

OCT 8 1954



LIBRARY
OF THE
UNIVERSITY
OF ILLINOIS

570.5
SC0
1923-25

BIOLOGY

NATURAL
HISTORY



Digitized by the Internet Archive
in 2016

The Scottish Naturalist

A Magazine devoted to Zoology

With which is incorporated

“The Annals of Scottish Natural History”

EDITED BY

JAMES RITCHIE, M.A., D.Sc., F.R.S.E.,
Keeper, Natural History Department, Royal Scottish Museum

AND

PERCY H. GRIMSHAW, F.R.S.E., F.E.S.
Assistant-Keeper, Natural History Department, Royal Scottish Museum

ASSISTED BY

VELYN V. BAXTER, F.Z.S., H.M.B.O.U.

W. EAGLE CLARKE, I.S.O., LL.D.

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

ANDERSON FERGUSSON, F.E.S.

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



EDINBURGH: OLIVER & BOYD, TWEEDDALE COURT
LONDON: GURNEY & JACKSON, 33 PATERNOSTER ROW

Price 3s. Annual Subscription, payable in advance, 15s. post free.

The Scottish Naturalist

All Articles and Communications intended for publication, and all Books, etc., for notice, should be sent to THE EDITORS, Royal Scottish Museum, Edinburgh.

Subscriptions and Advertisements should be addressed to the Publishers, MESSRS OLIVER AND BOYD, Tweeddale Court, Edinburgh.

Authors of General Articles will receive 25 Reprints (in covers) of their Contributions gratis. Additional Copies, in covers, may be had from the Printers, at the ordinary prices ruling, provided such orders accompany the Manuscript, or when proofs are being passed.

Thymoplas

MOUNTING OUTFITS ∴



A simple and permanent method
for mounting insects, etc.

Adopted by the Entomological Department,
Royal College of Science, London

Price **3s.** (postage 6d.) and **6s.** (postage 9d.)

HARBUTT'S PLASTICINE, LTD.

56 LUDGATE HILL, E.C. 4

AND

BATHAMPTON, Near BATH

Agent

G. A. BENTALL, F.Z.S., Naturalist

392 STRAND, LONDON, W.C. 2

The Scottish Naturalist

A Magazine devoted to Zoology

With which is incorporated
"The Annals of Scottish Natural History"

EDITED BY

JAMES RITCHIE, M.A., D.Sc., F.R.S.E.,
Keeper, Natural History Department, Royal Scottish Museum

AND

PERCY H. GRIMSHAW, F.R.S.E., F.E.S.
Assistant-Keeper, Natural History Department, Royal Scottish Museum

ASSISTED BY

EVELYN V. BAXTER, F.Z.S., H.M.B.O.U.

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

W. EAGLE CLARKE, I.S.O., LL.D.

ANDERSON FERGUSSON, F.E.S.

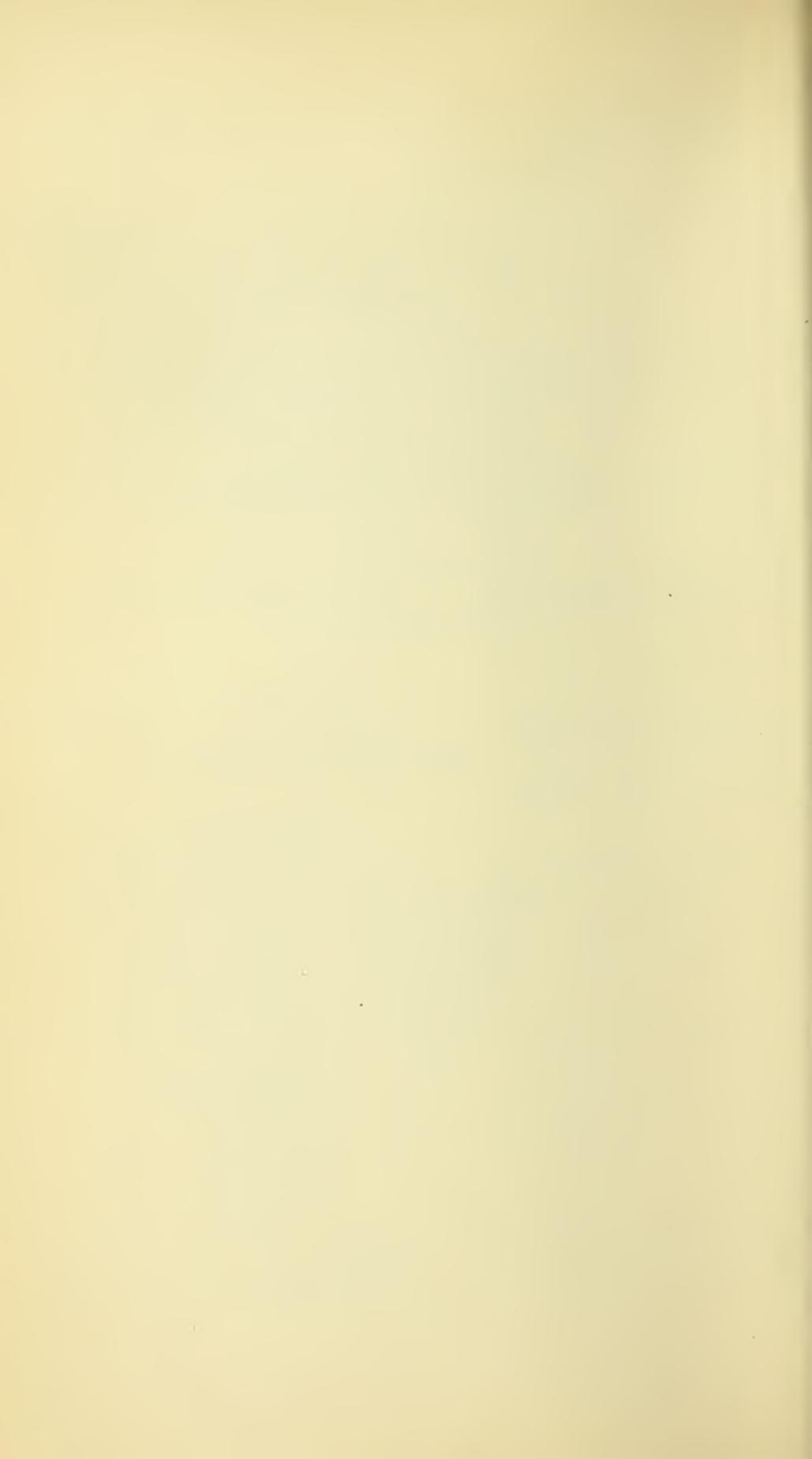
H. S. GLADSTONE, M.A., F.R.S.E., F.Z.S.

1923



DUNDEE: OLIVER & BOYD, TWEEDDALE COURT
LONDON: GURNEY & JACKSON, 33 PATERNOSTER ROW

1923



(Authors are responsible for nomenclature used.)

570.5
322
1923-25

Nat. Hist.

The Scottish Naturalist

Nos. 133 AND 134.]

1923

[JAN.-FEB.]

THE OPEN WINTER AND ANIMAL LIFE.

“A GREEN Yule maks a fat kirkyaird” runs the old Scottish proverb, and a similar suggestion, that snow and frost are but the proper and suitable companions of winter, is contained in that other saw:—

“Under snaw, bread,
Under water, dearth.”

While we are not prepared to vouch for the accuracy of these dismal beliefs of the ancients, we are bound to confess that the green Yule and the open winter of 1922-23, have had a noticeable effect on Scottish animal life in some of its minor manifestations. These influences may be grouped broadly in two sets: on the one hand certain creatures have carried on as if winter had never come, and on the other hand others have acted as if winter were already past.

A few illustrations will bring out our points. But, first, let us state the apparent cause of the dislocation in habits. The winter (which, we do not forget, has still a goodly part of its course to run) has been so far unusually “open”; there has been in the low grounds of Scotland little snow and even little frost, and when a low temperature has been recorded it has been of short duration—there has been no skating and no curling. Further, there has been little rain, and, for weeks on end, bright sunshine and a comparatively high temperature have been the rule.

Now, it is noticeable that several species of birds have refused to admit that the end of the season has long since passed. Rooks, instead of forsaking their summer nesting places and retiring to the security of their central winter roosts, have in many places lingered on. Till Christmas the small rookery at Blacket Avenue in Edinburgh was fully tenanted, and on 7th January, hundreds of Rooks were congregated in the woods of Thainstone near Port Elphinstone in Aberdeenshire, which are usually deserted in late autumn. So, also, unusual activity has prevailed in the rookery at Largo in Fife; as early as 9th December the birds there were breaking off twigs for nests, and by 18th December several new nests had been begun and the Rooks were busy tidying up the old ones. On 15th January they were still much engaged about their nests.

Other birds have failed to note the passing of the year. At Lahill, Fife, most, if not all, the breeding Thrushes leave in autumn, but this year many Thrushes have wintered. And Curlew, which breed in small numbers about Gilston in Fife, at an altitude of 600 feet, although they usually depart in winter, have remained on in the upland fields where they nested. A general hint of the delay of severe weather is also to be found in the fact that in Central Aberdeenshire, in the first week of the New Year, the winged seeds of the Hornbeam were still hanging green upon the trees.

The second effect on animal life that we have mentioned depends on the stimulus given by the open weather to habits associated with spring-time — some creatures are behaving as if winter were past. Apart from the nest-building Rooks of Largo, Stockdoves in the same neighbourhood not only broke from their customary routine, in failing to leave the trees where they have begun to breed during the last few years, but now they may be seen on any fine day performing their owl-like courting flight and uttering their characteristic *roo-roo-roo*. Wood-pigeons, too, have been cooing throughout the winter, and began their soaring flights, clapping their wings in the air, early in December. Even more remarkable is the fact that the Redwings about

an enthusiastic collector and student of British Lepidoptera. From his early youth he was a devoted admirer of butterflies and moths, and many years of ardent attention to his favourite insects resulted in the formation of one of the finest private collections in Great Britain. He was a Fellow of the Entomological Society of London, and a past President of the Aberdeen Working Men's Natural History Society.

Spread of Great Spotted Woodpecker in Argyllshire.—

I am enclosing three photographs sent me by Miss Berry illustrating the nesting of the Great Spotted Woodpecker at Glenstriven, Loch Striven, in the summer of 1922. She could not manage to get a photograph of either of the parent birds, but was lucky enough to be near the nests when one of the young ones flew out, and she "snapped" it creeping up another tree. A Great Spotted Woodpecker was seen at Glenstriven in October 1921, but no nest was discovered that year.—MARJORY GRAY BUCHANAN, Port Bannatyne.

[The photographs, which are on rather small a scale for reproduction, clearly show a couple of nesting holes and a Great Spotted Woodpecker in a characteristic climbing attitude, with its tail closely pressed against the tree trunk. In the *Scottish Naturalist* (1921, p. 134) the nesting of this species at Glenfinart was recorded; the present notice slightly extends the Argyllshire colonisation, and suggests the possibility of the birds occurring in Bute at an early date.—EDS.]

Grey Phalarope in Wigtownshire.—An example of this species, *Phalaropus fulicarius*, a rare winter visitor to the west of Scotland, was killed against the lantern of the Corsewall Lighthouse, Stranraer, on 11th November 1922. The bird is a male which still shows traces of its summer plumage. It has been added to the collection in the Royal Scottish Museum.—M. BEDFORD, Woburn Abbey.

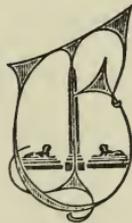
A PERTSHIRE
NATURALIST:
CHARLES MACINTOSH
OF INVER. ~ ~ ~

By HENRY COATES, F.S.A.ScOT.
Foreword by J. ARTHUR THOMSON,
M.A., LL.D., *Professor of Natural History in*
Aberdeen University, and PATRICK GEDDES,
F.R.S.E., *Late Professor of Botany in St. Andrew's*
University

With a Chapter on Scottish Folk-Music by
HERBERT WISEMAN, M.A., *Director*
of Music, Edinburgh Education Authority

ILLUSTRATED WITH A MAP OF STRATHTAY,
41 SEPIA REPRODUCTIONS OF SCENES AROUND
INVER, BIRNAM, AND DUNKELD, and
14 OF MACINTOSH'S MUSICAL COMPOSITIONS

Demy 8vo, Art canvas, 244 and XX pp.
Price 18s. net



PUBLISHED BY T. FISHER UNWIN
ADELPHI TERRACE, LONDON, W.C.2

A PERTHSHIRE NATURALIST—*continued.*

CONTENTS

CHAP.

- I.—INTRODUCTORY—HIS NATIVE STRATH, IN THE PAST AND IN THE PRESENT.
- II.—HIS FOREBEARS—1. VILLAGE LIFE IN THE EIGHTEENTH CENTURY.
- III.—HIS FOREBEARS—2. VILLAGE LIFE IN THE NINETEENTH CENTURY.
- IV.—EARLY YEARS.
- V.—AS A RURAL POST-RUNNER.
- VI.—LATER YEARS.
- VII.—CHARACTERISTICS.
- VIII.—MUSICAL ACTIVITIES—1. AS VIOLINIST AND PRECENTOR.
- IX.—MUSICAL ACTIVITIES—2. AS COMPOSER.
- X.—AS A BOTANIST—1. AMONG FLOWERING PLANTS AND FERNS.
- XI.—AS A BOTANIST—2. AMONG FUNGI, AND OTHER FLOWERLESS PLANTS.
- XII.—AS A LOVER OF BIRDS AND BEASTS.
- XIII.—AS A STUDENT OF THE ROCKS, AND THE STRUCTURE OF THE EARTH.
- XIV.—AS AN OBSERVER OF THE WEATHER, AND RECORDER OF NATURAL PHENOMENA.
- XV.—HIS INTEREST IN THE LORE OF OTHER DAYS.

Specimen Illustration from "A Perthshire Naturalist"

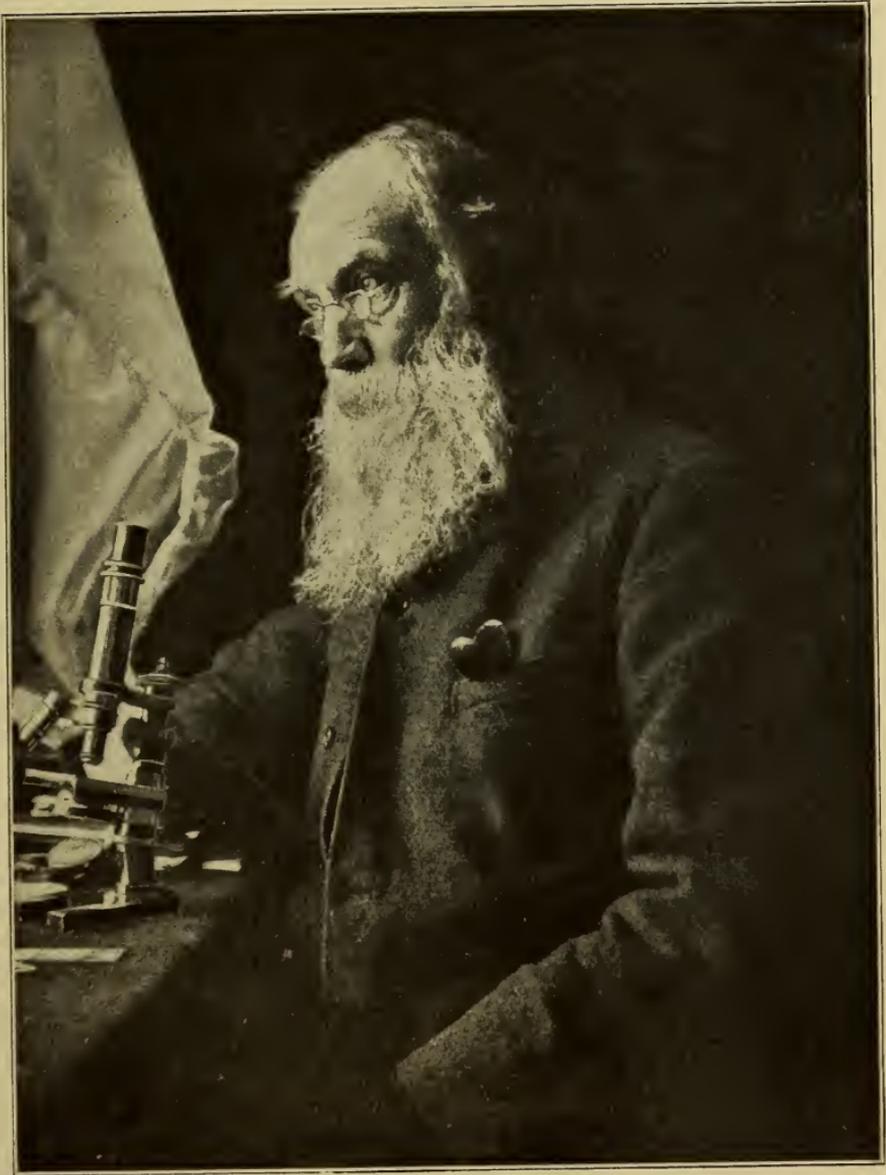


Photo by Jas. Macintosh.

CHARLES MACINTOSH AT HIS MICROSCOPE.



A PERTSHIRE NATURALIST—*continued.*

A PERTSHIRE NATURALIST



This is the life-story of a very remarkable Scots worthy—rural post-runner, naturalist, and musician—who died at the beginning of the present year, after eighty-two years spent in his native strath and native village. In many ways he was quite as remarkable a character as that other Scottish Naturalist whose name was immortalised by the late Samuel Smiles.

But the book is much more than a mere biography of Charles Macintosh. The opening chapters are taken up with a sketch of the topographical features and the past history of the region where his life was spent, and incidentally they throw light on the part which Central Perthshire played in the history of Scotland. Next, the folk-lore of rural Scotland during the eighteenth and nineteenth centuries is dealt with, and many half-forgotten customs and incidents are recalled. The closing chapters deal with Macintosh's activities and investigations as musician and collector of old tunes, and as botanist, ornithologist, geologist, meteorologist, and archæologist. These chapters, while designed mainly to record the results of Macintosh's researches, give at the same time a most interesting epitome of the Folk-Music and the Natural History of the premier county of Scotland.

FOREWORD

BY PROF. J. ARTHUR THOMSON, M.A., LL.D.,
AND PROF. PATRICK GEDDES, F.R.S.E.

“Good wine needs no bush,” but it is a privilege to recommend our friend Mr. Coates's interesting appreciation of a fine type of naturalist who made a success of his life in the true sense. Charles Macintosh was born with or imbued with a love of Nature—it is difficult to distinguish organic inheritance from the influence of the home tradition—and when a serious accident changed him, at the age of nineteen, from saw-miller to rural postman, he had opportunities in a particularly charming

A CENTURY OF ZOOLOGY IN EDINBURGH.¹

By WILLIAM CARMICHAEL M'INTOSH, M.D., LL.D., D.Sc., F.R.S., &c., Emeritus Professor of Zoology in the University of St Andrews, President of the Ray Society.

IN dealing with this extensive subject I at first grouped the work of those holding office in the University or who were graduates thereof, of others connected with the various societies, and of those who were merely citizens of the Scottish capital, under the several divisions of the animal kingdom—a method that, as regards the fauna of the area of the Forth, had been successfully followed by Mr Wm. Evans in his Presidential Address to the Royal Physical Society. However, in the first place, I shall give a brief sketch, more or less chronological, of the zoological researches (or their titles) carried out by the officials of the University and its graduates wherever accomplished, and by others in the city from 1821 to 1921. That it is just to include the zoological work of Edinburgh graduates wherever it was carried out I need scarcely defend, since the inspiration these men received from their *Alma Mater* and her surroundings unquestionably stimulated those inherent instincts present in every zoologist, or even laid the foundations of their subsequent achievements. Moreover, in this great Medical School, as well as in others less extensive, one conspicuous feature has ever been the brotherhood existing between Medicine and Natural History in its widest sense, an alliance prominently brought out in the Introductory Address of Professor Allman many years ago, and with reason, for the study of man and of his diseases forms but a part of the domain of Zoology. A glance at the subjects chosen for the theses of medical candidates in the University before the last Commissioners placed their veto against Natural History, will show how deeply rooted this brotherhood is and how futile such a veto in reality must be. It is no palliation to say that

¹ Read at the Edinburgh Meeting of the British Association, September 1921.

naturalists now have another channel for graduation, viz., by the Science Degree. That will not alter the instincts of those who were drawn to Medicine by their love of nature. What would the Commissioners make of the medical graduate now in a Chair of Zoology whose thesis was on the life-history and pathological relations of *Bacillus anthracis*? In the future, as in the past, the ranks of Medicine will surely produce men like Spigelius, Heister, Guettard, Daubenton, Camper, Pallas, de Blainville, Johannes Müller, Louis Agassiz, Peyssonnel, Rigâud, Rondelet, Kölliker, Ehlers, R. Sibbald, Wm. Harvey, Alex. Monro (*secundus*), Erasmus Darwin, Hans Sloane, John and Wm. Hunter, John Richardson, Richard Owen, John Goodsir, John Reid, J. H. Balfour, George Busk, Wm. Balfour Baikie,¹ W. B. Carpenter, G. J. Allman, Thos. Huxley, Wm. Flower, Wm. Turner, Albert Gunther, George Johnston, James Syme, Albany Hancock, Robert E. Grant, John Anderson, Joseph Hooker, J. B. Pettigrew, Alex. Dickson, G. S. Brady, Alleyne Nicholson, D. J. Cunningham, Cossar Ewart, Wm. Baird, and many others who have distinguished themselves in Zoology. Yet their labours and their influence have escaped the just consideration of the late Universities' Commissioners for Scotland.

With these preliminary observations I now proceed with the survey of Edinburgh zoology from 1821 onward. At this time (1821) the Chair of Natural History in the University was occupied by a distinguished mineralogist and geologist, Professor Jameson. Though he was mainly an original inquirer in the two subjects just mentioned, and enriched the University Museum in these departments, yet he lost no opportunity of adding to the zoological collections. Thus, many of the larger mammals were forwarded by his friends in India and Africa, whilst he secured the Dufresne collection of Birds. He also edited Wilson and Bonaparte's *American Ornithology*, and, with Gardener, the *Illustrations of Ornithology*. Moreover, whilst the University was not prominent in zoological researches, a

¹ Baikie, *Naturalist*, Niger Expedition, 1854.

popular teacher at the College of Surgeons, viz., Dr Barclay, kept the subject before the student by his summer lectures on Comparative Anatomy. Barclay's successor, Robert Knox, was an able and energetic anatomist and zoologist, whose numerous researches won him a high position in the department, though the Burke and Hare tragedies, perhaps unjustly, clouded his later years. He was the teacher of such men as John and Harry Goodsir, Edward Forbes, (Sir) Wm. Ferguson and John Reid, and, though he had but one eye, and a face by no means prepossessing, no more fascinating and eloquent lecturer has ever appeared in the capital, as his class of 504 in 1828 amply testifies. He was more of a vertebrate than an invertebrate zoologist, as shown by his remark that the swimming jellies were floated by air-cells, and that their locomotion was performed by parts exposed to the wind. Both Barclay and Knox were medical graduates of Edinburgh University. About this time Stark's *Elements of Natural History* appeared, and helped to interest the Edinburgh public in the subject. Other medical graduates about this period were Dr John Davy (the brother of Sir Humphry), who wrote various papers on zoological subjects, and Dr Wm. Baird, whose work on the *Natural History of the British Entomostraca* led to his appointment in the British Museum, where for many years he enriched zoology by his labours. He also edited the *Cyclopædia of Natural Science*. He and the brothers Gray, Albert Gunther, F. Smith, Butler, and Waterhouse met, in the Museum, workers from the outside, and visitors, such as Mrs Alfred Gatty, Dr Bowerbank, and J. Gould, and many a rencontre and knotty argument took place there.

Founded about the commencement of the nineteenth century, the Wernerian Natural History Society of Edinburgh was then in active operation, and published no less than eight octavo volumes of *Memoirs* between 1808 and 1829, when it was merged in the Royal Physical Society. Started mainly by Prof. Jameson, the society had a broad scope, though the bulk of its papers were zoological; and its record alone is a testimony to the widespread spirit

of observations and research of a kind highly creditable to science and our country. The contributors included such names as John Fleming,¹ Patrick Neill, R. and L. Edmonston, Thomas Stuart Traill, John Murray (not "Challenger" Murray), Laskey, Barclay, Knox, James Wilson of Woodville, Macgillivray, R. E. Grant, Craigie, W. Scoresby, John Richardson, G. Montague, W. E. Leach, P. J. Selby, James Duncan, Richard Parnell, and Edward Forbes. Such a band of able zoologists would alone have sufficed for the reputation of the department in the city.

The fame of Dr Barclay's lectures attracted men like Richard Owen to study in Edinburgh, and though he did not graduate, his colossal researches subsequently owe perhaps not a little to his early training here. Moreover, Charles Darwin likewise attended the University, but without graduating. Dr Barclay published comparatively little, but he founded the Museum of the Royal College of Surgeons, a collection which in after years became invaluable to every zoologist and every medical student. He was succeeded in the conservatorship by Knox, followed in turn by W. Macgillivray, whose ornithological preparations showed the trend of his work; then followed John Goodsir, who left the imprint of his researches, Hamilton Lee, Dr Saunders, who made many preparations of the development of the chick, James Bell Pettigrew, whose room harboured the flexible canes with which he was ever ready to demonstrate the effect of the down-stroke of the bird's wing in flight; and after him came the courteous Blair Cunynghame, the able surgeon Cathcart, Shennan, David Waterston, Wade, and Greig.² All added to the interest and value of this notable museum. Even the ancient attendant was popular with the students of the fifties of last century, and was full of information about the museum and the work of its Conservators.

But there were other men whose early training here

¹ Author of *The Philosophy of Zoology*, 1822, and *The History of British Animals*, 1828.

² To whose kindness I am indebted for a complete list of the Conservators.

led to great results in zoology as well as in medicine. These were William Sharpey, the able physiologist, Martin Barry and Allen Thomson, distinguished embryologists, and later Benjamin W. Carpenter, whose researches on the Foraminifera, the rosy feather-star and cognate subjects, not to allude to his work in connection with the cruises of the *Lightning*, *Porcupine*, and *Challenger*, and on the microscope, owe much to his early studies in Edinburgh. Further, a conspicuous zoologist in his day was Dr George Johnston (Berwick-on-Tweed), whose works, illustrated by his accomplished wife, on *Sponges and Lithophytes*, *An Introduction to the Mollusca*, his *Zoophytes and Polyzoa*, and his treatise on the *British Annelids* speak for themselves. Dr Coldstream again wrote on *Sepia* and gave an account of the wood-boring *Limnoria*.

Another society, which for more than a hundred years—from the days of the Monros, Hope, Gregory and Home—enabled Edinburgh to pursue zoological studies with great advantage, was the Royal Physical Society, with which almost every distinguished zoologist in and near Edinburgh has been connected. It is a stimulus even to glance through the twenty or more volumes published by this energetic society and read of the unbroken chain of naturalists who have kept the torch of their favourite subject burning brightly up to date. I can only allude to a few of the most prominent zoologists, now no more with us, who have enriched its *Proceedings*, and amongst these were Robert Grant, J. Barclay, R. Knox, John Goodsir, Strethill Wright, C. W. Peach, James Murray, Hugh Miller, J. Cleland, Ed. Forbes, J. Y. Simpson, Wyville Thomson, W. B. Carpenter, William Turner, John Anderson, Ramsay H. Traquair, Andrew Murray, T. R. Fraser, J. M'Bain, Adam White, A. B. Stirling, J. A. Smith, G. Brook, Dr Kelaart, Robert Gray, W. Rhind, Dr Duns, W. H. Lowe, S. Cobbold, John Struthers, and Harvie-Brown.

Then again, the vast stores of zoological research embraced in the important *Transactions of the Royal Society of Edinburgh*, in every division of the subject, almost baffle notice, and certainly a detailed notice, on the present

occasion. The larger memoirs of Knox, Goodsir, Turner, Traquair, Traill, Prince, Masterman, Herdman, Ewart, John Murray, Cole, J. Stephenson, and a host of other inquirers, form a rich mine of information to all zoologists, and demonstrate how persistently and successfully the subject has been studied by Edinburgh men. These memoirs have permanently added to our knowledge, though some of the older views, such as that of Knox, wherein the smolts which descend to the sea in April are said to return in six weeks fishes of 5 or 6 lbs., have been modified. The Royal Society has, further, encouraged research in many ways, and its Neill Prize is given to those who have made noteworthy advances in zoology or botany.

Before the fifties of last century, moreover, there was a patient and persevering zoologist in the neighbourhood, viz., Sir John Graham Dalyell, who searched the shores of the estuary of the Forth, as well as more distant parts, for marine rarities—so admirably described and figured in his *Rare and Remarkable Animals of Scotland*, and in his *Powers of the Creator*. These fine works will carry his name as an acute zoologist to all time. In the city, moreover, Robert Chambers published, at first anonymously, his remarkable *Vestiges of the Natural History of Creation*, a work which showed that the author was a naturalist as well as a man of note in literature. Hugh Miller, a self-made naturalist, though, perhaps, more a geologist than a zoologist, was another prominent figure of the period, and by his *Old Red Sandstone* and *Testimony of the Rocks*, made himself famous.

In the thirties of last century, Edinburgh held a group of ardent students of zoology in John and Harry Goodsir, Edward Forbes, John Reid, and George E. Day—all of whom were destined to attain distinction. The Goodsirs, Forbes, and Reid, had studied under Knox, and acted as his assistants at the College of Surgeons. John Goodsir's will ever be a name revered in the University—not only for his gifts as a teacher, but for his powerful influence on his students in stimulating them to research. His wide grasp of human and of comparative anatomy, as well as

his indomitable zeal in pursuit of knowledge, could not fail to attract every thoughtful student. Each felt the unselfish devotion of the man who, when unable to stand or sit, stretched himself on the floor and executed in coloured chalks his class-drawings, to be afterwards fixed in weak but boiling glue. His summer lectures on Comparative Anatomy were models of their kind, and were attended by his demonstrators as well as the students; and though he must have felt tired after his hour's discourse, yet he was ever ready to spend part of another hour in enlarging and explaining the subject to the eager band around him. No man took a keener interest in imparting his wonderful knowledge of zoology. His brother Harry was distinguished as a worker in the Crustacea and other invertebrates, and John Reid made important observations on the Coelenterates at St Andrews, whilst his researches on the eighth pair of nerves (glosso-pharyngeal) rendered his name familiar to every follower of medicine.

The anatomical rooms of the University were, under Goodsir, the rallying quarters of the young zoologists. There the smaller mammals were dissected, experiments on the nervous system carried out, skeletons prepared, and lively discussions held now and then. Moreover, the help of John Arthur, the Professor's *factotum*, and of A. B. Stirling, his skilful, practical assistant, combined to render the period noteworthy. Stirling began life as a gamekeeper at Pitmilly, then occupied by the Jacksons, and Goodsir, when assisting his father at Anstruther, had become acquainted with him at first by getting supplies of mice and other small quadrupeds for dissection, and afterwards attracted by his wide knowledge of animals. When settled in his Chair in Edinburgh he did not forget Stirling, who amply rewarded the remembrance, for he became one of the most skilful injectors of coloured fluids into the blood-vessels, and one of the most adept in mounting anatomical preparations. Further, he delighted to aid and encourage the young zoologists by every means in his power.

On the retirement of the veteran Professor Jameson, Edward Forbes, now with a brilliant reputation as a

zoologist, was appointed to the Chair of Natural History, but he had only held it for six months when he died. This was a serious blow to marine zoology, for there is no doubt that this genial and distinguished man would have made his occupancy of the Chair famous in this department, just as he would by his winning personality have charmed the students. His zoological labours had a freshness, richness, and breadth all their own, whilst his wonderful facility of expression, skilful artistic powers, great stores of knowledge, and his ready wit made him a fascinating teacher. His *British Starfishes*, *Naked-eyed Medusæ*, the fine work (with Sylvanus Hanley) on the *British Mollusca* and his *Natural History of the European Seas* were but the earnest of what he would have done in the Edinburgh Chair. His accomplished successor, George James Allman, worthily upheld the zoological position of Edinburgh by his classic researches on the Freshwater Polyzoa, his splendid volumes on the *Tubularian Hydroids*, and other able researches on the Cœlenterates and Protozoa, whilst he inculcated the value of marine work by regular dredging expeditions with his students. Allman's summer lectures were carefully written, and delivered with refined dignity, and now and then his passages burst into eloquence as he portrayed the insect-life on the Pyrenees, or the exquisite beauty of the forms before him. Of the sixty lectures, several of the concluding ones dealt with Physical Geography, and all were full of reliable knowledge of every group, and were well illustrated by coloured lecture-drawings on the screen, and by sketches on the blackboard. His occupancy of the Chair was all too brief, for his health necessitated retirement after fifteen years' service. He took an active share in the arrangement of the University specimens in the Museum of Science and Art, and was often seen devoid of his coat in their midst. Subsequently, as President of the Linnean Society, he added fresh laurels to his reputation; whilst in private life he was most genial, and none could excel him in his apt rendering of the Irish brogue in depicting the humorous scenes of his native country. The fame of the Chair was still further enhanced by Charles

Wyville Thomson, whose work on the Crinoids and other Echinoderms, his dredgings in the *Lightning* and *Porcupine*, his zoological leadership of the memorable voyage of the *Challenger* Expedition,¹ and his volumes on the Deep Sea and the Atlantic turned the eyes of the zoological world to Edinburgh. There the large 4to volumes (50 in number) and their fine plates were published, and alone would have made the annals of the Scottish capital noteworthy. The labours of his able successor, Cossar Ewart, have embraced researches on the Echinoderms, the structure of the Elasmobranchs, the races of domestic animals, much fishery work in connection with the Fishery Board for Scotland, and lastly, he has spared no effort to make the New Zoological Garden in Edinburgh a success.

It was no easy task to follow, either as regards anatomy or zoology, in the University Chair of John Goodsir, but William Turner proved not only an accomplished anatomist and facile lecturer, but, by a series of memoirs on comparative anatomy, he extended the boundaries of our knowledge. His extensive studies on the Cetaceans, on the crania of the various races of men, would alone have won a high reputation. Moreover, he was no less an administrator than a naturalist. Daniel John Cunningham,² again, his eloquent successor, was a talented comparative anatomist whose researches on the Marsupials and Primates were of a high order. His premature death cut short a career of great promise. Arthur Robinson, who followed, bids fair to carry out, at the same high level, researches in comparative anatomy.

¹ One Edinburgh graduate, at least, was asked to join this Expedition, but he could not vacate his important post at the time.

² *Lumbar Curve in Man and Apes. Suspensory Ligament on Fœtal Bone, On a Sylvian Fissure on Primate Brain.*

(To be continued.)

Yellow-browed Warbler in East Fife.—While we were on the Isle of May this autumn (1922) we saw quite a number of Yellow-browed Warblers (*Phylloscopus humei præmium*), nevertheless I was surprised, although much delighted, to see one here (at Lahill, Largo), on 23rd October, playing about on a yew-tree in the den. This is the first time the species has been recorded from the mainland of Forth. The habits of these little birds, which we, of course, only know on migration, are very attractive. They are never still for a moment, flitting from potato shaw to cabbage stalk, flying hurriedly to the top of the spade handle where a constant flirting of wings and quick, almost dancing turn, keeps up the perpetual motion. We have also watched them flitting about among the rocks, sometimes as many as three or four together. They are bold and fearless, will drive away much bigger birds from the garden, and if one keep perfectly still will play about quite near. The one which visited us on 23rd October fed quietly about in a yew-tree, searched for insects almost like a Goldcrest, then suddenly dashed off to hunt a Chaffinch off a plane-tree near, and I saw it no more.—LEONORA JEFFREY RINTOUL.

Whooper Swan in Edinburgh.—For some time in August and September 1922, we had three Swans on the loch at Loch End Farm, Edinburgh. Two of them, which I observed were Mute Swans, have left and gone to Portobello Clayhole. The other is a Whooper, its bill being black at the tip, and a great part toward the base lemon yellow. As I thought that it was unusual for a Whooper Swan to visit an Edinburgh loch, I thought I would draw your attention to this.—GEO. G. SCOTT, Edinburgh.

Seagull over Thirty Years of Age.—The following note is an interesting contribution to a subject regarding which much has still to be learned—the age to which wild creatures may attain. “Over thirty years ago the sons of Mr Huntly, Assembly Rooms, Dunbar, found a wounded Seagull on the beach, and took it home, where it was cared for, and, finding itself in good quarters, remained in their garden. It was fed almost solely on fish, and thrived amazingly. To many visitors to the town the bird was a continual source of interest. Several days ago it became sickly, and despite much care and attention it succumbed.”—*Scotsman*, 8th January 1923.

