legs and feet are less black and more livid coloured.

It seems strange that the discovery of the Willow-Tit came so late in the day, especially when we take into consideration the fact that under the title of Marsh-Tit it was so minutely described by Macgillivray some ninety years ago. His description of the head of an adult bird as "dull brownish-black" does not tally with Yarrell's "black, slightly glossed with bluish-green" nor Sharp's "glossy blue-black." Neither can his description of the tail as "rather long, slender, a little emarginate as well as rounded, the feathers pointed," by any stretch of imagination be said to apply to the British Marsh-Tit; nor that of the plumage as "soft and tufty."

Regarding distribution, probably no county in the British Isles presents such a favourable field for the study of the Willow-Tit as Lanarkshire, certainly no other Scottish county carries such a fine stock of these birds.

Outside Lanarkshire, during the breeding season, we have identified the Willow-Tit in the following localities: In Deeside near Kincardine O'Neil; on the Teith near Callander; on the Kelvin at Kirkintilloch; on the Cart near Busby; on the Lugton near Caldwell; and on the Nith near Dumfries; while on several of the tributary burns of the Almond, in Mid and West Lothians, we have caught these Tits on the nest over forty years ago. In none of these places can it be described otherwise than as a sparsely distributed species.

Nowhere, during the breeding season, and very rarely in other seasons, have we found it above the 750 feet level.

In Lanarkshire it is exceedingly rare on the banks of the River Clyde, but in the valleys of the Clyde's tributaries and their smaller burns, it is found, if nowhere numerous, at

least evenly, if thinly distributed. Its favourite spots are where the surrounding fields are drained into these valleys, and where the water, having to soak its way through the ground into the stream, creates a damp, water-logged soil, which in summer produces rank, dense undergrowth. Along the sides of these streams are usually found willows and alders, the stumps of which, when decayed, provide the principal nesting sites of the Willow-Tit. But these must be searched for methodically, for in many cases they are so short as to be quite concealed in the dense undergrowth. Most interesting, from a bird-association point of view, is the fact that the nest of the Blackcap is often found in close proximity to that of the Willow-Tit.

During the miners' strikes of this year and of 1921, with the resultant scarcity of coal, all sorts of people, even the most law-abiding, have scoured the woods with saw and axe in search of house-fuel. Consequently, in many parts of Lanarkshire, the domestic arrangements of this little bird have been sadly interfered with, a large number of the nesting sites having been destroyed. This means that for many years to come, the Willow-Tits in these places will either have to find different sorts of nesting sites, or to seek new quarters elsewhere. Thus the destruction of a nesting stump, which with the late Mr Charles Kirk we had the pleasure of photographing in a certain part of Monkland Glen, resulted in the birds withdrawing from that particular part of the Glen. Their nesting stump of the previous year, beside which a pair of Blackcaps also nested, had shared a like fate.

This summer we found that a pair had bored a nesting hole in the root of a rotten hawthorn, after the stump had been broken off and removed. In Lanarkshire quite 90 per cent. of Willow-Tits' nests are found in holes bored by the birds themselves, and in nearly every case the chips of wood are removed to at least a short distance from the stump. Four to five inches is the usual depth to which these holes are drilled, the bottom being lined scantily, with catkins, rabbits' wool, or a little cattle hair pressed into a felt. We have not, however, examined many of these

nests since our boyish bird-nesting days, as we found from experience that few species on the British list are more liable to forsake their nest, if it be disturbed. One nest found in the Blantyre district was of greater bulk than usual (a little green moss had also been used), but the cavity was only slightly excavated, one side of the nest resting against ivy which almost concealed the low rotten stump.

As a Willow-Tit haunt the glens of the Rotten Calder and its tributary burns have no equal. We do not think a score of pairs an extravagant estimate of the breeding stock, and during autumn and winter little family parties are always in evidence. On several stretches of both the Avon and the Nethan nesting also takes place. On the latter Mr Alston found the species not uncommon, and it nested regularly in his neighbourhood (Stockbriggs) (see Robert Gray, *Birds of the West of Scotland*, p. 105).

On the Douglas Water we have not found it during the breeding season, although we have heard its call in early autumn. In the Symington and Biggar districts it appears sporadically in winter, and so also in the Medwyn Water districts. On the Mouse Water a few pairs nest, and the Tit is also in evidence there during winter. About the Lee Glen it is more common as a nesting species, and in the Fiddler's Glen there are always a few pairs breeding. A curious nesting site of this bird, in the fork of a tree overhanging the burn, the nest being bulky and exposed, has been reported from here (J. B. Dobbie, Edinburgh, *Ann. Scot. Nat. Hist.*, 1898, p. 180).

Jock's burn and Garion Gill are rarely found without a pair or two of nesting birds. In the glen of the South Calder Water we have found it at Murdoston, Coltness, and Clelland; and on the North Calder it nests in one or two parts of the Monkland Glen. We also know of about two nesting places on the Legbrannoch burn in Bothwell; and in the same parish, in that natural bird-sanctuary, the Bothwell Castle Policies, one or two additional pairs are often seen, and no doubt nest.

NOTES ON FISHES FROM THE FIRTH
OF CLYDE.

By RICHARD ELMHIRST, F.L.S.

THE Standard Faunal List for the Fishes of the Firth of Clyde is given in the *Fauna and Flora of the Clyde Sea Area* (*Brit. Assn. Handbook*, 1901). Since that date a few additions have been published, chiefly in the *Annual Reports of the Millport Marine Biological Station*, the *Proceedings of the Glasgow Natural History Society*, and in *The Fauna of the Clyde Sea Area* (based on the records of the S. Y. Medusa), by J. Chumley, 1918.

The following notes are an attempt to combine such published records with data collected at the Millport Station to form a supplement to the 1901 Fauna List, and, where known, local breeding dates have been given, although our knowledge in this respect is far from complete. A number of the records are due to observations by Mr John Peden.

The only published records of Clyde fish breeding data occur in the *Reports of the Fishery Board for Scotland*, chiefly in two papers by W. C. McIntosh, *Ninth Annual Report*, and H. M. Kyle, *Fifteenth Annual Report*. When the records from these papers have not since been repeated, they are indicated by the initials McI. and K. respectively. The following abbreviations are used:—

F. Full roes or milt.	E. Eggs taken.
R. Ova, separate and clear, ready to be shed, or sperm active.	S. Spawning noted.
	H. Hatching.

The observations on the food of the Cod and on young Herring appeared almost in their present forms in the Reports of the Millport Laboratory for 1920 and 1922.

In the *British Association Handbook*, 1901, under the heading Marine and Fresh-Water Fishes, 139 specific names are listed, excluding Lampreys. To these are now added the 10 following species: *Trachinus draco*, *Caranx trachurus*, *Gobius orca*, *G. pictus*, *G. paganellus*, *Crystallogobius nilssonii*, *Lepadogaster decandollei*, *Solea lascaris*, *Rhombus megastoma*, *Pristiurus melanostonus*, and *Lamna cornubica*. The total recorded number, therefore, is now 150, of which 22 are

fresh-water fishes, at least 42 marine fishes which may be regarded as rare or casual, leaving 86 species of marine habit which may be regarded as resident and probable breeding species. Actual records of breeding or the occurrence of young exist for 55 of these. This list includes visiting migrants, of which the Mackerel is undoubtedly the most important, both numerically and biologically in relation to other organisms; of second but variable importance is the Hake; during the years 1919-21 Tope were of sufficient abundance to be of interest.

In 1902 Herdman published *Lancashire Sea Fisheries Memoir, No. II.*, dealing with the Fishes and Fisheries of the Irish Sea, in which he listed 141 species. In the *Twenty-third Annual Report of the Liverpool Marine Biology Committee, 1919*, *Raia fullonica* and *Callionymus maculatus* were added, making 143. A comparison of these two lists reveals the presence of a number of oceanic and southern forms from the Irish Sea which are, as yet, unrecorded from the Clyde Area. On the other hand the Clyde contains 2 Gurnards, 2 Gadoids, and a few other northern forms not yet noted in the Irish Sea. The remaining difference between the two lists is made up of a number of fresh-water species included in the Clyde list.

The Clyde list shows no distinctive faunal characters beyond those of the British fish fauna, which is intermediate in character between the Arctic and Mediterranean facies, and contains representative traces of both groups.

Geologically the Clyde Sea Area may be regarded as an arm of the Irish Sea, so that the Clyde fish fauna may be regarded as derived from the Irish Sea (see Map on p. 46 of *Scharff's European Animals, 1907*). This would account for the close agreement of the fish fauna in the two areas. The preponderance of oceanic and Atlantic species in the Irish Sea is to be expected, in view of its more southerly position, more open waters, and the through movement of the water, as "more water enters by the south (St George's) Channel than passes back" (Herdman, *op. cit.*, p. 9).

On the other hand, it seems reasonable to suppose from the known distribution of the species named, that such northern forms as *Cottus lilljeborgi*, *Triglops murrayi*,

Carelophus ascanii, *Lumpenus lampetiformis*, *Gadus poutassou*, *G. esmarkii*, *Raniceps raninus*, together with the Halibut and Long Rough Dab, have established themselves in the Clyde Sea Area by way of the North Channel, and not from the Irish Sea. This tendency is also shown by the annual invasion of Basking Sharks whose home is off north-west Ireland, the occurrence of the larvæ of *Crystalllogobius*, a species common in the north-west of Ireland but not yet recorded from the Irish Sea. Further, the evidence indicates that the vast shoals of Mackerel visiting the Firth each year come chiefly by way of the North Channel. Herring also enter the area by this route.

It would seem, however, that the new local records of *Solea lascaris* are best interpreted as an extension northwards from the Irish Sea *via* the sandy shores of the west coast.

ADDITIONAL RECORDS OF FIRTH OF CLYDE FISHES.

Sparus centrodontus, De la Roche.—Common Sea-bream. Caught occasionally by line fishermen on the Barrier and Ailsa Craig areas.

Cottus scorpius, L.—Sea scorpion. E. February to May.

Cottus bubalis, Euphr.—Father Lasher. Generally distributed. E. March to May.

Trigla lineata, Gmel.—Streaked Gurnard. Largs channel; south of Cumbraes.

T. pini, Bloch.—Red Gurnard. Largs channel; Fairlie sands; Arran.

T. lucerna, L.—Sapphire Gurnard. Several records between August and October, off Fairlie Bank and Portencross. E. August and September.

Parasites.—*Rhipidocotyle minima* in posterior half of the intestine.

Scolex polymorphus in anterior half of the intestine.

Ascarus clavata.

T. gurnardus, L.—Grey Gurnard. F. May, June and September. H. July and August.

Agonus cataphractus (Lin.).—Pogge. Generally distributed. No records of the spawn of this fish.

Lophius piscatorius, Lin.—Angler-fish. Generally distributed.

Trachinus draco, Lin.—Greater Weaver. October 1910, one 12-inch specimen from Fairlie sands. This fish still contained a few ova 1.3 mm. in diameter with large yellow oil globule 0.22 mm., which indicates a rather late spawning.

Scomber scombrus, L.—Mackerel. Newly spent specimens in June. E. H. June and July.

Caranx trachurus, Lin.—Horse Mackerel. Occasional summer visitor. Caught in Herring nets off Arran, 1909-1911, 1919 and 1920.

Lampris pelagicus (Gunn.).—Opah or King-fish. Mr M. D. Macpherson in letter gives the following record: "A fine specimen was caught in Brodick Bay on 9th August 1916. About 4 feet long and over 1 cwt. in weight."

Zeus faber, L.—John Dory. Occasional summer visitor.

Gobius orca, Collett.—Recorded by A. Patience, *Trans. Nat. Hist. Soc. Glas.*, vol. viii., 1908. East of Cumbrae, off Cock of Arran over 80 fathoms.