MIGRATION IN THE SEA.¹

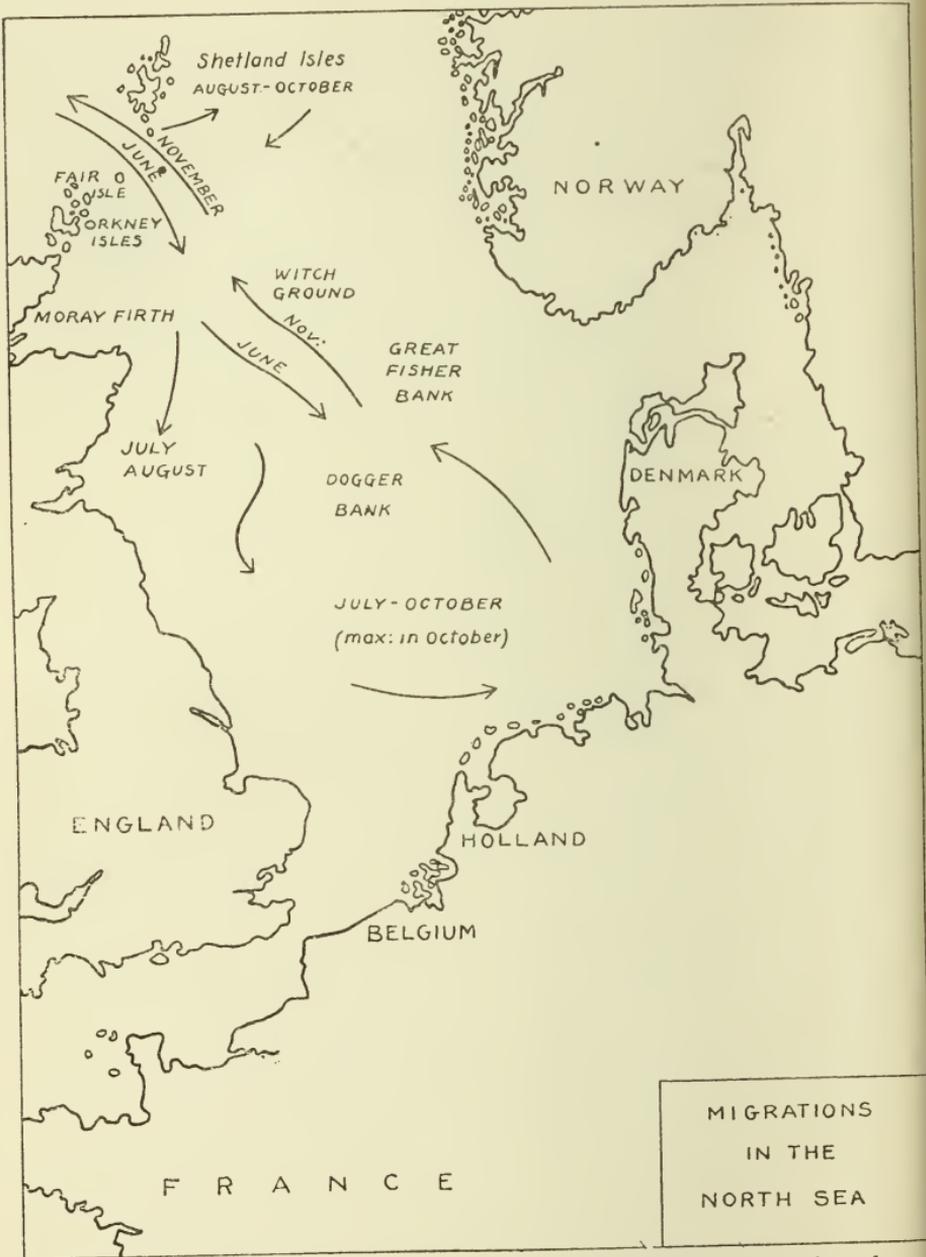
KNOWLEDGE of the precise movements of the denizens of the seas has been of slow growth. The old idea that fish shoals sped more or less from one end of the ocean to the other and back again, with the revolving year, having long ago been jettisoned, much thought and labour have been bent upon the task of deciphering the migrations that undoubtedly take place. But the difficulties of observation in the sea are great, and the unravelling of the watery path of even one species must be regarded as something of a scientific triumph. To that triumph, in the case of the present species, substantial contributions have been made by Scottish investigators.

The Hake, Herring-hake or Sea-pike (*Merluccius merluccius*), as it is variously known, is a common British food-fish, a relative of the Cod and Coalfish. It is caught in the North Sea from June till October, and since the individuals caught are either ripe or spent, these months represent a definite period in the life-history of the Hake—a period when the fish has gathered in shoals for the purpose of spawning.

But the distribution of the Hake is by no means uniform throughout the North Sea during these summer and autumn months. Collection and tabulation of the records of catches show that there is a progressive change in the position of the Hake shoals. Thus, while they may be tapped by fishermen in the neighbourhood of the Orkneys in June, in July and August large numbers occur off the east coast of Scotland, S.E. of Aberdeen, while in the southern portion of the North Sea the largest numbers are caught in October (see accompanying map). Here, then, is represented the first stage of the North Sea migration—a movement of concentration, which culminates in spawning in comparatively

¹ THE HAKE.—Translated from the French of Ed. Le Danois, London: published for the Ministry of Agriculture and Fisheries, by H.M. Stationery Office, 1922, and obtainable at 25 Forth St., Edinburgh. Price 2s. net., postage 3d. [To the courtesy of the Controller, we owe the map.—EDS.]

shallow water and in conditions most favourable for the fertilization of the floating eggs.



Map illustrating the southward movements of concentration and northward movements of dispersal of Hake in the North Sea.

The second stage of the migration is a necessary sequence of the first, if it be assumed that the North Sea is not the normal dwelling-place of the Hake. It is a

movement of dispersal, of return from the breeding grounds to the normal home. The Hake, having accomplished the purpose of its invasion, makes again for the open sea, travelling with greater rapidity on the return journey, so that by November it has passed the northern gateways to the North Sea, the Pentland Firth, and the Orkney-Shetland Channel. Winter catches of Hake in the North Sea amount practically to nothing.

Where does it go? We can only guess that it seeks deeper regions of the sea, where at a depth of 500 to 1000 metres it finds favourable and constant conditions of temperature and salinity. Why does it leave the depths for the shallows when the period of reproduction approaches? It used to be thought that it was impelled on these journeys by the movement of its normal food-supply, which it had of necessity to follow. But now it is considered that the solution is rather a physical one, that the food-supply is less important than the necessity of finding an area where the waters are less dense than in the depths, where the sea is less salt and the temperature higher; and such conditions are to be met with in perfection in the North Sea during the months of summer and early autumn.—J. R.

Garganey in Lanarkshire.—On 30th April 1922, along with Mr Charles A. Vynne, I had a Garganey (*Querquedula circia*, Linn.) under observation for some time at Frankfield Loch, Lanarkshire. It was a drake, and the broad white eyestripe was very conspicuous.

This species is becoming better known as a local bird, but the records of its occurrence are still very few in number.—ROBERT W. S. WILSON, Cathcart.

Birds Singing on Autumn Migration.—As we have recorded elsewhere, we have often heard migrants singing on the Isle of May in spring, but until last year (1922) we had never heard them sing in autumn. On 28th September, along with a very large number of other migrants, there were eight or nine Blackcaps, mostly males; they were singing sweetly, a definite song, though, as one would expect, only a modified form of that given in spring. While singing they displayed a little. On several occasions we heard Redbreasts singing vigorously, and once or twice a Redstart uttered a few feeble notes of song.—LEONORA JEFFREY RINTOUL and EVELYN V. BAXTER, Largo.

Gudgeon (*Gobio fluviatilis*) in Don.—On 2nd December the lade leading from the Don to the paper mills at Broomend was emptied, and I obtained with a shrimp net a large-sized Gudgeon. It must have entered at the intake from the Don, close to the road bridge between Inverurie and Port Elphinstone. It has been said for some years that Gudgeon occurred in the Don at Kintore, some three or four miles down the river, and still lower down the Don records in recent years have been more numerous; but I can learn of no record from the vicinity of Inverurie. It is difficult to run down records of introductions, but on making many inquiries, I have learned that the Gudgeon appears to have been set free in the Don some twenty years ago, through escapes from a pond at Woodside.—THOMAS TAIT, Inverurie.

[The records seem to indicate that the Gudgeon has become thoroughly naturalized in the Don, and that apart from increasing in numbers in the area of its original introduction, it has spread up the river for some fifteen miles. Look-out should be kept for this species still further up the Don, especially where the current is slack and the bottom gravelly, in order that the progress of the colonization may be recorded.—J. R.]

Additions to the List of Clyde Coleoptera (a Correction).
—Through an unfortunate slip which I failed to notice in proof, in the list of additions to the Coleoptera of Clyde published in a recent number of this Journal (1922, p. 163), the Weevil *Ceuthorrhynchus urticae*, Boh., was recorded as occurring on the sandhills at Stevenston in Ayrshire. The insect found at Stevenston to which I meant to refer was *Stenocarus fuliginosus*, March, another Weevil of an allied genus which had not previously been recorded for the area. *Ceuthorrhynchus urticae* is a southern species, and has not, so far, been recorded from Scotland.—A. FERGUSON, Glasgow.

Lunar Hornet Clear-wing in Easternness.—During the summer of 1922 I found, at Foyers, Inverness-shire, a specimen of Clear-wing, which was identified at the Royal Scottish Museum as the Lunar Hornet Clear-wing (*Sesia bembeciformis*). The individual was seen on 6th August, resting on the base of a willow-tree, within which the larvæ had doubtless fed, although the species is particularly partial to poplar trees. Barrett says that this species has been found in the southern parts of Scotland and as far north as Perthshire and Aberdeenshire, but he makes no mention of Inverness.—N. V. MELDRUM, Edinburgh.

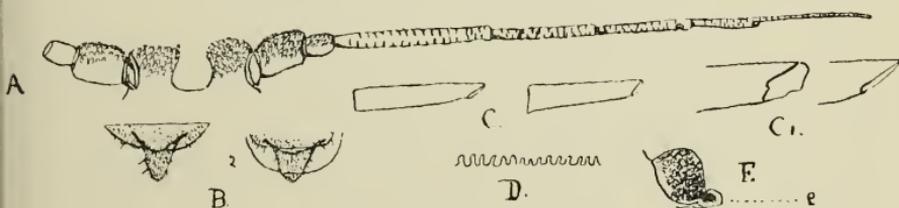
A NEW GENUS AND TWO NEW SPECIES OF APHIDES FROM ROSS-SHIRE.

By F. V. THEOBALD, M.A., Professor of Economic Entomology, South Eastern Agricultural College, University of London.

THE Aphides described here were collected by Miss D. J. Jackson in Ross-shire. Although Miss Jackson and the late Mr Evans have collected a great number of species in Scotland, so little is at present known of the Scottish Aphid fauna that careful collecting will not only add new locality records for many previously described species, but will almost certainly add many forms at present unknown to science.

Genus JACKSONIA, nov. gen.

Head with large frontal processes which project slightly inwards, much corrugated as in *Myzus*. Antennæ of six segments, not



JACKSONIA PAPILLATA, nov. sp.

A. Head and antenna. B. Cauda and anal plate: 1, young, 2, adult. C. Cornicles; C1. Enlarged apex of C. D. Cutaneous papillæ. E. Eye; e. ocular process.

quite half the length of body. Eyes large, with ocular process of abnormal form. Cornicles moderately long, cylindrical, not quite length of 3rd antennal segment, apex not flat but markedly sloping, no flared lip. Cauda small, usually scarcely projecting beyond the body, slightly constricted near base. Skin with dense small papillæ.

Apterous viviparous female only known.

JACKSONIA PAPILLATA, nov. sp.

Apterous Viviparous Female.—Brownish-ochreous. Antennæ less than half the length of body; basal segment much larger than 2nd; the latter barrel-shaped—both corrugated or of scaly appearance; 3rd longer than 4th, but shorter than 6th; 4th a little longer

than 5th; 5th a little longer than base of 6th—flagellum of latter not quite twice length of base; segments 3-6 markedly imbricated. Frontal processes very large, slightly projecting inwards, much corrugated. Eyes large, dark with red hues; ocular process large of abnormal form (Fig. Ee). Cornicles cylindrical, in some slightly expanding basally; apices sloping, no flared lip. Cauda small, constricted near base, usually hidden under the body, but in some extended, spinose, with four very fine hairs; anal plate narrow, fairly wide, spinose, with a few delicate hairs. Proboscis reaching just past 2nd coxæ, dusky at apex. Legs rather short and moderately thick; femora with a few hairs; tibiæ hairy. Skin of body covered with dense small papillæ, giving a corrugated appearance.

Length.—1.5 mm.

FOOD PLANT.—Potato.

LOCALITY.—Swordale, Evanton, Ross-shire (23 viii. 22), D. J. Jackson.

Observations.—Described from a single female and some young forms. The generic characters given at once separate it. The specimens were taken under a potato leaf.

ACAUDUS BIPAPILLATA, nov. sp.

Apterous Viviparous Female.—Body oval; antennæ short, a little more than a quarter length of body; of six segments; 3, 4, and 5 much the same length; 6th much longer than 4 + 5, its basal area about as long as 5; flagellum nearly twice as long as the base. Eyes moderate. Proboscis reaching to 2nd coxæ. Cornicles short, thick, cylindrical, slightly expanding basally, about as long but much wider than 3rd antennal segment. Cauda and anal plate rounded, both hidden under the body. Apex of abdomen with two small papillæ and a few hairs, which also are present on the head. Legs rather stumpy; tibiæ with hairs, some much longer than others on the hind pair.

Length.—1.2 mm.

LOCALITY.—Swordale, Ross-shire (23 viii. 22).

FOOD PLANT.—Potato.

Observations.—Described from a single perfect specimen taken and mounted in balsam by Miss D. J. Jackson. It is very distinct and can at once be identified by the two small apical papillæ.

THE SUB-SPECIES OF THE DUNLIN.

WITH SPECIAL REFERENCE TO THOSE FOUND IN
THE BRITISH ISLES.

By ANNIE C. MEINERTZHAGEN.

AN interesting paper on the sub-species of the Dunlin, by E. Qehn Schiöler, appeared in the *Dansk Ornithologisk Forenings Tidsskrift*, xvi., 1922, included under the title "Nogle Tilføjelser og Bemærkninger Til Qisten over Danmarks Fugle." The author deals exhaustively with the racial forms of the Dunlin and his main conclusions are given below. Thanks to the courtesy of Dr Hartert, we were able to examine a representative series of these races lent by Mr Schiöler, which confirms his remarks.

Erolia alpina alpina (L.)—This Dunlin breeds in Northern Norway and Sweden, Finland, Lapland, North Russia, and West Siberia, and passes through Denmark on migration. It is characterised in breeding plumage by the rich rufous-chestnut edges of the feathers of crown and mantle, by the greyish white nape, lower throat and upper breast, the nape contrasting with crown and mantle. In size it averages larger than British breeding birds: ♂ wing averages 116 mm., bill 32 mm.; ♀ wing averages 117 mm., bill 35 mm. (Schiöler). Breeding birds from the Yenesei measure: 6 ♂s, wing 110-117 mm.; 3 ♀s, 116-120 mm.; bill from feathers, ♂, 29-34 mm.; ♀, 30-36 mm. Breeding birds from Vadso, Norway: 2 ♂s, wing 113-115 mm.; 5 ♀s, wing 116-119 mm., bill from feathers, ♂, 29-30 mm.; ♀, 30-34 mm.

Erolia alpina schinzii (Brehm).—The breeding range of *E. a. schinzii* comprises the southern shores of the Baltic, Southern Sweden, Denmark, probably Holland, and the British Isles. It is distinguished from *E. a. alpina* by the fawny edges of the feathers of the upper parts, by the nape, suffused greyish-brown, and not contrasting sharply with crown and mantle; white of fore-neck and upper breast

usually suffused buff; black patch on belly as a rule, not so well defined and generally mixed with white; in size *E. a. schinzii* averages smaller: ♂ wing averages 108 mm., bill 28 mm.; ♀ wing averages 112 mm., bill 32 mm. (Schiöler). For detailed measurements I would refer the reader to Mr Schiöler's paper. The following are the measurements of British breeding birds:—♂s wing 106-110 mm., bill 25-30 mm.; ♀s wing 110-116 mm., bill 28-33 mm.

The Iceland Dunlin, Mr Schiöler is inclined to believe distinct, but in our own opinion it is not sufficiently distinct from *schinzii* to warrant recognition as a sub-species.

Erolia alpina arctica (Schiöler).—Breeds in North East Greenland and on the whole east coast of Greenland: it appears to be intermediate between *E. a. alpina* and *E. a. schinzii*. In size it approaches *schinzii*, but the upper parts are lighter, and nape and fore-neck are whiter, as in *E. a. alpina*; belly with less black, as in *schinzii*. One bird in our collection, obtained in Spitsbergen in July, appears to be *E. a. arctica*, ♂, wing 111 mm., bill 26 mm.

The breeding Dunlin of the British Isles is therefore *E. a. schinzii*, but there is no doubt that *E. a. alpina* passes through on migration, as evidenced by birds obtained in autumn and winter with wings of 120 mm. and over. In winter plumage *E. a. alpina* is only distinguished by size (that is to say, the outstandingly large Dunlins belong to this form), but in breeding plumage it is easily recognised. Amongst the material at the Natural History Museum, South Kensington, a specimen in breeding plumage from the Gould collection, labelled "Brighton," is undoubtedly *E. a. alpina*. Through the courtesy of Dr Ritchie, we have been able to examine the Dunlin in breeding plumage in the collection of the Royal Scottish Museum, Edinburgh. Of these, two are undoubtedly *E. a. alpina*, viz.:—♂, Fair Isle, 6/6/10; wing 112 mm., culmen 32 mm.; ♀, 6/5/05; wing 110 mm., culmen 25 mm.

THE GREAT WAXWING INVASION OF 1921.

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

(Concluded from 1922, page 201.)

To the remarks on the food of the Waxwing in Britain, with which the preceding instalment of this article concluded, I ought to add that the crop of one of the individuals examined in the Natural History Laboratory of the Royal Scottish Museum, was found by Miss Grace H. Jacob, B.Sc., to contain, in addition to remains of many rose-hips, seven specimens of the Dung Fly (*Scatophaga stercoraria*). The individual was from Holy Isle, 20th November, 1921.

Odd Observations.—On one of the Waxwings examined at the Royal Scottish Museum, an individual obtained by Mr Watson at Holy Isle, three Mallophagous parasites were found. These were submitted to Dr J. Waterston at the British Museum (Natural History), and were identified by him as *Ricinus bombycillæ*, Denny. This species has been recorded by Mr Evans on a Snow Bunting from North Berwick, under the name *Physostomum bombycillæ* (*Proc. Roy. Phys. Soc.*, vol. xviii., 1912, p. 276); and Dr Waterston adds that he has recently examined individuals from Waxwings obtained in Shetland and East Prussia.

Many recorders refer to the "tameness" of the Waxwings, a trait which was particularly noticeable on their arrival, and may have been due, to some extent, to exhaustion and to their undivided attention to food after an overseas fast.

All the birds which I examined in the Royal Scottish Museum, or saw in the shops of bird-catchers, or in captivity, were in full adult plumage, but a competent observer, Mr Charles H. Akroyd of Duncraggie, Brora, reports that in a flock of fourteen which he examined at close range, three or four were in immature plumage.

An interesting observation was made by Dr O. H. Wild at the Scottish Zoological Park, where, through his agency, five individuals, taken at Tranent by a bird-catcher, were deposited. On the 3rd and 4th December, a wild bird paid

a visit to the Park, attracted by the call-notes of the birds in captivity.

Almost since the Middle Ages the coming of the Waxwings in numbers has been popularly regarded in this and continental countries as a harbinger of pestilence. What truth there is in this widespread belief may possibly be accounted for by the facts brought out in the discussion of the primary cause of their southward flight from Norway. For the unwonted and widespread lack of food which causes an unusually large influx to southern countries, is likely to be due to an unwonted and widespread severity of weather, which by adversely affecting the year's food-supply for man over a wide area, may induce conditions favouring a heavy incidence of epidemic disease.

The Duration of the Waxwings' Stay in Britain.—After the last of the three waves of immigration had passed in the early days of December, a notable change took place in the character of the records received. Large flocks were no longer observed; from the 6th December onwards, no group of more than seven individuals was seen, and seven were seen only on two occasions (8th December and 9th January). As a rule the birds now occurred singly, or more rarely in groups of two to four. Clearly, the invading flocks had scattered.

But the records reveal more than a simple scattering, for with the advance of the months there was a progressive decline in the numbers seen. Thus, while December (from the 6th till the end of the month) yielded fifty-eight individuals in Britain, only thirty were seen in January, nineteen in February, two in March, and five in April. Yet we know that far more 1000 birds had arrived in the country. How is the absence of records to be accounted for? Partly because many birds were removed from the army of visitors by bird-catchers. Considerable numbers of Waxwings could be seen in bird-shops, or were advertised for sale in the appropriate periodicals, and their tameness made them an easy prey. Six out of a flock of fifteen were captured at Blairgowrie; eight out of nine at Tranent; eleven out of twelve at Port-Glasgow, and so on. Even a generous allow-

ance for birds taken or killed does not, however, account for the remarkable reduction in numbers observed; and it seems reasonable to suppose that the observations indicate a real reduction, in other words, that many of the Waxwings which had arrived were no longer in the country. I imagine that, as food became scarce, many continued the southward movement, and eventually crossed to the continent.

How long did the laggards in this movement remain in Britain? After January, when twenty-seven were seen, no Waxwings were recorded from Scotland, except apparently a faithful pair which, Mr Hay Fenton reports, remained in the city of Aberdeen, seen on 17th, 19th, and 24th February, and a single individual on 15th and 20th March. But even in April there were still a few in England, for Mr G. Bolam writes from Alston, Cumberland, that "I saw four flying past here on 8th April . . . and I have a letter from a friend stating that a single Waxwing appeared on the 9th and 10th in his garden at Corbridge, below Hexham, when it was eating Cotoneaster berries." If any deduction can be founded on this isolated case, it would tend to strengthen the idea of the southward movement, for perhaps even the laggards were drifting southwards.

I conclude this analysis, which I fear may have become tedious, with a summary list of localities at which Waxwings were seen.

LIST OF LOCALITIES VISITED BY WAXWINGS DURING THE MIGRATION OF 1921-22.

In this list, which is probably incomplete, but which shows sufficiently the trend of the migration, I have adopted the Watsonian system of counties and vice-counties, as affording a sensible geographical grouping. Considerations of space enforce the most summary references, and where no indication of outside source is given, it must be understood that the information is contained in letters received by me.

The number following a place-name refers to the number of birds seen, and the following contractions are used:— Each month is indicated by its initial letter, S to D being

in 1921, the remainder in 1922; *B.B.* = *British Birds*; *C.B.* = *Cage Birds*; *S.* = *The Scotsman*; *S.T.* = *Shooting Times*.

SCOTLAND.

WEST LOWLANDS PROVINCE.

Solway Area.—“Nr. Solway,” 4, N 21.

72. *Dumfries.*—Thornhill, 2, early N; Durrisdeer, 2, N 26; nr. Dumfries, 1, D 23 (all H. S. Gladstone); Langholm, 7, J 9 (*S.T.*), 1, n.d. (John Ritchie).

27. *Wigtown.*—Portpatrick, 1, N 19; Monreith, 4, c. D 20, and 1, c. J 2 (Sir H. Maxwell); Kirkmaiden, 1, D 28 (*S.*); Stranraer, 1, c. D.

75. *Ayrshire.*—Kilmarnock, 1, N 30; Kilwinning, 1, J 21 (E. R. Paton); Kilmarnock, 1, ? mid-D (*Country Life*).

76. *Renfrew.*—Port Glasgow, 12, early N (*S.T.*); Mearns Moors, end N (W. Rennie).

77. *Lanark.*—Cadder, 14, N 15; Neilson, 2-3, D 8; Blackfaulds, 5, D 10, and 1, D 17; Hamilton, 1, D 12 (all W. Rennie); Glasgow outskirts, 1, J 8 (*S.T.*)

EAST LOWLANDS PROVINCE.

78. *Peebles.*—Innerleithen, “flock,” c. N 21 (*C.B.*).

79. *Selkirk.*—Selkirk, 3, N 27.

80. *Roxburgh.*—Smailholm, “numbers,” early N (*S.*); Melrose, N 27.

81. *Berwick.*—Dunglass, c. 40, N 19 (*B.N.*); Lauder, 13 or 14, N 20 (Rev. Dr M'Conachie); Edrington Castle, 30, N 21 (J. H. Craw); Cockburnspath district, 50-70, N 21, 20-30, N 27. It is difficult to get at the facts of the total numbers in this area about this time. The birds seem to have arrived about the 19th, and subsequent records may largely refer to immigrants of that date. About 27th November Mr Falconer estimates, from many careful inquiries, that the total number in the district may have been about 200. Hutton, 6, N 22; Flemington, 9, N 22 (J. H. Craw); E. Reston, several, N 25 (*S.*); Chirnside, 6, D 4; Bluestone Ford, c. 6, D 4; Penmanshiel Tunnel, 2, D 6; Paxton, 6, c. D 11; Chirnside, 3, D 14; Skaithmuir, few, week ending D 17; Duns, 1, D 23-24, and end J; Cockburnspath, 2, J 3. The Berwickshire records are very largely due to Mr A. A. Falconer and the *Berwickshire News*.

82. *Haddington.*—N. Berwick, 1, c. N 12 (W. M. Ingles); Dunbar, c. 20, N 18 (*S.*); Musselburgh, 3, N 18 (*S.T.*), and 1,

N 21; Gosford, 2, N 20, and 7, N 22 (*S.T.*); Tranent, 9, N 21; Beil, 2, D 16.

83. *Edinburgh*.—Joppa, 4, 6, 13, and 9 respectively, on N 15, 16, 17, and 18 (Mr Gray); Inveresk, 1, N 16 (W. Evans); Cramond Bridge, several, N 20 (C. Campbell); Hermitage, Edinburgh, *c.* N 27; Corstorphine, 1, D 3; Dalkeith Park, D 4 (C. Campbell); Ratho, 2, D 7 (W. Evans).

EAST HIGHLANDS PROVINCE.

85. *Fife and Kinross*.—Anstruther, 1, *c.* N 22 (*Coast Boroughs Observer*); Isle of May, 2, *c.* N 24 (Misses Baxter and Rintoul); Cupar, 1, *c.* D 7-14 (*Fife Herald*).

86. *Stirling*.—Polmaise, *c.* N 10 (W. Rennie); Kilsyth, 1, N 12 (C. Kirk); Bonnybridge, 1, *c.* N 13 (*C.B.*); Torrance, Drymen, and Strathblane, early D (W. Rennie).

87. *West Perth*.—Balquhider, 5, *c.* N 21 (*C.B.*); Leny, 1, D 2 and 3 (M. Murray Buchanan).

88. *Mid Perth*.—Crieff, 4, N 16 and 17 (*S.*); Killiecrankie, 7, N 18 (T. M'Glashan); Killin, 25, N 18 (G. G. Blackwood), 20-30, N 20 (W. Wright Craig), 1, N 21 (G. MacGregor); Fincastle, 3, N 20, and Glendochart, 2, N 23 (Mrs C. M. Macgregor); Bankfoot, 3, N 25 (A. H. Mackenzie-Cotton); Perth, "flock," N 27-30, and J 25 and 26 (John Ritchie).

89. *East Perth*.—Blairstown, 15, *c.* first week D (*C.B.*); Dunkeld, 1, n.d. (John Ritchie).

90. *Forfar*.—Broughty Ferry, 2, N 12, and 2, N 14-19 (T. Leslie Smith); Arbroath, "party," N 20, and 1, D 4, 1, J 17 and 18 (D. G. Hunter); Monifieth, N 27 (T. L. S.); Invergowrie, 5, late N and early D (Prof. L. R. Sutherland).

91. *Kincardine*.—Bervie, "number," N 21 (*S.*).

92. *S. Aberdeen*.—Glentanar, 1, N 19 (*Aberdeen Weekly Journal*); Port Elphinstone, 1, N 25 (T. Tait); Aberdeen, 4, and "flock" in another part of city, N 28 (*Aberdeen Free Press* and H. Trail), 2, N 29, 4, N 30 (*S.T.*); Cults, 2, *c.* N 27 to D 2 (*Evening Express*); Aberdeen, 6, D 11 (*Evening Express*), 4, D 18, 2, F 17, 2, F 24 (Mr Esson), 1, M 15. Where no reference is given the records are those of Mr R. Hay Fenton.

93. *N. Aberdeen*.—Inverurie, 2, *c.* N 10 (J. Ritchie, sen.), also *c.* N 18 and mid-J; Keithhall, 1, N 18 (W. Seton Meston); Forge, several, N 19 (A. Smith).

94. *Banff*.—Banff, *c.* 12, N 19 (*S.*); Cullen, 1, *c.* N 26, and 2, J 24 and 25; Kilhillock (two miles from Cullen), *c.* 30, beginning D (all Miss J. Gowan); Auchindoun, Dufftown, small flock, *c.* D 6 (*Banffshire Journal*).

95. *Moray*.—Forres, "many," end N or beginning D (*Aberdeen Evening Express*); Garmouth, 2, end N and from this time flock of 2 to 6 up to J 16 (Dr Mahood); Fochabers, 11, n.d.; Elgin, 2, beginning D (*Aberdeen Evening Express*), 2, D 14, 2, D 16, 1, D 19 (Dr Mahood); Forres, 1, mid-D (*C.B.*).

96. *Easternness* (*E. Inverness, etc.*).—Inverness, c. 12, latter half N (*Daily Record*).

WEST HIGHLANDS PROVINCE.

97. *Westernness* (*W. Inverness*).—Fort William, 1, c. early D (*S.*).

98. *Argyll* (*Main*).—Oban, 5, mid-J (*Daily Record*).

99. *Dumbarton*.—Croy, "flock," N 10, 1, N 12, N 18, and Auchin-eden, 8, N 21 (A. Cuthbertson); Kirkintilloch, 1, N 27 (W. Wallace); Luss, 1, last week J (C. Kirk); Helensburgh, end of 1921 (W. Rennie).

NORTH HIGHLANDS PROVINCE.

105. *W. Ross*.—Poolewe, 2, N 15 and 16 (O. H. Mackenzie); Leckmelm, c. 12, N 22 (*S.*); Ardgay, several, N 28 (*S.*).

106. *E. Ross*.—Beaully Firth, "12 or more," N 20 (*S.*).

107. *E. Sutherland*.—Loth, 4, N 20 (*S.*); Skelbo, Dornoch, 1, N 22 (*S.*); Brora, 14, N 25 (C. H. Akroyd); Golspie, 7 or 8, D 8 (Mr Harper).

109. *Caithness*.—Sandside, Reay, "a few," c. latter half N (*John o' Groat Journal*); Halkirk, latter half N (Rev. J. Ritchie).

NORTH ISLES PROVINCE.

110. *Outer Hebrides*.—Stornoway, Lewis, between 50 and 70, N 18 (*S.*).

111. *Orkneys*.—Kirkwall, 10, c. N 22, "quite a number in the county" about same date (*S.*).

112. *Shetlands*.—Tresta, 2, N 18 till D 1 (*S.*); Lerwick, D (G. W. Russell).

I add the English records which have come to my notice. Where no reference is given they are from *British Birds*.

ENGLAND AND WALES.

PENINSULA PROVINCE.

3. *S. Devon*.—Dartmouth, 2, S 25, O 16 and 27.

THAMES PROVINCE.

17. *Surrey*.—Woodham, 2, J 24.

OUSE PROVINCE.

25. *E. Suffolk*.—Southwold, 4, 1st week D.

27. *E. Norfolk*.—Cley, "over a score," c. D 1; Hunstanton, "many," c. D 1.

30. *Bedford*.—Bedford, 1, D 15.

32. *Northampton*.—Ashton Wold, Oundle, 2, N 11.

SEVERN PROVINCE.

36. *Hereford*.—Ross-on-Wye, 1, N 22.

40. *Shropshire*.—Churchstoke, "small flock," N 21; Church-Stretton, 1, J 7; Longden, n.d.

TRENT PROVINCE.

55. *Rutland*.—Uppingham, 2, D 11 (*Field*).

MERSEY PROVINCE.

59. *S. Lancashire*.—Burnage, 2, N 10; and within Manchester, n.d.

HUMBER PROVINCE.

61. *S.-E. York*.—Sutton-on-Hull, 4, N 21, 22, and 23 (*Naturalist*); Driffield, 2, early D (Miss Covell).

62. *N.-E. York*.—Scarborough, 3, N 14, 8, N 15, 20, N 23, 7, N 24, 5, N 25, 9, N 28, and two parties at Whitby, n.d. (*Naturalist*); Whitby, "large flock," N (Miss Covell); Filey, 6, N 25 (*Yorks. Weekly Post*).

TYNE PROVINCE.

67. *Northumberland, S.*—Corbridge, 1, A 9 and 10 (Geo. Bolam).

68. *Cheviotland, or Northumberland, N.*—Holy Island, 1, N 14, 3, N 20, 1, N 26, 1, N 29; Teesmouth to Berwick, N 22 (Geo. Bolam); Beal, 10, N 23, 20, N 25; Otterburn, 8, last week N.

LAKES PROVINCE.

69. *Westmorland and N. Lancashire*.—Broughton-in-Furness, 3, F 1 (R. Fawcett).

70. *Cumberland*.—Carlisle, 4, N 20; Silloth, c. 12, N 22; Carlisle, 30-40, N 23; Workington, 6, n.d. (*Daily Mail*, J 3); Alston, 4, A 8 (Geo. Bolam).

NOTES FROM THE SCOTTISH ZOOLOGICAL PARK

A specimen of the Indian Wild Dog from Sikkim was being brought home by Major P. H. Bailey for the Zoological Park. Unhappily the dog died on the voyage—when only two days out from Liverpool—and so the Park was deprived of an interesting and rare inmate. Major Bailey has contributed the following valuable notes on the behaviour of this dog and its fellows while under his observation:—

THE WILD DOGS OF SIKKIM.

The Wild Dogs of Sikkim, generally attributed to the species *Cuon dukhunensis*, Sykes, do a great deal of damage to horses, cattle, and yaks, and are much feared by the natives.

Near Tangu (12,800), in the Lachen Valley of North Sikkim, during May 1922, a pack of Wild Dogs having killed a yak, the Lepcha inhabitants sat over the kill in the evening in the hope of destroying some dogs.

A mother with four puppies came with the pack, and, having apparently peppered the mother, which escaped with two pups, the Lepchas captured the remaining two and brought them to my wife and myself. I should put their age at that time at about one month. They were unsteady in their walk still, and may have been carried by the mother.

They were about the size of month-old collie pups. The fur was thick and woolly, milk-chocolate in colour, with a sprinkling of longer white hairs. There was a tuft of almost white hair at the entrance of the large and rather pointed ears. The eyes were smoke-blue, but turned gradually to brown. At first the pups could not lap milk—though they learnt to do so—and I fed them with small pieces of raw meat. They ate this with a plucking action, reminiscent of a feeding tortoise, very much to the detriment of my fingers. I had hoped that hand-feeding would conduce to tameness, but they never could differentiate between the food and my hand until, being all bandaged, they found it unpalatable.

They tried to swallow everything whole at one gulp. If not quite successful, the piece was easily brought up and further attempts made. When all attempts failed, the piece was vigorously

shaken in the teeth and placed on the ground. Then, using the strong dewclaws of the forepaws to hold it down, they tore it with their teeth. Later on they learnt to gnaw pieces off, as they could not tear fresh yak meat. They would, when in difficulties, trot round with the piece in their mouths, giving quaint muffled puppy-barks.

When camped at 17,000, where the tundra gave one a view, I allowed them to run loose with trailing cords. They played among the rocks, returning in the evening for their food, which consisted of hare, duck, yak, or wild sheep (*Ovis ammon*). Unfortunately, one strangled himself.

The "family cry" was a peculiar and mournful flute-like sound, made with the mouth almost closed and the cheeks puffed out, repeated at intervals of about two seconds.

The second dog, unfortunately, died on the way home, in the English Channel, aged eight to nine months, but, up to the time of his death, the note had not, I think, changed, and he would reply with it to my similar whistle.

The indications of his emotions were peculiar, being, as far as I could notice, identical with those of the cat tribe, and opposed to those of the domestic dog. Anger was expressed by laying back the ears, flexing the body, and a spasmodic lashing of the luxuriant brush. Pleasure was shown by a stiffening of the body, pricking of the ears (and consequent rounding of the eyes), and a stiffening and raising of the tail. When caressed he would throw himself on his side and, lifting his lip and drawing the corners of his mouth back, make crying, squealing noises. His ears were then sloped slightly back. He caressed me by licking my head or face, but never my hand.

When stalking anything, he moved very slowly, shaking each foot slightly before placing it, perhaps to make sure of not treading on a stick or loose stone.

When we took him for walks he would invariably try to keep above us, taking advantage of every cover. He would hide, invisible, in the shrubbery, and only come out when we moved on. When lost or entangled he would give his family cry.

At about four months the woolly fur began to give place to a stiffer fox-red coat, and I combed out the wool. At about five months the red coat was complete, with a whitish ruff and throat. His skin was white. The roof of the mouth was dark and was turning blacker. The tongue was pale pink. The brush, which was more luxuriant than a fox's, was black in appearance though the hairs were light at their bases. He had almost no smell. He would track me by scent when I hid.

I never actually saw a pack in action though they were close to me once or twice and I saw the hunted burhel running wildly from, I think, the dogs. I discussed the dogs with Lepcha and Tibetan yak herdsman. They never mentioned but one species to me. I saw the undoubted traces of Wild Dogs at 17,000, but do not think that they went much higher in my locality. The dog trails that I saw at 19,000 were probably Tibetan sheep dogs, which, the inhabitants said, killed wild sheep.

They did not appear to range below about 9000. The people at 8000 said that they had never seen them in their district. That jungle abomination, the leech, has apparently drawn a fairly definite blank zone for certain animals between certain levels.

Dr Bose of the Calcutta Zoological Gardens was of opinion that only one type of dog existed throughout India and the Himalayas, but while I hesitate to question the opinion of experts, I incline to the view that the Wild Dog of the higher altitudes differs in some respects from that of the plains.

The yak herdsman who said they had seen a kill on several occasions, told me that the dogs hunted in a pack of uneven number—usually five or seven (I think this is unlikely).¹ Their method was to divide themselves up into relays, one lot keeping close to their quarry, while the remainder, dropping back to an easier pace, cut off corners. When the quarry became exhausted, the whole pack closed in. One dog seizes the quarry by the buttocks, hanging on grimly and being carried or dragged along. The others range along each side, and when the tortured animal swings his head at the gripping terror behind, the dogs on the opposite side leap in to a throat hold, and another nature tragedy is soon over.

P. H. BAILEY.

[¹ Blandford states that the number in a pack may occasionally be as many as twenty.—EDS.]

The Scottish Naturalist

NOS. 135 AND 136.]

1923

[MARCH-APRIL.

THE WINTER WHITENESS OF THE STOAT.

THE brown Stoat of summer, that in winter changes, as if by witchery, into the snow-white Ermine, still affords an unsolved problem to the naturalist. And the solution of the problem lies in the hands of Scottish naturalists.

It is admitted that the Stoat is a representative of that ancient fauna which invaded Scotland after the disappearance of the ice-sheets of the Glacial Period. Like the Mountain Hare and the Ptarmigan it is a true Arctic creature; and the colour-change which it exhibits is a fine illustration of an adaptation to Arctic conditions, when a world, now snow-clad and now bare, demanded that for its stealthy approach to its victims as well as for its own safety, the Stoat should assume a varying garb in harmony with its changing surroundings.

But the Arctic conditions which induced this wonderful adaptation have gradually ameliorated since the ice-fields melted from our highland valleys, and the Stoat's facility for colour-change has also become modified. We no longer find that all our Stoats become white in winter. While in parts of Scotland a large proportion of our Stoats become white, in southern England it is rare to find an individual that loses its summer colour even in a severe winter.

Why should this be so? What are the conditions,

present in parts of Scotland, but absent from parts of England, which pull the trigger that sets the colour-change in motion? The old idea was, in the words of Bell, that "this transition from the summer to the winter colours is primarily occasioned by actual change of temperature, and not by the mere advance of the seasons"; although Poulton thought that "it is likely that the great difference is not wholly to be explained by the relation of northern to southern temperature, but at any rate partially by the fact that the change is disadvantageous in most parts of England." In a recent number of *Nature*, however, Sir Herbert Maxwell has suggested a new theory, that the power of colour-change is a hereditary possession dating from the Arctic conditions of long ago; that in the regions longest free from the grip of the ice, Stoats have had time to lose a habit no longer of vital importance to their welfare; that this loss of habit is gradually creeping northwards irrespective of the particular conditions in any limited locality; and that the proportion of Stoats that undergo the full winter change is, therefore, wholly a matter of latitude, the change being more perfect and more general as one proceeds further and further north.

Frankly, we do not share Sir Herbert Maxwell's view; we think we have sufficient evidence to show that latitude is not a safe guide in this matter, and that in the milder climate of the western isles the winter change to white is less frequent than in the more severe conditions of the east coast. But here the naturalists of Scotland can step in to solve a problem which has perplexed scientists for ages. The method we propose is a simple one. More evidence is required. Each year, particularly during the winter and spring months, Stoats are trapped for the protection of game. We do not suggest that more trapping of Stoats should be undertaken, for we are not convinced that, in a country overrun by other vermin, the killing of Stoats is wholly beneficial to the country at large. But whatever we might say on this matter, the trapping of Stoats will continue; and we would simply appeal to all landed proprietors, sportsmen, and gamekeepers, to keep a written record of the number

of Stoats killed on their ground, noting for each individual the date of capture, and the condition of pelage, whether full summer coat, full winter coat, or the extent of a partial change from one to the other. The sex of the individual and its probable age are also factors that might prove to be important. We would further suggest that our readers should collect such information or encourage its collection wherever opportunity offers. The information should be sent at the close of each season's trapping to the Editors of *The Scottish Naturalist* at the Royal Scottish Museum, Edinburgh.

What should we hope to gain from such facts? We should hope to learn to what extent the proportion of colour-change differs in different localities, so that an endeavour might be made to associate the changes with latitude or with climatic differences; and we should hope to learn, also, whether in the same locality severe or mild winters had any effect on the numbers of animals assuming the full winter coat. Finally, sufficient data might even lead to the discovery of the definite ranges of temperature or of other factors which actually set the colour-change in motion. These would be no mean results; the important point is that they can be attained only by the co-operation of many observers scattered over a wide area, and for this co-operation we now appeal.

*

*

*

*

On the 23rd February the Dunfermline Natural History Society celebrated its majority by a distinguished gathering, at which were shown many exhibits illustrating recent advances in scientific discovery. The addresses delivered showed how effective in stimulating a love of nature the steady efforts of such a Society may be, and Professor Bower wisely laid stress upon the place of local natural history societies in collecting the facts upon which scientific progress is based, and on the importance of stimulating the interest and guiding the activities of the "junior naturalist."

*

*

*

*

Although the late Henry John Elwes (born 16th May 1846; died 26th November 1922) cannot be regarded as a Scottish naturalist, and though he contributed but one paper to our national *Magazine*, his peculiar eminence amongst men of science demands more than a passing notice in our pages.

Elwes has been described as "perhaps the greatest traveller of his day, an authority second to no one in Europe on trees, a lepidopterist whose collections enrich the national museum at South Kensington, the author of what is still the authoritative work on Lilies, and a big-game hunter and ornithologist of great repute." Details as to his life and work must be sought elsewhere,¹ and it is welcome news to hear that his biography, or at any rate an account of his travels and discoveries, is in course of preparation.

So far as the *Scottish Naturalist* is concerned, the only paper therein by Elwes is that on "The Primitive Breeds of Sheep in Scotland,"² a valuable contribution to the literature on the subject; and it may be noted that his letters in *The Scotsman*,³ reviewing the report of the Departmental Committee on deer forests in Scotland, were described by a member of that Committee as the only intelligent review that he had seen.

It is difficult to summarise such a character as that of Elwes in but a few words—his friendship was steadfast, his power of assimilating knowledge was amazing, his memory was prodigious, his versatility has been indicated, his energy was inexhaustible, but perhaps his guiding characteristic in life was pluck.

¹ See the fuller notice by the writer of this note, Mr H. S. Gladstone, in *British Birds*, vol. xvi., pp. 245-250.—EDS.

² *The Scottish Naturalist*, 1912, pp. 1-7, 25-32, 49-52.

³ *The Scotsman*, 27th May and 3rd June 1922.

A CENTURY OF ZOOLOGY IN EDINBURGH.

By WILLIAM CARMICHAEL M'INTOSH, M.D., LL.D., D.Sc., F.R.S., &c., Emeritus Professor of Zoology in the University of St Andrews, President of the Ray Society.

(Concluded from p. 13.)

The period of Goodsir and Allman in the University produced many zoologists and comparative anatomists. Foremost amongst these were John Cleland, who combined human with comparative anatomy, and John Anderson, the author of several studies in Crustacea, of the large volumes of the expeditions to Yunnan and the Mergui Archipelago, of *From Mandalay to Mousin*,¹ and other works. A distinguished pupil of Goodsir's was James Bell Pettigrew, whose researches on the muscular fibres of the heart, bladder, and stomach, on the nerves of the heart, as well as those on flight, have won him a high reputation. R. O. Cunningham, the author of various contributions on the Solan Goose and a naturalist's experiences at the Strait of Magellan and the West Coast of Patagonia, was another of this period. No Goodsirian zoologist, however, distinguished himself more by his life-long laborious researches than Ramsay Heatley Traquair, who made Edinburgh a centre for discoveries in Fossil Fishes. Alleyne Nicholson, also a palæontologist, made a name for himself in researches on Fossil Corals and Graptolites. Another took up the neglected and difficult groups of the Nemertean and Polychæts, and has laboured at them ever since.

The work associated with the *Challenger* Office enlisted such able men as Beddard, Herdman, Fulton, Hoyle, and Pearcey—first under Sir Wyville Thomson, and then under Dr John Murray. John Murray was a student of medicine in the University, but disliked certain aspects of the subject. When making arrangements for the *Challenger* voyage, he was selected by Sir Wyville Thomson for preparing the

¹ *Fishes of the Nile. Reptiles and Batrach. of Egypt*, etc.

invertebrate captures, and was sent to Murthly to receive instructions on this head. It was thought that he might also look after the birds. On returning to Edinburgh after the voyage, he was anxious to describe the Radiolarians, but these went to Haeckel, and Murray, along with Abbé Renard, dealt with the oceanic deposits. On the death of Sir Wyville he succeeded him as the Director of the *Challenger* publications, and no one could have carried this out more efficiently or more successfully—both as regards the interests of the scientific workers and the Government. Further, he started a marine laboratory in the *Ark*, as the vessel was called, at Granton Quarry, where good zoological work was done by J. T. Cunningham, Ramage, Henderson, and others, for some years. Murray also published a theory of the formation of Coral Reefs. He managed the zoological work of the *Triton* and *Knight Errant*, and opened up a new departure in the zoology and other features of the Scottish lakes. He joined Hjort in the Norwegian ship, *Michael Sars*, in an important cruise in the Atlantic,¹ and altogether had great influence in forwarding zoology and oceanography in Edinburgh. His tragic death deprived the city of a career of great possibilities. Leslie and Herdman's "Invertebrate Marine Fauna of the Forth" was an able contribution by two of Sir Wyville Thomson's men.

Besides the work connected with the *Challenger*, zoology has been notably advanced in Edinburgh by Dr William S. Bruce's oceanographical laboratory, now unfortunately closed, where the results of his expeditions to the Antarctic Seas have been dealt with by the Director and those best qualified in the various groups. The publications of the laboratory merit much commendation.

Since Lord Dalhousie's commission, Edinburgh men and Edinburgh graduates, moreover, have initiated scientific fisheries' work (or fisheries zoology), under the Fishery Board for Scotland. This, indeed, led to the foundation, at St Andrews, of the first Marine Laboratory in Britain. These researches have done much to elucidate the life-histories of the food- and other fishes, as well as prove the permanence

¹ *The Depths of the Ocean* (1912).

of all the important marine food-fishes—pessimistic views notwithstanding. I need only mention the names of Ewart, Prince, Brook, Duncan Matthews, Calderwood, Fulton, Tosh, Gilchrist, Williamson, Fullarton, Ramsay, and Bowman, to show how great these advances have been. Other workers outside the Board's staff are Holt, Masterman, J. T. Cunningham, Cole, Stewart Thomson, John Wilson, Cleland, M. Gunn, Burdon Sandison, Gotch, Collinge, Sandeman, Wallace, H. M. Kyle, Ridewood, Paul, Fraser Harris, Marett Tims, Rennie, W. Nicoll, E. Shann, Herring, Craighead and Elder, and Augusta Lamont. Herdman, again, for many years has carried out important work in marine zoology and the fisheries at Peel and Port Erin, as well as at Liverpool. For the initiation of these researches the country is indebted to the 13th Earl of Dalhousie and the late Lord Reay, and for their loyal support—Dalhousie and Reay being *fratres gemini* in their sympathies with the scientific advances in the fisheries.

The old University Museum, again, was not without its influence on the generations of young zoologists who, with their sketch-books, were instinctively drawn to it. In the fifties of last century, Jameson had left it fairly supplied with mammals, from the duck-mole to the orang, with the Dufresne collection of birds and other groups, whilst the vanished hand of Edward Forbes was seen here and there—strange to say, his last touches being devoted to the rock-specimens of the neighbourhood of Edinburgh. Allman, again, had added many invertebrates to the eastern side-room and elsewhere. The dimly-lighted museum, with its finely-carved mahogany table- and wall-cases, seemed everywhere to harbour the shade of Forbes, a feeling perhaps heightened by the sombre quietude of the place, and the staid carriage of the two veteran attendants who were full of interesting traits of their former masters. Yet, though dear to the students of the period, it fell far short—for the purpose of diffusing information—of the splendid zoological display in the Royal Scottish Museum. On this subject, therefore, while our sympathies go entirely with the Senate and Sir Alexander Grant in the *Story of the*

University of Edinburgh, our judgment bears testimony to the great advance which ample funds and space have enabled the Government Department to make under the skilful hands of Drs Traquair, Eagle Clarke, and Ritchie, and Mr Grimshaw.

Taking therefore a broad survey of the subject, it is seen that, from the Protozoa upwards, Edinburgh men and Edinburgh graduates have advanced zoology in a remarkable manner. Thus Dr Carpenter's treatise on the Foraminifera, Strethill Wright's and Allman's *Memoirs*, the researches of James Young Simpson on Paramœcium, and the collections of Wm. Evans, worked up by Cash, Murray, and Penard, and lastly, Pearcey's observations and those of Henderson and Scott, are noteworthy in the Protozoa. Robert E. Grant gave the first correct account of the Sponges, to which Dr George Johnston, Wyville Thomson, J. R. Henderson, Wm. Evans, and J. Arthur Thomson added. Foremost in the study of the Cœlenterates were Edward Forbes, and George James Allman, the former distinguished not only for his power of lucid description, but by the artistic beauty of his drawings, the latter by his equally terse descriptions and the refined elegance of his figures. Both had their large works published by the Ray Society. The numerous memoirs of Strethill Wright,¹ with their fine original illustrations, the researches of Alleyne Nicholson on the Graptolites and Palæozoic corals, of Nelson Annandale on the Lucernarians, of J. Arthur Thomson on the Alcyonarians, of James Ritchie on the Hydroids, and of Annandale and Ashworth on the group are also noteworthy. Edward Forbes interested all naturalists by the exquisite woodcuts, humorous tail-pieces and lively descriptions of his *British Starfishes*. Every page breathes the freshness of the seashore, and the exhilaration of working the dredge in the open water. Wyville Thomson still further enriched the subject by his researches on the Crinoids, as also did Dr Carpenter on the same group; whilst Allman, Geddes, and notably

¹ It is curious that Strethill Wright thought the thread-cells he found in the papillæ of *Eolis* belonged to the mollusk.

Masterman, made additional contributions. In the parasitic Vermes, Edinburgh claims the work of John Goodsir on the anatomy and development of the cystic forms, and of Wm. Baird, Spencer Cobbold, Hugh F. Stewart, and Lovell Gulland. The Turbellarians were studied by Dalyell, Harry Goodsir, and an Edinburgh graduate who detailed the structure and development of the Nemertean from life, and to this group J. Stephenson made further contributions. The Chætognaths were taken in hand by Pringle Jameson, the Oligochæts by Dalyell and George Johnston, Beddard and J. Stephenson. To Edinburgh belongs the work of Wm. Baird on the Polychæts, a group till lately left—from their difficulty—severely alone, also the large monograph published, and now publishing by the Ray Society, besides the work of Wm. Haswell, Carpenter, J. T. Cunningham and Ramage, and the elaborate researches of J. H. Ashworth (partly with Gamble). Even the Rotifers (monographed by an English author) received attention from Thomas Scott and James Murray in the survey of the Scottish lochs. The Crustaceans were studied by Harry Goodsir, and, in one case, along with John Reid. The *Natural History of the British Entomostraca* was the work of Wm. Baird. Wm. Turner, Turner and Season Wilson, Malcolm Laurie, John Anderson, Thomas Clouston and another graduate also made contributions to the subject; whilst J. C. Howden, J. M'Bain, Thomas Scott, and Andrew Scott greatly extended our knowledge of the Crustacean fauna of the Forth and the Scottish seas; the fresh-water forms (Entomostraca), again, were ably dealt with by Dr and Miss Sprague.

Edinburgh produced various students of the insects. The earlier authors were James Wilson and James Duncan. Amongst others, Wm. Evans made interesting advances; Carter and Grimshaw worked ably at the Diptera, Andrew Murray at the Pediculi and Coleoptera, R. K. Morton and King at the Neuroptera, Grimshaw at the Lepidoptera and Coleoptera, whilst R. K. Greville, W. H. Lowe, R. F. Logan, Stewart Macdougall, Andrew Wilson, and Prof. Hudson Beare were other workers at the group. No

one, however, did more than Dr Buchanan White (an Edinburgh graduate).

Wm. Evans extended our knowledge of the Arachnida, and it may be noted in passing that Sir David Brewster found Acari between plates of mica. Other workers were Soar and W. Williamson. James Murray, again, dealt with the Tardigrada of the Scottish Lochs. In the group of the Fresh-water Polyzoa, Allman's monograph stands pre-eminent, and his discovery of the marine *Rhabdopleura* gave rise to many interesting homologies. Strethill Wright ably worked at *Phoronis*; Dalyell, Coldstream, and Grant added to the Polyzoan fauna, as did C. W. Peach and James Ritchie. Carpenter, Davison, and Ashworth have contributed memoirs on the Brachiopoda. In the popular group of the Mollusca, Monro (*secundus*) anatomised the Cuttlefishes and Edward Forbes and Hanley produced the classic work on the British forms. Carpenter described the structure of the shell, and John Stark and J. Fleming entered on the subject of the boring of rocks by certain forms. Neill and McBain also furnished contributions. Hoyle and Ritchie have dealt with the Cuttlefishes, the former, indeed, being the chief authority on the subject in our country. Harvey Gibson, again, gave an excellent account of the structure of the limpet. The Ascidians owe much to Edinburgh, for John Goodsir brought into notice the remarkable *Pelonaia*. Allman treated of their homologies with the Polyzoa, whilst Herdman is the leading authority on the group in Britain, his fine volumes on the *Challenger* series and other memoirs on the subject being well-known. Masterman, again, added considerably to our knowledge of *Cephalodiscus*, which was originally described by a graduate of Edinburgh.

In the group of the fishes the large folio work of Munro (*secundus*) is noteworthy for its fine anatomical drawings of many forms—mostly of life-size. Parnell's *Fishes of the Forth*, with the supplement by Eagle Clarke, is indispensable to every Scottish ichthyologist. It is curious that Knox held that in the young salmon the specific characters of all the sub-family were present, such

as red spots, dark spots, silvery scales, proportions and dentition. At first, he held, its dentition is that of the common trout, as it grows it assumes the character of the sea-trout, and lastly, it has the dentition of the salmon. John Davy also contributed various papers on fishes. The memoirs of Andrew Young and John Shaw on Salmonoids attracted much attention in their day. John Goodsir, early in his career, gave an account of the anatomy of *Amphioxus*. The papers of Thomas Stewart Traill, J. A. Smith (*Calamoichthys*), J. Duns ("Spiny Shark"), and C. W. Peach ("Tail-less Trout of Islay"), those of Wm. Evans, Ewart, and Ewart and Augusta Lamont ("Elasmobranchs"), and of J. Beard ("Lampreys and Hags"), are all interesting additions to our knowledge of the group. No man of the Goodsirian period, again, has done more distinguished work on Fossil Fishes, not only of Edinburgh and its neighbourhood, but of the rocks at large, than Ramsay Heatley Traquair, whose numerous and important memoirs, all well illustrated (often by his wife) have for more than forty years made Edinburgh one of the centres of the department.

The Amphibians and Reptiles appear to have had less attention than the other groups, though Monro (*secundus*) described and figured the organ of hearing in the "Tortoise or Turtle," Gregg Wilson's papers on the Müllerian duct in each group, and Berry Haycraft on the "Development of the Carapace in the Chelonians" being the most noteworthy. Wm. Evans, further, has paid much attention to the local forms in both groups. Recently Dr Crew has described interesting abnormalities in the frog's sexual system.

During the century many contributions to Ornithology have been made. Thus Macgillivray, besides his interesting work in the Museum of the Royal College of Surgeons, published his *British Birds*, and Edinburgh was associated with Strickland and Melville¹ on the Dodo, Andrew Murray and C. R. Bree (*Birds of Europe not found in Britain*), Turnbull (*Birds of East Lothian*), and Wm. Evans, also extended our knowledge of the subject. No names were more familiar in connection with the group than J.

¹ M.D., Edinburgh.

Alexander Smith and Robert Gray¹; whilst R. O. Cunningham, J. Bell Pettigrew (on flight), and another graduate on the bird's heart, Ewart and Dorothy Mackenzie, Waterston and A. C. Geddes also contributed interesting memoirs. Another Edinburgh man, viz., Symington Grieve, produced the monograph on the *Great Auk*. The most conspicuous worker in the group, however, in modern times, is Wm. Eagle Clarke, whose volumes on the migrations of birds, and his remarkable and beautiful display of the forms and of the economy of birds in the Royal Scottish Museum, besides his articles in the *Scottish Naturalist* (which he edited) speak for themselves. He has done much to advance the subject in Britain.

No group since the days of Monro (*secundus*), who described and figured the mouth, ear, and larynx of the porpoise, appears to have been more popular with Edinburgh men and Edinburgh graduates than the Mammals, as might have been anticipated in a great Medical School, for all distinguished human anatomists, such as Knox, Monro, Goodsir, Huxley and Turner, have likewise been comparative anatomists. During the period Robert Knox enriched the literature of the subject, not only by his anthropological studies and his transcendental anatomy, but by various memoirs, such as on *Ornithorhynchus*, the stomach of the llama, the dentition of the dugong, the gastric glands of the porpoise, the comparative anatomy of the eye; and on whales, the fine skeleton of the Blue Whale in the Royal Scottish Museum having been prepared by him and his brother. He, however, was not quite accurate in supposing that the whales, including the porpoise, followed the shoals of herring for the small pelagic animals on which the fishes feed. He thought that, as in the salmon, the young of every species represented a generic animal embracing in its structure the possible of all the species. Thus the horse a few months old resembled in its rich deep fawn colour the horse of the veldt, in its proportions it leans to the Quagga or Zebra, and in its motions to the wild horse of the African plains. He thought the Quagga

¹ R. Gray (*Birds of West of Scotland*, 1871).

nearest the generic type. John Goodsir's contributions included a memoir on musket-bullets in Elephant's tusks, and he added many fine preparations of the group to the Anatomical Museum. Falconer's splendid researches on Indian Fossil Mammals and his joint work with Cantley, viz., *Fauna Antiq. Sivalensis*, were both novel and important. Wm. Turner, again, furnished able memoirs on the comparative anatomy of the placenta, and stood prominently out as the leading authority on the Cetacea, a position worthily won by his heroic labours on the Long-niddry Whale. He also enriched the Anatomical Museum with a fine series of cetacean skeletons and other preparations. Andrew Murray's *Geographical Distribution of Mammals* was a notable landmark. John Struthers' memoirs on *Megaptera*, and his work on the Right Whale are other interesting cetacean contributions; and Spencer Cobbold dealt with the Ruminantia. John Anderson added to our knowledge by his fine memoirs on the fluviatile cetaceans and other mammals of India, as did also Morrison Watson on British cetaceans, whilst James Bell Pettigrew on the muscular fibres, and on the auriculo-ventricular valves of the heart, and Noel Paton on the action of these in the mammalian heart still further added to the subject. Hepburn and Waterston, again, dealt with the anatomy of Weddell's Seal, and the former also described the anatomy of the porpoise. Ewart treated of heredity, of the skull of the horse and of the development of the horse, the latter being also the subject of a memoir by Arthur Robinson. D. J. Cunningham contributed to cetacean literature, and on the stomach of man and mammals and other subjects. W. S. Bruce and R. B. Thomson gave a paper on the Antarctic Seals, and David Waterston furnished a fine memoir on the development of the heart. J. P. Hill, again, has distinguished himself by his able memoirs on the development of the Monotremata and Marsupials. The work of Dr James Ritchie on *The Influence of Man on Animal Life in Scotland*, and in other papers, has also notably added to our knowledge. These original contributions and many others attest the unflinching interest in the group. Lastly, the faunistic work

of Wm. Evans is noteworthy, as also are the well-known and interesting works of J. Arthur Thomson and Geddes on Heredity and kindred subjects. To Edinburgh further belongs the valuable zoological work of Nelson Annandale in India, and J. D. Gilchrist in South Africa.

The establishment of an Oceanographical Laboratory in Edinburgh by Dr Bruce has notably extended the sphere of zoological work, and produced important memoirs, as well as kept Edinburgh to the front in all that pertains to the Antarctic Seas. Lastly, the opening of a New Zoological Garden, on very different lines from those of the old one (stationed near the head of Leith Walk in the fifties of last century), cannot but foster a wide interest in the subject, and it is to be hoped will offer increased facilities for zoological research.

In this brief and necessarily imperfect sketch, the share of Edinburgh men and Edinburgh graduates in extending the boundaries of our knowledge in zoology, is shown to be undoubtedly great. Further, during the century, as time advanced, there has been an increasing ratio of original workers who have loyally kept up the reputation of the city. If Edinburgh had a Marine Laboratory in touch with the open sea, its resources would be greatly enhanced, and perhaps before the record of the next century's work falls due, this will be accomplished.

The Open Winter and Early Nesting—*Young Starlings in December*.—Mr John Budge, in a letter written to me from Pladda on 19th December 1922, says: "The Starlings have got a bit mixed in their seasons. In the latter end of November I watched a pair flying in and out of a nest with food for their young ones. The nest was too far in to get hold of. Others are busy just now building their nests. There is a nest I have been watching down in our pier. The Starlings were washed out of the pier yesterday with a high tide. There were *young ones in the nest*."—J. M. M^cWILLIAM, Rothesay.

Young Wood-pigeons in February.—A Wood-pigeon had two young ones in a nest in a yew-tree here on 17th February. I think they were hatched on 13th February, and they died during the cold weather of the following week.—JAMES BARTHOLOMEW, Torrance.

NOTES ON SOME OF THE BIRDS OF BUTESHIRE AND AYRSHIRE.

By the Rev. J. M. M'WILLIAM, B.A.

BUTE.

IN the *Scottish Naturalist*, February 1918, I described how numbers of the Rooks and Jackdaws of the island of Bute cross to the mainland of Argyllshire each morning, and return at dusk. At that time I knew of no other species which had the same habit. It was only on a very few occasions that I had seen other land-birds crossing the mile and a half of sea between Bute and Toward.

I have learnt, however, since then, that this daily crossing is not confined exclusively to these two species. Frequently in the dusk I have seen flocks of Starlings arrive at the shore, apparently from over sea. It is just possible, however, that these birds may only be travelling along the shore to their roosting places. But I have found that the Redwing has a regular flight in the winter evenings from the Argyllshire side to Bute. For about an hour before dark flocks of ten to twenty birds arrive on Bute, apparently to roost in the Ardenraig woods at Craigmore. On one occasion in the winter of 1921-22 I took a boat out to the middle of the channel and saw several little flocks passing over in this way. I have not yet seen them leaving Bute in the morning. I have also on several occasions seen little flocks of birds of the Finch size arrive in the dusk. I have not been able as yet to find what species they are, and there is also a slight uncertainty, as with the Starlings, as to whether they have actually crossed the sea. I have only seen them for an instant as they flit past in the dusk. I may repeat what I wrote in 1918, that there is no apparent reason why any birds should have formed this habit, and that, except with a very few species, it is the rarest thing at most seasons of the year to see land-birds going to or coming from the mainland. There is one further exception which may be

put on record. There is apparently a regular passage of small birds to the north over the island during July, in the daytime. I noticed several birds passing in this way in July 1921, at the time when the Curlew go south over Bute. This year (1922) I watched for them with greater care, and on many occasions during about a fortnight I saw little flocks, never of more than three or four birds, passing north. On 8th July I noticed them on several occasions, and on 9th July ten times in half an hour I saw them cross, from one to three birds at a time. They pass at a height of about fifty yards, and, to judge from their steady flight, they are not merely leaving Bute, but apparently come from farther south. It looks like a definite migration. I am aware that a similar movement towards the north before the regular migration to the south has been observed in other places.

PEREGRINE FALCON.—I have been informed by Mr A. Smart, the head keeper at the north end of Bute, that this species attempted to breed this year on a cliff at the Kyles, the female being shot.

GOLDEN EAGLE.—This species may perhaps be added to the list for Bute. In the last few years a pair have nested in the neighbouring part of Argyllshire, and on several occasions Eagles have been seen flying over Bute.

COMMON BUZZARD.—I have to add this species to the list of birds proved to nest on Bute. Since the war they seem to have become much more common in this district. In April 1921, a nest containing four eggs was found by the gamekeepers at the north end, on an inland cliff. The eggs, which have been placed in the Bute Natural History Museum at Rothesay, are graduated in colour, from one that is beautifully marked to one that has practically no colouring. The egg with the least marking was infertile. I had always assumed that in such cases the best-marked egg is the one that is laid first, but the late Mr Charles Kirk told me, shortly after these eggs were taken, that on the one occasion when he noted the order in which a set of Sparrow-hawk's eggs were laid, the first egg had the least marking and the eggs

deepened in colour till the last. Clutches of four Buzzard eggs are somewhat rare.

BLACK-THROATED DIVER.—An immature bird of this species was shot beside Craigmore pier on 14th February 1922, by Gilbert M'Kellar, and was brought to me. This species is the least common of the Divers in the Firth. I do not know of any other specimens having been taken on the island. I say "on the island" advisedly, as this bird swam in to the shore.

BLACK-HEADED GULL.—This Gull now nests on Bute. In 1921, Dr J. N. Marshall told me that he had seen it nesting on a little loch at the south end of the island, and on going there soon afterwards I found about fifteen pairs nesting on an island. I did not go out to them, but I could watch them sitting on their nests through a telescope. Early in July 1922, I paid another visit to the place and found that the numbers had increased very greatly. There were possibly two hundred adult birds flying over the loch. A couple of weeks later they had all gone.

CAPERCAILLIE.—In 1918, I wrote that this species had tried to establish itself on the island. From all that I have been able to learn, it does not appear that there was ever more than one brood of Capercaillie \times Black Grouse. I believe that there is still one of these birds on the island. An attempt was made last year to establish the species by means of eggs from Perthshire, but it was unsuccessful, none having hatched out.

PLADDA.

In the spring of 1920, I paid a couple of short visits to this island in the hope of obtaining birds killed at the light, or seeing them pass on migration. I have to thank the Commissioners of Northern Lights for giving me permission to do so, and Mr John M'Lean for his kindness in putting me up in his house. The results were rather disappointing. Very few birds came to the light, and on account of the island being so close to Arran, none halt

there during the day. This light, since it has been altered, revolves so quickly that it is only on exceptionally favourable nights that birds come to it in any number, perhaps two or three times in a year. I have stood on the balcony and watched birds trying to pass up the beams to the glass, but it revolved so quickly that they were nearly always left behind. Since I was on the island, Mr John Budge, one of the keepers, has very kindly sent me birds from time to time, and kept me informed as to what occurs, and we have made in this way a list of about thirty species taken at the light, or seen passing on migration. These include Starling, Snow Bunting, Skylark, Meadow Pipit, Golden-crested Wren, Willow Warbler, Sedge Warbler, Blackcap, Fieldfare, Redwing, Blackbird, Whinchat, Redstart, Martin, Swallow, Cuckoo, Storm Petrel, Dunlin, Curlew, Whimbrel, Common Snipe, Land-rail, Water-rail, Water-hen.

The Whinchat, which is comparatively rare in Buteshire, was taken at the light on 17th May 1920. The Blackcap, which is the first recorded from Buteshire, was taken on 15th October 1920. On that date Mr Budge wrote to me, "No great variety of birds, but countless in number, mostly Redwings and Larks." A Storm Petrel was taken at the light on 4th/5th September 1921. This species is seen in the Firth of Clyde not uncommonly in the summer, suggesting the possibility that it may breed regularly in some locality not yet discovered. There are a very few records of its nesting on Ailsa Craig, but by no means sufficient to account for the numbers seen at times by the fishermen. The Water-rail was taken at the light, and sent to me on 30th September 1921. The Water-hen was taken at the light and sent to me on 1st February 1922. This is not intended, of course, to represent a complete list of the birds that have been taken at this light. A number of records have been published from time to time in former numbers of this magazine. I have not thought it worth while to collect them in this paper, and have merely given those which have come under my own notice. I hope to be able to add considerably to this list in the future.

AYRSHIRE.

In the spring of 1922, I spent a short holiday in South Ayrshire, and added a few new records to the breeding-list for this county.

BLACK GUILLEMOT.—For many years it has been believed that this species nests on the South Ayrshire cliffs. Prior to 1871, Robert Gray had seen it near the entrance to Loch Ryan, as recorded in *The Birds of the West of Scotland*. In June 1900, Mr John Robertson actually saw these birds on the cliffs in this neighbourhood, leaving no reasonable doubt that they were breeding. However, on 30th May 1922, I explored from the sea the range of cliffs a little farther north, and gained the necessary absolute proof at last. We found three birds sitting in crevices in the little caves that are so common here. One nesting-crevice could be reached, and it contained two eggs. From the number of Black Guillemots that I saw in the neighbourhood of these cliffs, I should say that probably ten pairs nest here, and possibly rather more. This is almost certainly the largest breeding colony of this species in that ill-defined area—"Clyde." As long ago as 1898, Mr Robertson found a very few birds of this species nesting on Glunimore Island. There is a probability that, if the shores of Arran were carefully searched, a few pairs might be found to nest there. Surely it is time, by the way, that some exact definition of the Clyde Area was agreed upon for working purposes.

GREAT BLACK-BACKED GULL.—I have to record this species as breeding on the South Ayrshire cliffs. On 30th May 1922, we found one nest which contained three eggs, two on the point of hatching, and one infertile. There has been no certain record published of this bird nesting in Ayrshire till the present, though I believe that my friend Mr John M'Crindle has also found it in recent years. It appears that there is no record for Ailsa Craig that can be regarded as satisfactory. I have heard that it has been seen nesting on Inchmarnock, in Buteshire, since I was last there in the nesting season.

LESSER TERN.—Since 1871, when Robert Gray stated that a few pairs of this species then nested on Loch Lomond, there has been no record of its breeding in "Clyde." Gray noted, in *The Birds of the West of Scotland*, that stray specimens are occasionally seen in Ayrshire and Argyllshire. Old and young, able to fly, were seen near Ballantrae on 8th August 1912 (*Scot. Nat.*, 1912, 213). Two have been seen at Maidens, Ayrshire, 11th September 1915 (*Scot. Nat.*, 1916, 211).

On 29th May 1922, I saw two pairs of Lesser Tern in South Ayrshire, which were apparently about to breed on a certain stretch of shingle. They were to be seen at this place on every occasion that I went there till 1st June, after which I had to leave this district. I spent a considerable time in searching for their eggs, though in my opinion they had not yet laid, as my experience is that it is quite easy to watch these birds to their nest. They flew over me constantly when on one part of the shingle, and showed all signs of being about to lay. In case there may ever be any doubt about my identification it may be as well to say that the yellow on the bill was quite easily seen. I believe that in a few days eggs would have been found. I do not wish to suggest that this is sufficient evidence to give this bird a place on the present nesting-list for "Clyde," as in the case of so rare a bird for this area absolute certainty ought to be required. At the same time I have no doubt that unless some accident happened to the birds they did in fact nest there that year. Complete proof will probably be obtained before long.

RED-BREASTED MERGANSER.—During my visit I saw this species constantly near the mouth of the Stinchar, and on one occasion about a mile up the river. I note this as the place is rather beyond the known breeding-range for the species.

COMMON BUZZARD.—There is no record of this species nesting on the coast of Ayrshire, and even inland records are very rare. On 30th May 1922, I saw a Buzzard go out from one of the highest sea-cliffs in South Ayrshire. It flew

round for a minute or two and then lit again near the place which it had left, in full view from the boat. From the anxiety that it showed at our presence it apparently had a nest. The records which I give in this paper for this and other birds of prey show how they must have increased in the years since 1914, in the Clyde area.

A Well-stocked Mouse Nursery.—During January, when the farm men here were taking in a stack of oats to thresh, they found a nest containing eighteen very young mice all the same age.—JAMES BARTHOLOMEW, Torrance.

[It is apparent that the nest described must have been something in the nature of a mouse crèche, or at least a common nursery, since it is seldom that the litter of a House Mouse numbers seven, or of a Long-tailed Field Mouse, nine. But the promiscuous nursing of the latter species is a well-authenticated fact, for in 1881 R. M. Barrington recorded that he had “twelve to twenty mice, young and old, in the nest . . . the young of different ages suckling the mother at the same time, and the mothers appearing to suckle each other’s young indiscriminately.”—EDS.]

Supposed Breeding of the Blue-headed Wagtail in Scotland.—In the *Report on Scottish Ornithology in 1921* (*Scot. Nat.*, 1922, p. 79), there is a somewhat guarded reference to “A Wagtail, believed to be a Blue-headed Wagtail,” which “was seen at Kinfauns on the 17th [May] feeding three young: the nest was under a ledge of rock on the Dell Garden.”

A little consideration will show that the nest in question could not possibly have belonged to this species. In the first place the Blue-headed Wagtail, like our Yellow Wagtail, is a breeder in meadows, placing its nest on the ground in a slight depression usually among thick herbage, but never on rock ledges, which are the characteristic nesting haunt of the Grey Wagtail (*M. cinerea cinerea*). Moreover, the Blue-headed Wagtail is a late breeder, and in the few cases where nests have been met with on our south coasts, the eggs were laid towards the end of May and early in June. The eggs in the Kinfauns nest must have been laid about a month earlier, probably towards the end of April. This would be a very natural date for a Grey Wagtail, and there is little doubt that the note refers to this species, but certainly not to the Blue-headed Wagtail.—F. C. R. JOURDAIN, Abingdon, Berkshire.

Blackgame damaging Young Larch.—A wood here of some nine acres was planted in January and February 1919 with two-year-old native larch; these were eaten by Blackgame to such an extent that hardly a tree was spared, but though many succumbed the majority grew up as “scroggy bushes.” It was decided to “beat up” the plantation this year, and the work was begun on 5th February 1923. The weather was mild and open, but within ten days the Blackgame repeated their attack and, of some 5000 two-year-old Japanese larch, fully 2500 have already (17/2/23) had the side shoots nipped off all round, and about 2000 have had their leading shoot destroyed. The damage was done by a small pack of about eight to twelve Greyhens, and that Blackgame are by no means numerous in the vicinity is shown by the bags for the last three seasons which are only 33, 35, and 25 respectively.

It is curious that the 1919 trees (or rather “scroggy bushes”) have not been touched, the Blackgame, unfortunately, reserving their attention to the newly planted trees. Why these should alone be attractive I cannot tell; but, of course, it is well known both to the gardener and also to the farmer that any plant which has been just planted seems to have an irresistible attraction for rabbits, hares, rooks, etc.