G. paganellus, Gmelin.—Rock Goby. One taken by R. Kerr on the shore near Crosshouse Point, Millport, 27th February 1923.

G. pictus, Malm.—*S.M.B.A. Annual Report*, '23/4 North of Ardentinny in 8 fathoms.

G. niger, L.—Black Goby. H. April; E. March to May.

G. flavescens, Fabr. — Two-spotted Goby. Generally distributed. Chiefly on sand.

G. minutus, Gmel. — Speckled Goby. Common and generally distributed. 60 fathoms.

Crystallogobius nilssonii (D. and K.).—Larvæ first recorded by Kyle, April 1896, *Fifteenth A.R.F.B.S.*, pp. 246-61, in seaward part of the Firth. For a number of years the larvæ have occurred in tow-nettings off Cumbrae from the end of October until January. They have been taken almost at the surface at Keppel, and down to 45 fathoms west of Cumbrae Lighthouse in open tow-net. No records exist of the occurrence of the adults in the Clyde Sea Area, although they occur plentifully off the west of Ireland in 10 to 40 fathoms. The spawning period is usually given as May and June, but judging from the larvæ obtained in the Clyde it must extend over the summer. Dr Lebour records young in August (*Journ. M.B.A.*, vol. xii., p. 78). A number of Clyde

specimens caught in November 1923, identified by Dr A. Bowman, ranged from 6 to 29 mm. long.

Callionymus lyra, L.—Dragonet. Generally distributed. *C. maculatus* is a rare species which I have not taken yet.

Cyclopterus lumpus, L.—Lumpsucker. E. June and July. Generally distributed. Young are frequent inshore from June (9 mm. long) to winter (25 to 30 mm. long).

Cyclogaster montagui (Don).—Montague's Sucker. E. March to June.

Lepadogaster decandollei, Risso.—One specimen taken by J. Peden on the shore on East Flats, Cumbrae, March 1922.

Anarrhicus lupus, L.—Cat or Wolf-fish. Apparently not uncommon in the seaward part of the Firth; the only record I have of this fish is one specimen caught by A. Wright in April 1925 in Largs channel.

Blennius pholis, L.—Shanny. This fish, generally regarded as common, is not abundant in the Clyde. In nearly twenty years I have not handled more than a dozen specimens. Occasional at low tide and shallow water. E. March and April.

Chirolophis galerita (L.)—Yarrell's Blenny. Occasionally trawled off Bute, Cumbrae, and entrance to Loch Fyne.

Pholis gunnellus, (L.)—Butter fish. E. March and April.

Enchelyopus viviparus, L.—Viviparous Blenny. Largs channel. Loch Striven (Chumley). Young 4-5 cm. long in *Zostera*, south of Fairlie, April 1925.

Lumpenus lampetiformis (Walb.)—Sharp-tailed Lumpenus. Occasionally off Cumbraes and Largs.

Gasterosteus aculeatus, L.—Three-spined Stickleback. In brackish pools, E. April to July; young May to August.

Gastræa spinachia (L.)—Fifteen-spined Stickleback. F. R. April; E. May to July. In August the young are 2 in. long.

Labrus bergylta, Ascan.—Ballan Wrasse. Generally distributed. Comes inshore in summer. Caught plentifully off rocky shores from June to October. Young occur in autumn in sandy bays. Larvæ July and August.

L. mixtus, L.—Striped Wrasse, of similar occurrence to the above but rare. Larvæ June to August.

Crenilabrus melops (L.)—Goldsinny, once off Keppel.

Ctenolabrus rupestris (L.) R. E. June, E. H. July and August. During the latter half of September young averag-

ing 22 mm. in length occur inshore, during late October they average 35 mm. length, after that they are scarce inshore. In May 70 mm. seems about the average length. In the aquaria this fish lives for years but disappears behind the rockwork of the tank about the beginning of November and is not seen again until Easter. This practice has been noted annually for a long time.

Centrolabrus exoletus (L.)—Small-mouthed Wrasse. Fairlie sands, Cumbraes and Bute; rare.

Coris julis (L.)—Rainbow Wrasse. Occasionally caught on lines in the summer months; Cumbrae district; Arran. Spawning July and August.

Gadus callarius, L.—Codfish. Male, R. Jan., E. March to June; S. July in aquarium.

From time to time I have noted the contents of the stomachs of Cod caught by the long-line fishermen round the Cumbraes. One hundred stomachs containing recognisable food show that:—

Fish occurred in 22 per cent.

Mollusca occurred in 18 per cent.

Crustacea occurred in 94 per cent.

“Vermes” occurred in 15 per cent.

indicating that Crustaceans form the greater part of the food of local Cod. The fish examined ranged from 25 to 120 cm. in length.

Small Cod, less than 15 cm., feed almost entirely on the smaller Crustacea, as shown for the North Sea by R. A. Todd, *Second Report (Southern Area) North Sea Investigations*, 1907, p. 59.

The following species occurred in less than 5 per cent. of the stomachs examined. The figures indicate the percentage of stomachs in which such less important food-species occurred; brackets indicate that the species is also recorded as a food-species in the North Sea (*v. Todd, loc. cit.*):—

Gobius (1); Gadoid (1); Pleuronectid (2); *Clupea harengus* (3); *Leptocephalus* (Conger larva), 1; Cephalopod, 1; *Carcinus maenas*, 1; *Xantho tuberculatus*, 1; *Atelecyclus*, 1; *Gonoplax*, 2; *Portunus arcuatus*, 1; *Ebalia* (1); *Hyas araneus*, 1; *Stenorhynchus* (1); *Inachus dorsettensis*, 2; *Galathea strigosa*, 1; *Gebia* (1); *Calocaris*, 1; *Pandalina* (1); *Hippolyte* (2); *Spirontocaris spinus*, 4; Mysid (1); Amphipoda (4); *Ampelisca* (1); *Idothea*, 1; *Nephtys* (1); Nereid, 1; *Priapulid*, 1; Ophiuroid, 1.

The whole 17 per cent. Buccinum occurred in Cod from the south-west of Bute, *vide Zoologist*, June 1909. Among crabs of the

genus *Portunus* it is noticeable that the dominant local species is taken readily. Pagurids do not play as important a part as food-species as on the east coast. The frequent occurrence of *Hyas coarctatus* and *Munida rugosa* may point to their being more numerous in our western seas than in the north. Bell, in *British Stalk-eyed Crustacea*, 1853, mentions *Munida* as Cod food in Irish waters.

The following table shows the food-species occurring in 5 per cent., or more, of the stomachs examined, with comparative observations extracted from Mr Todd's Report (*loc. cit.*).

	Percentage of Stomachs with Food present.	Total Number of Specimens present in given Percentage of Stomachs.	North Sea, after Todd.
Fish, sp. unrecognisable	13	--	—
Callionymus	6	18	+
Mollusca, Buccinum	17	—	+
Crustacea, sp. unrecognisable . .	13	—	—
Portunus, sp. ?	12	—	—
Portunus depurator	14	22	14 <i>P. holsatus</i>
Hyas coarctatus	17	44	+
Eupagurus bernhardus	11	12	45
Pagurus, sp. ?	8	--	—
Galathea, sp.	18	44	Rare
Munida rugosa	14	26	Abs.
Nephrops norvegicus	7	8	+
Pandalids, spp. ?	23	43	—
Pandalus montagui	10	17	14
Crangonids, spp. ?	16	—	—
Crangon allmani	16	57	+
Polychæta, sp. unrecognisable . .	9	—	—
Aphrodite aculeata	5	6	11

Galatheids, apparently chiefly *Galathea nexa* (*dispersa*), are more noticeable as food-species than in the North Sea. A. M. Norman records *G. nexa* from Cod's stomachs at Hartlepool (*Trans. Nat. Hist. Soc. N., D. and Newcastle, N.S.*, vol. iii., Part II.).

The records of the less important food-species seem to show that any species of higher crustacean is eaten when available.

A few more recent observations show the importance of *Nephrops norvegicus* as food of large Cod; in the spring a considerable number of net-caught Cod are found to be feeding on Herring of the one-year group.

A pug-nosed example of the Cod was taken in April 1926; a healthy fish, in good condition; the abnormality was due to the shortening of the anterior parts of the skull, usual in such cases; the lower jaw was of normal length, protruding.

G. aeglefinus, L.—Haddock. E. March and April. The 1901 Handbook records the Cod as “common and generally distributed,” and the Haddock as “more or less frequent and generally distributed.” A noticeable change has occurred in the local occurrence of these fish round the Cumbraes in recent years. Thirty years ago the local fishermen caught chiefly Haddocks on their long lines, during the last twenty-five years this fish has entirely disappeared and been replaced by the Cod. In the last five years only a few dozen Haddock have been caught locally. The Haddock varies in abundance in the Clyde Sea Area from year to year, for instance during the years 1912-14 they were almost absent from Loch Fyne, rare in 1915-16, absent again in 1917 and subsequent years, although in previous years some tons were landed at Inveraray.

G. merlangus, L.—Whiting. Male R. January; E. March to June. Since 1906, this fish has been caught occasionally in spring and summer off the Cumbraes, but never in sufficient numbers to form a fishery. However, in the autumn of 1921, Whiting appeared in considerable numbers off Cumbrae and Bute, and each year since then has seen a good local fishery particularly off Fintry Bay, Cumbrae. Small fish are taken during the summer. In early winter large fish are got, but these gradually disappear as the gonads mature; apparently the mature Whiting go into deeper water for spawning about January.

Each winter their food has been chiefly young Herring (sile); about 5 per cent. of them have contained Crustacea including *Nyctiphanes couchi*, a Euphausid hitherto only recorded in the Clyde by Dr Robertson, *Trans. Glas. Nat. Hist. Soc.*, 1869, a record omitted from the Handbook.

G. minutus, L.—Poor Cod. Male, R. February; E. April to June.

G. luscus, L.—Bib. E. April. Off Cumbraes, S. of Bute, Loch Fyne.

G. pollachius, Lin.—Lythe or Pollack. During the last seven or eight years this fish has become comparatively scarce round Cumbrae where it was previously fairly abundant.

(To be continued.)

NOTES

Field Notes on the Twite and the Linnet.—During the last two years we have studied with considerable care the Twite and the Linnet in the field in the breeding season, and think that our experience may be of interest to other naturalists, as in some respects it is contrary to statements made in the majority of text-books on ornithology. Four nests of Twite were discovered and identified with certainty. The first was on Iona in June 1925. It was built on a ledge in a little cliff near the sea and contained two eggs. Both parent birds were examined at close range. The second nest was found on Bute a week later. It was built on level ground near the sea, under a tiny bush of heather, and contained six eggs. The female was examined at close range with the utmost care. The third nest was found on Texa, a small island near Islay, in June 1926. It was built on a ledge in a little cliff and contained six eggs. The female was seen at close range. Several pairs of Twites were seen on Texa, and no Linnets. The fourth nest was found on Islay a few days later. It was built in a gorse bush and contained five eggs. More than an hour was needed to identify this nest as there were Linnets in the neighbourhood, and the female on leaving the nest always dived into a clump of gorse of considerable size. Eventually, however, both the parents were carefully examined, so that there was no doubt as to the species. In June 1926 several Twites of both sexes, including adult males, were examined in the hand. In both years we examined many nests of Linnet. On Bute in 1926 seven nests of Linnet were seen in one day.

The most remarkable fact discovered was that the bills of these Islay Twites were not yellow, as they are commonly described, nor could they, by any stretch of imagination, be called yellow. They were of a pale-bluish-brown colour, darker at the tip, closely resembling the bills of Linnets in spite of the specific name *flavirostris*.

The eggs of the Twites showed considerable variation in colour and shape. In one nest they were beautifully scrolled at the large end; in another they were marked exactly like typical eggs of Linnet. They were, on the average, definitely smaller than Linnet's eggs, though it would be easily possible to find Linnet's eggs that were no larger. About half of the eggs were marked with streaks in a way not commonly found in Linnet's eggs. None of the eggs of Twite had the sharp point at the small end which is common with the Linnet.