The Blackgame cannot be frightened away by any sort of “scare-crow,” either in the shape of flapping bits of cloth or noise-producing instruments, and at this season of the year one is debarred by law from the satisfaction of shooting the marauders. It may be noticed, in this respect, that in the *Report of the Game and Heather-Burning (Scotland) Committee* (Command Paper, 1401 of 1921), it was recommended (Recommendation 69, p. 12) “that in the interests of forestry the Board of Agriculture for Scotland be empowered, where they are satisfied that Blackgame are damaging plantations of young conifers, to grant authority to the owner of such young trees to kill Blackgame in such plantations at any time.” The recommendations in this *Report* have not, as yet, been carried out, and it is to be feared that the *Report* has met with the same fate as so many of its predecessors, and that it is now lying snugly hidden in some pigeon-hole in one of the too numerous Government departments.

It must be confessed, however, that more than one of the marauding Greyhens was shot, and it is remarkable that when cooked and sent up to table they were so impregnated with the taste of larch as to be almost inedible.—HUGH S. GLADSTONE.

CONTRIBUTIONS TOWARDS A LIST OF THE
INSECT FAUNA OF THE SOUTH EBUDES.

From the Zoological Laboratory, University of Cambridge.

I. THE AQUATIC COLEOPTERA OF THE SOUTH EBUDES.

By FRANK BALFOUR-BROWNE, M.A. (Oxon et Cantab), F.R.S.E.,
F.Z.S., F.E.S. Lecturer in Zoology (Entomology) in the University
of Cambridge.

THE group of islands including "Islay and Jura and the adjacent islets" was named the "South Ebudes" by H. C. Watson in his *Cybele Britannica*,¹ where he divided England and Scotland into county and vice-county areas with the object of describing the distribution of the flora.

This definition is somewhat vague as it stands, but as, in the preceding sentence, Watson describes the "Ebudes" as "islands belonging by political geography to Argyle and Inverness," it is quite clear that he meant the South Ebudes to include the island of Gigha and its adjacent islets in this group, and not to treat them as belonging to the mainland vice-county of Cantire.

So far as I have been able to find, no one has recorded any water-beetles from the South Ebudes, and, having worked the Outer Hebrides and the North- and Mid-Ebudes, I was anxious to find out what species occurred in this southern group.

I therefore arranged to take a small party from the Zoological Department of the University of Cambridge to do some collecting. Mr G. L. R. Hancock collected Lepidoptera, Mr G. E. Hutchinson, Rhynchota, and Mr E. J. Pearce assisted me with the water-beetles and also collected a number of land-beetles, while the Hon. Ivor G. Montagu collected mammals.

¹ *Cybele Britannica, or British Plants and their Geographical Relations* 1859, vol. iv., p. 142.

Papers upon the insects collected will appear in this periodical, and a paper upon the mammals will shortly appear in the *Proceedings of the Zoological Society of London*.

We arrived at Port Ellen, Islay, upon 15th June and remained there until the 22nd, when we moved to Craighouse, Jura, where we remained until the 28th. On leaving



FIG. I.—THE ISLAY HUNTING-GROUND.

Jura, two of our party, Messrs Hancock and Hutchinson, landed on Gigha, where they spent four days collecting insects and trapping small mammals. I am thus indebted to them for the water-beetles recorded in this paper from the island of Gigha.

Although the weather was cold and frequently wet and mostly unpleasant, I do not think that the lists of water-beetles, or perhaps water-bugs, suffered greatly thereby, but land-collecting produced very poor results, probably

largely owing to these conditions. For collecting Lepidoptera things could scarcely have been more discouraging, and I cannot too highly praise Mr Hancock's indestructible enthusiasm, which undoubtedly enabled him to make a

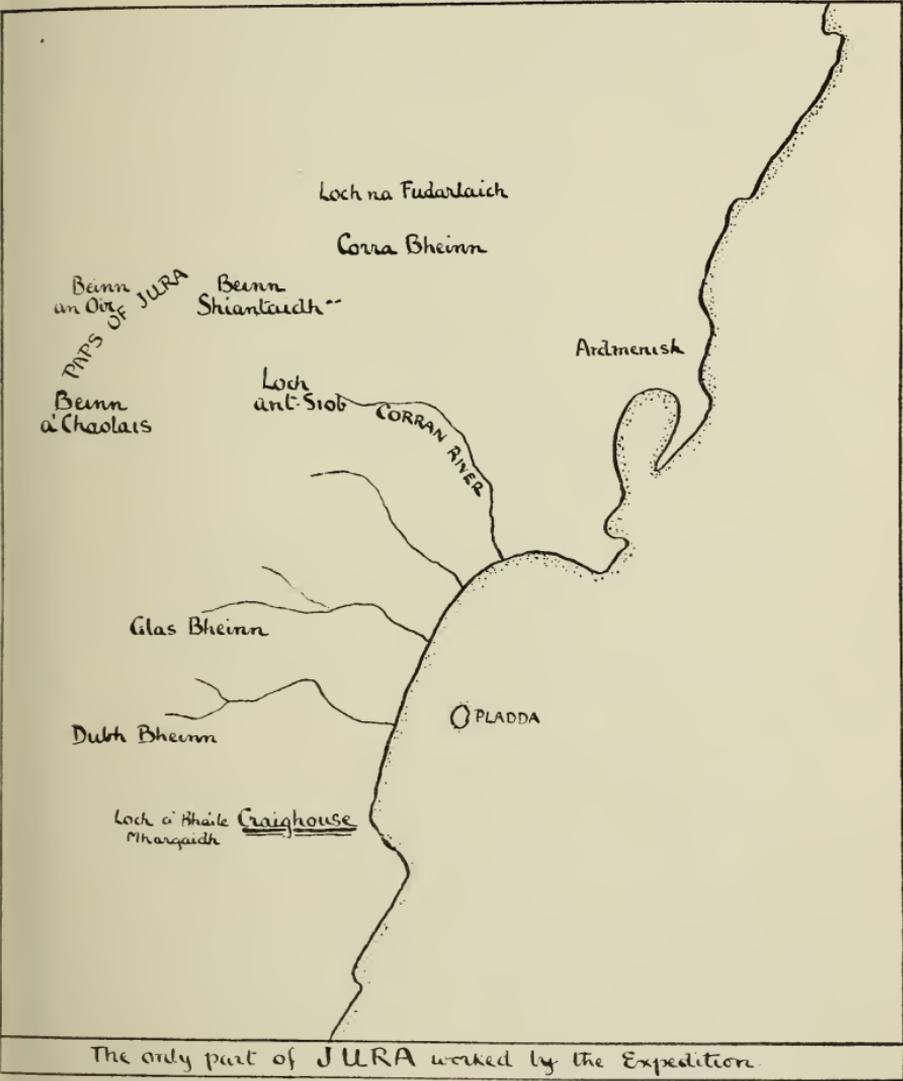


FIG. 2.—THE JURA HUNTING-GROUND.

much more complete collection than any faint-hearted collector would have made under the same conditions.

As will be seen from the accompanying maps only a small part of Islay, and again of Jura, was examined, and although I think that for Jura we examined most

of the varieties of habitat occurring on the island, I feel certain that the northern portions of Islay would have yielded additional species if we had had time to examine them.

The Islay list of water-beetles collected in the week includes fifty-six species, which is a greater number than is to be found in the list of any other Hebridean island so far explored :—

Skye	43 spp.	Coll	46 spp.
Eigg	37 „	Lewis	48 } 52 „
Mull	40 „	Harris	39 }

To some extent, no doubt, the number of species in each of the islands in the above list is dependent upon the time spent in collecting, but the list also depends very largely upon the variety of habitat which one finds in a district and partly upon the time of year in which the collecting is done.

The Jura list includes forty-three species, but in Jura there was little collecting ground other than peat-moss pools, lochs and burns; whereas in Islay, in addition to these, there were a few ponds and ditches in boulder clay on the lower ground, and also a very limited sea-turf pool area.

Forty-one collections were made in Islay and thirty-two in Jura, and as I have kept records of all the species taken in each collection, it is possible to extract for comparison the faunas of different types of habitat. For this purpose I have classified the collecting places under four heads: (1) lochs, including lochans, (2) streams, including everything from a river to a trickling burn, (3) peaty pools, and (4) the pond and ditch devoid of peat found in the boulder clay, and perhaps adequately described as a "silt pond" from the soft and oozy character of the bottom.

The following table gives particulars of the faunas of each of these types of habitat, and I have kept separate the lists for Islay and Jura in order to use them for comparison one with the other :—

ISLAY

Lochs and Lochans.		Peaty Pools.		Ponds and Ditches.		Rivers and Burns.	
o. of collections	14		10		4		5
o. of species	18		26		28		20
<i>H. palustris</i>	. 50*	<i>A. bipustulatus</i>	} 78*	<i>H. lineatocollis</i>	} 75*	<i>D. elegans</i>	. 80*
<i>H. arcticus</i>	. 29	<i>Ph. fuscipennis</i>		<i>H. pubescens</i>		<i>H. lineatocollis</i>	. 60
<i>H. fulvus</i>	} . 21	<i>H. pubescens</i>	} 67	<i>A. bipustulatus</i>	} 75*	<i>D. 12-pustulatus</i>	} 40
<i>H. natator</i>		<i>H. viridicollis</i>		<i>H. aquaticus</i>		<i>H. palustris</i>	
<i>H. griseostriatus</i>	} 14	<i>H. tristis</i>	} 44	<i>H. palustris</i>	} 50	<i>A. globulus</i>	} 20
<i>H. bipustulatus</i>		<i>H. morio</i>		<i>H. erythrocephalus</i>		<i>H. viridicollis</i>	
<i>H. punctulatus</i>	} 7	<i>H. obscurus</i>	} 33	<i>A. globulus</i>	} 33	<i>H. lepidus</i>	} 20
<i>H. globulus</i>		<i>A. chalconotus</i>		<i>L. minutus</i>		<i>H. ruficollis</i>	
<i>H. ruficollis</i>	} 7	<i>Rh. bistriatus</i>	} 22	<i>L. truncatellus</i>	} 33	<i>H. rivalis</i>	} 20
<i>H. lineatocollis</i>		<i>H. gyllenhalii</i>		<i>H. viridicollis</i>		<i>H. septentrionalis</i>	
<i>H. inæqualis</i>	} 7	<i>A. sturmii</i>	} 11	<i>H. obliquus</i>	} 33	<i>H. discretus</i>	} 20
<i>H. 12-pustulatus</i>		<i>I. ænescens</i>		<i>H. confinis</i>		<i>H. pubescens</i>	
<i>H. pubescens</i>	} 7	<i>H. picicus</i>	} 11	<i>H. fulvus</i>	} 33	<i>H. lituratus</i>	} 20
<i>H. lituratus</i>		<i>Ph. minutus</i>		<i>H. ruficollis</i>		<i>A. guttatus</i>	
<i>H. chalconotus</i>	} 7	<i>H. wehnckei</i>	} 11	<i>C. inæqualis</i>	} 33	<i>A. paludosus</i>	} 20
<i>H. fuliginosus</i>		<i>D. griseostriatus</i>		<i>D. 12-pustulatus</i>		<i>A. bipustulatus</i>	
<i>H. edwardsii</i>	} 7	<i>H. ruficollis</i>	} 11	<i>H. gyllenhalii</i>	} 33	<i>G. natator</i>	} 20
<i>H. fuscipennis</i>		<i>H. melanarius</i>		<i>H. memnonius</i>		<i>L. alutaceus</i>	
		<i>H. nigrita</i>		<i>H. obscurus</i>		<i>L. truncatellus</i>	
		<i>A. affinis</i>		<i>H. lituratus</i>		<i>H. aquaticus</i>	
		<i>D. punctulatus</i>		<i>I. fuliginosus</i>		<i>O. bicolon</i>	
		<i>C. fuscus</i>		<i>Rh. bistriatus</i>			
		<i>G. minutus</i>		<i>C. fuscus</i>			
		<i>G. natator</i>		<i>G. natator</i>			
		<i>P. nigroæneus</i>		<i>H. fuscipes</i>			
				<i>H. „ var. picicus</i>			
				<i>Ph. fuscipennis</i>			
				<i>Ph. minutus</i>			
				<i>H. granularis</i>			

* The numbers after the specific names indicate the percentage of occurrences of the species.

It will be noted from the tables¹ that, although the boulder-clay ponds and ditches in Islay produced only two more species than the peaty pools, the total was obtained in less than half the number of collections, suggesting that the community in each pond or ditch was richer than the community in each peaty pool. As a fact there was an average of 11.3 species per collection in the ponds, and of only 7.0 in the peaty pools.

Again, the comparative poverty in species of the lochs and rivers is noticeable. As to the lochs, very few true loch species were found on the islands, the majority of the

¹ For Jura table, see next page.

species making up the totals in the above lists being peaty pool species, occupying corners of the lochs where peaty pool conditions existed.

JURA		
Lochs and Lochans.	Peaty Pools.	Rivers and Burns.
No. of collections . 14	8	3
No. of species . 17	22	9
<i>A. arcticus</i> } 57* <i>A. bipustulatus</i> } <i>D. griseostriatus</i> } <i>H. palustris</i> } 29 <i>G. natator</i> } <i>H. erythrocephalus</i> } 21 <i>H. pubescens</i> } <i>H. obscurus</i> } <i>Rh. bistriatus</i> } 14 <i>H. fulvus</i> } <i>H. ruficollis</i> } <i>H. lineatocollis</i> } <i>H. nigrita</i> } 7 <i>A. chalconotus</i> } <i>D. marginalis</i> } <i>Ph. minutus</i> } <i>L. ytenensis</i> }	<i>A. bipustulatus</i> 62* <i>H. pubescens</i> 50 <i>H. morio</i> <i>A. arcticus</i> } 37 <i>Ph. fuscipennis</i> } <i>H. gyllenhalii</i> } <i>H. obscurus</i> } <i>H. nigrita</i> } <i>A. congener</i> } 25 <i>Rh. bistriatus</i> } <i>G. natator</i> } <i>H. viridicollis</i> } <i>D. griseostriatus</i> } <i>H. tristis</i> } <i>H. palustris</i> } <i>H. melanarius</i> } <i>A. sturmii</i> } 12 <i>A. chalconotus</i> } <i>A. sulcatus?</i> } <i>P. nigroæneus</i> } <i>A. globulus</i> } <i>H. aquaticus</i> }	<i>H. pubescens</i> } 67* <i>A. guttatus</i> } <i>A. bipustulatus</i> } <i>A. globulus</i> } <i>H. melanarius</i> } <i>H. obsoletus</i> } 33 <i>Ph. fuscipennis</i> } <i>H. aquaticus</i> } <i>H. viridicollis</i> }

* The numbers after the specific names indicate the percentage of occurrences of the species. No "Pond and Ditch" collections were made in Jura.

As to the rivers also, very few true running water species were found in the islands, and, of those that were present, such species as *H. rivalis* and *septentrionalis*, *A. guttatus* and *paludosus*, were only met with on one occasion each.

With reference to the scarcity of loch species it is to be noted that in two lochs on Islay (two of the Leorin lochs), and in five lochs on Jura (Loch a' Bhaile Mhargaidh, Loch na Cloiche and two neighbouring lochs, and Loch na Fudarlaich), there were no beetles at all, while in Loch Ant Siob, a fairly large piece of water to the southern side of Beinn Shiantaidh, a single specimen of *H. obscurus* was the only water-beetle obtained.

(To be concluded.)

First Records of Wood-Wasps from Berwickshire.—

There is a reference to the occurrence of *Sirex gigas* and "*juvencus*," in the Border district, with which the late Mr Evans (*Scot. Nat.*, 1922, pp. 184 and 187) seems to have been unacquainted, and which, as it appears to be much earlier in date than any other of the records from the south of Scotland, deserves notice. In the *Proc. Berwickshire Nat. Club* (1872, p. 306), Dr Hardy, after mentioning the capture of *Sirex gigas* at the Langleyford meeting of the Club on 25th July of that year, goes on to state that "about a month afterwards a second species of the same genus, *Sirex 'juvencus*,' of similar habits, was sent by Mr Jerdan, Jedburgh, and it is supposed that both of these have been observed in these localities for the first time."—ALLAN A. FALCONER, Duns.

Early Records of Wood-Wasp (*Sirex*) in North and South Aberdeenshire.—

While Mr Evans' comprehensive paper on Scottish Wood-wasps (*Scot. Nat.*, 1922, p. 175) was in process of publication, I was unable to lay hands on a volume—Smeaton's *Memoir of Alexander Thomson*, published in 1869—in which I remembered having noticed early references to the occurrence of these insects in Aberdeenshire. I have now been able to renew my acquaintance with the volume, and find it not only gives a record from South Aberdeen, but also one from Haddo House, North Aberdeen, which is unrepresented in Mr Evans' account. Thomson, the distinguished founder of the Thomson Lectures in Natural Science in the United Free Church College in Aberdeen, examined "a dreadful insect" found by his forester in a Scots fir which was being cut in the sawmill on his estate at Banchory House. I quote his own words: "I soon found it to be the *Sirex gigas*, the insect which has caused such fearful ravages in the German forests. I happened soon after to go to Haddo House, and mentioned the insect to Lord Aberdeen, who takes a great interest in his extensive woods, and he told me that his forester had that year in like manner got one, and these two seem to have been the first seen alive in this country. My theory is, that the insect had come in the pupa state in a log of German wood to Aberdeen, and had come to maturity in the woodyard, and when ready, taken flight to the nearest fir plantation, and then gradually spread over the country." The year of this discovery seems to have been 1866.—JAMES RITCHIE.

BOOK NOTICES.

A PERTHSHIRE NATURALIST: CHARLES MACINTOSH OF INVER.
By Henry Coates, F.S.A. Scot., with Introduction by Prof. J. Arthur Thomson, LL.D., and Prof. Patrick Geddes, F.R.S.E.
London: T. Fisher-Unwin, 1923. Pp. xx + 244. Price 18s. net.

Scotland has been famed for its worker naturalists, men who, in humble situations, with no technical and little school education, have earned for themselves worthy places as contributors to the world's stock of knowledge. Charles Macintosh, the postman of Inver, was one of these. Mr Coates tells the story of Macintosh's life and work, showing how his heredity, his early environment, and his love of nature moulded the pursuits of his leisure hours, leading him in the paths of music, of botany, zoology, geology, and meteorology, to study for himself the phenomena which forced themselves upon his observation at every turn. It is an excellent record, for in the group of Fungi alone, Macintosh discovered 13 species new to the flora of Britain and 4 new to science; and it should serve as a stimulus to the many workers whose untutored instincts lead them to study and learn from the fields of nature. A map and many illustrations add to the interest of Mr Coates's handsome volume.

THE CONSERVATION OF THE WILD LIFE OF CANADA. By C. Gordon Hewitt, D.Sc. New York: Charles Scribner's Sons, 1921. Pp. xx + 334.

In the short space of his official career in Canada, the late Dr Hewitt did incomparable service for the preservation of the wild birds of the country, and this work continues, and alas! concludes his efforts to ensure the preservation of a fauna upon which civilization has wrought grievous and irreparable changes. Here he traces in detail the histories of the game mammals and the game birds of Canada, and the tale is too often, as in the notorious case of the Bison, a story of inordinate slaughter and of consequent threatened or accomplished extermination. But a mere history is not enough for Dr Hewitt's purpose, and he presses home his thesis by expounding the real value of wild life to the inhabitants of a country, and by showing how individually and by co-operation, as well as by State legislation and the creation of sanctuaries, the remnant the fauna may be safeguarded from destruction.

Canada is not the only land where the native fauna has been sadly diminished by the acts of man, and the arguments here set forth apply with equal force to the needs of our own country. The publishers claim that "this book is of prime interest to sportsmen and lovers of nature everywhere." It is a modest claim. The work is a fine appeal for a reasoned and consistent policy towards animal life, and affords a lesson to our own legislators of the need for action, and of the advances which have been made by progressive countries, such as Canada, in the conservation of wild life.

A TEXT-BOOK OF EUROPEAN ARCHÆOLOGY. Vol. I., "The Palæolithic Period." By Prof. R. A. S. Macalister, Litt.D., F.S.A. Cambridge: at the University Press, 1921. Pp. xvi+610. Price 50s. net.

Professor Macalister has undertaken a great and worthy task in endeavouring to collate and gather together under one roof the multitudinous and scattered observations which make up the history of man in Europe in the days before History began. The study of the facts here summarized, and commented upon with caustic directness, is of prime importance for anyone who would understand the slow evolution of humanity; for Europe, although probably not the region of the first upspringing of the human kind, nevertheless affords the only consecutive information regarding the wonderful advances that were made during the Old Stone Age.

The bias of the author's training and life-work has led him to lay weight upon the development of Man rather from the point of view of his capacity and skill in manufacturing implements and depicting his surroundings than from his own physical progress; but the isolation of the older Archæology is avoided by the introduction of short descriptions of the outstanding discoveries of human remains which can be definitely associated with the various stages of the stone industry. Apart from actual examination of the real artefacts in a museum, no better guide could be found to the characteristics, often of the most subtle kind, which distinguish the different culture stages; for in addition to lucid description the text is abundantly furnished with excellent illustrations largely derived from the original monographs.

The author is to be heartily congratulated on the completion of the most up-to-date and most complete account of the European Old Stone Age in our language. We doubt if he is correct in dating the M'Arthur cave beach at Oban to "immediately after the final retreat of the ice-sheet," and we think it would have been well to have mentioned that, in addition to his lack of agriculture, Oransay man possessed no domestic animals; but all will endorse his spirited protest against the desecration and entire demolition, by stone-quarrying, of the Oban cave, "the oldest known human dwelling in Scotland."

THE BOOK OF A NATURALIST. By W. H. Hudson. London, Edinburgh, and New York: T. Nelson & Sons, Ltd. [1923]. Pp. viii+282. Price 2s. net.

In this volume are collected a mixed lot of short essays on subjects ranging from "The Chequered Daffodil" to "A Sentimentalist on Foxes." They are written with great charm and ease of manner, and since their literary qualities surpass the weight of their scientific information, they are clearly meant for readers who prefer to swallow the pill of knowledge in a large spoonful of verbal jam.

POULTRY (LIGHT BREEDS) AND HOW TO KNOW THEM. By Edward C. Ash, M.R.A.C., F.R.M.S. London: The Epworth Press, 1923. Pp. 64. Price 1s. 6d.

We cannot conceive of any book which, at the price, could afford a better guide to the general qualities of the light breeds of fowls. This is due to the fact that the descriptions though short are pointed, and that a profusion of illustrations makes clear the outward distinctions of breeds. So far as space allows an endeavour is also made to single out the particular utility qualities of each of the twenty-five breeds described.

EXPLORATION OF AIR: OUT OF THE WORLD NORTH OF NIGERIA. By Angus Buchanan, M.C. With numerous photographs by the Author, and a map. London: John Murray. Price 16s. net.

This is a narrative of an adventurous journey to the remote and little-known 'mountain area of Air or Asben, in the Western Sudan of Northern Nigeria. In this remarkable portion of the Mid-Sahara, Captain Buchanan spent eleven months alone among the Hausa people, Beri-Beri, Fulani, and Tuareg, collecting natural history specimens for Lord Rothschild. In carrying out this mission, our Author had many unique and varied experiences in a country whose past history is unknown, but its great fortified cities, once densely populated, are now mere villages amid seas of desolate sand, beyond which lies the wild desert mountain region of Air, the main object of the expedition. Interesting notes were made and specimens collected and recorded each day in order to afford links in the chain of the zoo-geography of the country, about whose animal life nothing was previously known. The collections made by the expedition were most valuable and comprised 1100 Mammals and Birds and over 2000 Lepidoptera. Many new species and sub-species were obtained, and these, with very many others, are recorded in the appendices which form the concluding section of the volume.

Captain Buchanan's book is one of the most interesting combinations of travel and natural history that has appeared in recent years, and affords a graphic account of a most singular region and its fauna.

PROCEEDINGS OF THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, for the Session 1921-22.

We have been favoured with a copy of the above work. The Society is in a healthy and vigorous condition, and the pages of its publication bear excellent testimony to the zeal of its members. Papers are printed on the habits of the Ichneumon Fly, *Rhyssa persuasoria*, the British Hydracarina or Fresh-water Mites, and the Maintenance of Highways and Byways, while the Presidential Address, by Mr K. G. Blair, is on the subject of "Will-o'-the-Wisp," and in it the opinion is expressed that the Ghost Swift Moth is the true source of the popular belief.

(Authors are responsible for nomenclature used.)

The Scottish Naturalist

Nos. 137 AND 138.] 1923

[MAY-JUNE

REPORT ON SCOTTISH ORNITHOLOGY IN 1922, INCLUDING MIGRATION.

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

INTRODUCTORY.

WE are once more indebted to our recorders for a very comprehensive series of observations; they have sent us much that is of interest and value, and we thank them most warmly for all the trouble they have taken. Since our last Report was published, Scottish Ornithology has sustained a serious loss in the death of Mr William Evans, who has for so long been one of the foremost workers in this branch of natural history. For many years Mr Evans has contributed valuable information for the Reports on Scottish Ornithology, and we shall sadly miss his kindly interest and unflinching help. The Report has also sustained a loss in the death of Mr T. B. Maclellan, who has sent us schedules and observations from various lighthouses for a considerable number of years.

We are glad to welcome new recorders, and hope that all who have helped us hitherto will continue to do so. Our thanks are due in the northern group of localities, to—Henry Jamieson, Skerries Lighthouse, and Jerome Wilson, Fair Isle; in the eastern group, to—Jane Gowan, Cullen; Wm.

Ogg, Elgin; Alex. Clark, Garmouth; Dr A. E. Mahood, Banffshire; John Ritchie, Perth; Professor M'Intosh, Nevay; H. R. Colman, Broughty Ferry; Henry Boase, Dundee; Douglas Hunter, Arbroath; the lightkeepers on the Bell Rock; William Berry, Tayfield; C. H. Guild, St Andrews; Lady Erskine, Cambo; N. E. Baxter, Gilston; J. H. Gaskell, Balchrystie; Sir Ralph Anstruther, Balcaskie; P. G. and R. A. Anstruther, Cairnie; M. C. Deas, Kirkcaldy; N. M. Johnston, Kinglassie; Frank Magee, Collessie; M. Murray Buchanan, Leny; M. Sutherland and T. B. Maclellan, Isle of May; J. Muir and C. Maceachern, Bass Rock; Captain Ewing, s.s. *Pharos*; John Pagan, Bathgate; William Eagle Clarke and H. Burn-Murdoch, Edinburgh; Sir Everard im Thurn, Cockenzie. In the western group, to—George Beveridge, Vallay; A. M. Stewart, Kinlochmoidart; John Bain, Hyskeir and Mull of Galloway; Iain Ramsay, Islay; A. Cuthbertson, Lochgoilhead; James Bartholomew, Glenorchard; W. Rennie, Nicoll Hopkins, John Robertson, Thomas Hill, Thomas Malloch, D. Macdonald, Mrs and Charles C. Graham, E. G. Cumming, Wm. Jamieson, R. W. S. Wilson, R. G. Ramsay, A. W. Houston, all of Glasgow; the members of the Andersonian Natural History Society, Glasgow; T. Thornton Mackeith, Kilmacolm; John Craig, Beith; E. Richmond Paton, Kilmarnock; Sim Baigrie, Ailsa Craig. In the southern group, to—the Rev. W. M'Conachie, Lauder; Gilbert Davidson, Melrose; F. Baillie, Harleyburn; C. Menzies, Kames; Rt. Hon. Earl of Home, Hirsell; A. C. Gairns, Broughton; H. S. Gladstone, Capenoch; and J. G. Gordon, Corsemalzie.

The year 1922 was a curious one—the summer was cold and inclement, but this seems to have exercised little influence on the nesting of our Scottish birds. No new species was added to the list of breeding birds, but there are indications of the increase and spread of various species in the country. The mild winter of 1922-23 caused certain irregularities and abnormalities, which will be found fully described under the heading of Winter. A considerable number of uncommon visitors are recorded, many of which

arrived during the great rush of migrants which took place in the end of September and beginning of October. Except for this movement migration seems to have followed a very normal course.

The following abbreviations are used in this Report:—

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

BIRDS NEW TO FAUNAL AREAS AND UNCOMMON VISITORS.

There are a good many records of uncommon visitors to our shores in 1922; a considerable number of these appeared during the large immigration which took place late in September. In the *Courier* of 12th August, a male Rose-coloured Pastor is reported to have been shot "recently" on Dee-side, while a Golden Oriole visited the Isle of May on 7th August. A few Northern Bullfinches are noted on Fair Isle on 12th January, and an Ortolan, shot near Portmahomack on 15th September, proved to be a young female, this being a first record for Moray area (I. 1922, 165). Lapland Buntings are recorded from the Isle of May on 27th and 28th September, Fair Isle on 3rd, 9th, and 10th October and Hyskeir on 16th November, the last being the first record for the Inner Hebrides. A Wood-lark was on the Isle of May on 26th and 27th September, and Waxwings are noted on 3rd January at Cockburnspath (I. 1923, 26), on the outskirts of Glasgow on 8th, and Langholm on 9th January (I. 1923, 26), while about the middle of the month they occurred at Oban (I. 1923, 28) and St Andrews. Several are recorded from Garmouth (Morayshire) between 15th January (6) and 12th February (1), and single birds are noted in Forfarshire on 17th January, Kilwinning (Ayrshire) on 21st, Melrose, Duns, and Luss (Dumbartonshire) at the end of the month, while two were at Cullen on 24th, and a flock at Perth on 25th and 26th January (I. 1923, 27). Two were seen at Aberdeen on 17th, 19th, and 24th February,

and one on 15th and 20th March (i. 1923, 25). Mr John Bain reports a Red-breasted Flycatcher at the Mull of Galloway on 24th September, this being the first record for Solway, and indeed for the Scottish mainland, and one was on the Isle of May on 28th September. Eversmann's Warbler was obtained on Fair Isle on 27th September. Yellow-browed Warblers frequented the Isle of May from 24th September to 1st October, as many as four or five being seen on the 28th, and one appeared at Lahill (Fife), on 23rd October (i. 1923, 14). A Barred Warbler visited the Isle of May on 25th September; two or three Black Redstarts were there steadily from 26th September to 1st October; and a Norwegian Bluethroat appeared on 24th September. In the *Field* of 6th May 1922 (p. 622), Mr Steuart Menzies records having seen one pair, if not two, of Lesser Spotted Woodpeckers on 14th and 20th April at Arndilly, Craigellachie; this is corroborated by Major Bates, who reports a pair in the second week of April close to Carnegie salmon throw, and again a little higher up (*Field*, 20th May 1922, p. 692); and Dr Mahood has written us that they were reported to him lower down the Spey in June, July, and August, and four or five at Akenway in September. The only authenticated earlier Scottish records of this species are from Solway. Greenland Falcons, single birds in each case, are noted between Dundee and Broughty Ferry on 23rd January (i. 1922, 49) and at Vallay (O.H.) on 21st March (i. 1922, 94), while in June a Hobby was thrice seen at Rowardennan, Loch Lomond. Ospreys are recorded from a locality in West Ross and at Loch Lomond.

On 18th January a Bittern is reported at Hirsell Loch, Coldstream (i. 1922, 49), while two and probably three Snow Geese were seen on the Solway from early October till the sharp frost at the end of the month (2. xvi. 327). Three Garganey were seen on the marshes by the banks of the Kelvin, west of Summerstown Station, Dumbartonshire, on 1st and 2nd April (i. 1922, 174), and a drake on Frankfield Loch, Lanarkshire, on 30th April (i. 1923, 17). Red-necked Grebes occurred at Insch (Aberdeenshire) about 1st February, at Fair Isle 8th to 11th February, and on the Tay

on 12th February, while a Black-necked Grebe is reported on a pond west of the Tay Bridge, Forfarshire, on 19th February. A Little Stint recorded from Vallay on 27th June is the third occurrence of this species in the Outer Hebrides, while a Green Sandpiper was at Morton Loch, North Fife, on 1st August. A Grey Phalarope was killed at Corsewall Light, Stranraer, on 11th November (2. xvi. 254); Black-tailed Godwits are recorded in autumn from the Forfarshire coast, and Great Snipe from Mid-Clyth, Caithness, on 9th September (*Field*, 7th October 1922, p. 539), near the Dee, Kirkcudbright, on 11th October (1. 1922, 174), and at Drum, Aberdeenshire, on 3rd November (*Field*, 11th November 1922, p. 714). Roseate Terns are reported in May and June from two Scottish localities, and a Spotted Crake from Whitedyke, Corsemalzie, on 15th February.

EXTENSION OF BREEDING RANGE.

No less than twelve species fall to be included under this heading. The first, a very interesting occurrence, is the return of the Raven to the Lammermoors, Rev. Wm. M'Conachie recording (1. 1922, 191) the nesting of this species in a narrow rocky gorge high up among these hills. The next two extensions are additions to the birds breeding on the Isle of May: a pair of Carrion Crows built on the top of a rocky stack off the south end of the island and hatched out five young, while a pair of Willow-warblers nested on a grassy bank close to the engineers' houses. From Fair Isle we hear of the nesting of one or two pairs of House-martins on the face of the cliff there. Mr Jerome Wilson writes: "Some small boys robbed one nest of the eggs, but there was another one at least. I could see the nest, but not whether there were any eggs in it or not, as the place was overhung and could not be seen from above." In a very interesting paper (1. 1923, 48), Rev. J. M. M'William adds the Common Buzzard to the breeding birds of Bute, and although the first nest was found in 1921, we think it well to include the record here for the sake of completeness. We are not told whether the Buzzards nested there again this year, but on 30th May 1922 Mr M'William

saw a Buzzard go out from one of the highest sea cliffs in South Ayrshire, and from its behaviour believed it had a nest; although this cannot be taken as proof of breeding it is a very interesting occurrence, and watch should be kept for the birds there in future. Two pairs of Fulmars frequented the cliffs on the Isle of May this season, and Mr Maclellan believed they bred there although, because of the nature of the cliff, he could not actually see the eggs. On 8th June a Great Crested Grebe's nest was found on Loch Ken, Kirkcudbright (2. xvi. 288); this is the first record of the species having bred in the Stewartry. Mr Ramsay writes that he has added the Red-throated Diver to the list of birds breeding in Islay. The species has been suspected of nesting there for several years, but this year he "got one of the immature young, which puts the matter beyond doubt." Black-headed Gulls now nest in Bute; they were first found there in 1921 when about fifteen pairs bred on a loch at the south end of the island (1. 1923, 49); and the first record of the Great Black-backed Gull nesting in Ayrshire is that given by Mr M'William (1. 1923, 51), where he tells of a nest containing three eggs found on 30th May on the South Ayrshire cliffs. Another addition to the Islay list is the Arctic Skua, which bred on a loch there this summer. Lastly, there is Mr M'William's interesting record of the Black Guillemot breeding in South Ayrshire (1. 1923, 51). He found the birds sitting in the crevices in the little caves, saw the eggs, and from the number of Black Guillemots seen in the neighbourhood of the cliffs thinks probably about ten pairs nest there.

INCREASE AND DECREASE OF SCOTTISH BREEDING BIRDS.

In 1922 it is satisfactory to notice that no widespread or general decrease in numbers is reported, as has been the case with the *Hirundinæ* in recent years: there are some local notes of decrease but nothing of any great importance. On the other hand, we have gratifying evidence of the effect of protection in the increase in numbers of such interesting species as the Kingfisher, which is reported as much more

plentiful on the Borders and in Ayrshire, and the Great Skua which has increased so greatly in our northern Isles. The Great Spotted Woodpecker is also on the increase as a breeding bird in Scotland, details of the records being given under another heading. To turn to local instances of increase in numbers, we find that Carrion Crows are said to be much more numerous at Nevay Park, Meigle, and on the Kilpatrick Hills; while Hoodie Crows have become so plentiful in North Uist that they are a perfect pest there and do much damage to young lambs, duck, and grouse (*Field*, 20th May 1922, p. 692). A new rookery is reported from the village of Lochgoilhead; that at Bishopbriggs (Clyde) had "an increase of twenty-five nests over last year"; and at Nevay Park, they are "too numerous and do much damage to grain in stook, and also eat eggs in spring and summer." Magpies are becoming more numerous in the valley of the Clyde, and Bullfinches were much more plentiful than usual in Ross-shire this season. Tree-sparrows have bred regularly near Melrose for the last few years, and Goldcrests and Blackbirds were more than usually common in Berwickshire. An increase in Tree Pipits is reported from Dumbartonshire. Pied Wagtails, Goldcrests, Cole Tits, and Pochard are becoming more numerous in the Kirkcaldy district of Fife, and Skylarks and Kestrels are increasing near St Andrews. At Possil Marsh, East Renfrew, a greater number of Willow-warblers, Whitethroats, Sedge-warblers and Meadow Pipits were successful in bringing off their broods than for some years past. Stonechats are still increasing at Corsemalzie, Wigtownshire, where they have been steadily going up in numbers for the last few years. More Swallows than usual nested at Cockenzie, near Edinburgh, and House-martins were particularly plentiful at Kellie, Fife. Great Spotted Woodpeckers are increasing in numbers about Perth, and the recorder suggests that the reason for this is the increase in the district of *Sirex gigas* and *Sirex cyaneus*. It would be interesting to know whether evidence from other localities supports this contention. Woodcock were unusually numerous this year at Gilston, Fife, and Black-headed Gulls are increasing in Bute; about

fifteen pairs nested on a small loch at the south end of the island in 1921, and when Mr M'William visited the same loch this season he found "possibly two hundred adult birds" flying over it (I. 1923, 49), a very substantial and satisfactory increase in numbers. On Ailsa Craig, Guillemots, Razorbills, and Kittiwakes are increasing in numbers, and our correspondent adds, "as for the Gannets it is not easy to tell, except that they are extending their breeding ground further along the cliffs."

With regard to the species reported as being scarcer this season, Jackdaws are said to be much less numerous than formerly on the Kilpatrick Hills (Clyde), and Ring Ouzels are now almost unknown as a breeding species there. Our correspondent at Dundee found "almost all species, but particularly those arriving in April and May below the average in 1922." In addition to these migrants he found Linnets rare all the year, Pied Wagtails scarce, and Tits below the average. Tree Pipits were scarce at Melrose. No Spotted Flycatchers were seen in the Kirkcaldy district of Fife, and a scarcity of this species is reported from Corsemalzie, Wigtownshire, and Dundee. At the last-named locality, few Whitethroats and Wheatears were seen, no Chiffchaffs were heard, and House-martins, Sand-martins, and Swallows were below the usual number. House-martins are said to have deserted Ardmellie since 1920. Swallows were also scarce at Lochgoilhead, Nevay Park, and at Beith, while Cuckoos were not seen in the Kirkcaldy district of Fife, and were scarce at Corsemalzie. Nightjars and Corncrakes were below the average there; none of the latter was seen near Kirkcaldy, and very few at Ardmellie, Banff. Sandwich Terns have ceased to nest on the Loch of Strathbeg, driven away, it is said, by the persecution to which they were subjected (*Trans. Banffshire Field Club*, 20th December 1922), and Puffins on Ailsa Craig are now much less plentiful than they used to be.

SUMMER AND NESTING.

The summer of 1922 was a very cold and unpleasant one, but, in spite of this, birds seem to have carried on their

nesting operations in a normal way. We have a good many interesting happenings under this heading, and there is pleasing evidence of the spread of several species. We are fortunate in having notes from several Scottish Islands, and we think it perhaps best to give these records first.

From the Out Skerries, Shetland, we hear of Oystercatchers and Arctic Terns nesting, also a "good few" Black Guillemots and a "big lot of Puffins on the rock." Eider also nest there, and the lightkeeper sends the following note on the Arctic Terns: "all left us and even deserted about a dozen young ones which were hatched out. Then the Gulls came and started to take the Eider's eggs. We built little shelters with loose stones round the Duck's nests, and in this way saved some of them; twenty got off with young." At the shore station for this lighthouse one Tern's nest and a lot of Ringed Plover were found.

A pair of Gannets built a nest on a ledge of the west cliffs of the Isle of May, but, after having completed it, they deserted it and no eggs were laid; only three pairs of Common Terns bred on this island in 1922.

From the Bass we have notes of Pied Wagtails, Rock Pipits, a Wheatear ("the first Wheatear which has nested on the rock for at least seven years"), and Hedge-sparrows, all with young, in addition to all the sea-birds which nest on this great bird rendezvous.

Goldcrests nested in Islay this year, as did Grey, Yellow, and Pied Wagtails. A Peregrine attempted to breed on a cliff at the Kyles of Bute in 1922, but the female was unfortunately shot (I. 1923, 48).

Eider are spreading up the hills in North Uist, Mr George Beveridge writes from there (26th June 1922): "For some time past I have noticed Eider flying up the hill across my moor, some distance from the sea. This year I told my shepherd to look out for Eider's nests on the hill, and last week he reported two. In each case the nest contained four eggs. The first nest found was a little over one mile from the shore, and at an altitude of about 150 feet; the second, which I saw myself, was just a mile from the shore, and at an altitude not lower than 250 feet." The

Eider would appear to occupy first the sites nearest the sea, and when these are taken up they spread inland, and sometimes to a considerable height above sea-level. On 4th June a Glaucous Gull was seen near the northern end of North Uist; it was by itself and seemed tired (2. xvi. 289).

While on a motoring tour in the Highlands, Mr M'Conachie made some interesting observations: he records Tree-sparrows at Inverlochy Castle, Fort William, and Wood-warblers near Glen Lyon, Kinloch Rannoch, Loch Eil, Invergarry, near Loch Duich, Glen Affric, Loch Laggan, Relugas on the Findhorn, by the Garry above Struan, and at Killiecrankie (I. 1922, 100). Writing of the same species in the district of Strathtummel and Rannoch, Mr Boase says: "Frequent all over, and in some parts almost equal to Willow-wren." Mr Boase also found the Garden-warbler in this district, though only in one locality. Fourteen pairs of Stonechats were found nesting in the Lochgoil district of Argyllshire. There is abundant evidence of the continued nesting of the Great Spotted Woodpecker: Mr M'Conachie (I. 1922, 100) says: "A gamekeeper in Abernethy Forest told me that a pair of Great Spotted Woodpeckers had nested there this summer, but the nest was robbed. Another pair was seen by myself on several occasions in a line of old aspens by the Highland Railway, near Grantown. From their anxious movements and cries they appeared to be nesting, but unfortunately they shifted their quarters a few days later." A good many were about Aboyne in July, and a pair nested near the Cairnton water. The species was seen by Mr Boase in Strathtummel, and near Arndilly, Banffshire, on 30th June, by Mr Stewart Menzies; it is also recorded from the Eastern Sidlaws on 28th August, and an extension in Argyllshire is shown in the note of its nesting at Glenstriven, Loch Striven, in the summer of 1922 (I. 1923, 4). Lastly, Great Spotted Woodpeckers have been heard and seen in the woods at Gilston, Fife, although we have, as yet, no proof of their having nested there. A very interesting record is that which appeared in the *Field* of 6th May 1922, p. 622, where Mr Stewart Menzies writes: "It may be of interest to state that I have located one pair,

if not two, of the Lesser Spotted Woodpecker here," at Arndilly, Craigellachie. The identification is confirmed by Major Bates (*Field*, 20th May 1922, p. 692) who knows the birds well in England.

A Meadow Pipit's nest found at Beith contained a Cuckoo's egg which hatched out four days after those of the Meadow Pipit; the Cuckoo threw out the young Meadow Pipits before it was two days old, although they were twice its size. A pair of Hen-harriers tried to nest at Logie Almond within a few miles of Perth, but both old birds were destroyed. Red-breasted Mergansers were constantly seen in May near the mouth of the river Stinchar, Ayrshire (1. 1923, 52), and Mr Beveridge reports two nests of the Red-necked Phalarope at Vallay, both of which hatched out.

For several years we have been hoping to receive definite record of the nesting of the Turtle Dove in Scotland; from the interesting notes by Mr Portal (2. xvi. 192) it would seem almost certain that it bred on his property this year, but the nest was unfortunately not found. Five or six were seen in Locknaw Woods on 31st May, and two pairs between Locknaw and Lord Stair's property in June. Old birds were seen by Mr Portal's keeper on 20th and 24th June and 2nd July. The species had not been seen there before.

Satisfactory evidence of the continued nesting of the Slavonian Grebe in Inverness-shire is found in the SCOTTISH NATURALIST (1922, 146), where the recorder reports having seen five nests with eggs this season. This is one of our rarest and most attractive breeding birds, and it is gratifying to hear that it is carefully protected at its nesting place. A Greenshank's nest, found in a "remote part of Inverness-shire," was built on the top of a hummock about 30 inches from the ground (2. xvi. 133).

The fishermen at Largo, Fife, tell us that Black-headed and Herring Gulls were more plentiful on the shore there this summer than they have ever known before, and we have records of Iceland Gulls from Oban and Newport, Fife; the former is recorded by Mr John Bain as follows: "On the 15th June I observed an Iceland Gull among the large

number of various Gulls frequenting the railway pier at Oban. The herring-fishing fleet discharged their catch there and, of course, the feeding was plentiful. I saw it daily during the whole of the month I was ashore and it was very tame; it would swim about a few yards off the pier quite unconcerned, although the pier was usually crowded with people. On mentioning it to several people I learned that there had been a pair of them up to about the last week of April." Unfortunately this bird was killed about the middle of July by a boy with a stone, its tameness having proved its undoing. The Iceland Gull at Newport was in the white plumage sometimes seen in this species; it was seen by us on 15th August but had been there for some time before, and was shot shortly after. It too was very tame.

Quail were heard calling daily near Grantown-on-Spey for a week in June (1. 1922, 100). Young Partridges were said to be almost non-existent in the Cabrach district this season (*Banffshire Journal*, 10th October 1922), while Grouse were said to have small clutches, the best being one of fifteen at Lesmurdie, Banffshire, which hatched out clean. In Cabrach, Glenfiddich, and Speyside moors there was an average of seven eggs; in Lower Strathavon of six eggs; and in Tomintoul an average of five to six eggs, 95 per cent. hatching out (*Field*, 5th August 1922).

By 2nd January Stockdoves had returned to their nesting trees at Lahill, Fife, where Carrion Crows were seen at their nesting places on 13th January. On 11th February Rooks were seen at their nesting trees at Cullen, Banffshire; House-sparrows were building there next day; on the 17th Partridges were seen in pairs at Collessie, Fife, and on 18th Rooks were carrying sticks in the rookery at Auchterderran, Fife. In March we have records of Rooks, Missel-thrush, Song-thrush, Heron, and Lapwing all nesting, the Heron as early as the 5th, when four nests were found on an island in Mochrum Loch, one containing an egg. On 16th March a Hedge-sparrow was seen carrying nesting material at Largo, while a Dipper at St Andrews was building on the 22nd, but eggs were not laid till 7th April. With April we

have the usual records of the nesting of most of our resident species, including nests and eggs of Jackdaws, Chaffinches, Stonechats, Dippers, Golden Plovers, Black-headed Gulls, Grouse, and Coots; while young Robins, Tawny Owls, Mallard, and Wood-pigeons are also noted. On 21st April a Long-eared Owl at Hareshawmuir, Ayrshire, had five eggs "ten or twelve days set"; they hatched out on 5th May. On the 29th the same species had four well-feathered young in an old Crow's nest at Corsemalzie, Wigtownshire. The fact that the first mentioned locality is 600 feet above sea-level doubtless accounts for the difference of time of nesting.

On 2nd May the first egg was found in the Herring-Gullery on the Isle of May; on the 4th a Merlin's nest and one egg was found at Hareshawmuir, "an early date," and next day Redshanks there had four slightly incubated eggs. On the 8th a Yellow-hammer at Largo, Fife, had four hard-set eggs; on the 10th over twenty pairs of Fulmars were recorded from the sea cliff at Hopeman, Morayshire. Seven pairs of Herons nested in the heronry in the Lochgoil district this month, and about this time three pairs of Grey Wagtails were found nesting there. A pair of Shelduck with young are recorded from Vallay (O.H.) on 25th May; on 29th Lesser Terns were thought to be nesting on a stretch of shingle in South Ayrshire, but no eggs were found (I. 1923, 52); and on the 31st Wigeon and young were found on Lochandain, Perthshire. Mr Boase found the Terns on Tentsmuir very late in nesting, no eggs being seen on 20th May when full clutches are usually plentiful, and even on 10th June nesting was poor. A Linnet's nest with five pure white eggs was found at Cambo, East Fife, on the 8th June, and Mr John Bain tells us that he found a Buzzard's nest on the Oban "town boundary"; it was placed about 12 feet from the top of a small cliff. When discovered on 23rd June it contained three young almost full-fledged, which left the nest on the 1st July. During the month there are reports of eggs and young of all our common breeding birds, and by the 27th young Partridges were able to fly in Fife. Eight nests of Swifts were found in the village of Lochgoilhead.

July brings some records of interest: Black-throated Divers were seen on almost all the lochs about Kinlochewe on 18th July; several Common Sandpipers with young were seen at the Loch of the Birds, and Greenshanks there evidently had young; at Loch an Iasgair, two adult Greenshanks and one young were noted on the same day. On the 22nd two adult and two young Black-throated Divers were on Loch Rosque, an Eider and five half-grown young on Loch Torridon, next day and on the 25th a female Goosander and eight or nine young ones, just getting feathers, on the little river which runs past Kinlochewe into Loch Maree. The young ones scuttled along very fast and were expert divers.

There are a good many reports of late nesting: on 5th August a brood of Moorhens, two or three days old, was found at Helensburgh, and next day Sedge-warblers at Possil Marsh were still feeding young in the nest. On the 26th Hedge-sparrows with young are recorded from the Bass Rock. On the 2nd September the first young Gannet left the nest at this famous colony; a pair of Little Grebes near Broughty Ferry had three "very small downy young" on the 7th; "another two young birds much bigger were on the same pond," which suggests that the downy young were the result of a second nest. A Wood-pigeon at Glenorchard on the 11th had two young not nearly fully fledged, and House-Martins were still in the nest at Largo on 16th September. In *The Scotsman* of 23rd November a Redbreast's nest with two eggs is recorded from near North Berwick, and on 18th December young Starlings were washed out of their nest in the pier at Pladda by a high tide. Mr John Budge, who recorded the occurrence, says Starlings were feeding young there in November, and at the time of writing (19th December) were "busy building their nests" (1. 1923, 46). A Blackbird in Perth had a nest in December.

WINTER.

The winter of 1921-22 was chiefly remarkable for the great immigration of Waxwings, the main record of which came into the period of our last Report, but in January,

February, and March 1922 their occurrence in various parts has been recorded, although in no great number. There were unusual numbers of Bramblings and Siskins in Berwickshire this winter; while Cormorants in large numbers were seen in the Tay Estuary, as many as a hundred being observed on 14th January. A violent storm raged at Fraserburgh from 1st to 5th January, reaching its maximum on the night of the 4th; during this period the following birds were noted; sheltering behind the breakwater of the harbour were about a dozen Goldeneye, six Scaup, fourteen Eider, and a score of Long-tailed Duck. A number of dead birds were found along the shore to Cairnbulg, including Puffins, Guillemots, Razorbills, Herring-Gulls, a Great Black-backed Gull, a Common Scoter, a Little Auk, a Slavonian Grebe, and a few Cormorants. Flocks of Turnstones, Ringed Plover, and Dunlin, a large number of Scaup, and three immature Glaucous Gulls were also seen.

In the first fortnight of February there are an unusual number of records of Red-necked and Slavonian Grebes on the east coast from Fair Isle to the Tweed. Otherwise the period under consideration shows nothing very remarkable; there were the usual winter visitors present in the country, and we have notes of goodly numbers of Duck wintering round our coasts, these being especially plentiful on the shores of Fife. In Fife, too, there were very large numbers of Wood-pigeons all through the winter, and systematic shooting was carried out; among the numbers shot there was a small percentage of Stockdoves which rose steadily after the beginning of the year.

The winter of 1922-23 was an abnormal one, ornithologically; the easterly and south-easterly winds in autumn and early winter brought enormous numbers of *Turdinæ* into Scotland, and we have records of unusual numbers of Redwings, Fieldfares, Song-thrushes, and Blackbirds from all over the country. As well as these great immigrations of winter visitors, the mildness of the winter induced abnormal behaviour in our resident species, and we have Rooks beginning to build at Largo on 18th December, and Starlings at Pladda with young in the nest the same day

(1. 1923, 46); in Edinburgh the Rooks remained in the rookery at Blacket Avenue till Christmas (1. 1923, 2). The mildness of the winter affected our partial migrants also, and we find Song-thrushes staying all through the winter at Lahill, Fife, Lapwings remaining about Perth all winter, and Curlew at Gilston, 600 feet above the sea (1. 1923, 2). Stockdoves, too, which generally leave their nesting sites in Fife in autumn and return in March, remained about their nesting trees throughout the winter, and were seen on 12th December doing their owl-like courting flight, and next day both they and the Wood-pigeon were uttering their spring notes. Redwings, too, might be heard singing, not their usual chattering warble well known to all who watch them in spring, but a fine full song, more varied than that of the Thrush. The mildness of the winter allowed the Ducks to remain on the lochs in the centre of the country, and we do not therefore find the enormous numbers in the rivers and estuaries, which are always reported when there is frost and snow inland. From Fair Isle we have this note: "all birds scarce" for the winter of 1922-23.

RINGING.

During the War there were, of course, but few birds ringed, and the returns of marked birds for the last year or two have therefore been less interesting than before. This year, however, there are many records of very great interest to all students of migration; we give below those referring to Scotland, but recommend our readers to study the papers from which they are taken for records made elsewhere. Returns of particular interest are a Meadow Pipit ringed at Kilmacolm, Renfrewshire, as a nestling on 13th July 1921, reported at Azur, Landes, France, on 11th October 1922 (2. xvi. 301); a Cuckoo ringed at Gryffe Reservoir, Renfrewshire, as a nestling on 9th July 1921, reported at Gattatico, Reggio, Emilia, Italy, on 21st August 1922 (2. xvi. 302); and two Mallard ringed at Leswalt, Stranraer, Wigtownshire, as adults on 28th February 1921 and 3rd March 1922, were recorded in August 1922 at Skaraborgs Lan, near Väner Lake, Sweden, and at Petsma,

Kvevlaks, Wasa, Finland (2. xvi. 302 and 303). Further evidence of winter movement to Ireland is found in the records of a Song-thrush ringed at Torrance, Stirlingshire, as a young bird on 2nd July 1919, reported at Annalong, Co. Down, Ireland, at the end of January 1922 (2. xvi. 14); Lapwings ringed at the same place on 3rd June 1920 and 1st July 1921, as young birds, reported on the shores of Loch Neagh, Ireland, and at Rathfriland, Co. Down, in January and on 13th February 1922 (2. xvi. 17); and a Snipe ringed at Lann, Dumfriesshire, as a young bird on 23rd May 1922, reported on the Earl of Caledon's estate, Armagh, on 8th December 1922 (*Field*, 23rd December 1923, p. 928). Further interesting records of movement through the country are a Song-thrush ringed at Bardowie Castle, Stirlingshire, as a young bird on 7th May 1918, reported at Victoria Park, Manchester, on 29th June 1922 (2. xvi. 301); another bird of this species ringed at Lytham, Lancs., as a young bird on 5th May 1920, reported on board a ship in the River Clyde, 26th October 1922 (*loc. cit.*). A Blackbird ringed as an adult at Torrance, Stirlingshire, on 10th August 1919, was reported from Dunning, Perthshire, on 13th July 1922 (2. xvi. 301); two Sparrow-hawks ringed as nestlings at Kinclune, Kingoldrum, Forfarshire, the one on 2nd July 1921 the other on 8th July 1922, were reported from Stanley, Perthshire, on 11th February 1922, and St Fink, Blairgowrie, on 7th December 1922 (2. xvi. 16 and 302); a Ringed Plover, ringed at Holy Island, Northumberland, as a nestling on 26th July 1922, was reported at Cardross, Dumbartonshire, on 18th September 1922 (2. xvi. 303); a Lapwing ringed at Lann, Dumfriesshire, as a young bird in spring 1922, was reported on the River Clyde on 14th October 1922 (2. xvi. 303), while a bird of this species ringed as a young bird at Glenisla, Forfarshire, 15th July 1922, was reported at Stonehaven, Kincardineshire, 26th November 1922 (2. xvi. 303). A Redshank ringed at Torrance, Stirlingshire, as a young bird, on 28th May 1920, was reported near Lytham, Lancs., on 10th March 1922 (2. xvi. 17); a Lesser Black-backed Gull ringed at Foulshaw, Westmoreland, as a young bird on 21st July 1921, was

reported from Grantown-on-Spey, Morayshire, on 14th August 1922 (2. xvi. 304); and Guillemots ringed at Ailsa Craig as young birds on 3rd July 1922 were reported at Kilbrennan Sound, off Skipness, and Loch Fyne, Argyllshire, in late September and in December 1922 (2. xvi. 304). Further, we have records of a Starling, a Greenfinch, a Song-Thrush, a Blackbird, a Redbreast, a Kestrel, two Mallards, a Cormorant, a Snipe, and two Woodcock reported at or near the place where they were ringed, from a few months to four years after the date of marking (2. xvi. 13-18 and 300-303).

PLUMAGE.

There is less than usual to be recorded under this heading; a Carrion Crow was seen at Buddon Ness on 2nd October with white slanting bars across its wings, while a Rook at Nevay Park "this summer" had white primaries and other feathers in the wings. A "dark coloured Finch apparently a melanic House-sparrow" was seen at Invergowie on 9th April, and a male Blackbird is reported from Buddon Ness on 15th September, having its head "well powdered with white." What appeared to be a white Pink-footed Goose was seen on the Solway in early October; it was in company with three Snow Geese, but when seen within 40 yards was reported to be much more cream-coloured than these birds (2. xvi. 327). A white Gannet was seen several times in May and June on the Bass Rock; this bird was pure white all over, without the black primaries which usually show so prominently. Hen Pheasants assuming male plumage were shot at Largo House, Fife, on 7th January, and Derrie, Wigtownshire, on 17th January; the latter had "a dark green head and neck, no ring, reddish under parts but a short tail"; and, lastly, a cock Pheasant almost pure white was seen in a field near Carlhurlie, Fife, on 4th and 11th March.

FOOD, HABITS, ETC.

A Carrion Crow was seen at Glenorchard, Stirlingshire, chasing a Hawk "for a long time" on 9th April, and at

Barry a Rook tried to fly away with a piece of tarpaulin nailed to a board, and when it would not come "he pecked and scratched in a great rage uttering loud squawks of fury." Rooks and Jackdaws were feeding on beech-mast at Largo, Fife, on 15th November. They pulled off the seed, held it between their claws and the branch, pecked it open and ate some of the contents; "but they are very wasteful and drop much of the food." The following note comes from Leny, Callander: "In May this year a Blackbird nested in the ivy in the garden wall and hatched out. Towards the end of June on looking at the nest again I found that a Spotted Flycatcher had built its nest inside the Blackbird's and had five eggs. Another Flycatcher has built and hatched out on the top of an old Flycatcher's nest from which young were hatched last year." At Glenorchard on 31st March a Song-thrush "had the points of its tail feathers frozen together, forming a loop which had stuck on a spike of a rhododendron; the feathers came out when I tried to catch the bird and it flew away." A Kestrel was caught on 31st May at Glenorchard in a trap set to catch Carrion Crows, baited with three hens' eggs, and set on the top of a rock; three more Kestrels were got shortly after in the same trap. Mr Bartholomew adds: "We do not destroy Kestrels and I cannot understand why they went into this trap. It was not a place where they would get trapped unless they went to inspect the eggs. There was plenty of room for them to alight on the rock without going into the trap. It was a large flat rock."

On 25th September a Heron at Buddon Ness was attacked by about thirty Carrion Crows. "As it passed, they rose with a tremendous uproar and dived at its wings; so hard were some of the blows and so frequent that the Heron was nearly borne to the ground. It only escaped by rising to a considerable height above its noisy pursuers." On the sands there on 29th September our correspondent saw a Grey Plover alone on the sand and went closer to look at it as it was new to him. He says: "I stopped about three yards off, but instead of rising the Plover ran towards me and stood a few inches from my boot. Cocking its head on

one side, it proceeded to inspect me for several minutes; I bent down and nearly touched it before it flew away a few yards." An Oystercatcher at Out Skerries, Shetland, was seen feeding its young ones on Tern's eggs. Mr Wm. Rennie on 12th March writes: "An echo of the Tennant's stalk disaster. At noon the loud report of an explosion was heard at Possil Marsh. The Gulls that were on the water became very excited, restless, and noisy but soon settled down again. The second charge at 1.30 was not so severe and had no visible effects on the birds there." In the *Banffshire Journal*, 21st November 1922, an account is given of a Pomatorhine Skua being shot near Dallas; it runs as follows: "While Mr David Rothnie, The Inn, Dallas, was out walking, he observed a Pomerine Skua flying over a stubble field, and saw that its objective was a Brown Hare which was running across the field. The hare had become apparently exhausted, and the voracious bird was closing in on it. Mr Rothnie hurried home for his gun to his house about half a mile away; but before he returned to the scene the blood-thirsty bird had killed the hare and was helping itself to a meal. Mr Rothnie had no difficulty in shooting the bird, which is now being set up by Mr John Macpherson, Sports Emporium, Inverness."

(*To be continued.*)

Colour Variation in a Sea Anemone.—The variations in the colour and certain structural characters of the Sea Anemone, *Tealia crassicornis*, are many of them seemingly adaptations to different types of surroundings, for the shore, shallow water and deep water forms show each a constant set of characters. Messrs Elmhirst and Sharpe point out that shore forms are more strongly coloured than deep water forms, the additional colour acting as a light filter which modifies the intensity of the sun's rays. They regard the tentacle colours as of "aggressive" value and the body colours as affording concealment. (*Ann. Mag. Nat. Hist.*, May 1923, p. 615.)

GLANDULAR SECRETION IN THE GOLDEN
PLOVER.

By J. N. DOUGLAS SMITH, M.B., Ch.B.

LAST summer (1921) while I was watching a pair of Golden Plovers (*Charadrius apricarius*) at their nest on Tentsmuir, Fife, I noticed a point about one of them, which I have not seen mentioned in any of the books I have consulted.

The weather was oppressively hot, and the female Plover was sitting very closely, as the nest at that time contained one egg and three newly hatched young. She sat facing the slight breeze with her bill open, often moving her mandible, and from time to time closing her mouth and swallowing. Whenever she opened her bill, I saw that her mouth was full of a white viscid secretion, which stretched and contracted with each movement. On one occasion when she left the nest, this secretion ran down her bill and hung from the tip like a very fluid spittle. The next day when I was photographing one of the chicks, the female ran past within ten yards of me, with the white drop again hanging from her bill. A short time afterwards as I was in my hiding-tent, she walked up to the nest with an even larger drop, about the size of an almond; but just as I was about to take a photograph it fell off.

I am not sure of the composition of these drops, and on this point I am open to correction, but my impression is that they were secretion from the naso-lachrymal glands, which in the Charadriidæ are of a considerable size. It seems possible that during hot weather these glands may be stimulated to such an extent that the secretion, besides performing its normal function of washing out the nasal passages, may also act as saliva.

Some Rookeries in Fifeshire.—Although the following short list does not pretend to give an exhaustive account of the rookeries in Fifeshire, it contains records of those with which I am acquainted in the Kinglassie and Leslie districts, as they existed in the spring of 1921, with the addition of two earlier rookeries there, now deserted. I have added a few odd records from other districts:—

I. ROOKERIES (existing in spring of 1921).

Kinglassie and Leslie Districts—

- (1) Inchdairnie estate: large rookery just south of the Lochty Burn; 76 nests in fir-trees and 592 nests in elms. The wood where the nests occur is known locally as the Crow Wood.
- (2) One in Rothes House estate.
- (3) One in Strathendry House estate.
- (4) One near water-works, Lomond Hills.
- (5) Small rookery near road from Scotland well to Kinglassie, not far from Lochend, only 4 or 5 nests.
- (6) Auchterderran Manse, 83 nests.
- (7) Auchterderran Church, 12 nests.
- (8) Pitkinnie Farm, about 50 nests.

II. ROOKERIES (former).

Kinglassie and Leslie Districts—

- (1) One existed in a wood beyond Manorleys Farm near the road. The trees have been cut down, felling commencing in 1919.
- (2) Auchmuir Bridge plantation. One half of this plantation has been felled since 1914, probably in 1916. I understand that a rookery was in this half. Craigend Hill plantation is not far from this wood. Rooks have never built here, but I am told that the Carrion Crow does.

III. OTHER DISTRICTS.

- (1) Methil, near Muiredge Pit.
- (2) Dunfermline, Valley Wood, now cut down, had formerly a rookery.
- (3) Dunfermline, Pittencrieff Glen.
- (4) Thornton, near Hospital.
- (5) Cameron Bridge.
- (6) Cupar — (a) Tarvit; (b) Lochmalony, two; (c) Mount Quainy; (d) "Big House."

NORMAN M. JOHNSTON, Kinglassie.

CONTRIBUTIONS TOWARDS A LIST OF THE
INSECT FAUNA OF THE SOUTH EBUDES.

From the Zoological Laboratory, University of Cambridge.

I. THE AQUATIC COLEOPTERA OF THE SOUTH EBUDES.

By FRANK BALFOUR-BROWNE, M.A. (Oxon et Cantab), F.R.S.E.,
F.Z.S., F.E.S. Lecturer in Zoology (Entomology) in the University
of Cambridge.

(Concluded from p. 60.)

A comparison of our Islay and Jura lists shows that, so far as peat-pool species are concerned, one island is about as rich as the other, ten collections on Islay having produced twenty-six species, and eight on Jura having produced twenty-two species. In loch and in river species Jura is poorer than Islay. So far as river species are concerned this is easily explained, since the streams of the latter island are distinctly more suitable for water-beetles than those of the former, but it is difficult to account for the great poverty in Jura of the loch fauna.

There are certain points in connection with the loch faunas of these western Scottish islands which require investigation. In none of the islands I have so far investigated is there any sign in the lochs of such species as:—

<i>Haliphus flavicollis</i> , Sturm.	|	<i>Deronectes elegans</i> , Panz.
„ <i>nomax</i> , BB.		„ <i>depressus</i> , F.
<i>Celambus 5-lineatus</i> , Zett.		<i>Platambus maculatus</i> , L.
„ <i>9-lineatus</i> , Steph.		

—amongst others, species which are common loch species in various parts of the mainland of Scotland. The majority of these species are apparently absent from the western islands, but those that occur are almost always absent from the lochs and only present as river species. For instance, *D. elegans*, wherever it has so far occurred, has been a river species and absent from the lochs (*e.g.* Skye, Mull, and Islay), whereas on the mainland, *e.g.* in the Solway district, it is a common loch species.¹

¹ Vide “On *Deronectes depressus*, F., and *elegans*, Panz.,” *Ann. Mag. Nat. Hist.*, ser. 9, iii., 293-308, April 1919.

The only specimen of *P. maculatus* which I have found in the islands occurred in the Broadford River, Skye.¹

Why should these species, some of them common to lochs and rivers on the mainland, be absent from the lochs on the islands? Is it possibly to be accounted for on the ground that, for these species, the river habitat is the real home and that they become loch species only when the struggle for existence compels them? that in these islands the river community being small, the struggle is not great, and therefore but few of the species have passed on to the lochs?

In the following list are included all the species which were taken in the three islands visited by us. In the case of Islay and Jura I have given the percentage of occurrence of each species, first in the 72 collections made in the two islands taken together, then in the 41 collections made in Islay, and again in the 31 collections made in Jura. In the case of Gigha, crosses indicate the species collected there by Messrs Hancock and Hutchinson during their four days' visit, all the specimens having passed through my hands.

List of Water-beetles collected in the South Ebudes, showing the percentage of occurrence of each species (1) in Islay and Jura together, (2) in Islay, (3) in Jura.

	Islay and Jura, 72 Coll., 62 Spp.	Islay, 41 Coll., 57 Spp.	Jura, 31 Coll., 40 Spp.	Gigha, Spp.
<i>Haliplus obliquus</i> , F.	1	2	...	...
„ <i>confinis</i> , Steph.	1	2	...	×*
„ <i>fulvus</i> , F.	3	10	3	×
„ <i>ruficollis</i> , De G.	6	7	3	×*
„ <i>wehnckeii</i> , Gerh.	3	5	...	...
„ <i>lineatocollis</i> , Marsh	14	17	10	...
<i>Cœlambus inæqualis</i> , F.	3	5	...	×
<i>Deronectes elegans</i> , Panz. . . .	6	10	...	×
„ <i>12-pustulatus</i> , Ol.	6	10	...	...
„ <i>griseostriatus</i> , De G.	11	7	16	...
<i>Hydroporus lepidus</i> , Ol.	1	2	...	...
„ <i>rivalis</i> , Gyll.	1	2	...	...

* Recorded on the authority of Mr E. J. Pearce, who has the specimens.

¹ *Vide* "The Aquatic Coleoptera of the North Ebudes," *Ann. Scot. Nat. Hist.*, July 1911, p. 156.

	Islay and Jura, 72 Coll., 62 Spp.	Islay, 41 Coll., 57 Spp.	Jura, 31 Coll., 40 Spp.	Gigha, Spp.
<i>Hydroporus septentrionalis</i> , Gyll.	1	2	...	...
" (<i>lineatus</i> , F.)	...	...	?	...
" <i>tristis</i> , Payk.	6	7	3	...
" <i>gyllenhalii</i> , Schiöd.	11	12	10	×
" <i>morio</i> , Dej.	10	10	10	...
" <i>palustris</i> , L.	25	27	23	×
" <i>incognitus</i> , Sharp	1	2	...	...
" <i>erythrocephalus</i> , L.	8	7	10	...
" <i>melanarius</i> , Sturm.	6	5	6	...
" <i>memnonius</i> , Nic.	7	5	10	...
" <i>obscurus</i> , Sturm.	15	17	13	×
" <i>nigrita</i> , F.	11	5	19	...
" <i>discretus</i> , Fairm.	3	2	...	...
" <i>pubescens</i> , Gyll.	36	37	35	×
" <i>planus</i> , F.	3	2	3	...
" <i>litratus</i> , F.	11	10	13	×
" <i>obsoletus</i> , Aubé	1	...	3	...
<i>Agabus guttatus</i> , Payk.	4	2	6	...
" <i>paludosus</i> , F.	1	2	...	...
" <i>affinis</i> , Payk.	3	5	...	...
" <i>congener</i> , Payk.	3	...	6	...
" <i>arcticus</i> , Payk.	22	12	35	...
" <i>sturmii</i> , Gyll.	7	10	3	×
" <i>chalconotus</i> , Panz.	10	12	6	...
" <i>bipustulatus</i> , L.	47	39	58	×
<i>Ilybius fuliginosus</i> , F.	3	5	...	×
" <i>ænescens</i> , Thoms.	3	5	...	...
<i>Rhantus bistratus</i> , Berg.	13	12	13	...
<i>Colymbetes fuscus</i> , L.	3	5	...	...
<i>Dytiscus punctulatus</i> , F.	7	12	...	...
" <i>marginalis</i> , L.	1	...	3	...
" <i>lapponicus</i> , Gyll.	1	...	3	...
<i>Acilius sulcatus</i> , L.	1	...	3	...
<i>Gyrinus minutus</i> , F.	1	2	3	...
" <i>natator</i> , Scop.	19	17	23	×
" <i>elongatus</i>	...	...	...	×
" <i>edwardsii</i> , Sharp	1	2	...	...
<i>Hydrobius fuscipes</i> , L.	1	2	...	...
" " <i>var. picicus</i> , Thoms.	10	7	13	...
<i>Philhydrus fuscipennis</i> , Thoms.	22	24	19	×
" <i>minutus</i> , F.	6	7	3	...
<i>Paracymus nigroæneus</i> , Sahlb.	4	2	6	...
<i>Anacæna globulus</i> , Payk.	26	27	26	×
<i>Laccobius ytenensis</i> , Sharp	4	2	6	...
" <i>alutaceus</i> , Thoms.	3	2	3	...
" <i>minutus</i> , L.	3	5	...	...
<i>Limnebius truncatellus</i> , Thoms.	8	7	10	...
<i>Helophorus aquaticus</i> , L.	13	15	10	...
" <i>viridicollis</i> , Steph.	25	29	19	...
" <i>griseus</i> , Herbst.	1	2	...	...
" <i>granularis</i> , L.	1	2	...	...
" <i>brevipalpis</i> , Bedel	3	2	3	...
<i>Octhebius bicolor</i> , Germ.	1	2	...	...

In the foregoing list it will be noticed that *Agabus bipustulatus* was the commonest species, both in Islay and Jura, occurring in 39 per cent. of the collections in the former island and in 58 per cent. of those in the latter.

In a previous paper¹ I gave a table showing the first eight species in the lists of four of the western Scottish islands, and also of Clare Island in the west of Ireland, and in all these lists *A. bipustulatus* was amongst the three commonest species. The point, however, to which I want to call attention is that the percentage of occurrence of the commonest species on these islands was as follows:—

Lewis	73	Coll	60
Eigg	75	Clare Is.	80
Skye	62		

From the fact that in Jura the commonest water-beetle occurred in only 58 per cent. of the collections, it is suggested that the water-beetle fauna of Jura is about as dense as that of Coll, while the water-beetle fauna of Islay, in which the commonest beetle only occurred in 39 per cent. of the collections, appears to be very poor.

The average number of species per collection in Islay was 5.1, and in Jura was 5.0, and if we compare these figures with those for other Scottish islands² we find that the average collection is poorer than in any other island so far examined. But from the fact that the South Ebrides collecting was done in June, while the other islands were visited in August or September, it is scarcely safe to draw this conclusion, since it may well be that June is a poor collecting month, or possibly 1922 was a poor season compared with those in which the other islands were visited.

A few comments on some of the species in the list are perhaps necessary.

Hydroporus lineatus.—A single specimen was reported to me by Mr Pearce as having been found by him in a ditch on Jura, but unfortunately he did not keep it. It is a very distinct species and not one likely to be confused with any other, but as it has

¹ "The Aquatic Coleoptera of the Outer Hebrides," *Scottish Naturalist*, p. 66, 1915.

² Vide *loc. cit.*, p. 20.

so far not been recorded for Scotland except from Kirkcudbright, Roxburgh, and Berwick I hesitate to include it.

Hydroporus obsoletus.—Some six or eight specimens of this rather rare species occurred in a gravelly pool in a very small burn almost at sea level in Jura.

Agabus affinis.—The first record for this species for any of the western Scottish islands, though on the mainland it has been taken as far north as Perth S. and Clackmannan, Fife and Kinross, and Forfar.

Agabus congener.—The absence of this species from Islay and its great rarity on Jura, where only a few specimens were found, is remarkable, in view of the fact that its distribution is mainly Scottish although it has been recorded for some of the northern English counties and vice-counties, one Welsh county, and four southern English counties. Although it has been recorded from as far north as the Orkneys it is not common in the western islands though it has occurred sparingly in Lewis and Harris, Skye and Mull.

Ilybius ænescens.—Occurred only twice in Islay and not at all in Jura. This species has occurred in most of the western islands and many of the Scottish counties and vice-counties as far north as Easternness, and I think that possibly June is a bad month for finding the imago.

Dytiscus lapponicus.—This species is recorded on the strength of the discovery of a head of a female specimen in a small lochan on the high plateau (about 1200-1300 ft.) between Glas Bheinn and Dubh Sheinn on Jura. I expected to find the species on both islands and I worked a number of lochans which seemed to me to be ideal habitats. I am quite satisfied as to the correct identification of the head, and unless I happened upon the head of the last survivor on the island the suggestion as to the life-history of the species which I made previously¹ is now shown to be wrong. If the male survived more than one season, as I thought must be the case, I would have been bound to find some individuals in June when I was actually at a place where a female must have lived quite recently. I found no larvæ.