We came to the conclusion that he would be a rash person who would claim to distinguish in *all* cases between the nests and eggs of Twite and those of Linnet. The difficulty of identification was increased by the continual close proximity of the two species in certain cases, the birds being seen together, and the nests of the two species being found within a few yards of each other. When the male Twite or the male Linnet was seen at the nest the identification was of course certain, the rose-coloured rump of the one and the rose-coloured breast of the other being very easily observed. The two species have certain differences of movement and behaviour which can hardly be described but which are easily apparent when a good view of the birds is obtained. The Twite is smaller and more delicately shaped than the Linnet.

Our experience is that the Linnet breeds as definitely in little colonies as the Twite does, and that in some cases the two species inhabit exactly the same area, nesting side by side in similar situations. The main result of our observations was to convince us that extremely careful observation is in many cases necessary to distinguish with certainty between the nests of the two species, and that the colour of the bill is useless as a guide to identification, so far, at least, as our recent experience goes.—OLIVER H. WILD and J. M. M'WILLIAM.

Red-spotted Bluethroat in Edinburgh.—In the early part of August Mr R. Readman, mechanic at the Royal Observatory, told me that there was a "beautiful little bird" in the Observatory grounds. On the north and west of the buildings, and separating them from the hill is a stretch of grass, with shrubs and thick bushes beyond it, and within the boundary railing. This is very quiet and in the morning sunny, and the birds frequent it freely. It can, however, be overlooked from all the Observatory windows on the north. It was round about this part that the bird was seen, and here last year a young Cuckoo was many times watched being fed by two foster parents of different species. The markings of the bird, examined with a good field glass at a range of 30 to 50 feet, indicated the Red-spotted Bluethroat (*Luscinia suecica*), probably a young male with the blue in course of development, and this was confirmed by an examination of the specimens in the Royal Scottish Museum. I saw the bird repeatedly hawking for insects in short runs and flights along the grass and along the face of the bushes. It was quick and nervous in its movements, and solitary in its habit. Mr Readman, who first saw the bird about mid-August last, noticed it on 7th September, after which, with a change of weather,

the bird disappeared. He noted that its bright plumage attracted the attention of the other birds frequenting the shrubbery.—R. A. SAMPSON, Royal Observatory, Edinburgh.

[Although it appears with fair regularity at Fair Isle on autumn migration, and appears to travel southwards along the east coast, the Bluethroat has only once before been recorded at this season from the mainland—Elgin, 15th September 1890.—EDS.]

Little Auk in Early Autumn.—In Colgrave Sound, between Fetlar and Yell, Shetland, on 16th August this year, I had a close view of a Little Auk, and on 15th September at Fair Isle, Mr George Stout informed me that he had that day seen in the N. Haven another bird of the same species. There have been few records of this bird on the Scottish coasts in early autumn.—J. H. STENHOUSE.

Filial Regard versus Migratory Instinct.—In his annual report, read on 13th October, Mr J. H. Craw, Secretary of the Berwickshire Naturalists' Club, recorded a strange example of postponed migration:—"An interesting record came from Coldstream. A Swallow was observed in the middle of December last in the vicinity of Little Swinton, and as it was seen to descend frequently to a grating over a drain it was watched. On examination of the drain its mate was found imprisoned, having obviously fallen down a spout into the drain, and here it had been regularly fed by its companion, which had resisted the migratory instinct rather than desert its mate. On the grating being opened both birds flew away and were never seen again."

[Swallows have very rarely been seen in Britain so late as December, and the half-dozen occurrences which have been recorded have mostly been in southern England. Continued mild weather seems in some cases to have accounted for the delay, but we doubt if any individual has had so good an excuse for postponing its departure as the Swinton individual. Probably the interned Swallow was a young one, the other the parent, for Dr. Eagle Clarke's observations at the Eddystone Lighthouse suggest that young and old travel together on migration.—EDS.]

Oleander Hawk-Moth in Arran.—In the early part of September, while wandering through the grounds of Dubhgharadh Lodge, Arran, I discovered a large Moth with bright green and buff coloration resting upon a gorse bush by the edge of Torsa River. It was identified by Mr Wotherspoon, Glasgow, as an Oleander

Hawk-Moth, and on his advice it was sent by me to the Natural History Collections in the Royal Scottish Museum.—DIANA E. RUSSELL, Ingatestone, Essex.

[This rare Hawk-Moth which has been found in Scotland on only three previous occasions—Crieff, 1873, Glasgow, 1886, and Barrhead 1900—is a native of Southern Europe and Africa, which seldom finds its way northwards to Britain. Except the Crieff record (July) all the Scottish examples have occurred in September.—EDS.]

Extensive Damage caused by Oak-Eggar Moth.—While motoring in the neighbourhood of Amulree, Dunkeld, Perthshire, on 24th June, my attention was drawn to a large red patch of vegetation on a hill-side. Under the impression that the vegetation had been damaged and become brown owing to the presence of the Heather Beetle, I sent my keeper to investigate. He reports that he saw no sign of the Beetle, that the heather is not attacked, but that about three acres of blaeberreries or whortleberries (*Vaccinium myrtillus*) are stripped like the enclosed samples, and that the damage has been done by hairy caterpillars, like the one I send for identification.—R. J. ROWAT.

[On the blaeberry plants received the leaves and succulent outer layers have been gnawed away from every shoot for a distance up to three inches from the tip. The exposed portions had become brown, which accounts for the red colour of the three-acre patch. The caterpillar enclosed was that of the Oak-eggger Moth, *Lasiocampa quercus*, a species well known to feed on low bushes such as blaeberreries, as well as on trees such as hawthorn, blackthorn, etc. We are not aware, however, that it has ever been recorded as having caused damage to such an extent.—EDS.]

BOOK NOTICES

PROBLEMS OF BIRD MIGRATION. By A. Landsborough Thomson, O.B.E., M.A., D.Sc. London: H. F. & G. Witherby, 1926. Pp. xiv + 350. Price 18s. net.

Armed with a first-hand knowledge of the latest methods of investigating a difficult problem, through his association with the Aberdeen University Bird Migration Inquiry, and fortified by experience at bird-watching stations on the Continent, Dr Thomson started

well-equipped for the task which he set himself and which he has accomplished so meritoriously in this volume. He has not attempted to bring the reader into that intimate touch with bird migration in Britain which makes Dr Eagle Clarke's *Studies* invaluable, but he has succeeded in producing a comprehensive account of the phenomena of migration, which far exceeds in value anything that has appeared in this country. He has, indeed, done for Britain what Lucanus in his excellent *Die Rätzel de Vogelzuges* did for Germany in 1922, with the great advantage that the English work is more up-to-date and much more fully illustrated.

Following upon an introduction, in which the migration of birds, in some respects a unique phenomenon, is compared and contrasted with migration in other animal groups, the main body of the book is divided into three sections. In the first are discussed the general aspects of migration throughout the world and particularly in the British Isles, the conduct of the birds themselves, the directions of their movements, the weather conditions which set migration agoing, and such like. The second section indicates the means by which the facts of migration are obtained, and by detailed accounts of the movements of selected species illustrates how field observations and the data obtained from ringing combine to give a wonderfully complete picture. The third and most fascinating section leaves the solid ground of fact and cautiously and logically deals with the theories which have been suggested to explain the purpose of migration, its origin, the forces which cause its annual recurrence, and the problem of pathfinding.

Throughout, Dr Thomson has made full use of the most recent observations: one need only instance his account of the relationship of periodic migrations to sun-spot cycles (p. 19) and his application of the theory to the more important "irruptions" of Pallas's Sandgrouse, the 22-year period of which suggests that the next great influx in Britain will occur roundabout the year 1930 (p. 118). A valuable feature of the volume are the lists of papers bearing on the subject-matter of each chapter. Every naturalist who desires to keep abreast with the rapidly extending knowledge of migration should read and possess this work.

EVOLUTION AND RELIGION IN EDUCATION. By Prof. Henry Fairfield Osborn. New York and London: Charles Scribner's Sons, 1926. Price 7s. 6d. net.

The fundamentalist controversy, which has raged in the United States of America from 1922 till the present day, has evoked a library of evolutionist literature, to which Professor Osborn's book is the latest addition. It contains a series of articles and addresses, published in various journals and delivered to audiences of varied degree, but all bearing upon the problem of evolution, and setting forth in plain language the foundations upon which scientific workers base their faith in a progressive development of living things. If the controversial

setting of many of the chapters detracts somewhat from the directness of the story, it gives an opportunity for a forceful statement of the case which adds zest to the argument. In Professor Osborn's opinion "religion and science will unite to control the future of mankind," and he strongly advocates the teaching of the universal elements of religion in schools, as well as the well-established truth of evolution, so long as no confusion is allowed to arise between what is ascertained truth or fact, and what is no more than opinion, hypothesis, or theory.

BERWICKSHIRE AND ROXBURGHSHIRE (Cambridge County Handbooks). Rev. W. S. Crockett. Cambridge: at the University Press, 1926. Pp. 199. Price 3s. net.

So far as Scotland is concerned this excellent series under the able editorship of Professor W. Murison, approaches completion, for with the present volume the descriptions of thirty (out of thirty-three) counties are completed. This volume, like its forerunners, contains short accounts of almost every aspect of the counties concerned, from their physiography and geological structure to their climate, agriculture and industries, history, antiquities, architecture, peoples, etc. The chapter on natural history is necessarily a very condensed summary of what is known of the animals and plants of the counties, for the *Transactions of the Berwickshire Field Club*, Mr Muirhead's *Birds of Berwickshire*, and other well-known works furnish a wonderfully complete knowledge of the natural history of the district.

BRITISH SPIDERS: THEIR HAUNTS AND HABITS. By Theodore H. Savoy. Oxford: Clarendon Press. 8vo, pp. 180 and 34 Figures. 1926. Price 6s. net.

As a general rule Spiders are regarded by the public with abhorrence, and this is probably due, in great measure, to ignorance, owing to the absence of popular books dealing with their natural history. We therefore welcome the little volume which has been recently issued by the Clarendon Press, since the clear exposition therein given of the many interesting features connected with their anatomy, habits and life-histories will do much to dispel such feelings of distaste, and will probably arouse no little degree of interest in what are, after all, creatures of remarkable structure and wonderful instincts. The book is attractively written, careful and accurate, beautifully printed, and provided with useful analytical tables which will enable any intelligent reader, after a careful study of the first few chapters, to refer any Spider which he may capture to its proper family or even to its genus. We can heartily recommend this volume as a capital introduction to the study of British Spiders, the collection and preservation of which, as shown in a useful Appendix, are matters of little difficulty.

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1926 [NOVEMBER-DECEMBER

NATIONAL PARKS—A CONTRAST.

IN Scotland in the fine wild surroundings of the Holyrood Park, fortunately preserved for the nation in some semblance of its natural beauty, there lies Duddingston Loch, recently set aside by the Government authorities as a bird sanctuary. It is the only national sanctuary in Scotland, and it is probably the largest natural sanctuary of those recently created in the Royal Parks of Great Britain. The extent of the loch and the surroundings which constitute the sanctuary is 40 acres.

In Canada, a proclamation of the Governor-General issued on 23rd October 1926, has just constituted a new Dominion Park, to be known as "Wood-Buffalo Park." It lies partly in the North-West Territories and partly in Alberta, and its area is 17,300 miles, more than half the area of Scotland, greater than either Switzerland or Denmark. And this is only one, though the largest, of Canada's national parks. Jasper Park extends over 4400 square miles, and the famous Banff Park over 2751.

The Parks of Canada are under the administration of the Department of the Interior, and we regret to see that a practice begun in 1925 has been continued in 1926—the

transference of surplus American Bisons from the Wainwright Park to Wood-Buffalo Park.