It seems to me that it would be most interesting to visit a known habitat of this species at intervals throughout the year in order to discover the true facts of its life-history.

Acilius sulcatus.—This species is recorded on the strength of several larvæ found in two widely separated peat pools on Jura.

¹ "The Aquatic Coleoptera of the North Ebudes," *Ann. Scot. Nat. Hist.*, July 1911, pp. 155, 156.

I only assume that the species is *sulcatus* as the pools were on high ground, and so far I have never found *fasciatus* except on low ground, nor is there any record for it in the extreme western districts of Scotland—though I have taken it in Antrim, Down, and Armagh.

Hydrobius fuscipes.—It is interesting to notice the scarcity of the typical form of this species which is scarce in the western islands, in some being entirely replaced by the variety *picicrus*.

Laccobius ytenensis.—This species, separated by Dr Sharp in 1910, has so far been recorded from very few places, it having previously been regarded either as *nigriceps*, Thoms, or as *sinuatus*, Motsch. Neither of these species has, however, been recorded for any of the western islands. I have seen specimens of *ytenensis* from Arran (Clyde Is.) and have taken the species in Kirkcudbright, but otherwise I know of no Scottish records.

Helophorus viridicollis.—I have made no attempt to subdivide this variable species, as I believe it to be, into the several forms raised to the rank of species by Thomson and others, and later by Dr Sharp.¹

Helophorus granularis.—An interesting species because of the fact that it turns up comparatively seldom, but when it occurs it usually abounds. In this particular case, a number of specimens occurred in a very small grassy pool at the side of the small river Machrie in Islay. It has been recorded from many counties and vice-counties in England and Scotland, but I have only taken it in Easternness, Hants S., and Surrey, and have seen specimens from Sussex E., Cantire, and Arran. In Ireland I have taken it in Mayo W., Donegal W., Derry, Antrim, Down and Wicklow, and have seen specimens from Kerry S. I think that the common species, *H. brevipalpis*, has on many occasions been recorded as this species.

Several species were absent which I expected to find in the islands, and of these three require special reference:—

Cælamбус 9-lineatus, Steph.—I certainly expected to find this species, as it has been taken in Eigg and Tiree, although it has not been recorded from any other of the western islands. It is a typical loch species, as distinct from a river species. It occurs from the Orkneys and Caithness southwards in many localities to Cumberland and Northumberland, and otherwise it is recorded in England for Chester, Berkshire, and Hants N. In Ireland the records are all for the northern half of the island.

Deronectes depressus, F.—The distribution of this species in

¹ "Studies in Helophorini," *Ent. Mo. Mag.*, ser. 3, vol. i., 1915.

the British Islands is at present very incompletely known. So far it is only recorded from Cumberland in England, from Ayr, Kirkcudbright, Dumfries, and Selkirk in Scotland, and from Cork W., Sligo, Fermanagh, Cavan, and Antrim in Ireland. It is distinctly a northern species in Europe and therefore probably widely spread in Scotland, but it has not occurred in any of the western islands I have so far examined.¹

Platambus maculatus, L.—I have already mentioned this species as common on the mainland in lochs and rivers, and so far unrecorded from the western islands except for one locality in Skye.

Octhebius lejolisii, Ray and Muls.—The absence of this species is extraordinary, considering the fact that it occurs in various places north, west, and south of these islands. I have found it in Argyle Main, Westernness, North and Mid Ebudes, in Kirkcudbright, Isle of Man, and all round the north coast of Ireland. I searched most particularly for it in both Islay and Jura but without success.

It will be seen from the remarks made in this paper that, for the field naturalist who collects insects, various problems arise if the collecting is done methodically; problems which are of interest to more than those who merely wish to follow in the tracks of others and collect species where they have been previously taken.

The living animal is of much greater interest than the dead specimen, and every detail discovered in the life-history of the organism and its relationship to environmental conditions is a contribution towards the larger problems of ecology and geographical distribution.

Land and Fresh-water Mollusca of Perthshire.—A valuable and comprehensive account of the above group, by Mr Henry Coates, appears in *Trans. and Proc. Perthshire Soc. Nat. Hist.* (vol. 7, pt. iv., 1922). It says something for the steady progress of Scottish nature knowledge that since the first list of forty-four species was published in 1870, the number of known species, now ninety-three, has been more than doubled in the last fifty years. The paper is much more than a list, giving in every case information as to the habitat and local distribution of the species.

Spread of American Grey Squirrel in Scotland.—I have already summarised elsewhere² the present-day distribution of the

¹ Vide "On *Deronectes depressus*, F., and *elegans*, Panz.," *Ann. Mag. Nat. Hist.*, ser. 9, iii., April 1919.

² *Influence of Man on Animal Life in Scotland*, p. 288.

American Grey Squirrel in Scotland; but a new locality has to be added. During a visit to Dunfermline, in February of the present year, on the occasion of the majority of the Dunfermline Field Naturalists' Club, I saw many Grey Squirrels (*Neosciurus carolinensis*) at large in the beautiful public park at Pittencrieff Glen. On making enquiry of the head gardener, I learned that for some years Grey Squirrels were kept in large cages associated with an aviary in the park; but that they showed such tameness, and such friendliness with visitors that, some three or four years ago, say about 1919, they were set free. They appear to have increased in numbers since that time and may now be seen playing amongst the trees and even feeding from the hands of children. Evidence of damage was also apparent, for large limbs of elm trees were dead owing to the girdling of the bark at their bases, and even the trunks of trees showed places where long strips of bark had been torn off.

There is a possibility that Pittencrieff Glen, like other establishment areas, notably that near Loch Lomond, may become a centre of wider dispersal; for already odd individuals from the Dunfermline centre have been reported from Pitfirn and Rosyth, both situated some miles away. Sir D. A. Seton-Steuart informs me that some years ago his gamekeeper found a Grey Squirrel in a trap at Touch near Stirling. As no individuals appear to have been set free in this area, the Touch specimen, now mounted in the Smith Institute in Stirling, may be regarded as a wanderer from the Loch Lomond colony.—JAMES RITCHIE.

Hoopoe in Kirkcudbright.—A Hoopoe was shot at Carrick in the early part of the week ending 14th April 1923. The man who sent me it says he did not know it was a stranger or he would not have shot it.—W. LEARMONTH, Gatehouse.

Hoopoe in Midlothian.—My friend Mr James Cullen consulted me as to the identity of a rare bird which had been observed on the 15th April by Mr Alex. Morham of Butelands, Balerno. From the description I concluded it was a Hoopoe, and to place the identification beyond dispute we visited Butelands on the 22nd in the faint hope of possibly seeing the bird, and also to obtain a clear personal account from Mr Morham. He informed me he had it under observation for fully five minutes at a distance of ten yards, as it picked about in a sandy hollow at the edge of a grass field. It displayed little alarm at his presence and finally flew off with an easy rolling flight. He specially noted the black tipped crest with one or two more bars on it; the broad black and white bars on the wings and lower back; the buff cinnamon

colour of the head, neck, upper back, and under parts, and also the long bill. Even the somewhat low set attitude of the bird as it picked about attracted his attention. Mr Morham deserves to be congratulated on the accuracy of his observations, as it places the identity of the Hoopoe beyond a doubt. This is the first time this rare species has been recorded from Midlothian.—J. KIRKE NASH, Edinburgh.

The Sub-species of the Dunlin.—I wish to correct my measurements in my article on the "Sub-species of the Dunlin" in *Scot. Nat.*, 1923, pp. 21, 22. Of the two Fair Isle birds examined (p. 22, last three lines), the culmen of the ♂, measured from feathers to tip of bill, should be 27 mm. instead of 32 mm., and of the ♀ 29.5 mm. instead of 25 mm., while the date of the latter should be 6/5/08 instead of 6/5/05. The following misprints occur: p. 21, l. 6, for "Qehn" read "Lehn"; l. 8, for "Qisten" read "Listen"; and l. 33, for "fawny" read "tawny."—A. C. MEINERTZHAGEN, London.

Some Perthshire Beetles.—Among the Coleoptera collected by the writer during the excursion of the Royal Scottish Arboricultural Society in July 1922, the following species are perhaps worthy of note. Male and female specimens of *Malthinus flaveolus*, Payk., were obtained by sweeping herbage under various conifers in Lynedoch Estate on 4th July. This is not a very common beetle in Scotland, and does not appear to have been noted from the Tay area in Dr Sharp's list. The northern Weevil, *Otiorrhynchus septentrionis*, Hbst., occurred in fair numbers on young conifers on the same day in Dupplin Estate and also near Struan Village. Several examples of another Weevil, *Cionus pulchellus*, Hbst., which is rare in Scotland, were found on its food plant, *Scrophularia*, on the borders of the well-known Douglas fir plantation at Taymount on 5th July.—A. CUTHBERTSON, Yoker.

A Scarce Lamellicorn Beetle (*Hoplia philanthus*, Füss.), in Main Argyll.—A single example of this beetle was swept by me on heathy ground in Glen Kinglass close to Cairndhu during the last week of August 1922. Although search was made for further specimens none was found. This seems to be a rare beetle in Scotland, but it has been recorded from the Sutherland, Clyde, and Solway areas. The occurrence of the insect in Argyllshire is of some interest as its previous capture in the Clyde area took place so long ago as 1855, when three specimens were found at Catacol in Arran by the Rev. J. E. Somerville.—J. D. LESLIE, Glasgow.

BOOK NOTICES.

RECORD BAGS AND SHOOTING RECORDS. By Hugh S. Gladstone, M.A., F.R.S.E., etc. London: H. F. & G. Witherby, 1922. (2nd Impression.) Pp. 240. Price 15s. net.

With amazing detail and with a wealth of reference, which gives some idea of the amount of research his labours have involved, Mr Gladstone has gathered together a mass of shooting records in a volume which must remain a standard of reference on the subject for many years to come. The author is too good a naturalist to condone or make apology for record-making as such; the records have been made, and he has simply collected them, judging them to be of historical significance. But, quite apart from their evidence to the skill and endurance of sportsmen, the records contain many hints of interest to the naturalist. They illustrate, in vivid manner, the enormous influence sport has had in preserving and increasing the numbers of some of the most interesting members of the native fauna of Britain. Take the case of Red Grouse on Broomhead Moor in Yorkshire: sixty-five years ago the record bag for one day was 82 birds—in 1904 it had risen to 2748. Even allowing for the change in shooting methods, this seems to indicate an enormous increase in the numbers of the birds themselves, due to the specialised protection of the grouse moor. To what degree we owe to the sportsman also the preservation of the Capercaillie, the Red Deer, and many others, may readily be gathered from the records in these pages.

The volume is by no means confined to recording outstanding bags; almost half its bulk consists of an interesting series of chapters on marksmanship, remarkable shots, shooting stories, and, of particular value to the naturalist, on the speed of birds and on the weight of game, both birds and mammals, and wild-fowl. A dozen illustrations enliven the text.

SIDELIGHTS ON BIRDS. By H. Knight Horsfield, M.B.O.U. With a Foreword by W. Eagle Clarke, I.S.O., LL.D. London: Heath Cranton, Ltd. Pp. 224. Price 12s. 6d. net.

For long we have admired the natural history page of the *Yorkshire Weekly Post*, with its casual comments on wild life in general, and in this book we find the same light touch. Mr Horsfield has provided a very fresh "introduction to the study of British bird life," all the more readable because it sets aside formal instruction and carries the reader at once to the homes and the habits of birds. In a series of easily written chapters he has gathered together fragments of bird lore dealing with many aspects of bird life—the movements of birds, the height and speed of their flight, their migration, senses, proprietorship, language, mating, childhood, and so on; and the final quarter

of the book describes in vivid fashion five well-known bird haunts, ranging from Shetland to the Alps and Canada. It is not an easy thing to write a new book about birds, but Mr Horsfield has succeeded; and this because, while he treads the paths of recent scientific knowledge, he treads them with a light step, and does not hesitate, when the mood seizes him, to leave the beaten track of orthodoxy for speculations of his own. The book, while furnishing a wealth of information, is designed to give the young naturalist much food for thought.

FABRE'S BOOK OF INSECTS. Retold from Alexander Teixeira de Mattos' Translations of Fabre's *Souvenirs Entomologiques* by Mrs Rodolph Stawell. London, Edinburgh, and New York: Thomas Nelson & Sons, Ltd., 1923. Pp. 287, 8vo. Price 2s. 6d. net.

This is a fascinating little volume, admirably suited for the youthful reader, and containing a nicely varied selection of essays from the well-known and justly popular writings of the great French entomologist who, living for the greatest part of his time in poverty, yet by a long series of patient observations and experiments added more to our knowledge of the habits of insects than any man of his day. Whether the chapters are a paraphrase of Mattos' translations, or a series of extracts therefrom—probably the former—the result is eminently readable, retaining as it does much of the fascinating style of Fabre himself. To take up the book is to read on and on, and once commenced it is laid down with reluctance. This charming volume, cheap but exceedingly well printed, can be heartily recommended to our readers.

OUR WILD FLOWERS, AND HOW TO KNOW THEM. By E. Fitch Dalglish, F.L.S., F.Z.S. London: Thornton Butterworth, Ltd., 1923. Pp. 127. Price 6s. net.

An addition to the many works available for the identification of our wild flowers is to be welcomed, especially when, as in this case, it may meet the needs of pleasure seekers to whom formal classification and Latin names are bugbears. The author professes to reject "scientific classification," and by a system of tables, indicating shapes, colours and sizes, guides the enquirer by easy steps to the identification of the flower before him and to a fuller description of it and of the plant to which it belongs. It is evident, of course, that this entails a very considerable amount of classification, but the artificial keys and the diagrams which accompany them simplify the tyro's search. The book is not intended for the naturalist who wishes to know anything of the natural affinities of his discoveries in the country-side. It contains nineteen excellent half-tone illustrations and a coloured plate of some of the flowers described.

GUIDE TO THE UNIVERSITY BOTANIC GARDEN, CAMBRIDGE.

By Humphrey Gilbert-Carter, Director of the Garden.
Cambridge University Press, 1922. Pp. xvi + 117, 23 plates.
Price 3s. 6d. net.

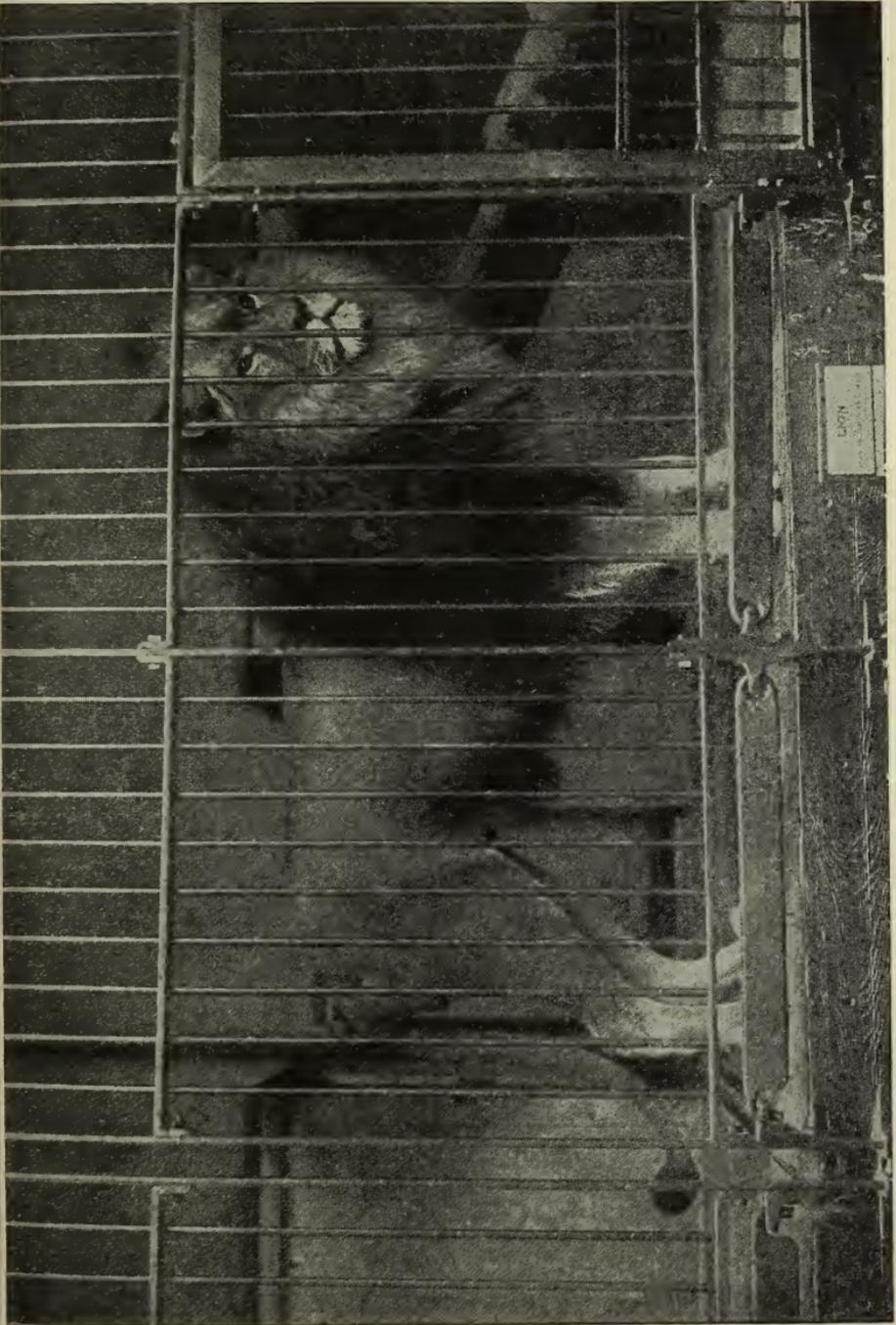
This little volume is really a series of concise notes on the trees, shrubs, and more conspicuous flowering plants one usually sees in cultivation in the various parks and public gardens of the British Isles. In the ordinary sense of the term it can hardly be called a guide to any particular garden, since the notes are arranged strictly in botanical sequence. But the book is a handy and useful one, and has much to recommend it. We think it a pity that the native names of a large number of the plants should have been printed in Arabic, Persian Sanskrit, Hebrew, and other characters, without any attempt at transliteration, for such names, while adding to the expense of production, convey no meaning whatever to the average reader.

NOTES FROM

THE SCOTTISH ZOOLOGICAL PARK

THE DEATH OF "BRUTUS," AND THE AGE OF LIONS.

The death of the old lion "Brutus," which occurred a few weeks ago, will cause regret to a large number of visitors to the Park, for "Brutus" was one of the best-known and most outstanding animals in the Park as well as one of its oldest inhabitants (a polar bear, "Starboard," two brown bears, a spotted hyæna and one or two birds were the only animals alive at the time of his death which had been in the Park before "Brutus" came). He arrived here on 6th January 1914, having been purchased for the Society by the late Mr John Jordan, so that he had lived in the Park for over nine years. He had been for some considerable time showing very manifest signs of old age: his teeth were nearly all worn away, his sight was undoubtedly failing, and it had been apparent for some time to those who knew him best that his death could not be very far off. His exact age is not known, but the owner from whom he was purchased for the Park, had had him for over five years, and he was believed to be forest-bred, and to have been nearly, if not quite, full grown when captured, so that his age cannot have been less than about nineteen years—probably a year or two more.



[Miss Dorothy A. L. Mackenzie.]

"BRUTUS."

Photo.]

There can be no doubt that for a Lion twenty years is a good old age, equivalent, perhaps, to four score in humanity, though the average duration of life in lions is a matter not too easily determined. It is said that the lion may live to thirty or even forty years; there is a tradition indeed that a lion which lived in the old Tower Menagerie, in the eighteenth century, was seventy years old when it died; such a record is, however, almost incredible. Mr V. Ball, Director of the Science and Art Museum, Dublin, in a paper (*Trans. Roy. Irish Academy*, vol. xxviii., 1886) on lion breeding in the Dublin Zoological Gardens, mentions that "No lion or lioness has lived longer in the Gardens than sixteen years—indeed only one attained that age. Judging from the decrepitude observed in several cases, we should be justified in saying that a lion of eleven or twelve years of age is nearly worn out and has not much longer to live." That is, perhaps, however, rather too low an estimate for, in Dublin, since that time, as well as elsewhere, lions have lived to an age of twenty years or more. During last year there died in the Dublin Gardens a lion, "Niger," which had lived there since 1905, when it came as a cub, and which was therefore somewhere in the neighbourhood of nineteen years. Its death, like that of "Brutus," was attributed to old age. The lioness "Nigeria," which came to Dublin at the same time, is still alive there. The average duration of the lion's life may perhaps therefore be taken at something a little under twenty years, and it would be a very old lion indeed whose years went much beyond the score.

"Brutus" was certainly a very fine lion, and made a deep impression on everyone who saw him. How much that impression may have owed to the mind and sensibilities of the beholder, and how far the qualities of "Brutus" justified it, may be a matter of doubt. He was not a particularly intelligent lion, and he was not specially friendly, but he was of slender and very graceful build with a well-developed head and an exceptionally heavy mane, and he had a habit of standing at the front of his cage and gazing with a far-away look in his eyes over the heads of the people in front of him in a manner which suggested to the onlooker a regal contempt for the vulgar sightseer, and to the more sentimental observer a melancholy dreaming of the lost spaces of his youth; though as his gaze was directed to the quarter from which the meat-barrow comes, it was probably nothing more than the patient outlook for dinner.

T. H. G.

(Authors are responsible for nomenclature used.)

The Scottish Naturalist

Nos. 139 AND 140.] 1923 [JULY-AUGUST

REPORT ON SCOTTISH ORNITHOLOGY IN 1922, INCLUDING MIGRATION.

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

(Concluded from p. 84.)

MIGRATION—SUMMARY OF MOVEMENTS.

January.

Slight weather movements caused by snow inland in Scotland are recorded in the first half of the month; the species principally affected were Starlings, Finches, Turdinæ, and Lapwings. During the second half little movement is noted. Waxwings are recorded spasmodically during January.

February.

In February there are notes of the return of some of our partial migrants to their nesting grounds. Some Duck and Wader movement is also noted, and an unusual number of Slavonian and Red-necked Grebes are recorded.

March.

The prevailing winds during the first half of the month were from some northerly or westerly quarter, and a more

pronounced return of our partial migrants to their breeding quarters took place. A few early summer visitors are noted, and the departure of winter visitors is recorded. In the second half of March these movements were intensified, more summer visitors are reported and some passage migration. During this period the wind was chiefly between north and east.

April.

In the first half of April the wind was almost entirely between N.E. and N.W., but a good deal of movement is recorded; summer visitors were arriving, chiefly in the south and west, and winter visitors leaving us. From the 13th to the 17th there was an unusually well-marked northward movement of *Turdinæ*. In the last fortnight there was still a predominance of northerly winds, a very pronounced arrival of summer visitors took place, and further departures of winter visitors and a little passage migration are recorded.

May.

During the month the prevailing winds were westerly and northerly, and migration seems to have followed a very normal course. Up to the 24th a steady stream of summer visitors is recorded, more passage migrants were moving through the country, and winter visitors were departing, few being left by the last week of the month.

June.

The prevailing winds in June were from some westerly quarter; during the first half there was a certain amount of passage migration and Wader were beginning to flock. Thereafter to the end of the month, most of the notes refer to the return of our Wader to the shores after nesting.

July.

In July the westerly type of weather continued and our own birds show movement within the country, this increasing as the month advanced. In the latter half of July there are notes of the arrival of Wader from overseas.

August.

The wind in August was chiefly from the west and the migration continued on normal lines. There are steady notes of the autumn movements of our own birds, and further arrivals of Wader from overseas and a certain amount of passage migration are noted. After the middle of the month the departures of our summer visitors became more pronounced, and some arrivals of Geese are recorded.

September.

Up to the 23rd of September, with light variable winds, there was a good deal of normal movement but nothing in the nature of a rush. A good many departures of summer visitors, some passage migration and the arrival of a few winter visitors are noted. Thereafter the wind was south-easterly and an enormous arrival took place, many passage migrants and uncommon visitors being recorded, as well as arrival of winter visitors.

October.

Up to the middle of the month the wind was light and variable and there was a great immigration of Turdinæ and other winter visitors. Some passage migration and a good many last records of summer visitors are also noted. The movement continued, though less markedly, during the second half of October; the winds were chiefly northerly and easterly, and there was a very cold spell in the last few days of the month. The chief feature of the movement is the large number of Turdinæ which are recorded from all over Scotland.

November.

During November, the wind being mainly from some westerly quarter, the arrival of winter visitors continued, this, however, becoming less pronounced as the month advanced.

December.

This month was mild and the wind chiefly light and westerly, and we find an absence of the weather movements, caused by frost and snow, so often recorded in other years.

NOTES ON THE MOVEMENTS OF BIRDS IN 1922,
ARRANGED UNDER SPECIES.

HOODED-CROW, *Corvus cornix cornix*.—Movement is noted on the east coast from 27th February to 18th March, and again from 1st October to 6th November, while on 21st December a Hoodie visited the Bell Rock.

CARRION-CROW, *Corvus corone corone*.—On 21st April many Carrion-Crows were seen at the East Neuk of Fife coming in singly over the sea from the east, as many as twenty being in sight at one time. One visited Fair Isle on 6th October.

ROOK, *Corvus frugilegus frugilegus*.—Passage is noted at Fair Isle between 8th March and 12th April.

JACKDAW, *Colæus monedula subsp.?*—A Jackdaw is recorded at Outskerries (Shetland) on 25th January.

STARLING, *Sturnus vulgaris vulgaris*.—Movement is recorded from west coast stations, chiefly Hyskeir, from early January up to 7th April; on 17th April a flock of sixty was seen at Leuchars (Fife), and flocks of hundreds at Hareshawmuir (Ayrshire) on 23rd May. From 29th September to 24th November there are a good many notes of arrivals from stations on both sides of Scotland, while on 22nd December three appeared on the Bell Rock.

ROSE-COLOURED STARLING, *Pastor roseus*.—See p. 67.

GOLDEN ORIOLE, *Oriolus oriolus oriolus*.—See p. 67.

GREENFINCH, *Chloris chloris chloris*.—A marked movement of Greenfinches is reported from Cadder (Clyde) on 5th January, on 13th January two males appeared on Hyskeir, a few on Fair Isle on 11th February, and one on Ailsa Craig on 25th February. On 14th April a few again visited Fair Isle, and one was on the Isle of May on 21st May. At Buddon Ness arrivals from east and north-north-east are noted on 21st, 22nd, 27th, and 30th September.

GOLDFINCH, *Carduelis carduelis*.—There are several records of flocks of Goldfinches (probably of the British race) from Wigtownshire in January, September, and October. Two were seen at Kingoodie (Tay) on 1st October, two at Invergowrie on 8th October, and one at the last locality on 5th November.

SISKIN, *Carduelis spinus*.—During January several were seen in Cadder Woods (Clyde), fourteen at Barrachan (Mochrum) on 18th October, eleven at Derrie (Mochrum) on 7th November, and large flocks in West Lothian during December.

MEALY REDPOLL, *Carduelis linaria linaria*.—On 12th January a few are recorded on Fair Isle, and numbers in the Anniesland district of Glasgow two days later. Single birds visited Hyskeir on 11th March and Isle of May on 28th May.

LESSER REDPOLL, *Carduelis linaria cabaret*.—A few were seen at Cadder (Clyde), on 5th January, and twenty at Corsemalzie on 16th February.

LINNET, *Carduelis cannabina cannabina*.—One visited Fair Isle on 4th February, and one went north over the Isle of May on 13th May. Migration up the Tay estuary was noted at Buddon Ness on 22nd and 30th September, two were on the Isle of May on 3rd October, and a flock of 300 at Alticig, Wigtownshire, on 14th October.

NORTHERN BULLFINCH, *Pyrrhula pyrrhula pyrrhula*.—See p. 67.

BRITISH BULLFINCH, *Pyrrhula pyrrhula nesa*.—Two pairs were seen near St Andrews from 18th January to 22nd March.

CROSSBILL, *Loxia curvirostra subsp.?*—Two males and a female were seen in the Eastern Sidlaws on 28th August.

CHAFFINCH, *Fringilla cœlebs cœlebs*.—A "marked movement" of Chaffinches is reported from Cadder (Clyde) on 5th January, and next day a flock of about 400 at Corsemalzie. On 6th and 7th March a few were on Ailsa Craig, huge flocks at Largo on 24th March, and small numbers at Fair Isle on 28th March, 8th, 14th, and 24th April. A considerable immigration took place in autumn between 25th September and 12th October, and is recorded from Fair Isle, Skerries lantern, Buddon Ness, Bell Rock, Isle of May, Bass Rock, Hareshawmuir, and Ailsa Craig, while on 14th November three visited Hyskeir.

BRAMBLING, *Fringilla montifringilla*.—A female is noted at Hyskeir on 5th March. Last seen, Invergowrie on 9th April, Haining, near Selkirk, the next day, and Fair Isle 26th April. Considerable arrivals are noted on the east coast from Fair Isle to Isle of May from 21st September to 14th October, at Hareshawmuir on 6th and 14th October, and one at Hyskeir on 24th and 25th October.

TREE-SPARROW, *Passer montanus montanus*.—Two or three are recorded near Invergowrie on 23rd April and 7th May, and one at Largo on 7th August.

YELLOW-BUNTING, *Emberiza citrinella citrinella*.—A few were

on Fair Isle on 11th February and 18th April, several on Ailsa Craig on 6th and 7th March, and one there on 7th June.

ORTOLAN, *Emberiza hortulana*.—See p. 67.

REED-BUNTING, *Emberiza schœniclus schœniclus*.—On 7th September four were seen near West Ferry (Forfarshire), and arrivals are noted at the Isle of May, Buddon Ness, and Fair Isle from 24th September to 9th October.

LAPLAND BUNTING, *Calcarius lapponicus lapponicus*.—See p. 67.

SNOW-BUNTING, *Plectrophenax nivalis*.—Snow-Buntings visited the Isle of May on 12th January, Ailsa Craig on 16th January, and Vallay (O.H.) on 4th March. Last seen, Ailsa Craig on 15th March and Skerries on 23rd March. Early returns are noted in autumn from Hyskeir on 3rd September, Fair Isle and the Bass Rock on 18th, and Isle of May on 23rd September. Thereafter considerable immigration up to 14th November, while on 12th December three appeared on Ailsa Craig, one at Hyskeir two days later, and twenty-four at Vallay on 28th December.

WOOD-LARK, *Lullula arborea arborea*.—See p. 67.

SKYLARK, *Alauda arvensis arvensis*.—A "weather movement" is noted to south and south-east over Dundee, and to west over Garmouth between 15th and 22nd January, while a good deal of movement is reported from Ailsa Craig and Hyskeir from 25th February to 24th March, probably returns from Ireland. Small numbers visited the last station on 9th, 12th, and 20th April, and a Skylark struck the Isle of May lantern 21/22nd May. By 30th August one was seen at Hyskeir, and passage up the Tay Estuary took place on 8th and 10th September. A large movement to the west and south-west is reported from many east coast stations from 18th September to 3rd October. On 23rd and 27th September Skylarks in numbers were moving at the Mull of Galloway, and on 28th September at the Ailsa Craig lantern, while from 6th to 23rd October we have further west coast records of arrivals, chiefly from Hyskeir and Hareshawmuir. On 3rd and 4th, 9th and 10th October passage to the south was observed at Buddon Ness, Isle of May, and Largo, and on 6th and 8th October considerable passage to the east was seen at the last station. Further westward movement is reported from Dundee on 22nd and 29th October, 5th and 9th November, two Skylarks were at the Bell Rock on 22nd December, and one at Hyskeir on 27th December.

TREE-PIBIT, *Anthus trivialis trivialis*.—Is recorded from Loch Goil on 18th April, Killermont on 23rd April, Melrose on 5th,

and Hamilton on 6th May. Small numbers were seen on the Isle of May on 15th, 18th, and 21/22nd May. Autumn movement is noted at Balgay (Forfarshire), from 20th August; last seen, Mull of Galloway lantern on 18th September, Balgay on 21st, and Isle of May on 22nd September.

MEADOW-PIBIT, *Anthus pratensis*.—On 1st March many Meadow-Pipits were seen at Corsemalzie, and many notes of arrival, no doubt chiefly of our own nesting-birds, come from mid-March to 20th April, while constant passage of small numbers is reported from Hyskeir from 6th to 22nd May. By 18th August autumn movement was noticeable and continued to 8th November, in the majority of cases where direction of flight is noted it was to the west, these being doubtless oversea immigrants, but emigration to the south is also recorded up to 9th October. On 21st December three Meadow-Pipits arrived on the Bell Rock.

YELLOW WAGTAIL, *Motacilla flava rayi*.—Spring arrivals are reported from Muirend, Cathcart, on 22nd April, Summerston next day, Lochwinnoch and Hareshawmuir on 25th, and Beith on 27th April. On 11th May one was seen at Clubbiedean Wood, Midlothian. Last seen at Hareshawmuir on 2nd September, and a belated bird at Hyskeir on 19th October.

GREY WAGTAIL, *Motacilla cinerea cinerea*.—Arrivals at breeding-places are recorded between 26th March and 25th April, and returns to the shores from 29th August. One visited Fair Isle on 28th October.

WHITE WAGTAIL, *Motacilla alba alba*.—Early records of passage come from Vallay (O.H.) on 8th March, Cullen on 11th and 15th and Summerston on 26th March. Very considerable movement took place between 22nd April and 26th May. This is chiefly recorded from west coast stations and Fair Isle, but there are also some notes from the east coast. The return passage is reported from the west coast from 20th August to 27th September, from Fair Isle between 22nd August and 18th September, and from the east coast from 27th August to 26th September.

PIED WAGTAIL, *Motacilla alba yarrellii*.—Arrivals at breeding-places are reported from 26th March to 10th April, one is recorded at Fair Isle on 8th March, and small numbers there on 12th and 22nd April and 3rd May. Autumn movement is noted from many stations from 29th August to 4th October, a few being reported from Fair Isle on 30th September.

GOLDCREST, *Regulus regulus*.—Single birds are recorded from

Hyskeir on 18th March and Ailsa Craig on 3rd April, possibly our own birds returning; but Goldcrests at Fair Isle on 10th and 26th April were no doubt on their way to breeding-grounds on the continent. On 17th September what was probably one of our British birds emigrating was caught at the Mull of Galloway lantern, and small numbers of the British race occurred on the Isle of May from 24/25th September to 1st October. On 20th, 25th, and 27th September many Goldcrests were seen at Buddon Ness, two on the Bass Rock on 24th September, and some at the Ailsa Craig lantern on 27/28th September; the subspecies of these was not noted, but a large movement of the continental *R. r. regulus* is reported from the Mull of Galloway lantern on 27/28th September.

WAXWING, *Bombycilla garrulus*.—See p. 67.

SPOTTED FLYCATCHER, *Muscicapa striata striata*.—Is first recorded from Broughton on 10th May, Milton Lockhart (Clyde) and Melrose on 13th, and Isle of May lantern on 15/16th May. Thereafter arrivals took place, and are recorded from all over Scotland to 29th May. Autumn movement is noted as early as 21st July and continued steadily till 22nd September; last seen, Mull of Galloway lantern 27/28th September and Isle of May on 30th September.

PIED FLYCATCHER, *Muscicapa hypoleuca hypoleuca*.—Single birds are recorded from Possil Marsh (Clyde) on 29th April, and the Isle of May on 22nd May, 24th, 27th, and 28th September.

RED-BREASTED FLYCATCHER, *Muscicapa parva parva*.—See p. 68.

CHIFFCHAFF, *Phylloscopus collybita*.—Arrivals, no doubt of our own *Ph. c. collybita*, are recorded on 12th April from Livingstone (Castle-Douglas), Row on 16th April, and Beith on 20th April. Further spread is recorded up to 6th May. Autumn movement is reported from the Isle of May on 23rd and 28th September, the Mull of Galloway on 24th and 27/28th September, and from Buddon Ness on 21st October, some of these may be referable to *Ph. c. abietinus*.

WILLOW-WARBLER, *Phylloscopus trochilus trochilus*.—Recorded in numbers from Bathgate on 13th April, from Corsemalzie and Yoker next day, Broughton on the 15th, and Glasgow, Helensburgh, Melrose, and Castle-Douglas on 16th April. Thereafter, notes of arrival come from all over Scotland up to 6th May, and migration is recorded at the Isle of May, Hyskeir, and Ailsa Craig up to 22nd May. By 6th August autumn movement was apparent, and continued up to the end of September. Last seen, Mull of

Galloway lantern 27/28th September and Isle of May on 1st October, and a Willow-Warbler on Fair Isle on 20th October may have been *Ph. t. eversmanni*.

WOOD-WARBLER, *Phylloscopus sibilatrix sibilatrix*.—Is recorded from Johnstone on 9th May, Dunoon on 10th, and Isle of May on 18th May, and from Balgay (Forfarshire) on 6th August.

EVERSMANN'S WARBLER, *Phylloscopus borealis borealis*.—See p. 68.

YELLOW-BROWED WARBLER, *Phylloscopus humei præmium*.—See p. 68.

GRASSHOPPER WARBLER, *Locustella naevia naevia*.—Single birds are recorded from the Isle of May on 2nd October and Fair Isle on 9th October.

SEDGE-WARBLER, *Acrocephalus schænobaenus*.—Is first recorded from Loch Elrig on 6th May, Possil Marsh on 7th, and Beith on 9th May; thereafter the spread was rapid, continuing up to the 23rd May. Last seen in autumn at Invergowrie on 30th August, near Broughty Ferry on 7th September, Possil Marsh 10th, and Loch Elrig 11th September.

BARRED WARBLER, *Sylvia nisoria nisoria*.—See p. 68.