Wood-Buffalo Park is best known as the area which contains the only truly wild survivors of the American Bison, or "Buffalo" as it is invariably called in North America. These differ in some respects from the remnants of the plains herds which, from a comparatively small number captured many years ago by an Indian, have vastly increased in numbers in the buffalo reserves. The difference is so marked that the Plains Buffalo and the Wood Buffalo are regarded as two distinct species.

The increase of the Plains Buffalo or Wainwright has made a reduction in numbers necessary, and this has been achieved, first by the slaughter of many for food, and secondly, by the transference over a difficult journey of some 700 miles, by rail and river barge, of 1634 animals in 1925 and approximately 2000 in 1926. These have been placed at large in Wood Buffalo Park. This was the sole territory of Wood Buffalo estimated to number some 1500 to 2000; and amongst these have been dumped 4000 individuals of a different species or geographical race. The transference may lead to cross-breeding and the consequent swamping of the distinctive characters of the Wood Buffalo; it may lead, as some Canadian zoologists hold, to the introduction of disease into the wild herd. In any case its dangers are obvious and its benefits problematical. For ourselves we should have preferred to see the Wood Buffalo, the only wild Bison which survives, left to dree its own weird, with that protection which the new national park could well afford.

* * * *

The Scottish Marine Biological Station at Millport is coming to its own as a centre for the prosecution of marine investigations and for the education of workers interested

in marine animals and plants. The annual report for 1924-25, issued during the past summer, shows that a large number of researchers have availed themselves of the opportunities afforded by the station, and that their labours and those of the permanent staff have made considerable additions to the knowledge of the marine life of the Firth of Clyde. Some of the results, such as those dealing with the movements of diatoms and the feeding of the lesser crustacea may prove to be of real practical value, for they constitute one end of an economic chain, at the other end of which depend certain of the most important of food fishes. The greater activity of Millport Station is traceable to the stimulus of a substantial grant made by the Government from the Development Fund.

* * * *

An important addition has been made to the extensive collection of British insects in the Royal Scottish Museum. Mrs Isabel Black of Nethercroft, Peebles, has generously presented to the Museum the valuable collection of British Beetles made by her late husband, Mr James E. Black. The collection contains about 13,000 specimens and comprises fully 75 per cent. of known British species, including many of the most recent additions to the British list. The collection is available for study by workers interested in the group.

Black Rat at Leith.—An example of the typical form of the Black or Ship Rat (*Epimys rattus*) has been presented to the Royal Scottish Museum by Mr A. Currie, from Leith, where it was killed on 1st November. The fact that the specimen is a young male, apparently one of a family, and that it had been frequenting a garden in Fort Street, a considerable distance from the Docks, suggests that a temporary colony of Black Rats may have become established in the locality.—JAMES RITCHIE.

Continental Blue Tit at Fair Isle—Second Occurrence in Britain.—On 20th October I saw on the steep bank of a gully on this island, a strange bird. It was very restless and wild and was only secured with much difficulty. It proved to be a Blue Tit, but whether it is of the British or Continental form I cannot say, though I hardly think it is a British bird. We had north and north-east winds all the week before it was found. It has been sent to the Royal Scottish Museum.—GEORGE STOUT, Fair Isle.

[The bird was determined by Dr Stenhouse as being of the Continental race, *Parus c. caeruleus*, and for comparison with Scandinavian skins it was sent to Dr Hartert, Tring Museum, who kindly examined it and confirmed the identification. This is only the second authenticated occurrence of this Continental race in the British Isles—the first example, which is now in the Royal Scottish Museum, was obtained at La Mancha, Peeblesshire, September 1895 (J. L. Bonhote, *Bull. B.O.C.*, xxvii., p. 101).—EDS.]

Roseate Tern in Forfarshire.—Late one autumn about twenty years ago a Roseate Tern was shot at Elliot. No further occurrence was noted in the district until 10th September 1926, when on scrutinising a flock of Sandwich Terns (the last of the season) resting on the foreshore, I observed that one of the birds, which were as usual all facing the same way, appeared to reflect a sunset glow from its breast, although the day was misty. On more careful examination it was found to be a Roseate Tern, the first specimen I have seen on this coast.—DOUGLAS G. HUNTER, Arbroath.

THE GREAT SKUA IN SHETLAND.

THE increase in recent years of the Great Skua (*Stercorarius s. skua*) as a breeding bird in the British Isles is in all probability the most striking success achieved so far by bird protection in this country.

Earlier ornithologists writing on British Birds all agree in stating that the Bonxie, to give it its well-known local name, was known to nest in Britain only in the Shetland Islands, and that it had never been known to nest elsewhere, not even in the Orkneys. Few birds have such a restricted breeding range: outside our islands it is known to favour only Iceland and the Faroe Islands. There have been reports of its having bred in eastern North America, but these have never been substantiated.

In its habits the Bonxie is a robber and a pirate, and the terror of the Terns and Smaller Gulls, whom it chases and harries regularly in order that they may disgorge their food or drop the fish which they have caught. In addition it will not hesitate to kill and devour birds as large as a Kittiwake, and in the season eggs and nestlings of other birds are eagerly sought after. It is curious that in the Shetlands at least, rabbits, which are in places there quite numerous, appear to have no attraction for this bird: for in the *Ibis* of 1900, Mr Robert Hall, writing on the Birds of Kerguelen Island, states that there the Skua, *Stercorarius antarctica*, a close ally of our bird, decimates the rabbits and long ago settled the question of there being any danger of these rodents overrunning that land. In view of its predatory habits, it is all the more interesting, however, to learn that in the olden days the Bonxie was held in favour by the Shetlanders, the reason being that wherever it was established, there the young lambs were secure from the attacks of the Sea Eagle, the Bonxie in defending his own territory from the bigger bird, effectually acting as a protector. Now that the Eagle has disappeared from our avifauna, probably never to return, it is difficult to find in

the Bonxie's conduct any feature which deserves commendation, and a recent writer on the Shetlands, the author of the *Land o' the Simmer Dim*, describes it as "the curse of the crofters, for it kills the treasured Geese."

Whether or not the Bonxie in the olden days was an abundant bird in the Shetlands I have not been able to discover; but one thing seems certain, viz., that about the beginning of the last century, the eggs of the bird became desiderata with egg-collectors and as a consequence with egg-dealers. As a result of their combined attentions, the numbers in the Shetlands rapidly diminished; and that this result was so quickly brought about is not surprising when the bird's nesting habits are taken into consideration. The Bonxie nests on the ground and in colonies, and it was quite easy to sweep the nesting-place clear of all eggs. Outside the breeding season, the bird can look well after itself. It arrives at its nesting grounds about the beginning of April and leaves about the end of August, and, the intervening months being spent on the high seas, it is seldom that, away from its breeding place, a chance is obtained to shoot it should anyone so desire.

About the middle of last century those interested in Shetland birds noted with dismay the rapid diminution of the Bonxie, and fears were entertained that it would soon be lost as a native bird. Writing in 1850, Mrs Edmonston in her *Tales from Shetland* tells us that about that date there were only two colonies left, one at Hermanness in Unst and the other in the outlying and little visited island of Foula. How many pairs were in Foula at that time is not recorded, but at Hermanness only two pairs were left. Dr Saxby, in his *Birds of Shetland* written in 1861, gives the number of pairs at Hermanness as three, and states that at Foula only a remnant of its former numbers were then on that island. The proprietor of Hermanness took steps to protect the Bonxies breeding there and later appointed a watcher to scare off would-be egg-robbers, but the birds were slow in increasing. In 1890 the number at Hermanness had increased to nine pairs, while those in Foula were estimated that year at seventy-five pairs and in the following year at

one hundred pairs. It appears, however, that the great spread in the numbers of the birds which subsequently occurred, is traceable to the Hermanness colony; the report in 1899 was that they were increasing and extending their range. At first the overflow established a new breeding ground in Unst on the other side of Burrafirth from Hermanness, and soon afterwards the birds began to come south. Fetlar was colonised, then Hascosay and Yell, and farther south another settlement was made on the island of Noss, all on the east side of the Archipelago. In all probability there are breeding places in other parts of Shetland, for the birds at present are increasing very rapidly and it would not be surprising were they back at Rona's Hill on Mainland, where in olden days one of the largest colonies had its site.

A most interesting and unique extension of their range, however, was discovered in 1916 by two naval officers who were doing a little bird-nesting to beguile the tedium of their enforced stay in Scapa Flow. They found a nesting place of the Bonxie in Orkney: that nesting ground is still occupied, and in 1925 two pairs bred there. When it is considered, that so far as is known, this bird had never previously nested in Orkney, this extension of its breeding outside the Shetlands is all the more noteworthy.

It was the writer's privilege this autumn to be able to pay a visit to a large and recent colony of the Bonxie on one of the northern isles. The birds came there about ten years ago: at that time there were three pairs. It is estimated that this year there were thirty pairs, and in addition an overflow party had made another settlement about six miles off. From the road our way lay over moorland for about two miles until we reached the Bonxie ground, which occupied a stretch of about a mile on the south side of a loch. Close at hand were the ruins of two abandoned crofts and in their neighbourhood the grass grew long and rich, but elsewhere all around heather covered the peaty ground. Rivulets rushing down to the loch had cut channels in the soil and left little isolated knolls everywhere, and it was on these knolls that the Bonxies placed

their nests. The nearest inhabited house was about four miles away. As we approached the nesting ground some of the birds came to meet us, but none swooped near us though they kept flying overhead and calling. The season was practically over, the young must have been nearly all able to fly, and in all likelihood some birds had already left for the open seas. It was difficult to estimate their numbers, but about twenty were always on the wing and others were settled on the moor. In addition on the loch fourteen were counted together indulging in a washing carnival. Artemus Ward, in one of his inimitable dissertations, describes the ladies of his household on washing days as "affectionately boiling soap together and abusing the neighbours." Judging from the clamour which at times reached our ears from the loch, the Bonxies there were carrying out the second part of that programme most effectually, and the reputations of their neighbours were having a sorry time.

And who were the neighbours of these bold, powerful, and predatory birds? When the Bonxies first settled there, there was on the hillside to the west a large and thriving mixed colony of Herring and Lesser Black-backed Gulls: Common Gulls were not uncommon here and there all over the neighbourhood: on an island in the loch there was a settlement of Black-headed Gulls (the most northern breeding place of this bird in the British Isles), and they shared their home with a flourishing community of Arctic Terns. On an islet, also in the loch, a pair of Red-throated Divers regularly nested; about a mile away, where the little burn which drains the loch enters the sea, large numbers of Kittiwakes nested on the cliffs, and many pairs of Whimbrel (a bird, like the Bonxie, practically restricted to Shetland as a British breeding bird) annually resorted for nesting purposes to the moorland to the south. Now what is the state of affairs to-day! A few, a very few pairs, of both Herring and Lesser Black-backed Gulls still remain on the ground which they formerly dominated; there is only an odd pair of Common Gulls left; the Black-headed Gulls and Arctic Terns have deserted their island; the Red-throated Diver no longer

nests on the loch; the Kittiwakes have left their cliffs to the possession of a few odoriferous Fulmars, and worse than all, this year the Whimbrel failed to put in an appearance, having been driven away by these robber-gulls. The proprietor of the ground, who is an ardent supporter of the Royal Society for the Protection of Birds, hopes that the Whimbrel have not been exterminated, but that they have merely changed their ground and gone to other quarters where the Bonxies cannot trouble them. The only bird of any size which has held its own is the Common Snipe, which breeds freely in the immediate neighbourhood. Its eggs are probably too well hidden for the Bonxie to find them, and the bird itself is too quick on the wing to suffer from the plunderer's attention, powerful flier though he be.

As one left the neighbourhood and returned over the moor, the opinion was reluctantly formed that the protection of the Bonxie had now gone far enough, and that it was time something was done to keep the numbers of this destructive bird within reasonable limits. It was therefore no surprise to me, on my asking another land-owner, a lady, if any Bonxies bred on her land, to receive the reply, "No, I am glad to say the nasty things have not come to me yet, and I hope they never will."

In the new Bird Protection Act now in Parliament, there is a clause which, if passed, will give land-owners power on license, to take steps to restrict the numbers of destructive birds, and it seems quite certain that in Shetland, some at least will take advantage of this clause and do something to keep the Bonxie in check. In the Shetland County Council the question has already been raised of the amendment of the present law, which enforces complete protection all the year round.

J. H. S.

Herring Gulls and Corn.—On 15th August 1926, Mr George Ross of Rhynie pointed out to me the great number of pellets cast by Gulls on the shores of Loch Eye, a shallow inland loch in the east part of Ross-shire.

These castings consisted almost exclusively of oat grains in varying stages of ripeness, some, indeed the majority of the heads being quite green. The pellets were moist (probably because they had been forced up by a draught of water) and loosely held together oblong in shape, and when whole measured approximately 2 inches in length. They contained a certain amount of grass in addition to the oats and in one case a strand of corn spurrey. Most of the pellets were broken up and the corn lay spread on the stones, where I was informed by Mr Ross that it is eaten by numbers of Rooks who collect there for that purpose in the autumn. For myself, I only saw one Rook apparently engaged in feeding at the lochside, but this may quite well be explained by the unripeness of the grain. From the number of the species in the vicinity and the size of the castings, it appeared most probable that they were put up by Herring Gulls.

A very considerable amount of corn must be wasted in this way. It appeared to be quite undigested and it seems difficult to explain the action of birds in swallowing large quantities of grain apparently for the sole purpose of its later ejection.

Very few fields of oats were cut in the district at the date in question; most of the consumption must, therefore, have been on growing crops. So far as I can gather from the books, Herring Gulls are well known to consume corn, but the extent to which it is a habit in this district appears to be somewhat exceptional. Saunders says they feed on grass seeds and T. A. Coward remarks that oats are occasionally found in ejected pellets.—CHARLES G. CONNELL, Edinburgh.

[Further notes on this subject are to be found in SCOTTISH NATURALIST, 1925, p. 180, and in an article on Birds as Farm Pests in *Scottish Journal of Agriculture*, October 1925, p. 414.—EDS.]

Little Gulls in Forfarshire.—During the past year or two a Little Gull has wintered at Elliot. On 24th September 1926 a bird in immature plumage was seen hawking insects over a marsh near the sea. On its attempting to settle on a sheet of fresh water beside some Black-headed Gulls they drove it off. Three Carrion Crows then took up the chase by turns and harassed it for a long distance. On 28th September and again on 15th October an adult specimen was observed.—DOUGLAS G. HUNTER, Arbroath.

THE CHAR OF LOCH OSSIAN.

By the Right Hon. Sir HERBERT MAXWELL, Bart., F.R.S., LL.D.

AMONG the few traces of the Pleistocene Ice Age that may be recognised in the existing fauna of the British Isles, none illustrates more directly the physical condition of the country consequent on the retreat of the land-ice than the present distribution of two genera of sub-arctic fishes—*Salvelinus* (Char) and *Coregonus* (Gwyniad, Pollan, etc.). These fishes are intolerant of any but very cold water; wherefore, when the climate of the British Isles became warmer and the temperature of our lakes and rivers rose conformably, they ceased to exist in all but a few English, Welsh, Scottish, and Irish lakes in which, owing to their great depth, there remains a constant body of cold water. From the shallower lakes the Char may have made escape to the sea (in the most northerly rivers of Europe Char are still anadromous, migrating to the sea and returning to the rivers to spawn). Failing to do so, they must have succumbed to the rise of temperature, their place being occupied in turn by the Common Trout, *Salmo fario*. An instance in point occurs in Loch Leven where Char abounded one hundred years ago; but in 1830 the water-level was lowered by drainage to the extent of $4\frac{1}{2}$ feet, causing a general rise of temperature in the lake, which proved fatal to the Char, though propitious to the trout. The last recorded capture of a Char in Loch Leven was in 1837.

The significance of the present distribution of Char in the British Isles as incidental to climatic change makes it of some importance that the register of such distribution should be scrupulously accurate, having regard to the frequency with which certain fresh-water fishes—Grayling, for instance—have been transferred by human agency from one water to another. Well-known facts have been briefly recited above merely as preface to an incident which it may be well to record in order to avoid future misapprehension.

About twelve summers ago I was on a visit at Sir John Stirling Maxwell's lodge of Corrou, which stands at the foot of Loch Ossian, a deep sheet of water in Inverness-shire, 1269 feet above sea-level. This lake is three miles in length and at no part is as much as half a mile in breadth. It contains small trout in great number, the spawning ground in numerous hillside burns producing a population for which the granitic soil of the lake provides but meagre provender.

One fine evening I went with the ladies to have tea by the loch side, where we were joined by Mr Graham Moir, who had been fishing. He turned out the contents of his basket for our inspection—some two or three dozen troutlets, none more than four or five ounces in weight. "Hullo! there's a Char," I exclaimed, "and there's another!"

This was exciting, seeming to constitute a new record, for neither my host nor I had suspected the presence of that fish in Loch Ossian. We took the brace of Char home to be bottled in spirit, intending to send them to Mr Boulenger of the British Museum for identification. Next morning, however, Sir John, meeting Mr Ferguson the head stalker (a fine man now, alas! no more), asked him whether he had known of Char in Loch Ossian. "Never," replied Ferguson, "till we put in those that Sir Herbert sent us five years ago."

I had totally forgotten that I had obtained, probably from the Howietoun Fishery, one hundred Char, and sent them to be turned out in Loch Ossian on the chance of that being a suitable abode for them, as it appears to have proved. The purpose of this note is to prevent it being assumed at any future time that the Char of Loch Ossian are a survival in that lake from glacial times.

THE NESTING OF THE VELVET SCOTER, LONG-TAILED DUCK, AND SCAUP IN SCOTLAND.

By H. W. ROBINSON, M.B.O.U., F.Z.S. Scot.

WITH regard to the breeding of certain species of diving ducks in Great Britain, there is so much uncertainty, even in the most recent literature on the subject, that something definite and authentic is desired. Have the Velvet Scoter and Long-tailed Ducks ever nested in Britain? are cases in point.

With regard to the Velvet Scoter (*Ædemia fusca*), in the latest standard work, *The Practical Handbook of British Birds* (Witherby and others) we read, "Said to have nested, Scotland, but no proof." In the late Sir Vauncey Crewe's collection there was a clutch of two eggs taken by Mr J. Whitaker in Orkney in June 1914. Mr Whitaker very kindly gives me the following particulars, although the exact locality may not be divulged. "I took the Velvet Scoters myself. It was where they had nested more than once and the Ducks were there. They had laid under a clump of rushes early in spring and snow had flattened rushes in the nest, so they left it and nested hard by, but, of course, I was satisfied with the two eggs." This, therefore, is proof positive that the Velvet Scoter has actually nested in Great Britain and not once only.

With regard to the Long-tailed Duck (*Clangula hyemalis*, *Harelda glacialis*), the same authority states: "Eggs apparently of this species taken several times in Shetland; breeding reported and eggs taken summer of 1911 Orkneys (O. V. Aplin), and some evidence of previous nesting Orkney." With regard to this clutch of 1911 there was a lot of controversy, in which I took part, and the general verdict was, I believe, not proven. In the same collection as above, dispersed at Stevens's, was part of a clutch of Long-tailed Duck catalogued as "Taken in North Ronaldshay, 1912, by Gunn, given by J. Whitaker 1914." Mr

Whitaker has the other part of the clutch in his collection, and says that he had such a high opinion of Gunn as to be absolutely certain about the authenticity of the data. Here, then, we have two authentic records which I cannot find mentioned with certainty in any published book.

Of a clutch of eleven eggs of Scaup (*Nyroca marila*) and nest, described as taken in Fife, 6th June 1880, in the same collection, I cannot obtain any further data. In *The Practical Handbook* several records of its having nested in the Outer Hebrides are given, and once in Sutherland in 1899. "Also recorded breeding Orkneys (*B. O. U. List*, 1915)." The latter is, I feel sure, correct, as I knew the man who took the clutch and also the small island where they nested more than once. If the Fife clutch is genuine, which I am unable to verify, then it is only the second record for the mainland of Scotland.

Reeve, Grey Plover, and Bewick's Swan at Aberlady, East Lothian.—An adult Reeve in summer plumage was forwarded to me for identification. It was a solitary bird obtained by a wild-fowler near Aberlady, East Lothian, on 11th October 1926. I have one other record of this species from this district, a young male in autumn plumage obtained near Luffness on 20th August 1910.

An adult male specimen of the Grey Plover in full nuptial plumage was obtained at Aberlady, East Lothian, on 18th October 1926. Two specimens of this bird with black breasts had been frequenting the shore from early October. The Grey Plover is fairly common at Aberlady as a winter visitor. The majority consist of specimens in first year immature plumage. Second year birds are much rarer: I have examined two only. The present specimen is the only adult I have known of from Aberlady.

On 20th October 1926 an adult Bewick's Swan was found dead in the sea at Aberlady. The head and neck, which were forwarded to me, were speckled with a rusty tinge. The bill measured 88 mm. from anterior feathers to tip, and the bird was probably a female. This is a somewhat early date for the species.—OLIVER H. WILD, Cheltenham.

NOTES ON FISHES FROM THE FIRTH
OF CLYDE.

By RICHARD ELMHIRST, F.L.S.

(Concluded from p. 158.)

G. virens, L.—Saithe. R. March, E. April K. Several cases of “pug-head” have occurred from time to time. Large numbers of young Saithe frequent the Laminarian zone during the summer months, in June these young fish of the year range from 22 to 28 mm. long and in August from 6 to 9 cm. long.

Merluccius vulgaris, Cuv.—Hake. Generally distributed in the deeper parts of the area, including Upper Loch Fyne, and Loch Striven; sometimes occurring in abundance during late summer and autumn. During the winter small specimens under 12 in. long are not uncommon, but larger fish also occur, *e.g.*, 8th Dec. 1924, three Hake caught off Largs were ♀ 42 cm., ♂ 55 cm. and a ♀ 63 cm., all feeding on Herring. A 17-lb. fish, F. May. A 4-lb. fish spent, 31st May 1926.

Molva molva, L.—Ling. Male, R. May, T. Scott; E. July, McI.

Onos mustela (L.).—Five-bearded Rockling. E. February to June. Generally distributed.

*Onos tricirratu*s (Brun.). — Three-bearded Rockling. Rare; off Cumbrae and Bute. R. July.

Raniceps raninus, L.—Lesser Fork-beard. One specimen in a lobster creel, September 1921, Keppel. Mr J. Sheddon, an experienced lobster fisherman, told me he had seen others (perhaps half a dozen in twenty years) caught that way off Arran and the Ayrshire coast. Also Patience (*loc. cit.*), Gareloch (Chumley).

Ammodytes lanceolatus, Le Sauvage.—Greater Sand-lance. Generally distributed in sand. Young 47 to 50 mm. long, dug in February in sand at Millport. Roes filling from September onwards; as late as February ovarian eggs are found which would indicate a long winter spawning period.

Hippoglossus vulgaris, Flem.—Halibut. Taken rarely off Cumbrae and Bute.

Drepanopsetta platessoides (Fabr.).—Long Rough Dab. E. April and May; a few still mature June 1924.

Bothus maximus, L.—Turbot. E. April, K; July, McI.

Zeugopterus punctatus (Bl.).—Muller's Topknot. Cumbrae, Largs channel, East Kyles; occasionally taken on the shore at l.-w.s. E. June and July.

Scophthalmus unimaculatus (Risso).—One-spotted Topknot. Cumbrae, Largs channel, Ayrshire coast. Arran basin (Chumley). E. June and July.