GARDEN WARBLER, *Sylvia borin*.—First recorded from Crossford on 13th May, and arrivals continued up to 24th May. Noted on migration in autumn at Fair Isle on 14th September, and the Isle of May on 21st and 28th September.

BLACKCAP, *Sylvia atricapilla atricapilla*.—The only spring note is from St. Boswells on 26th April. Autumn passage is recorded from the Mull of Galloway lantern on 17th September, Isle of May, in some numbers, from 26th September to 4th October, and Fair Isle on 30th September and 17th October.

WHITETHROAT, *Sylvia communis communis*.—Recorded on 1st May from Kilmaccolm, and on 9th May from Johnstone and Bathgate; the main body of arrival took place between 13th and 24th May, during which period we have notes from all over Scotland. Last seen, Balgay (Forfarshire) on 20th August, Invergowrie on 27th, and Monifieth Bay on 29th August, and Largo on 13th September; while at the Mull of Galloway lantern the Isle of May, and Fair Isle passage took place up to 1st October.

LESSER WHITETHROAT, *Sylvia curruca curruca*.—Single birds are recorded from Hyskeir on 22nd April, Fair Isle on 2nd June, and Isle of May on 25th, 28th, and 29th (2) September and 1st October.

FIELDFARE, *Turdus pilaris*.—Weather movements are noted on 4th, 15th, and 17th January, and 5th and 19th February in north-eastern Scotland. From 13th April (when many were on passage at Fair Isle) to 2nd May much northward movement is recorded. Last seen, Skerries (L) on 4th May, and Hareshawmuir on 7th May, while during the second week of May many are reported as passing at Ardmeallie (Banffshire).

The first notes of autumn arrival come from the Isle of May on 24th September, Hareshawmuir on 7th October, and Fair Isle on 9th. Thereafter a large immigration took place, and is recorded steadily till 12th November. A flock is recorded on 19th December on the Campsie Hills (Stirlingshire), nearly 1000 feet above sea-level.

MISSEL-THRUSH, *Turdus viscivorus viscivorus*.—Weather movements are recorded from Dundee on 22nd January and 5th February. A Missel-Thrush visited Ailsa Craig on 10th June, and by 26th August flocking is reported, while single birds visited the Mull of Galloway on 20th September and Isle of May lantern on 20/21st September.

SONG-THRUSH, *Turdus philomelus*.—Weather movement is recorded in Forfarshire on 14th January. A British Song-Thrush visited Hyskeir on 25th February, and some Thrushes were on Ailsa Craig on 10th March. A great northward movement is recorded from Melrose from 13th to 17th April, and at the same time, and on 24th April, Thrushes occurred on Fair Isle. This looks like a northward movement of *T. ph. philomelus*. From 17th September to 3rd October considerable movement is recorded from the southern stations of our British *T. ph. clarkei*, while from 26th September to 2nd November a big immigration of the continental form is recorded, chiefly from our northern islands and east coast, but also from Hareshawmuir and Hyskeir. A few Thrushes visited Hyskeir on 11th December, and one on 26th December, while on 22nd December one was on the Bell Rock.

REDWING, *Turdus musicus*.—Weather movements are recorded from Dundee on 4th and 15th January, while from 8th March to 24th April considerable and continuous northward movement is recorded. During the second week of May a "big movement" was noted at Ardmeallie (Banffshire), and the last record comes from Hyskeir on 17th May. An enormous autumn arrival of Redwings is one of the features of this year's migration notes; this is first reported from Bathgate on 26th September, Isle of May on 27th, Skerries lantern and Fair Isle on 28th September.

Thereafter much immigration is reported up to 5th November. An unusual proportion of the notes during this period refer to daylight arrivals, the birds coming in great numbers on 5th and 17th October from a point just east of north, and on 16th, 18th, and 29th October from north-east and east.

RING-OUZEL, *Turdus torquatus torquatus*.—Several Ring-Ouzels are noted at Fair Isle on 13th and 15th April, a pair on the Greenock hills on 20th April, single birds at the Skerries lantern on 4th May, and the Isle of May on 22nd and 25th May. On 19th September one appeared at the Mull of Galloway, while a great immigration took place at the Isle of May between 24th September and 1st October; hundreds were on the island on 27th and 28th September, many being seen on the 27th, arriving during the day from east-north-east. A Ring-Ouzel struck the Mull of Galloway lantern on 27/28th September, several were on Fair Isle on 29th September and 3rd October, and one on Hyskeir on 10th October.

BLACKBIRD, *Turdus merula merula*.—Single males are recorded at Hyskeir on 5th January and 15th March, while from 8th to 24th April considerable migration is recorded from Fair Isle, and on 10th and 11th April some Blackbirds were on Ailsa Craig. Four Blackbirds were at the Mull of Galloway lantern on 27/28th September, a female on the Bass Rock on 29th September, and three on the Bell Rock lantern on 3rd October. From 6th October to 6th November a large immigration is recorded, chiefly from our northern and eastern stations, but also from Hyskeir, Ailsa Craig, and Hareshawmuir.

WHEATEAR, *Enanthe enanthe enanthe*.—First recorded from Strathblane on 18th March, Bathgate on 29th, and Torrs Sandhills on 30th March. Throughout April many arrivals at breeding-places are recorded from all over the country; some Wheatears were at the Skerries lantern on 4th May, and movements are recorded from the Isle of May up to 16th May and Hyskeir to 22nd May. By 7th July autumn movement was already apparent, this continued spasmodically up to 20th August, when the movement strengthened, and continuous migration is recorded from all over the country up to mid-October. Last seen, Fair Isle 16th, and Hyskeir 19th October.

GREATER WHEATEAR, *Enanthe enanthe leucorrhoea*.—Northward passage, in small numbers, is recorded from Hyskeir from 3rd to 24th May, from the Isle of May from 16th to 24th May, and

from Balgay (Forfarshire) on 21st May. The Mull of Galloway reports autumn passage from 19th to 28th September, the Isle of May from 22nd September to 4th October, and Buddon Ness on 2nd October.

WHINCHAT, *Saxicola rubetra rubetra*.—First noted near Oban on 26th April, Loch Goil on 3rd May, and Hareshawmuir two days later. Arrivals at breeding-places are reported up to 14th May, one was at Hyskeir on 22nd, and passage continued at the Isle of May up to 24th May. Autumn movement had begun by 9th August and continued steadily throughout September. Last seen, Possil Marsh on 1st October, and Buddon Ness on 6th October.

STONECHAT, *Saxicola torquata*.—Considerable movement, probably of our British *S. t. hibernans*, is recorded between 4th September and 11th November from stations in both eastern and western Scotland. The only record from the Northern Isles is of one at Fair Isle on 29th September.

REDSTART, *Phœnicurus phœnicurus phœnicurus*.—First recorded at Loch Goil on 20th April, Hirsell (Coldstream) on 22nd, and Craiggallian and Milngavie on 30th April, and arrivals are reported up to 15th May. Redstarts were on passage at the Isle of May up to 22nd May. Return migration had begun by 8th August and continued steadily throughout September; a big movement took place at the end of September at our east coast stations, undoubtedly of overseas immigrants. Last seen, Isle of May on 4th October.

BLACK REDSTART, *Phœnicurus ochrurus gibraltariensis*.—See p. 68.

NORWEGIAN BLUETHROAT, *Luscinia svecica gætkæi*.—See p. 68.

ROBIN, *Erithacus rubecula*.—A Robin, "apparently of continental race," was seen at Kingoodie (Perthshire) on 5th February, and small numbers at Fair Isle on 15th, 24th and 26th April were undoubtedly *E. r. rubecula*. Single birds on Ailsa Craig on 28th August and the Bass Rock on 30th August were probably our British *E. r. melophilus*, and movement of this race is recorded from the Mull of Galloway and Isle of May from 17th September to 3rd October, while "numbers" of Robins on Ailsa Craig on this last date were probably also our own birds leaving us. Immigration of the typical form is noted at the Isle of May from 26th to 28th September, at Fair Isle on 6th and 16th October, and on 29th October what was believed to be a continental bird was seen at Invergowrie.

HEDGE-SPARROW, *Prunella modularis*.—Birds of this species are reported on Ailsa Craig on 3rd, 10th and 11th April, and Isle of May on 9th May, while one, no doubt the continental *P. m. modularis*, occurred on Fair Isle on 18th April. Buddon Ness, Isle of May, Hyskeir, and Ailsa Craig record autumn movements from 27th September to 10th October.

WREN, *Troglodytes troglodytes troglodytes*.—Autumn migrants are noted at the Isle of May on 30th September, Ailsa Craig on 3rd October, Buddon Ness on 3rd and 4th October, Hyskeir from 7th to 19th October, and the Bass Rock on 24th October.

SWALLOW, *Hirundo rustica rustica*.—Is first recorded from St Boswells on 12th April, Hirsell (Coldstream) and Corsemalzie on 14th, Cockburnspath, St Andrews, Invergowrie, Melrose, Kinglassie, Leslie, Kilmacolm and Lunan Water (Montrose), on the 15th April. Thereafter a great arrival took place and continued till 8th May, by which time our breeding-birds seem to have been well distributed. A pair were on Ailsa Craig on 11th May, two at Vallay (O.H.) on 15th, and one at Hyskeir on 15th and 16th May, while passage was observed on the Isle of May up to 25th May, and at Fair Isle on 5th June. Autumn movement is noted by 20th August and continued steadily throughout September. Last seen, Possil Marsh, Dundee, and Buddon Ness on 1st October, Elliot Junction on 7th, and Lundin Links on 21st October.

HOUSE-MARTIN, *Delichon urbica urbica*.—Arrived near Coldstream on 13th April, Largo on 15th, Johnstone, Kirkcaldy, Melrose, St Andrews, and Aberdour on 16th April. Thereafter there are many notes of return to breeding-places up to 15th May: House-Martins were on passage at the Isle of May up to 25th May, and arrived at Fair Isle next day; while on 15th June one was seen at Skerries lighthouse. Departures are noted from 12th August throughout September. Last seen, Westferry (Forfarshire) on 30th September and Coupar Angus on 2nd October.

SAND-MARTIN, *Riparia riparia riparia*.—First noted, Hirsell, near Coldstream, on 3rd April, Bardowie Loch on 9th, and Beith on 12th April. Thereafter many records of arrival up to 9th May, and passing the Isle of May till 17th May. By mid-July departures from nesting colonies had begun, and steady notes of departures come throughout August. On 2nd September great numbers were seen at dusk at Buddon Ness, and on 4th hundreds at Dunbog (Fife). Last seen, Broughty Ferry on 7th September, Largo on 15th, and Mull of Galloway on 27th September.

SWIFT, *Apus apus apus*.—Recorded near Berwick-on-Tweed on 30th April (*Scotsman*, 2/5/22), Kilmacolm and Kinglassie (Fife) next day, and Muir of Ord on 2nd May (*Field*, 20/5/22), while that afternoon a northward passage was noted at Dryburgh Abbey. From 6th to 19th May constant arrivals are recorded, and by the latter date full numbers seem to have arrived. On 13th July one was caught in a bedroom at the Skerries lighthouse, and throughout August continuous departure is recorded. Last seen, Conon (East Ross) 1st September, Glenorchard on 2nd, Balfron on 7th, and West Ferry on 14th September.

NIGHTJAR, *Caprimulgus europæus europæus*.—Recorded from Kames (Berwickshire) on 26th April, Ailsa Craig on 23rd May, Corsemalzie next day, Whiting Bay, Arran on 28th May, and two at Bathgate on 12th June. Last seen, Corsemalzie on 2nd September.

KINGFISHER, *Alcedo atthis ispida*.—On 20th February one was seen at Loch Elrig, while up to 22nd March a pair frequented the Lade Braes near St Andrews. Seen on 30th July at Braeburn (Currie), and in some numbers in autumn on a Border stream (*Scotsman*, 21/10/22). On 2nd October two were seen at Kinlochmoidart (West Inverness) and one by the river near Kinlochewe about 7th October.

LESSER SPOTTED WOODPECKER, *Dryobates minor subsp.?*—See p. 68.

CUCKOO, *Cuculus canorus canorus*.—Heard 13th April at Penmanshiel (*Scotsman*, 19/4/22), Bathgate on 19th, and Hareshawmuir on 20th April. Thereafter many arrivals are recorded from mainland localities up to 17th May. Passing the Isle of May up to 22nd May, and two at Fair Isle on 2nd June. Last seen, Corsemalzie on 6th September and Hareshawmuir on 10th September.

LONG-EARED OWL, *Asio otus otus*.—One was on Fair Isle on 2nd August and two at Buddon Ness on 29th September.

SHORT-EARED OWL, *Asio flammeus flammeus*.—On 3rd May two were on Fair Isle, and two were catching birds round the lantern of the Mull of Galloway on 27th/28th September.

GREENLAND FALCON, *Falco rusticolus candicans*.—See p. 68.

HOBBY, *Falco subbuteo subbuteo*.—See p. 68.

MERLIN, *Falco columbarius æsalon*.—On 5th September one flew in over the sea from the east at Buddon Ness, on 29th

September one visited the Bass Rock. Two were on Hyskeir on 3rd October, one at Fair Isle on 16th October, and one at Pittenweem (Fife) on 14th November.

KESTREL, *Falco tinnunculus tinnunculus*.—A Kestrel visited Hyskeir on 3rd February, while on 22nd May one was on Fair Isle and one passed the Isle of May going north. From 21st September to 15th October a good deal of movement is recorded from Fair Isle, Bell Rock, Isle of May, and Ailsa Craig.

HEN-HARRIER, *Circus cyaneus cyaneus*.—An adult bird of this species was killed near Loch Spynie on 24th February, and one occurred near Oban on 25th April.

OSPREY, *Pandion haliaetus haliaetus*.—See p. 68.

BITTERN, *Botaurus stellaris stellaris*.—See p. 68.

WHOOPEE SWAN, *Cygnus cygnus*.—Northward movement was apparent at Vallay on 3rd March, (50), on 12th March arrivals were recorded at Possil Marsh, these all leaving in the first week of April. By 28th September four were seen at Vallay, and arrivals are recorded from 16th October to 3rd November. On 26th and 27th December a number were seen in Wigtown Bay.

BEWICK'S SWAN, *Cygnus bewickii bewickii*.—On 12th January seven occurred on Fair Isle, one on Possil Marsh on 5th February and 23rd April, and three there on 16th March.

GREY LAG-GOOSE, *Anser anser*.—A flock of twenty-eight arrived at Alticig, Luce Bay, on 21st August, "very early." On 26th December two were seen at the Isle of May.

Grey Geese in large numbers were noted at Loch Leven on 29th April, on the Tay Estuary next day, and going north near Perth on 1st May. In autumn numbers are recorded as arriving from 20th September to 22nd October.

WHITE-FRONTED GOOSE, *Anser albifrons*.—A flock of fifty was seen at Vallay on 14th April, and the species returned to the Outer Hebrides about 5th October.

BEAN-GOOSE, *Anser fabalis fabalis*.—On 27th February a Bean-Goose was shot on the Tay Estuary (r. 1922, 59), on 16th April seven flew north over Crossmichael, and movement to the north-east is recorded from Hareshawmuir on 23rd April and 8th and 9th May. On 17th August an exceedingly early return is noted at Hareshawmuir, where three Bean-Geese were seen.

PINK-FOOTED GOOSE, *Anser brachyrhynchus*.—About thirty were seen near Luffness on 7th April, one at Glenorchard on 9th April,

two, dead, at Loch Leven on 6th May. In October about two thousand Pink-footed Geese were seen on the Solway (2. xvi. 327).

SNOW-GOOSE, *Anser hyperboreus subsp.?*—See p. 68.

BARNACLE-GOOSE, *Branta leucopsis*.—Last seen, Vallay 9th March and Hyskeir 7th April. Had returned to Hyskeir by 10th October and the Outer Hebrides by 12th October, while on 13th November about a hundred were seen at Vallay.

BRENT GOOSE, *Branta bernicla bernicla*.—Five were seen at Fair Isle on 4th February, and four at Vallay on 15th February. About forty appeared on Fair Isle on 6th October, twelve at Aberlady on 28th October, and twenty at Vallay on 17th December.

SHELD-DUCK, *Tadorna tadorna*.—Two at the Isle of May on 23rd May. A flock of seventy off Kingoodie (Tay) on 16th July, had all gone except six on 23rd July.

MALLARD, *Anas platyrhynchos platyrhynchos*.—The break-up of the winter flocks took place in the first half of April; on 8th June a flock of ten was seen at Vallay, and flocks on the flats at Invergowrie on 16th June. Movement of what were apparently immigrants is recorded from Fair Isle on 30th September, and thereafter from various stations up to 2nd November.

GARGANEY, *Anas querquedula*.—See p. 68.

WIGEON, *Anas penelope*.—On 5th and 6th January large and restless flocks were flying east in Largo Bay, where, as a rule, they are not common. Small flocks were seen on the River Dee, near Crossmichael, on 16th April; during May notes of what were probably passage migrants come from Isle of May, Tayport Bay, and Fair Isle, and one or two were seen at the last station on 2nd and 8th June. By 29th August movement is again noted at Fair Isle, the "first flight" arrived in Islay on 15th September, and considerable movement is reported up to 2nd November.

SHOVELER, *Spatula clypeata*.—On 16th April several pairs were seen on the River Dee at Crossmichael, and two drakes and a duck at Torrs Sandhills (Wigtownshire) on 28th May.

COMMON POCHARD, *Nyroca ferina ferina*.—Arrivals are recorded on 8th October in Forfarshire, 9th October at Castle Loch, Mochrum, and 19th October on Fair Isle.

SCAUP, *Nyroca marila marila*.—Enormous numbers are recorded on 31st January from St Andrews, 10th February Largo Bay, mid-February Tay Estuary, and 18th February Luce Sands. Last seen, Tay Estuary 23rd April, reappeared, Lunan Bay 7th October.

GOLDENEYE, *Bucephala clangula clangula*.—Last seen, Hirsell (Berwickshire) on 26th April, Lundie Lochs (Forfarshire) 29th April, and Holy Loch 9th May. Return is noted from Loch o' the Lowes, Perthshire, on 23rd September, while from 24th to 31st October considerable immigration is recorded.

LONG-TAILED DUCK, *Clangula hyemalis*.—Last seen, Cullen 10th April, East Neuk of Fife 21st April, Isle of May 25th May; re-appeared on 2nd October at Monifieth Bay and Buddon Ness, and immigration is recorded up to the end of November.

EIDER, *Somateria mollissima mollissima*.—The break-up of the winter flocks took place during the last week of April. Large flocks are recorded in September and October about our east coast.

COMMON SCOTER, *Ædemia nigra nigra*.—A large flock was seen in Largo Bay as late as 15th June; on 24th August six were seen in Monifieth Bay, fair numbers Tay Estuary 11th September, while on 13th October a great arrival of this and the Velvet Scoter was observed in Largo Bay, "flocks coming in constantly from the east."

GANNET, *Sula bassana*.—Four on 17th January between the Bell Rock and the North Carr Lightship, and on 29th January several were seen about Ailsa Craig, otherwise the movements were normal.

STORM PETREL, *Hydrobates pelagicus*.—Two were seen at one of our east coast stations on 20th May, and one was at the Hyskeir lantern early on 3rd September.

MANX SHEARWATER, *Puffinus puffinus puffinus*.—Seen in the Firth of Forth up to 15th June, at the Hyskeir lantern on 31st August and 3rd September, and Mull of Galloway lantern on 17th September.

SLAVONIAN GREBE, *Podiceps auritus*.—A good many records of this species in January and February. On 26th August two were seen at Coulin (West Ross) two in the sea at St Andrews on 2nd November, and one in Tay Estuary on 25th December.

RED-NECKED GREBE, *Podiceps griseigena griseigena*.—See p. 68.

BLACK-NECKED GREBE, *Podiceps nigricollis nigricollis*.—See p. 69.

BLACK-THROATED DIVER, *Colymbus arcticus arcticus*.—On 14th February one was shot at Craigmore, Bute (I. 1923, 49), while on 15th June six, and on 12th July two were seen in Largo Bay. On 21st October one, still partly in summer plumage, was noted off Buddon Ness.

RED-THROATED DIVER, *Colymbus stellatus*.—Seen in Tay Estuary up to 17th April. Notes of return movement come from 3rd

October onwards, while on 2nd November great numbers were seen round the coast about St Andrews.

WOOD-PIGEON, *Columba palumbus palumbus*.—From 15th April to 20th May notes of small numbers come from Fair Isle, Vallay (O.H.), and the Isle of May, and again in autumn from these stations from 26th September to 16th October.

STOCK-DOVE, *Columba ænas*.—On 6th January a good many were seen about Largo, and the species increased rapidly thereafter, while on 1st February a flock of thirty-seven was seen at Glenorchard.

TURTLE-DOVE, *Streptopelia turtur turtur*.—Two visited Fair Isle on 5th June.

OYSTERCATCHER, *Hæmatopus ostralegus ostralegus*.—Returns to breeding-places are recorded from 25th February onwards. Large flocks remained about the mouth of the Tay throughout summer, while in August there are notes of departure from breeding-places.

DOTTEREL, *Charadrius morinellus*.—One was on the Isle of May from 26th to 30th September.

GOLDEN PLOVER, *Charadrius apricarius*.—From 25th February to 20th April much migration of Golden Plover is recorded, many of the earlier records, no doubt, refer to our own breeding birds, *Ch. a. oreophilus*, while the later ones may refer to passage migrants of the typical form. In autumn there is a very well-marked movement extending from 23rd August to 6th November, and recorded from stations all over Scotland, but we cannot say to which form the notes refer.

GREY PLOVER, *Squatarola squatarola squatarola*.—Notes of one or two come from Largo Bay on 6th January, Luce Sands on 18th February, and Luffness on 7th April. Autumn arrivals are recorded from Buddon Ness and Largo Bay from 29th September to 4th November.

LAPWING, *Vanellus vanellus*.—Weather movements are recorded on 4th and 14th January at Dundee and Broughty Ferry, and on 22nd and 23rd January considerable movement to the east is noted at Glenorchard. Returns to breeding-places are recorded from 9th February to mid-March; a few Lapwings were seen on Fair Isle in April, and one or two at the Isle of May from 20th to 25th May. Autumn movement is recorded steadily from 1st September to 16th October; many of the notes refer to coastward movements of our own birds, but arrivals from overseas are also recorded.

TURNSTONE, *Arenaria interpres interpres*.—Is recorded up to 24th May on the Isle of May, 7th June on Hyskeir, and 20th June at Vallay. Return movement is noted at Hyskeir on 20th July and Tentsmuir Point on 5th August, and many other places thereafter.

SANDERLING, *Crocethia alba*.—Some numbers are recorded in Tayport Bay on 20th May and 10th June. One was seen at Gairloch (West Ross) on 23rd August, while from 28th August to 9th October small numbers are recorded from Fair Isle, Hyskeir, and Monifieth Bay. One was at the Edenmouth on 2nd November, and a few at Fair Isle and Hyskeir on 28th December.

KNOT, *Calidris canutus canutus*.—Recorded in the Tay Estuary up to 25th March. Arrivals are noted on 22nd July on Tentsmuir Point, 28th August on Fair Isle, and 30th August on Hyskeir; thereafter there is a good deal of movement up to 4th October.

CURLEW-SANDPIPER, *Calidris ferruginea*.—On 31st August about twenty are recorded from the Dornoch Firth (i. 1922, 165), four were in Monifieth Bay on 2nd September, one at Buddon Ness on 2nd October, and one at Invergowrie Bay on 8th October.

LITTLE STINT, *Calidris minuta*.—See p. 69.

PURPLE SANDPIPER, *Calidris maritima maritima*.—Seen up to 23rd May on the Isle of May, and had returned to Hyskeir by 22nd July.

COMMON SANDPIPER, *Tringa hypoleucos*.—Arrivals are noted at Clubbiedean, Midlothian, on 11th April, Summerston next day, Eaglesham on 14th, Kilmaccolm, Corsemalzie, and Hareshawmuir on 15th April. Thereafter steady arrival of breeding birds is recorded up to 10th May, and the species was on passage at the Isle of May up to 18th May. Last seen in autumn near Cambuslang (Clyde) on 3rd September, near Easthaven, on 9th September, and at the Isle of May on 4th October.

GREEN SANDPIPER, *Tringa ochropus*.—See p. 69.

GREENSHANK, *Tringa nebularia*.—Two seen at Vallay on 1st March and one at Hyskeir on 3rd May. By 22nd July autumn movement was noted at Hyskeir, and is recorded pretty steadily from various stations up to 12th October. Five were on Linlithgow Reservoir from about the third week of September to 17th October, and one was seen there on 2nd November (i. 1922, 174), while a Greenshank was on Morton Loch, (North Fife), on 20th and 23rd December.

GREY PHALAROPE, *Phalaropus fulicarius*.—See p. 69.

RED-NECKED PHALAROPE, *Phalaropus lobatus*.—Returned to a breeding-place on 2nd June.

BAR-TAILED GODWIT, *Limosa lapponica lapponica*.—A flock of a hundred was seen on Luce Sands on 18th February, eighty in Tayport Bay on 10th June, thirty there on 24th June, and about a hundred and fifty on 22nd July. Had returned to Vallay by 11th August and the Forfarshire coast by 24th August, thereafter there are many records of this species on our coasts.

BLACK-TAILED GODWIT, *Limosa limosa limosa*.—See p. 69.

CURLEW, *Numenius arquata arquata*.—Returns to breeding-places are noted from 23rd February to 16th March; flocking after breeding had begun by 2nd June, and during July and the first half of August many returns to the shores are noted. Curlew were at the Skerries lantern on 2nd September, and numbers at the Mull of Galloway lantern on 27/28th September.

WHIMBREL, *Numenius phaeopus phaeopus*.—First recorded from Vallay and Hyskeir on 6th May, Fair Isle and Luce Bay on 8th May, and records of small numbers, moving, come up to 4th June. Return movement is noted on 16th July and continued throughout August. Last seen, Hyskeir 3rd September, Hareshawmuir 13th, and Mull of Galloway 28th September.

GREAT SNIPE, *Capella media*.—See p. 69.

COMMON SNIPE, *Capella gallinago gallinago*.—Movement is recorded at Fair Isle up to 26th April. By 22nd August one was seen on Hyskeir, and throughout September and October a good deal of movement is reported from many parts of Scotland. A Snipe was at the Bell Rock lantern on 6th November, and a few at Fair Isle and Hyskeir on 28th December; some of these records may refer to *C. g. faeroensis*.

JACK SNIPE, *Lymnocyptes minimus*.—One was seen at Skerries on 21st May. Autumn arrivals are noted on 18th September in Luce Bay, 26th September on Isle of May, and 27th September on Fair Isle, thereafter there are a good many records of arrivals, a number being seen at Vallay on 17th November.

WOODCOCK, *Scolopax rusticola rusticola*.—Passage migration is noted at Fair Isle from 8th April to 3rd May. Autumn arrivals are noted from 27th September to 20th November, notes coming from both east and west.

SANDWICH TERN, *Sterna sandvicensis sandvicensis*.—First seen at the East Neuk of Fife on 21st April, Tayport Bay next day, and

Luce Bay on 8th May. Last seen, Luce Bay on 10th September, Buddon Ness on 3rd October, and the Firth of Forth on 5th October.

ROSEATE TERN, *Sterna dougallii dougallii*.—See p. 69.

COMMON TERN, *Sterna hirundo hirundo*.—Seen at the Tay Estuary on 6th May, and on 9th in the Firth of Forth. Last recorded from the Mull of Galloway lantern 27/28th September, Buddon Ness 4th October, and a good many from Firth of Forth 5th October.

ARCTIC TERN, *Sterna paradisica*.—Arrivals are recorded on 4th May from Vallay, 15th May from Hyskeir, and 18th May from Skerries.

LITTLE TERN, *Sterna albifrons albifrons*.—Recorded on 12th May from Tentsmuir Point, and 24th May from Vallay. Last seen, Buddon Ness on 6th September, and one at Hareshawmuir on 9th September.

BLACK-HEADED GULL, *Larus ridibundus ridibundus*.—Returns to breeding-places are noted during the first half of April; the first movements to the shores took place early in June and continued till 12th August, by which date the gulleries seem to have been deserted. On 27/28th September some were at the Mull of Galloway lantern.

LESSER BLACK-BACKED GULL, *Larus fuscus fuscus*.—One was seen at Isle of May on 24th May.

BRITISH LESSER BLACK-BACKED GULL, *Larus fuscus affinis*.—Returns, apparently all of this sub-species, are recorded from Glasgow Harbour and Erskine Ferry on 7th March, Loch Goil on 15th March, and Hareshawmuir on 15th April.

GLAUCOUS GULL, *Larus hyperboreus*.—A few are recorded from Fair Isle in January, February, and November, and one at Hyskeir on 22nd December.

ICELAND GULL, *Larus glaucoides*.—Single birds are recorded from Hyskeir on 15th January, and Fair Isle on 20th January and 4th February. Up to the end of April two frequented Oban and one remained to the middle of July when it was killed. An Iceland Gull was at Newport (Fife) for some time from 1st August.

POMATORHINE SKUA, *Stercorarius pomarinus*.—One was shot at Dallas, near Forres, in autumn (*Banffshire Journal*, 21/11/22).

ARCTIC SKUA, *Stercorarius parasiticus*.—Seen 10th May at the Isle of May and 22nd May at Vallay. One was seen at a Black-

headed Gullery in the hills above Pitlochry in July, and one off Balcomie (East Fife), on 8th July. A good deal of movement is recorded on the east coast from 11th September to 17th October.

LITTLE AUK, *Alle alle*.—In the beginning of January a few were seen about Fraserburgh, a few at Fair Isle on 12th January and 4th February, and one in Largo Bay on 28th January.

CORNCRAKE, *Crex crex*.—Arrivals are recorded from Kilbarchan (Renfrewshire) on 25th April, Hareshawmuir on 1st May, and Beith and Invergowrie on 7th May, after which there are many notes of arrival up to 21st May. Late records come from the Bell Rock lantern on 19th October, Latheron, Caithness, 28th October (*Scotsman*, 4/11/22), Errol on 7th December, and near Girvan twice during this month (*Scotsman*, 13/1/23).

SPOTTED CRAKE, *Porzana porzana*.—See p. 69.

MOORHEN, *Gallinula chloropus chloropus*.—One struck the Pladda lantern on 1st February (I. 1923, 50).

BLACK GROUSE, *Lyrurus tetrix britannicus*.—A Greyhen flew against a wall at Viewforth, Edinburgh, and was picked up stunned on 27th April (*Scotsman*, 29/4/22).

QUAIL, *Coturnix coturnix coturnix*.—One occurred at Whitehall (Berwickshire) on 24th September.

The British Common Guillemot. A New Sub-species.—Under the sub-specific name of *albionis*, Mr H. F. Witherby, in *British Birds*, May 1923, has separated the Common Guillemot breeding in the British Isles from the typical race, *Uria troille troille*. The new sub-species is distinguished from the typical form by its paler and less black upper parts, which are brownish mouse-grey, by its brown, not black, flank streaks, which are also narrower and less prominent, and by its throat in summer being paler chocolate brown. Its distribution in Scotland is still very incompletely known; but birds breeding on St Kilda and the Orkney and Shetland Isles, are stated to belong possibly to the typical race, while birds in the Royal Scottish Museum collections from Ailsa Craig are of the *albionis* race, like those breeding in England, Ireland, and possibly on the N.W. coast of France and on the Berlengas off the Portuguese coast. The measurements of this southern race average less than those of typical northern birds, but measurements overlap and are apparently unreliable as an absolute means of identification.

ON THE OCCURRENCE OF THE FARÖE SNIPE
IN THE BRITISH ISLES.

By Mrs A. C. MEINERTZHAGEN and Col. R. MEINERTZHAGEN.

THE Faröe Snipe, *Capella gallinago faröensis*, a native of Iceland and the Faröes, is distinguished from the Common Snipe by its much redder upper parts, which are more plentifully vermiculated with rufous; the buff edges of the scapulars also appear to be narrower. The Faröe race has not previously been recorded as occurring in the British Isles. The following Snipe in the collection of the Natural History Museum, South Kensington, belong to this race, which probably occurs fairly frequently on migration, but is overlooked.

	Sex.	Locality.	Date.
IRELAND	♀	Donegal	6/2/93
	♂	"	18/1/—
	♀	Mayo	8/12/92
ENGLAND	?	Cornwall	no date
	?	"	Christmas 1871; type of <i>Gallinago russata</i> .

The Snipe in the Royal Scottish Museum, Edinburgh, were placed at our disposal through the kindness of Dr Ritchie, and among them were two Faröe Snipe, viz.:—

	Sex.	Locality.	Date.
SCOTLAND	♀	St Kilda	12/9/10
	♂	"	30/9/11
	♂	Tiree	14/12/88*

In addition we have examined one ♂ from Swordale, Ross-shire, 20/10/15, and one ♀ from same locality, 20/9/22, both of which belong to this race.

* This third Scottish specimen of this race is in the collection of the British Museum (Natural History), London.

Winter Example of Black Variety of Mountain Hare.—

Amongst Mountain Hares the appearance of a black individual is of rare occurrence; I would, therefore, record a specimen specially obtained for the Royal Scottish Museum by Mr D. Keith Murray of Thurso. It was shot on 1st February 1922, at Altnabreac, Caithness, and it is worthy of note that the cropping up of black individuals appears to have a definite regional significance, for the few black specimens of Scottish Mountain Hares which have been recorded, have all hailed from the south-eastern portion of Caithness. Latheron parish has furnished two: an individual killed at Achnaclay, Dunbeath, on 7th March 1903, now in the Royal Scottish Museum, and one taken at Braemore, Langwell, on 3rd February 1902, in the possession of the Duke of Portland; while the specimen here described comes from the southern extremity of the neighbouring parish of Halkirk. This localisation suggests that there may be a persistent strain of melanism running in the stock of the area.

In structure apart from colour, it is a typical Scottish Mountain Hare (*Lepus timidus scoticus*). It was shot of set purpose in mid-winter, when all the rest of the Mountain Hares in the region were in full winter coat, so that some observation might be made regarding the extent to which a melanic form shares in the winter change to white. The specimen does indeed show a certain very faint tendency to greyness, particularly to be noticed on the thighs, which in normal individuals show the most marked snow-white change in winter. The suggestion of greyness is due to the presence of scattered white hairs. It is quite possible, however, that the white hairs may not indicate an actual winter change, but may have been present in the summer coat also.

In this connection it may be mentioned that the Achnaclay specimen has densely black fur, showing no trace of greyness; yet it was killed on 3rd March, an early date for the assumption of the summer coat in the north of Scotland.—JAMES RITCHIE.

Pheasant Nesting in Tree.—I am writing to record what I think must be a rather unusual occurrence, namely the nesting of a Pheasant in a tree, where she not only built her nest but incubated her clutch of eggs. As a rule, I take it, Pheasants prefer even roosting on the ground, unless in cold weather, when they will take to the trees, but the making of a nest and sitting on the eggs in a tree, as has just happened at Brigton, near Douglstown in Forfarshire, seems to be a considerable departure from their usual habits.—W. C. DOUGLAS of Brigton, Brig.-General.

CONTRIBUTIONS TOWARDS A LIST OF THE
INSECT FAUNA OF THE SOUTH EBUDES.

From the Zoological Laboratory, University of Cambridge.

II. THE LEPIDOPTERA.

By G. L. R. HANCOCK, B.A. (Cantab).

THE first of this series of papers upon the entomology of the Southern Ebudes appeared in May 1923. In it Mr Balfour-Browne¹ briefly described the nature of the vegetation and cover in the islands of Islay and Jura and gave maps showing the ground covered by the expedition in these two islands.

In the four days which Mr Hutchinson and I spent on Gigha, I covered very superficially almost the whole of the island. This, except in the absence of high ground and the presence of a wood which was a mixed one, damp, and with a considerable amount of *Juncus* growing in parts of it, resembles in its character and vegetation the area covered in Islay and Jura.

The list of species given below cannot be considered in any way complete. Collecting was only carried on for a very short time, and it was not to be expected that the majority of the Lepidoptera would be found as imagines so early in the year.

The shortness of the period of darkness, the cold, windy, and mainly wet weather were probably responsible for the failure of "sugar" at which very few insects were taken; and light was not tried chiefly because conditions were against it.

So far as I can find no lists have been published of the Lepidoptera in any of these islands, and I know only the following species to have been recorded from them:—

From Islay—*Chrysophanus phleas*, L. (Branston Jones).¹⁵*

Callophrys rubi, L. (W. B. Jones).¹⁵

Plebeius argus, L. (W. B. Jones).¹⁵

Acherontia atropos, L.²¹

Sphinx convolvuli, L. (C. Kirk).⁸

* The numbers refer to the bibliography at the end of this paper.

From Jura—*Hemaris tityus*, L. (Evans).¹⁵

Celerio galii, Schiff. (Campbell).¹⁵

Adscita statures, L., "Sound of Jura" (Vaughan).¹⁵

The following list includes all the species, both larvæ and imagines, taken or observed in the islands of Islay, Jura, and Gigha between 15th June and 2nd July 1922. (Species marked with an asterisk (*) were kindly identified or checked for me by Mr W. Mansbridge of Wavertree):—

The islands are denoted: I.=ISLAY. J.=JURA. G.=GIGHA.

Pieridæ—

Pieris napi, L. (I.J.G.).

? „ *brassicæ*, L. (G.).

Nymphalidæ—

Vanessa urticæ, L. (J.).

Pyrameis cardui, L. (I.).

„ *atalanta*, L. (I.G.).

Argynnis aglaia, L. (J.).

Melitæa aurinia, Rott. (I.J.).

Cænonympha typhon, Rott. (I.J.).

Cænonympha pamphilus, L. (I.J.G.).

Lycænidæ—

Chrysophanus phlæas, L. (J.).

? *Lycæna*, Sp. (I.).

„ *icarus*, Rott. (J.G.).

Arctiidæ—

Spilosoma menthastri, Esp. (I.).

Parasemia plantaginis, L. (J.).