S. norvegicus (Gunther).—Ekstrom's Topknot. Rare. Keppel, 8 fathoms.

Rhombus megastoma (Don).—Sail-flake. Chumley records this species from the Arran basin and Plateau districts.

Pleuronectes platessa, L.—Plaice. E. March to May; a few still mature in June 1924.

P. limanda, L.—Dab. E. March to June, July, McI. In the *Annals of Scot. Nat. Hist.* for April 1911 I described a completely ambi-coloured Dab caught in the Holy Loch. More recently I have had two completely ambi-coloured specimens, one caught in May 1921 off Ormidale and sent in by Mr R. A. McCallum, and the other caught at Fintry Bay, Cumbrae, by Mr J. MacNeil in 1925. Complete ambicoloration in this species seems to be rare. Bateson in *Materials for the Study of Variation* gives no records, and Gemmill in *Teratology of Fishes* records two cases, including the first of the above.

P. microcephalus, Don.—Lemon Dab. E. June and July. Small specimens show extremely rapid colour changes, for instance, while swimming across an aquarium they change colour completely, say, within two seconds.

P. cynoglossus, L.—Witch. E. June and E. July, McI. Generally distributed on mud.

P. flesus, L.—Flounder. E. April to June; July, McI.

Solea vulgaris, Guensel.—Black-sole. Rare; off Cumbrae and Inchmarnock. Loch Striven and the Gareloch (Chumley).

Solea lascaris, Risso.—French Sole. Chumley records

Solea aurantiaca, Gunther, from the Gareloch. This name is a synonym of *Solea lascaris*, Risso, a species extending from the Mediterranean to the North Sea and Irish Sea (Cunningham, *Marketable Marine Fishes*, 1896, p. 257). On 27th August 1924, a large specimen of this species was caught in shallow water on Hunterston Sands. In view of the small size of *S. lascaris*, "usually 8 to 12 in., and not known beyond 14 in." (Cunningham), the following particulars noted are of interest:—

Female, recently spent; 19 in. (48 cm.) long, 2 lb. 8 oz. weight. Gut contained lugworms; a number of *Scolex polymorphus* occurred in the intestine. Colour lemon-stone with dark spots and blotches; blind side very white.

Formula:—D85 P10 V5 A70 C17 L1150.

Another specimen was obtained during the summer 1925, east of Cumbrae, length 29 cm. *Udonella soleæ*, an ectoparasitic Trematode was found on this specimen.

I have seen two other specimens but exact locality was not known.

Argentina sphyrcna, L.—Hebridean Smelt. Chumley gives Loch Striven and Gareloch. Largs channel 1926.

Rhamphistoma belone (L.).—Garpike. 1919 and 1920, Kilbrennan Sound in herring nets. Judging by fishermen's reports an occasional summer visitor to the area.

Clupea harengus, L.—Herring. E. January to May, September to October, R. November.

"The majority of the Clyde Herring carry out a winter spawning migration to the Ballantrae banks in February; despite this fact experienced fishermen assert that Herring spawn may occur in any month of the year. This is confirmed by records of spawning of smaller shoals in March, July, September, October and December in the Inchmarnock basin, the Kyles, Loch Fyne and near Cumbrae.

The early post-larval Herrings from the great annual spawning seem to travel westward towards and round the south of Arran. Post-larval Herrings and Sile, 1 to 1½ in. long, occur in April and May in South Kilbrennan Sound and Cumbrae deep, generally in deep water. These spread slowly northward entering Loch Fyne in summer. Some of the later fry (or occasionally some of the

earlier ones) follow the Ayrshire coast and are prevalent round Cumbrae in August and September, being about $2\frac{1}{2}$ in. to 3 in. long. By the following January these 0-year group fish vary in length from $3\frac{1}{2}$ to 6 in. in different years and localities.

Occasionally, in December and January, post-larval Herrings 20-30 mm. long are taken off Cumbrae; these are undoubtedly autumn spawned fry.

At the same time as the young of the year reach Skipness district in their northern progress large Herring are usually entering the Clyde Sea Area from St George's Channel. It will be interesting to know whether this is an invasion of outside Atlantic fish entering the Clyde as part of a summer movement or whether they are fish, which left as spent fish in the early part of the year, returning.

When the southward spawning migration begins in mid-winter, the van consists of the ripest (often the largest) fish and the shoal tails off to immature fish in their second year with, often, a following of the larger of the 0-year group. After spawning the spent fish retire to the deeps to recuperate and the immature "camp-followers" spread northward, their movements usually coinciding with the northward return of the Gannets which leave this district in October and return in March.

Shoaling: Young Herring may shoal at a very early age: post-larval Herring about 1 in. in length may shoal. Throughout the summer of 1922 (May to September), Sile were present in the Fairlie channel, but shoaling was never observed. In other years shoaling occurs, particularly in autumn, when shoals of Sile are ravaged by Whales, Porpoises, Gannets, Gulls, Guillemots, Razor-bills, Cormorants, etc. In fact the presence of the shoal is usually indicated by a flock of screaming birds (vide *The Zoologist*, January 1912).

Sile are eaten by dog-fish, cod, saithe, haddock, whiting, lythe, gurnards, mackerel and large herring. For example, during the winters since 1921, there has been a good whiting fishing west of the Cumbrae, and during each season nearly all the fish containing recognisable food had been feeding on herring sile.

The autumn Sile are mixed-plankton feeders. One fish has been found to contain *Acartia*, *Calanus*, *Paracalanus*, *Pseudocalanus*, *Oithona*, a Harpacticid, *Sagitta*, *Oikopleura*; another in the same catch contained *Calanus* only, others again had mixed copepods."

C. sprattus, L.—Sprat. E. April K.; June; July, McI.

In the *Handbook* Scott states that they are not uncommon in the Clyde, and are frequently mistaken for

young herrings, so that their number and distribution are somewhat uncertain. Both M'Intosh (*Resources of the Sea*) and Chumley (*Medusa records*) make no mention of sprats. There are, however, specimens in the Robertson Museum taken by S. Y. Medusa which are incorrectly labelled "Young Herrings." The same mistake has been made regarding some of the specimens on which the preceding remarks on young herring were originally based. Whilst in general the foregoing quoted passage is correct, it should be noted that at the time of writing (October 1926) there are both sprats and young herring in considerable numbers around the Cumbraes—a condition which has occurred also in other years (*e.g.* 1910 and 1917). Sprats are also caught among "mixed" herring in the winter fishing in the lochs.

Anguilla vulgaris, Leach.—Eel. Taken occasionally by long-line fishermen in all parts of the area. In 1926 two of the late larval stage called "glass eels" were taken, one on 14th January in surface tow-net at Keppel, and the other 4th February at 50 fathoms, west of Cumbrae Lighthouse in open tow-net. Both specimens were $2\frac{3}{4}$ in. long, and feeding. They began to form pigment during April, and by the middle of May had obtained normal elver colouring. Elvers 3 in. long are occasionally taken at Keppel from January to March. Between tide-marks, rare.

Conger niger (Risso).—Conger Eel. Generally distributed in all depths. Fishermen recognise a palish type as occurring on sandy ground, which agrees with observations by Couch. The pale colour variety with black-edged fins occurs occasionally, and in my experience has always been a male. I recorded two specimens of the *Leptocephalus* larval stage from the Clyde in *Nature*, 2nd December 1920, p. 441; Keppel, July 1907, from the stomach of a Saithe, and Ardnell Bay, March 1908, from the stomach of a Cod. On several occasions large Congers after living for several years in the aquarium have died, or after exhibiting a restlessness, which is probably due to developing gonads, have leapt out of their tank and been found dead on the floor. This has always happened between October and February. The conditions in their cases are very like those described by Cunningham

(*Marketable Fishes*, p. 202). With approaching maturity these female Congers have shown certain characters. First they ceased feeding, possibly for months; the eye enlarged somewhat and had a glassy look; the bone softened so that it was easy to make a transverse cut through the fish; the stomach was always much shrunken and the Trematode parasites, *Lecithochirium rufoviride*, which are usually present in the fundus of the stomach, are then found loose in the intestine and occasionally in the rectum as well; roe well developed, e.g., February 1912, in a fish 4 ft. 8 in. long, 29 lb. in weight, the roes were 22 in. long and weighed $4\frac{1}{2}$ lb.

Young ones 8 in. to 10 in. long have occasionally been taken on the shore at l.w.s.

Syngnathus acus, L.—Great Pipe-fish. Frequent and generally distributed. R. July.

Nerophis æquoreus (L.).—Straight-nosed Pipe-fish. Rare; Cumbrae, Ayrshire shore, Mount Stuart. E. October.

N. lumbriciformis (Will.).—Worm Pipe-fish. Frequent and generally distributed on hard ground. E. and young, June to October.

Orthogoriscus mola (L.).—Short Sunfish. *Handbook* one record; J. Paterson in *Glasgow Naturalist*, vol. ii., p. 30, gives a second record.

Carcharias glaucus (L.).—Blue Shark. The *Handbook* gives two records to which I cannot add.

Lamna cornubica (Gmel.).—Porbeagle. In August 1920 I received a male specimen, 5 ft. 3 in. over all length, caught off Arran in herring nets, from T. Muir. A few days later he got a smaller specimen. Other records are Port Bannatyne, October 1910, a large specimen, Dunlop, *Trans. Nat. Hist. Soc., Glasgow*, 1892, Duthie, *Ann. Scot. Nat. Hist.*, 1901; and Campbell, *Ann. Scot. Nat. Hist.*, 1902. In "Naturalists' Notes" in the *Glasgow Citizen*, 8th October 1921, Mr J. Paterson summarised sundry records of this species from 1837 onwards, from which it would appear that this species, omitted from the 1901 *Handbook*, is by no means rare in the Firth, particularly during the summer when it pursues the shoals of Herring and Mackerel, and the Dog-fish preying on them.

Galeorhinus galeus, (L.).—Tope. *Handbook*: "Several at Girvan 1899"; usually scarce, but during 1919, 1920 and 1921, this fish became comparatively abundant in the Clyde, reaching Bute and the Cumbrae. Fishermen complained of its destructiveness to long-line caught fish.

Alopias vulpes (Gmel.).—Thrasher Shark. Professor Graham Kerr has handed me a record of a Thrasher landed at Machrie Bay in August 1922, identified from photographs by G. A. Allan, Esq., McCrindle, *Glasgow Naturalist*, vol. vii., records one off Troon in October 1915, and others off Ayr and Portencross. Numerous verbal records of this species reach me, which are probably correct, as the tail is distinctive.

Cetorhinus maximus (Gunn.).—Basking Shark. A large specimen, apparently damaged by a ship's propeller, was washed ashore at Craigmore on 2nd July 1925. In the *Glasgow Naturalist*, 1913, I gave details of a large tailless specimen washed ashore on Little Cumbrae. Later evidence showed that this fish had its tail cut off while fast in the nets of two Girvan boats. McCrindle, *loc. cit.*, gives other records. This species is a frequent summer visitor in the Firth of Clyde, known as the "Sail-fish" by yachtsmen and fishermen.

Scylliorhinus canicula (L.).—Lesser-spotted Dog-fish. Occasional; widely distributed; enters the Lochs. E. April, May.

S. stellaris (L.).—Nursehound. Occasionally caught on long lines; rather rarer than the last species. From its habit of closing its eyes is known to the fishermen as the "Blinker"; another name said to be associated with this habit is "Fohmy," a word the origin or meaning of which I have been unable to ascertain. E. January, February.

Pristiurus melanostomus (Bonap.).—Black-mouthed Dog-fish. Occurs occasionally amongst hauls of *Acanthias*.

Squalus acanthias, L.—Piked Dog-fish. The common Dog-fish of the Clyde. Sometimes very abundant; can be caught at all seasons by the use of herring bait. December and January young with yolk-sacs attached are shed in

the boats as the mature females are hauled in on the line. Fully developed embryos in October.

Raia batis, L.—Grey Skate. Frequent off shore. Also got in Largs channel, Loch Striven and off Inchmarnock.

R. clavata, L.—Thornback Ray. E. May.

R. nævus, Muller and Henle.—Given in the *Handbook* as *R. circularis*—Couch. Cuckoo or Sandy-Ray. According to R. S. Clark, *Journ. Marine Biol. Assn.*, xii., *R. circularis* is a deep-water species which has been confounded with *R. nævus*, M. & H., a more coastal species. He has examined a number of Clyde specimens and confirms them as *R. nævus*.

Quail in Shetland.—On 2nd September whilst the bere was being cut on Sumburgh Farm, three Quails were seen, and one of them, which has since thriven well in captivity, was taken alive. It was known that strange birds were in the neighbourhood; their call was first heard on 22nd June, but, though one of the birds was once flushed by a dog, it was not till the above mentioned capture that their identity was definitely established.

I may add that at Exnaboe, about a mile to the north, another pair of Quails nested in a hayfield. When the grass was cut, enough was left round the nest to make a shelter and the pair reared several young, though some of the eggs did not hatch.—W. LAIDLAW M'DOUGALL, Sumburgh.

[This has been a Quail year in Shetland. In addition to the occurrences reported by Mr M'Dougall, a male bird in breeding condition was found dead, having struck wire, at Reawick, Sandsting, on 2nd July. This bird, presented by Dr J. C. Bowie of Bixter, is now in the Royal Scottish Museum. Further, in the *Shetland Times* of 28th August, it is reported that on 21st August two nests of the Quail were found on Bressay; one with twelve, the other with eleven eggs. Quail in all probability also bred at Fair Isle: three were seen there in September and one shot was an adult female which had bred.—EDS.]

SOME RECORDS OF NORTHERN CRANE-FLIES.

By ALEXANDER CUTHBERTSON.

DURING a study of material in the collection of Mr J. J. F.-X. King, F.E.S., of Glasgow, the following little-known Crane-flies (Dipt.: Tipuloidea) from North Scotland were identified by the writer:—

(a) From Aviemore and Nethy Bridge, summers 1903-1906.

<i>Dicranomyia consimilis</i> , Zett.	<i>Gonomyia simplex</i> , Tonn.
„ <i>rufiventris</i> , Strobl.	<i>Tricyphona lucidipennis</i> , Edw.
<i>Hexatoma lucidipennis</i> , Curt.	<i>Tipula juncea</i> , Meig.
<i>Gonomyia lucidula</i> , de Meij.	„ <i>melanoceros</i> , Schum.

(b) From Forres, summer 1904.

<i>Molophilus flavus</i> , Goet.	<i>Liogma glabrata</i> , Linn.
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A number of interesting records of Tipulids from the King collection are included in a recent paper (*Ent. Mo. Mag.*, 1926, pp. 31-35) by F. W. Edwards, containing a description of a new species *Dicranomyia caledonica*, from Inverness.

In an earlier memoir (*Trans. Ent. Soc. Lond.*, 1921, pp. 191-230) there are many Northern records, and a description of *Tricyphona lucidipennis* (Elgin). The following short list is selected from the publications here cited:—

<i>Trichocera rufescens</i> , Edw.	<i>Adelphomyia fuscula</i> (Lw.).
<i>Dicranomyia consimilis</i> , Zett.	„ <i>nielseni</i> , Kuntze.
„ <i>occidua</i> , Edw.	<i>Ilisea obscuripes</i> , Zett.
„ <i>patens</i> , Lundst.	<i>Nephrotoma aculeata</i> , Loew.
<i>Orimarga attenuata</i> , Walk.	<i>Tipula alpium</i> , Bergr.
<i>Pilaria meridiana</i> , Staeg.	„ <i>vafra</i> , Ried.
<i>Tricyphona schummeli</i> , Edw.	

The Crane-flies of the remote parts of the Highlands will repay in interest anyone who will collect them carefully.

Mr F. W. Edwards of the British Museum (Nat. Hist.) has kindly confirmed the above determinations.

NOTES

Colour of Bill of Twite.—In the last (September-October) number of the SCOTTISH NATURALIST, p. 59, Dr O. H. Wild and I described the colour of the bills of the Twites which we examined in Islay in the breeding season this year. In connection with what we stated then I have to say that in the first week of November I examined five Twites in the hand in Bute, and in each case the bill was of a clear yellow. Apparently we have here a seasonal change, assuming that the Islay Twites follow the same course as the Twites in Bute. It is remarkable that the brighter colour should be assumed *after* the breeding season. This account of the colour of the bill of the Twite is directly contrary to the statement made by Howard Saunders in the *Manual of British Birds*, where the bill of the Twite is described as being less yellow in the winter than in the summer. It is also very different from the quite elaborate account given in MacGillivray's *British Birds*.—J. M. M'WILLIAM, Craigmore.

Starling Roost at Barnton.—Several references to Starling roosts have appeared in the SCOTTISH NATURALIST, some of the roosts being more or less of a permanent nature, the occupancy extending over several years, and some of a temporary nature. One of the latter came under notice during the present autumn. I cannot say exactly when the roost began, but it was first observed on 5th September, when the Starlings arrived in several flocks, numbering many thousands, and settled in the bushes behind the Plant Breeding Station, about a mile south of Barnton Station. Every evening the birds arrived a little after sunset and always came from a direction bounded by south and south-west. By 26th September they were observed to have thinned appreciably in numbers, and on 10th October and the subsequent days not a single Starling was seen to come to the roost, which was now deserted.—A. C. STEPHEN, Royal Scottish Museum.

Rough-legged Buzzards in Sutherland.—While out on the moors with my cousin, who was stalking on the Dunrobin forest, Golspie, from the 16th September to 6th October of this year, I was much impressed with the number of Rough-legged Buzzards. It was quite usual to see two or three sailing overhead at once, and on carefully questioning our stalker, a very knowledgeable man, he

assured me that the Rough-legged Buzzard is the Common Buzzard of Sutherland at that season, and the Common Buzzard is very rarely seen at all.—DORIS WILSON, St Andrews.

Albino Meadow-Pipits. — When shooting at Allershaw (Lanarkshire) on 27th August I was told by the shepherd that a pair of Meadow-Pipits had reared a brood which contained two pure white birds. He could not tell me the colour of their legs or eyes, but he had frequently seen the birds when looking after his sheep, and he saw one of them as recently as 11th August.—HUGH S. GLADSTONE.

Deal-fish at Montrose. — *The Field* of 14th October 1926 contains, along with a photographic reproduction, the following:—“A correspondent who sends us the accompanying photograph of a Deal-fish writes: It is a perfect specimen, length 5 ft. 4 in., breadth 1 ft. 3 in., with large protruding eyes and long red fin. The last Deal-fish caught in the district was in 1872. The fish (*Trachypterus arcticus*) is a rare visitor to these shores. The one illustrated here is rather smaller than the one in the Montrose Museum, caught in April 1872, which was 5 ft. 10½ in. long. . . . Less than two dozen examples were taken in the British Isles during the last century, of which the largest was one 7 ft. 9 in. long, washed ashore in Donegal Bay in 1875.”

Thresher Sharks in the Solway.—The 8-foot Thresher Shark recently forwarded to the Royal Scottish Museum was caught alive in a salmon stake-net at Carsluith, Creetown, on Thursday, 12th August, at 4 P.M. Several Threshers had been observed some days previously at Isle of Whithorn, and this is in the direct set of the flood tide about eight miles distant. Although I did not see them I have no doubt this was one of a company. About a week before catching the Museum specimen we got in the same net a larger one, 10 feet long, which I sent to Welsh National Museum, Cardiff. Again about 18th August we got another, but as it was dead it fell into deep water and was not recovered. Another was taken in the same week by Mr Davidson, Cally Fishings, Gatehouse.

One was got at Carsluith about fifty years ago, and about 1900 I got one 7 feet long which is in the Stewartry Museum, Kirkcudbright. These are the only records I know of for the high end of Wigtown Bay.—ADAM BIRRELL, Creetown.

BOOK NOTICES

THE GAME ANIMALS OF AFRICA. By R. Lydekker, Second Edition revised by J. G. Dollman. London: Rowland Ward Ltd., 1926. Pp. xiv + 483. Price 30s. net.

This remains for the sportsman and naturalist an indispensable guide to the structural characteristics and habits of the game animals of Africa, ranging from the elephants, rhinoceroses and antelopes to cats, hares, and rabbits. The numerous illustrations of game animals and particularly of heads and horns, where they furnish diagnostic characters, make identification a relatively simple matter, and the text is full of interesting field observations. Lydekker when he completed the first edition of this work in 1908 felt certain that many additions to the knowledge of habits as well as of races and species had still to be made in Africa. His forecast was correct, and the necessary additions and alterations have now been collected and contributed to the second edition by Mr J. G. Dollman. Among these, however, we note that no reference is made to a new species of wild-cat and other distinctive animals discovered by Captain Angus Buchanan on his journeys across the Sahara Desert.

BIRD STUDY IN INDIA. By M. R. N. Holmer, M.A., F.Z.S. London: Humphrey Milford, Oxford University Press, 1926. Pp. 148. Price 4s. 6d. net.

This book is written as an introduction to the study of birds in India for those to whom the volumes of the Fauna of British India are too advanced. As Miss Holmer's experience appears to have been in the Punjab, this work will principally appeal to residents in that province; but the two chapters on classification and the recognition of a bird in the field will be useful to the beginner in any part of the country.

The book is divided into two parts—the first dealing with the species commonly met with round Delhi, and the second with the birds frequenting the Punjab Hill Stations. Miss Holmer has a happy way of describing birds and their habits, and we only wish she had added a little more about their eggs, nests, and their status as residents or visitors. Two coloured plates and several black-and-white drawings add to the value of the work, and are certainly the best we have seen in a book of this kind. We think the replacement of the two appendices on classification by an account of the winter visitors to India would have added to the usefulness of the book, and note that the name of the Red-Wattled Lapwing is given by Miss Holmer as "Pity-to-do-it" in place of the general name of "Did-you-do-it," derived from the bird's call.

N. B. K.

GOLD-FISH CULTURE FOR AMATEURS. By A. E. Hodge, F.Z.S., and Arthur Derham. London: H. F. & G. Witherby, 1926. Pp. xii + 103. Price 5s. net.

The building of modern and attractive aquaria at the Zoological Gardens in London and in Edinburgh will create a new interest in the home aquarium. But the beginner will soon find that many difficulties conspire against complete success. This book will cause the difficulties to vanish, for it deals with just those points about the changing of water, aeration, and feeding, upon which safe and practical guidance is difficult to obtain. It goes much further, for it describes the requirements for breeding, and contains invaluable hints upon the management and feeding of the adults about spawning time, and subsequently of the fry. Although the work is confined to gold-fish, many of the curious varieties of which are illustrated, the directions given for the management of an aquarium apply equally well to many other fresh-water fishes.

WILHELM HOFMEISTER: THE WORK AND LIFE OF A NINETEENTH CENTURY BOTANIST. By Dr K. von Goebel. Translated by H. M. Bower, M.A., and Edited Botanically by F. O. Bower, F.R.S. London: Ray Society, 1926. 8vo, xi + 202 pp., with 3 figures, portrait, and two facsimile letters. Price 12s. 6d. net.

In this important volume we find a carefully written account of the epoch-making investigations of one of the most famous of modern botanists. A perusal of the excellent summary furnished by Goebel, Hofmeister's "last surviving pupil," will enable the reader to judge how far botanical science was advanced by the great Heidelberg professor's thorough and painstaking investigations in a difficult field. The subject-matter of the main chapters is naturally of a highly technical character, and not always easy reading; but there is a wealth of information in the pages of this volume concerning such subjects as fertilisation and seed-formation in the flowering-plants, the development and formation of fruit in mosses, ferns, and their relatives, and on the genesis of vegetable cells. Lighter reading is provided in the excellent biographical sketch of Hofmeister by his daughter, Constanze Ganzenmüller. Since this occupies more than one quarter of the volume one would expect to find much of interest to the layman, in contrast to the severe scientific pages which precede it; and in this we are not disappointed, for the botanist's life-story is well told, and forms a fitting conclusion to a volume which will rank as one of the most interesting in the long series issued by the Ray Society during a period of more than eighty years.

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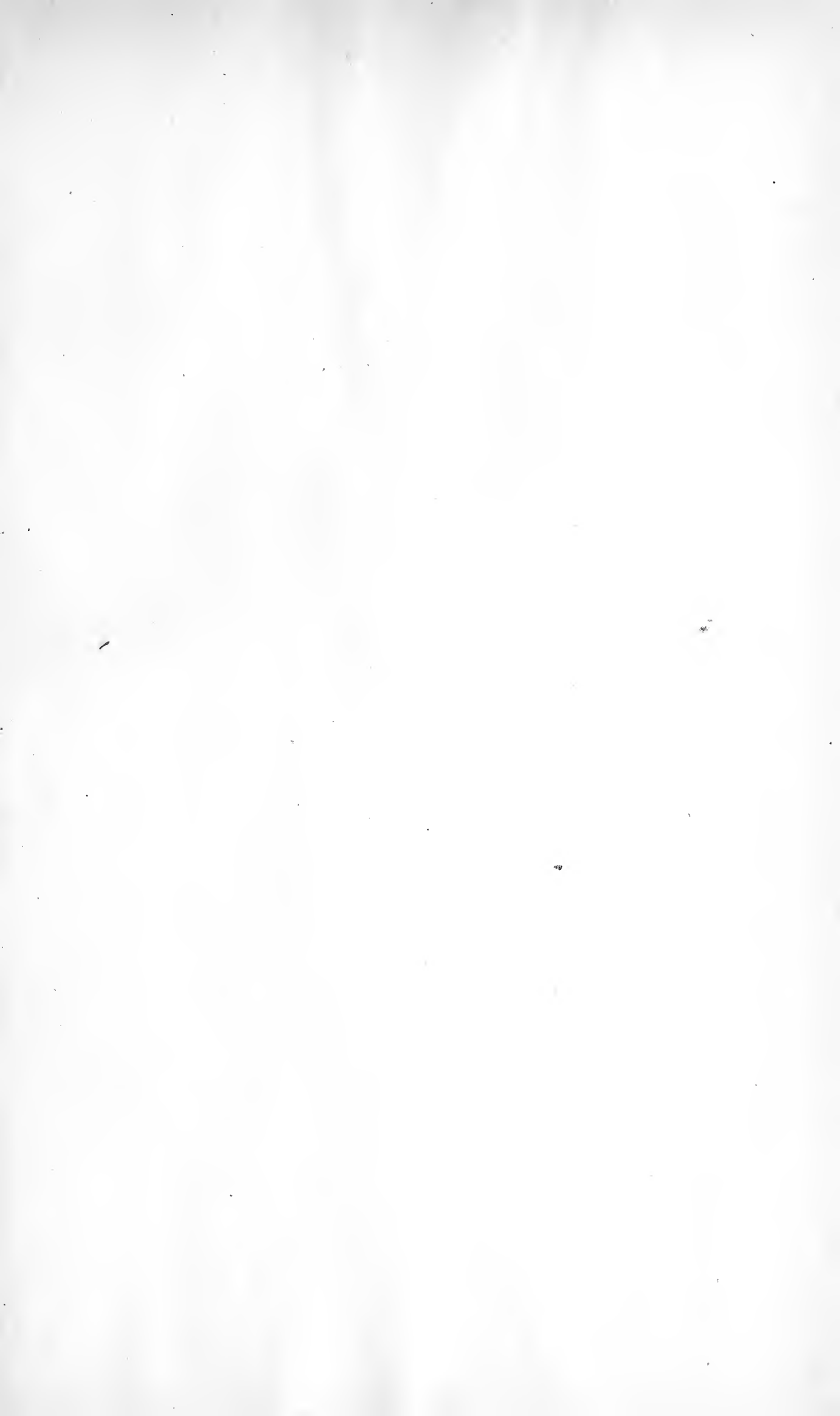
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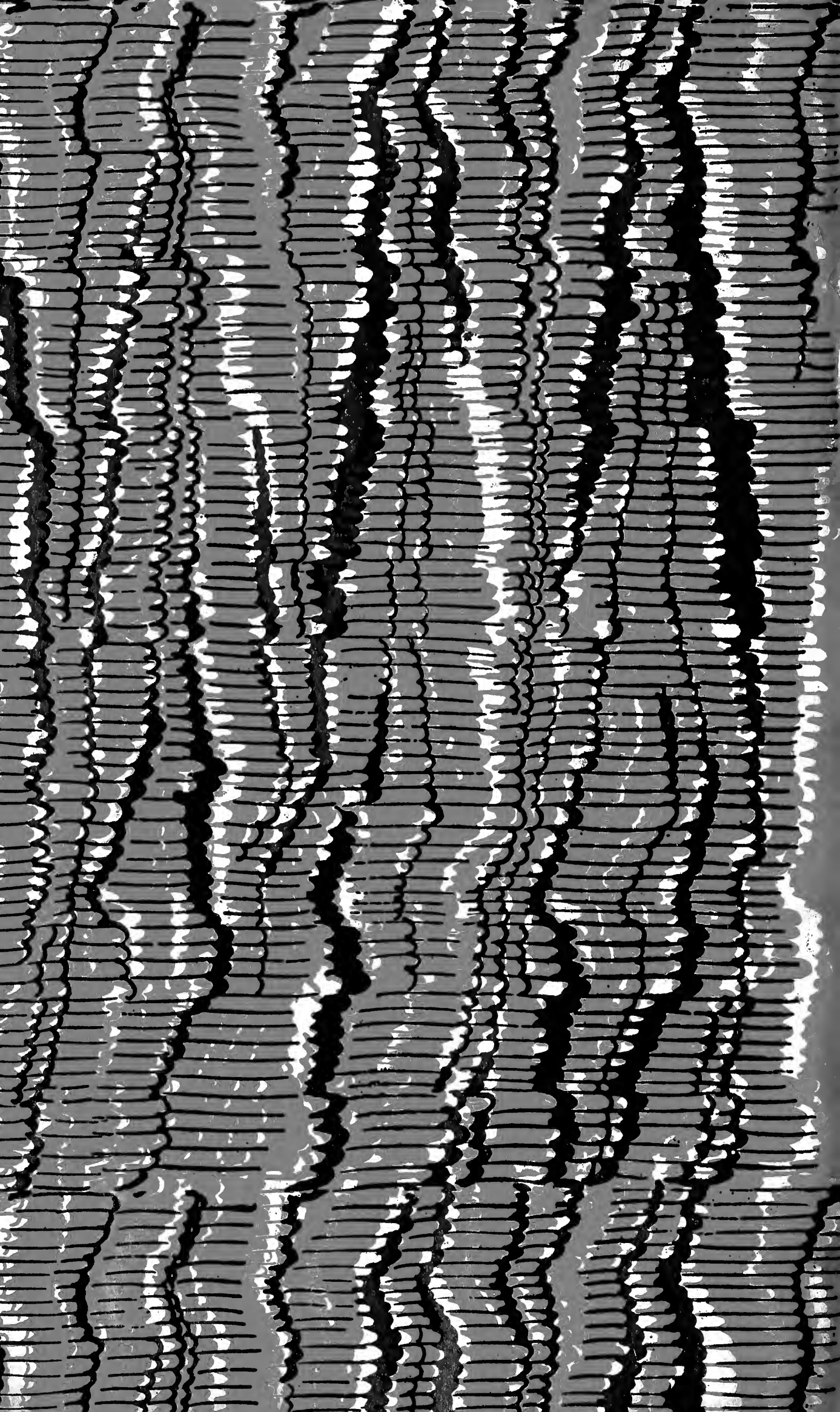
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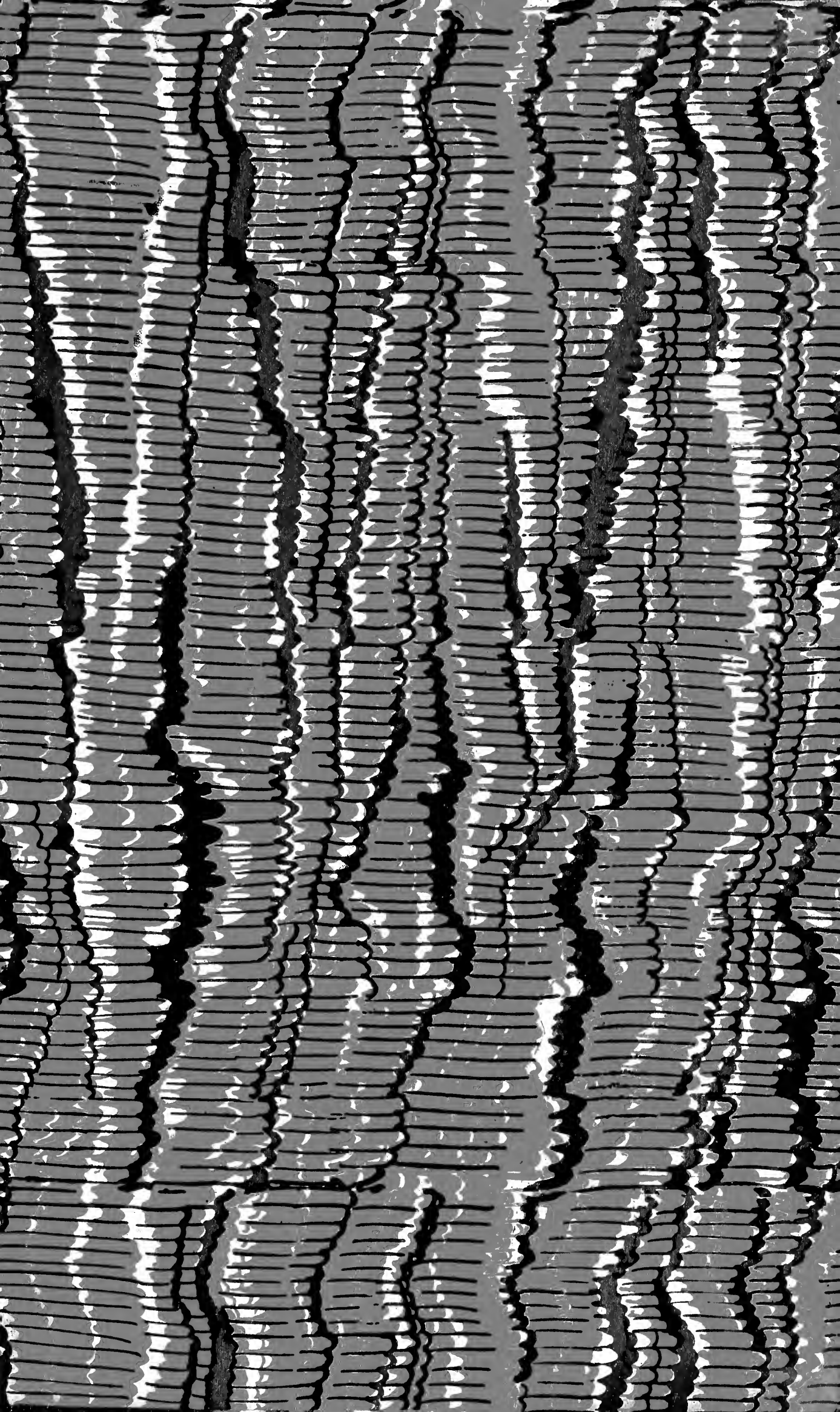
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