Lasiocampidæ—

? *Macrothylacia rubi*, L. (I.J.).

Lasiocampa quercus, L. (I.).

Noctuidæ—

Phlogophora meticulosa, L. (G.).

Mamestra oleracea, L. (I.).

„ *dentina*, Esp. (I.).

Caradrina quadripunctata, F. (I.).

Acronycta rumicis, L. (G.).

Triphæna pronuba, L. (G.).

Agrotis strigula, Thnb. (J.).

Noctua plecta, L. (I.J.).

Apamea gemina, Hb. (I.J.).

Hadena adusta, Esp. (J.).

Noctuidæ—

Cucullia umbratica, L. (I.).

Xylophasia rurea, F. (G.).

Prothymnia viridaria, Cl. (J.).

Plusia interrogationis, L. (I.).

Petilampa arcuosa, Hw. (G.).

Geometridæ—

Ematurga atomaria, L. (I.J.).

Xanthorhoe montanata, Bkh. (I.J.G.).

Scodiona belgaria, Hb. (I.J.).

Cabera pusaria, L. (I.J.).

* „ *exanthemata*, Sc. (I.).

Perizona flavofasciata, Thnb. (G.).

Camptogramma bilineata, L. (G.).

Eupithecia nanata, Hb. (I.J.).

* „ *satyrata*, Hb. (I.J.).

Gymnoscelis pumilata, Hb. (J.).

* *Acidalia fumata*, Sthp. (J.).

* *Coremia designata*, Rott. (I.).

Hydriomena impluviata, Hb. (I.).

Zygænidæ—

Zygæna, Sp. (J.).

Pyralidæ—

* *Phlyctænia fuscalis*, Hb. (J.).

Pyrausta purpuralis, L. (I.).

Scoparia ambigualis, Tr. (I.J.G.).

„ *dubitalis*, Hb. (I.).

* *Crambus pratellus*, L. (I.J.G.).

* „ *hortuellus*, Hb. (I.J.G.).

Tortricidæ—

* *Eucosma lacunana*, Dup. (I.J.).

* „ *dimidiana*, Sodof. (I.).

Tortricidæ—

- **Bactra lanceolana*, Hb. (I.J.).
- **Ancylis myrtillana*, Tr. (J.).
- Symæthis oxyacanthella*, L. (I.).
- Stigmonota compositella*, Fb.(J.).
- **Ephippiphora trigeminana*, St. (I.).
- **Euxanthis angustana*, Tr. (I.).
- **Phalonia nana*, Hw. (I.).
- **Cacœcia musculana*, Hb. (I.).
- *? *Catoptria ulicetana*, Hw. (I.).

Tineidæ—

- Gelechia ericetella*, Hb. (I.J.).
- * „ *terrella*, Hb. (I.J.).
- Endrosis fenestrella*, St. (J.G.).
- **Glyphipteryx thrasonella*, Sc. (J.G.).

Tineidæ—

- Argyresthia conjugella*, Z. (J.).
- **Acompzia pseudospiretella*, Str. (I.J.G.).
- **Coleophora cæspititiella* ? Z. (I.J.).
- **Coleophora albicosta*, Hw. (J.).
- **Monopis rusticella*, Hb. (I.).
- **Elachista subalbidella*, Schl. (I.).
- **Adela fibulella*, Schiff (I.).

Hepialidæ—

- Hepialus humuli*, L. (I.J.).
- „ *velleda*, Hb. (J.G.).

Micropterygidæ—

- **Eriocephala aureatella*, Scop. (J.).

REMARKS UPON SOME OF THE MORE INTERESTING SPECIES IN THE PRECEDING LIST.

Pieris napi.—Mr Bethune Baker very kindly examined my specimens from Islay and one from Jura. They are all *Pieris napi napi*, and not what Verity¹⁷ calls *napi britannica*.

One or two specimens were observed on Gigha, but unfortunately none was captured.

Pieris brassicæ.—One specimen was observed on Gigha but not captured.

Vanessa urticæ.—Several larvæ were found feeding on a clump of nettles by the roadside near Feolin Farm (Jura) on 28th June. Two imagines were eventually bred from them emerging 15th and 16th August.†

Argynnis aglaia.—The ground colour seems rather deeper and redder than most southern specimens, being the same as a single Aberdeen specimen in the Hawkshaw collection at Cambridge. The specimens were all freshly emerged ♂♂. South¹³ states that the species has only been recorded from Skye in the Western Isles, but it has since been recorded from Coll,⁴ and is also recorded from Arran.¹⁹

Mr H. T. G. Watkins has very kindly examined two of my specimens. He tells me that they are larger than the typical *A. aglaia* and closer to his *A. aglaia scotica* (*Entomologist* 1923,

† All larvæ were reared at Cambridge.

p. 108), but they differ from the specimens of this form in the British Museum in being deeper tawny above and below, and having the apex of the forewing rounder. They more resemble the one Irish ♂, which he thinks may possibly be found to be another race when the Museum has more material.

Melitæa aurinia.—The Rev. George Wheeler very kindly examined some of the specimens for me, and describes them as belonging to *var. scotica*. The specimens from Islay were captured in a very restricted area in a slight depression on the south-west side of the road from Port Ellen to Kintra, an area more or less exposed to the east. On Jura they were distributed some distance up a valley, again exposed to the east, and also below a steep bank facing east on the west side of the road running north from Craighouse. They were not nearly so restricted in area as on Islay. The preference of the larvæ for an eastern exposure is recorded by Moses Harris, according to Barrett.²

Cænonympha typhon.—Was just emerging, but only ♂♂ were captured, one from Oa (Islay) and four from the west of the road running north from Craighouse (Jura). These specimens are of the northern race³ *var. scotica* Staud (= *laidion* Bork), and closely resemble some of the specimens from Rannoch in the Hawkshaw collection, but are somewhat grayer, like the single Stornoway specimen in the same collection. Some Arran specimens in the Hawkshaw collection are typical *typhon* Rott.

Cænonympha pamphilus.—Was the commonest butterfly on the Islands. Watson,¹⁹ however, records it as being rare on Arran.

Chrysophanus phlæas.—One very worn from Jura.

Lycæna icarus.—Was just emerging, the ♂♂ were fairly plentiful on Gigha. Mr Montagu observed what he thought to be a *Lycæna* on Islay. Two ♂♂ and one ♀ were captured on Jura. The ♂♂ are very brilliant blue, some specimens having a few minute black dots on the upper side on the outer margin of the hind wings. The ♀♀ are also bright with a large amount of blue scaling, extending in two specimens all over the forewings with the exception of the apex and outer margin.

The orange spots are not very large or numerous, and distinctly less than is to be seen in some specimens of the second 1922 brood from Ireland taken by Mr S. G. Campbell of Christ's College, who kindly allowed me to compare my specimens with his. The discal spot is in no case surrounded with whitish blue in the few Ebudes specimens, whereas a moderate percentage in Mr Campbell's Irish

series have this character. The specimens are all referable to *var. clara* which, as Tutt points out in Vol. XI,¹⁵ unlike many of our described British varieties, does not come under Oberthür's¹⁰ British race *tutti* (Fasc. IV., p. 138), which is described as being grayer than the continental and having a reddish tint. Tutt also mentions that *var. clara* is racial on the extreme west and north-west coasts.

Parasemia plantaginis.—One freshly emerged ♂ was captured below the Paps of Jura. Mr Balfour-Browne found one larva in Jura from which a ♀ was reared, which emerged on 30th July. Both specimens were rather heavily marked with black. The ♂ has no tendency towards *var. hospita* Schiff.

Macrothylacia rubi.—This species was observed once or twice in Islay and Jura.

Lasiocampa quercus.—Several larvæ, which eventually died, were found feeding on *Calluna* in Islay.

Apamea gemina.—Two of the specimens from Islay approach *var. remissa*.

Plusia interrogationis.—One larvæ swept from *Calluna*. Imago emerged 24th July.

Triphæna pronuba.—One specimen, which was brought to me. It had purple-brown forewings; a form mentioned by Watson.¹⁹

Zygæna sp.—A cocoon, spun on a grass stem below the Paps of Jura.

Catoptria ulicetana.—Mr Mansbridge says:—"Catoptria ulicetana, I believe; one is worn and the other a melanic example, but I think my identification is correct."

Glyphypteryx thrasonella.—The only specimen captured on Gigha was *var. cladiella* Stt.

Coleophora cæspitiella?—Too worn to determine species certainly.

Hepialus humuli.—Only ♂ ♂ were captured, all of them typical.

Hepialus vellela.—Two Jura specimens of *var. gallicus* (which is also recorded from St Kilda^{6, 18} and Lewis.⁵)

Most of the species recorded are found also in both Scotland and Ireland. I can find no record either by Meyrick⁹ or Kane⁷ of *Adella fibulella* from Ireland. Nor

is this species recorded for the Clyde area of Scotland.²¹ I do not know whether *Stigmonota compositella* is common in Scotland; Meyrick⁹ records it only from the south of York, but Barrett² has one record from Perthshire.

The records from the islands on the west coast of Scotland are not at all complete. There are still several of the larger islands concerning the Lepidoptera of which no records have been published, so far as I can find. There are lists published of the Lepidoptera from St Kilda, Lewis, Coll, and Arran, though they are almost certainly incomplete, except perhaps "The Rhopalocera of Coll."⁴ I have found also a few notes from Skye.

Considering only the Rhopalocera (these probably having been less overlooked) from the records, I have found the Southern Ebudes in general resemble the mainland. The common and widely distributed species of the mainland mainly extend to the Outer Hebrides except St Kilda, where *C. pamphilus* is "the only butterfly"²⁶ (the migratory *V. cardui* excepted). *Pieris rapæ*, however, seems still unrecorded from any of the Hebrides. South states that there are no records from them.¹³ I can see no reason for this well known and abundant species being absent from these islands. It occurs²⁵ in the Orkneys and Shetlands.²⁵ South does not mention *Pieris napi* from the Hebrides. Mr W. S. Bristowe of Kaines College has shown me a specimen of this species from the Shiant Islands (Outer Hebrides).

I am not acquainted with Arran, Coll, or the Outer Hebrides, and therefore cannot tell how far the numbers of their species are affected by the nature of the habitats available. Neither am I sufficiently well acquainted with the varieties of the Lepidoptera occurring on the mainland to compare my specimens with them. Except in *C. typhon* I have not noticed the general tendency to grayness in specimens from the Southern Ebudes mentioned by J. Jenner Weir,²⁰ as characteristic of many of the Lepidoptera of the Outer Hebrides.

Lycæna icarus var. *clara* is the only other variety of special interest.

I wish to thank all those persons who very kindly helped me by examining specimens or referring me to records.

BIBLIOGRAPHY.

- ¹ Balfour-Browne, F., "The Aquatic Coleoptera of the South Ebudes," *Scot. Nat.*, 1923.
- ² Barrett, C. G., "Lepidoptera of the British Islands," London, 1893.
- ³ Buckell, F. J., "The Races of *Cœnonympha typhon*," *Ent. Rec.*, 1895, p. 100.
- ⁴ Cowan, F., "The Rhopalocera of Coll.," *Scot. Nat.*, 1919, p. 64.
- ⁵ Fremlin, H. S., "Lepidoptera from Lewis," *Entomologist*, 1900, p. 37.
- ⁶ Hewitt, C. Gordon, "Lepidoptera from St Kilda," *Scot. Nat.*, 1907, p. 220.
- ⁷ Kane, W. F. de V., "Catalogue of the Lepidoptera of Ireland."
- ⁸ Kirk, C., "Note on *Sphinx convolvuli* in Islay," *Scot. Nat.*, 1915, p. 331.
- ⁹ Meyrick, E., "A Handbook of British Lepidoptera," London, 1895.
- ¹⁰ Oberthür, C., "Études de Lépidoptérologie comparée."
- ¹¹ Scott, H., "Lepidoptera, Hymenoptera, Hemiptera and Siphonaptera, collected in the Outer Hebrides, 1914," *Scot. Nat.*, 1915, p. 252.
- ¹² Seitz, A., "Lepidoptera of the World," Stuttgart, 1913.
- ¹³ South, R., "Butterflies of the British Isles," London, 1906; "Moths of the British Isles."
- ¹⁴ South, R., *The Entomologist*, "Synonymic Reference List," London, 1884.
- ¹⁵ Tutt, J. W., "British Lepidoptera."
- ¹⁶ Verity, R., "Rhopalocera Palearctica, Pieridæ and Papilionidæ," Florence, 1905.
- ¹⁷ Verity, R., "Races of British Butterflies" (several papers), *Ent. Rec.*, 1916.
- ¹⁸ Waterston, J., "Some Lepidoptera and other Insects from St Kilda," *Scot. Nat.*, 1912, p. 262.
- ¹⁹ Watson, H. B., "Lepidoptera from Arran," *Entomologist*, 1893, p. 52.
- ²⁰ Weir, J. Jenner, "Lepidoptera from the Outer Hebrides," *Entomologist*, 1881, p. 218.
- ²¹ Dalglish, A. A., and King, J. J. F. X., "Lepidoptera in Handbook of the Natural History of Glasgow and the West of Scotland," edited by G. F. Scott Elliot, Malcolm Laurie, and J. Barclay Murdoch, Glasgow, 1901.
- ²² Gilmour, T. F., *Trans. Nat. Hist. Soc., Glasgow*, vol. vi., p. 169, "Exhibit of *A. atropos* from Islay."
- ²³ Belfast Naturalists' Field Club, "A Guide to Belfast" (for British Assoc.) Belfast, 1902.
- ²⁴ Grimshaw, P. H., "Notes on the Insect Fauna of South Uist," *Scot. Nat.*, 1920, p. 87.
- ²⁵ South R., "List of Lepidoptera, from Orkneys, Shetlands, and Outer Hebrides," *Scot. Nat.*, vol. iii., p. 297.

²⁶ Dale, C. W., "Insect Fauna of St Kilda," *Entomologist*, 1889.

²⁷ Evans, W., "Lepidoptera from Scottish Lighthouses (including Lewis)," *Scot. Nat.*, 1914 and 1915.

Collections used for comparison in the Cambridge University Museum of Zoology: (a) Hawkshaw collection; (b) Blackburn—Maze collection.

Abnormal Growth of Hoofs in Red Deer.—I have sent to the Royal Scottish Museum two hind's feet from Corroul which show an abnormal growth of hoof. The hind had lost the lower part of one of its forelegs as the result of a shot or accident, and although the animal was on three legs for a whole year it was in good condition when killed. The fourth leg was short by six inches, the end being quite healed up and hard. The third hoof, which my keeper did not keep, showed the same strange development as those I have sent.—JOHN STIRLING MAXWELL, Pollokshaws.

[These interesting specimens show what must be looked upon as the ordinary growth of hoof. In natural conditions the wear and tear of active life counterbalances this steady development; but with a reduction in activity caused by the loss of a limb, the wear on the hind's hoofs no longer kept pace with the growth, so that the hoof projected far beyond its usual limit. The case is paralleled in the Scottish Zoological Park, where, again, owing to the enforced inactivity of the animals as compared with their wild life, the hoofs of the Reindeer and Barbary Sheep far overshoot the normal growth.—J. R.]

Turtle Dove in Banffshire.—On 31st May I observed a Turtle Dove in a plantation skirting the main road a quarter of a mile to the south of the town of Cullen. It allowed of approach within a dozen yards or so and would then move on to the next tree. I could not find from inquiry that it was an escape.—JANE GOWAN, Cullen.

[The increase in the numbers of Turtle Doves seen in Scotland, sometimes in pairs, during the summer season, suggests that this bird, which nests in England as far north as Cumberland, Durham, and perhaps Northumberland, is meditating an extension of range into Scotland, to which it has hitherto paid only passing visits. We should be glad to hear of the occurrence or of the nesting of this species north of the Border.—J. R.]

Pied Flycatcher in Selkirkshire.—When walking along the wooded banks of the Yarrow, quite near to the stately ruins of Newark Tower, my attention was drawn to a strange song. I am acquainted with nearly all the songs of our local birds, but this one was quite distinct. The song was not much to boast of, consisting of only a very few notes, but I cannot describe it. The singer was perched on a neighbouring tree, and I was at once struck by its singular markings, in pure black and white. In a little while it flew to an adjoining tree and there it clung to the side of a hole, and in a little while disappeared inside, only to reappear in a few moments. The hole was about 11 feet from the ground, and I think the tree was an ash. Shortly afterwards the bird flew about 50 yards away, alighted on a fallen tree trunk, and from this point of vantage it made short excursions into the air, or to the ground amongst short grass, in every case returning to the tree trunk. Its movements were characteristic of a Flycatcher, and I concluded that I had chanced on the rare Pied Flycatcher at a nesting site in Selkirkshire.—J. R. SIMPSON, Selkirk.

Müller's Topknot, *Zeugopterus punctatus*, off Shetland.—Mr Johnston Flucker, of the trawler *Fair Isle* of Granton, has forwarded to me for identification a mature example of the above species from the Shetland Isles. It was trawled on 5th June 1923 off the Skerries, on a sandy bottom at a depth of 32 fathoms. It was practically full-grown, measuring $7\frac{1}{4}$ inches from tip to tip.—JAMES RITCHIE.

Scottish Cephalopods.—An important paper by Dr E. S. Russell, dealing with the Cephalopod collections made by the research steamer *Goldseeker* off the Scottish coast, has recently been published by the Fishery Board for Scotland. The paper records sixteen species, including three new species and one new variety, and contains some excellent figures.

Great Wood-Wasp in Westernness.—During the present summer I obtained an example of the Great Wood-Wasp (*Sirex gigas*) in a wood in Glen Garry, an area in Inverness-shire, where the occurrence of this large species has been disputed, although I have known of its presence there for some time.—M. MATHESON, Invergarry.

[The specimen, which was forwarded to the Royal Scottish Museum, was a female, and is the first definite record from Inverness-shire, north of the Caledonian Canal.—J. R.]

Scandinavian Lesser Black-backed Gull on Spring Passage at the Isle of May.—From the records given in the *Practical Handbook of British Birds*, there seems to be little definite information available regarding the occurrences of the Scandinavian Lesser Black-backed Gull on our coasts, we think therefore it may be of interest to record what we saw on the Isle of May this spring (1923). On 1st May six were seen passing over the island about 11 A.M. going north, they were all together in a little party and were not flying very high, but were travelling steadily onwards. Three were seen on the 3rd also going due north, while on 4th, 5th, 7th, and 13th May single birds were noted; that on the 4th was going N.N.W., the line most commonly taken by birds passing the island in spring. Any others which were seen passing were going directly to the north. This form is easily distinguished from the British Lesser Black-backed Gull, the dark mantle being very striking.—LEONORA JEFFREY RINTOUL and EVELYN V. BAXTER, Largo.

Manx Shearwaters at the Lantern at Hyskeir.—From 10 P.M. till midnight on the 12th April 1923 was a great night here with Manx Shearwaters, they were striking every two or three minutes on the tower, parapet, lantern, and dome. I had to do some quick side-stepping to avoid being struck, when on the balcony, by those which came up from below the rays and struck the parapet wall. Fortunately, all of them (but four dead) which I picked up in the morning, were able to fly when flung into the air. They had to be flung up head to wind, they just came down flop if thrown up with the wind; two of them had broken beaks. I think this may be of sufficient interest to record, as I don't think it is common to see these birds at the lantern in such numbers.—JOHN BAIN, Hyskeir Lighthouse, Inner Hebrides.

Great-spotted Woodpecker in North Perthshire.—On 8th July, while on holiday in the Tummel district, I saw a Great-spotted Woodpecker at Aldcharmaig, near the head of Loch Tummel, Perthshire. I had a good view of the bird, which flew past me quite close, with characteristic undulating flight, and hung on to the upright trunk of a tree about 40 yards off.—JAS. HEWAT CRAW, West Foulden.

Little Stints in Orkney.—As the Little Stint (*Tringa (Erolia) minuta*) is not often met with in Orkney, it may be of interest to record that I saw a flock of about three hundred of these birds on Loch Harry on 27th February 1905.—H. W. ROBINSON, Caton.

BOOK NOTICES.

PRACTICAL ZOOLOGY: FOR MEDICAL AND JUNIOR STUDENTS. By J. D. F. Gilchrist, M.A., D.Sc., Ph.D., and C. von Bonde, M.A. Edinburgh: E. & S. Livingstone, 1922. Pp. xi + 329. Price 15s. net.

Devised in the first place for the use of students of elementary zoology in South Africa, this guide to the structures and dissection of typical vertebrates and invertebrates has been adapted for the use of British students by the inclusion of several additional forms familiar in zoological laboratories in this country. The volume is distinguished by the conciseness of its practical directions for dissection as well as by the number and excellence of the illustrations which accompany the text, and the majority of which are original drawings from actual dissections. The types selected follow the old-established order, and it seems a pity that in a work designed for medical students no attempt should have been made to replace the Cockroach by an insect of medical importance, such as the House-fly or Mosquito, and that Arachnids, some groups of which possess so much medical significance, should be omitted, although the smallness of these forms militates against their value for untutored dissection.

THE BADGER: A FIELD AND UNDERGROUND. By H. Mortimer Batten, F.Z.S. London: H. F. and G. Witherby, 1923. Pp. 159. Price 8s. 6d. net.

By his close observation of the habits of members of our native fauna, Mr Batten is placing naturalists more and more in his debt, and this fresh account of the ways of the Badger will be read with interest by all who share his love for one of the most curious relics of the ancient fauna of Britain. It is true that, reduced to their essentials, many of his observations but record facts already well known, but the merit of his account lies in that it is largely a record of his own experience. His story of a captive Badger that in one night tore a hole clean through a stone wall eighteen inches thick, his excellent descriptions and figures of the complexities of a badger-warren, and his conclusion that, though it is not always guiltless of a taste for game or lamb, the Badger as a rule is a harmless feeder, illustrate the freshness, detail, and independence of his history. But while independence is an admirable virtue, it may be carried too far, and a reference to any standard text-book or museum collection would have prevented his suggestion, that, while a female Badger has six incisor teeth, a male has only five (fig. p. 14), and that the purpose of the sagittal crest is to protect the brain (fig. p. 118), whereas its true use is to afford attachment for the large muscles which work the lower jaw.

A HANDBOOK OF THE LARGER BRITISH FUNGI. By John Ramsbottom, O.B.E., M.A., F.L.S. London: Trustees of the British Museum, 1923. Pp. 222. Price 7s. 6d.

Originally designed as a guide to a series of models of British fungi in the British Museum, this work has expanded into an invaluable account of all the larger fungi. Its main purpose is systematic, but hints are given for the control of destructive species, and the fleshy Agarics are discussed from the point of view of their edible or noxious qualities. Not the least valuable of the new features is an expanded introduction which gives a synopsis of classification and of the natural history of the group, and discusses items of universal interest, such as the formation of fairy rings, the luminosity of fungi, their change of colour, and their usefulness as food. The text contains 141 illustrations, and these and the succinct descriptions greatly simplify identification in a difficult group.

THE HIGHLANDS WITH ROPE AND RUCKSACK. By Ernest A. Baker, D.Litt., M.A. London: H. F. and G. Witherby, 1923. Demy 8vo, 253 pages and numerous photographs. Price 12s. 6d. net.

We have read this book with much interest, especially the introductory chapter, which discourses at some length on the inaccessibility of the greater part of the Scottish Highlands to the general public. We are much in sympathy with the author's complaint that so much of the finest scenery in Britain is beyond the reach of the tourist, and reserved exclusively for a few wealthy sportsmen who spend a week or two annually in pursuit of the Red Deer. The case is clearly and skilfully argued, and all true lovers of nature must read with regret, not to say annoyance, the particulars which are given of the unsuccessful efforts of the Royal Commissions and Departmental Committee on the one hand, and of the Access to Mountains Bill on the other, to come to any arrangement by which some millions of acres of ground, now absolutely forbidden to the harmless pedestrian, might at least be thrown open to the general public under conditions which would at the same time safeguard the interests of the sportsman. The rest of the volume narrates sundry experiences of the author and his friends in various parts of Scotland—including some of the forbidden ground! The adventures are racily told, and interspersed with much delightful word-painting of some of the most enchanting scenery to be met with in the British Isles. We have followed on our own maps some of the tramps and climbs described, and feel that the interest of the book would have been increased by the insertion of large-scale plans of the ground traversed. The photographic illustrations are excellent, and add much to the attractiveness of the volume, which is printed and bound in the customary good style of the publishers.

(Authors are responsible for nomenclature used.)

The Scottish Naturalist

Nos. 141 AND 142.] 1923 [SEPTEMBER-OCTOBER

NATURE STUDY AND BOOKS.

THE study of Nature is essentially a ploy for the open air ; but if we are to gather fresh facts to be added to the book of nature knowledge we must not only observe acutely, we must at some time or other forsake the open for the study. It is only with the bethumbed pages of the great books before us that we can learn what men have already mastered, and speculate on what still remains to be known. What we wish to make clear is this, that so far as nature study is concerned, the use of books is not a prime necessity, but it is almost a necessity, if we are to avoid, in print, the monotonous and wasteful repetition of things already well known to every careful observer. On the other hand, for those who are not interested in animals as they live in nature, the reading of a lively natural history tale has about as much significance as the reading of a light and lively novel. It has no more relationship to serious nature study than has the book version of a lark's song to the real ripple of the bird's music.

Yet, for the serious student, books provide a stimulus to and at the same time a check upon observation, and since in these days the majority of the useful books are expensive, there is a danger that the naturalist may be compelled to forego the purchase of a book which might have cleared his path of difficulties and led him to fresh lines of observation. It is something to be able to say that this danger has been banished through the generosity of the Carnegie United Kingdom Trust. In the autumn of 1921, this Trust estab-

lished a Scottish Central Library for students, from which adult residents in rural areas were enabled to obtain on three months' loan, on payment of carriage only, authoritative modern works on any serious branch of knowledge. Now, in September 1923, after the scheme has undergone a successful trial, the Trust has extended the facilities thus offered to cover residents in municipal library areas. Wherever there exists a Scottish burgh or parish which maintains a free library service, there the librarian is empowered to act on behalf of the Trust in this matter.

Scotland is remarkable for the number of its Nature-lovers; it is famous for the number of naturalists of humble birth and education who have added to the mass of nature knowledge — Hugh Miller, Robert Dick, Thomas Edwards, George Sim of Aberdeen, Charles M'Intosh of Inver, are but a few. Surely these new facilities, which offer (after direct observation in the field and systematic training in the Universities) the best means of guidance along a pleasant but difficult path, ought to be made use of to the utmost, and ought finally to add to the amount as well as to the value of Scotland's contributions to the solution of Nature's riddles.

Yet there is one proviso to be made. The Trust aims at aiding the serious student; and although the serious student must begin somewhere, it is obvious that the books he ought to be supplied with are books which add something to the stock of knowledge, and are the best and most suitable books for the particular study aimed at and for the particular stage of study the student has reached. Now, the list of the works which have been supplied for the purposes of nature study seems to me to indicate that neither the applicants nor the officers of the Trust are always in a position to select the best book for the serious prosecution of a particular branch of study, and this must necessarily be so where sciences have diverged into many branches, and where there exist multitudes of works of all degrees of merit. We would suggest to the Trust, therefore, that its ends would be furthered, its applicants helped on their course, and its funds conserved by the appointment of

an expert in each branch of learning, who would advise not only as to the best work for a particular purpose, but also whether a book requested by an applicant is that best fitted for the limited study he has in view.

Early Arrival and Late Stay of Swifts.—On 4th April 1923, I was surprised to see three Swifts flying over the river Esk at Musselburgh. Aware that this was an exceptionally early arrival I took care to make quite certain. This was not difficult as the birds came quite near, and I had them under observation for fully ten minutes. They were in company with a few Swallows, a fairly early date even for this species. The Swifts were again seen on the 5th April, both at noon and night, and Sand-Martins had now also joined the company. On 6th April a cold spell began, and Swifts and Swallows disappeared, but Sand-Martins stayed on. Swallows reappeared on the 13th, but Swifts were not seen again till the 25th, and this time at Duddingston Loch. Even this was an early date for Scotland; I did not see them again until the main body arrived on 2nd May. On that day I saw them at several localities. Strange to say, as well as arriving earlier, Swifts have been seen later than usual also. Fully a dozen were about Duddingston all the second week of September, and the last I saw of them was on the 15th of that month.—DAVID HAMILTON.

Late Stay of Swifts near Edinburgh.—Some of the Swifts of the south-eastern quarter of Edinburgh have made a later stay than usual this year. The majority of them disappeared about the regular time, 12th to 15th August, but every evening (sometimes during the day too) up to the end of the month we saw about four of them flying round exactly as they had been doing all the summer. On the last evening of August and the first of September their number had increased to seven, but after that we saw no more in our immediate neighbourhood except for a single one on 4th September. The four Swifts, increasing to seven, presumably represented two pairs with late broods. But even a fortnight after their departure we had not seen the last of this year's Swifts, for on 17th September we found a party of nine or ten flying in company with House- and Sand-Martins over Duddingston Loch, in high wind with showers of cold rain. For anything we know to the contrary they may have been about Duddingston continuously up to and beyond that date.—E. LEONARD GILL, Edinburgh.

Late Swift in Inverness-shire.—On 17th September in rain and a southerly gale I saw a Swift on the wing at Aviemore—a very late date for seeing them.—SETON GORDON, Aviemore.

Hoopoe in Lanarkshire.—On the 7th May last some lads while bird-nesting in a wood near the Stand, Airdrie, Lanarkshire, captured a fine male Hoopoe which appeared to be in a somewhat exhausted condition. By them it was given to a local bird-lover, who tried to keep it alive by placing it in his garden-frame. Three days later, however, it died, and the dead bird was brought to Mr Gavin Reston, senior, Airdrie, who at once dispatched it to a Glasgow taxidermist for preservation. A few days ago the mounted specimen was received, and it has since been added to the ornithological section in the local museum.—JAS. JACK, Airdrie.

Nesting of Great Spotted Woodpecker in Forfarshire.—In May 1923 a pair of birds of this species bred on the Gannochy Estate at Brig-o'-Mooran, near Edzell. The nesting-place was in an alder tree beside the river Northesk, the trees in the vicinity consisting chiefly of birch and pine. The cavity for the nest, which was about twelve feet from the ground, was situated just below the junction of a limb with the trunk. The District Girl Guides, who were camping at the spot, daily observed the old birds carrying food to their offspring, and often heard the cries of the latter. On 4th June, while several of the ladies were studying the movements of one of the parents on the tree, an under-keeper came along, shot the bird, and carried it away. Subsequently he was fined in the Sheriff Court, and severely reproved by the Sheriff, who also ordered forfeiture of the bird. The day after the shooting the dead bird's mate was observed at the nest, but nothing further was seen or heard of the birds, old or young. The latter were believed to have flown off with the surviving parent.

A pair of birds of the same species have nested during the past two seasons in the woods of Craigs, near Montrose. One of the Girl Guides referred to got the information direct from Mr Macpherson-Grant, the proprietor.

The occurrence of a single bird of the species at Kinloss, Cupar-Fife, on 20th March, was reported to the writer by Mr Addison-Scott, the owner of the property.—DOUGLAS J. HUNTER, Arbroath.

[Through the kindness of Sir Eric Hambro, we have had an opportunity of examining the Edzell specimen, which belongs to the British race, *Dryobates major anglicus*, a confirmation of the extension of range of the native form.—EDS.]

THE ROOK IN LANARKSHIRE.

By WALTER STEWART.

THE following is a short summary of a "Census" and inquiry into the conditions and status in the year 1922 of the Rook in Lanarkshire.

The initial work of the Census, which consisted of locating the rookeries, commenced early in February, and was continued until the middle of April, by which time I concluded that all nest-building had finished. Now commenced the counting of the nests, and recording of the following particulars: parish, place, number of nests, kind of trees, age of rookery, young rook shooting, increase or decrease, and general remarks. The Spring of 1922 proved inordinately cold and backward, but this had its compensations, for the advent of the foliage was as a consequence much retarded; and so well did the undertaking progress that when really compelled to call a halt, I found the Census complete, with the exception of the Glasgow rookeries. A Census of these had been taken by Mr H. Boyd-Watt in 1900, and a copy of the results was kindly lent to me by Mr John Robertson, Glasgow. This rendered the remaining part of my work comparatively easy when it was resumed and completed in late October. I found many of these Glasgow rookeries sadly depleted and some defunct; but I was gratified to find one small rookery in the Bellahouston district which had not been included in Mr Boyd-Watt's list. Of this I was unable to glean any particulars, the owners being from home on the day of my visit.

My list, which I now consider fairly complete, contains:—

Total number of rookeries	.	.	.	.	125
„ „ scattered nests	.	.	.	.	33
„ „ nests	.	.	.	.	18,882
„ „ defunct rookeries	.	.	.	.	27

Until the year of the Census my study of the Rook had been mainly confined to that part of Clyde Valley lying between Hamilton and Glasgow. This I had reason to

regret, for on pushing my studies farther afield, I found my knowledge of the bird's habits very incomplete, in fact I found in the Upper Clyde a Rook of different habits altogether.

In order to give some idea of the diversity of the Rook problem as it now presents itself, I have deemed it advisable to divide Lanarkshire into two almost equal parts, which for convenience may be called the North-west and South-east Areas. The line of intersection will cut from the Ayrshire boundary in the south-west to that of Midlothian in the north-east, through that part of the county which contracts to a breadth of only 17 miles. A glance at the rough diagram map which accompanies this paper, will show that our North-west Area really consists of what is known as the Lower and Middle Wards, containing at least 90 per cent. of the county population, while our South-east Area is the sparsely populated Upper Ward.

The following table indicates some of the contrasts between these areas:—

	North-west Area.	South-east Area.
Arable land	90 per cent.	10 per cent.
Rookeries (125)	101	24
Scattered nests (33)	31	2
Total nests, 18,882	8,552	10,330
Winter roosts—		
Deciduous	1	0
Coniferous	0	1
Nesting trees—		
Deciduous	85 per cent.	14 per cent.
Coniferous. . . .	15 „	86 „
Complaints—		
Egg-stealing	None	90 per cent.
Grain-eating	Very few	...

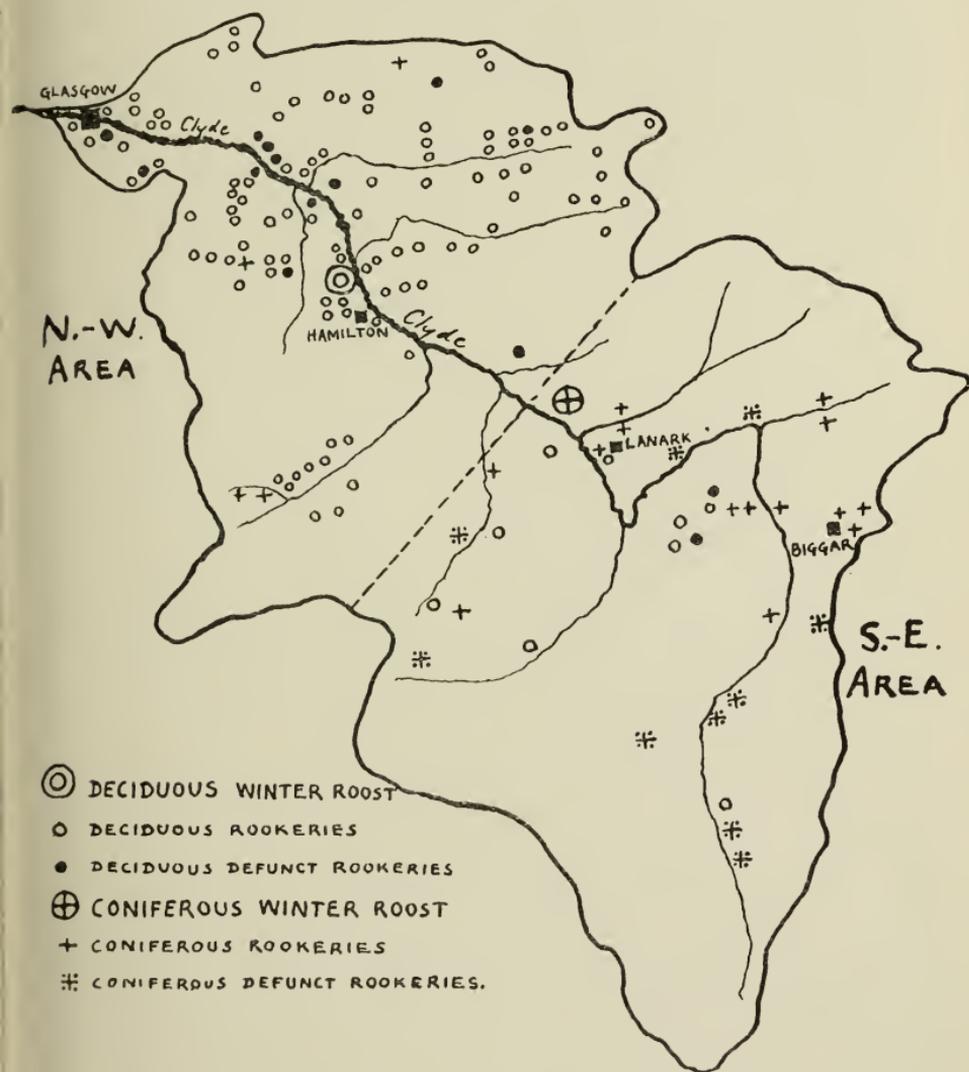
North-west Area.—One or two small rookeries in north-east Lanarkshire, also a few where coniferous rookeries exist in Avondale and East Kilbride.

South-east Area.—Bitter complaints against almost 90 per cent. of the rookeries in this area.

WINTER HABITS.

North-west Area.—Migration, except for an exodus of young birds in October, does not affect the Rook population here. Have visited the majority of the districts during Autumn and Winter and find Rooks

distributed very similar to the other seasons. In mild days in November and December I found them sitting about the nests at all times of the day. All deciduous rookeries showed some droppings about the trees and ground. Two coniferous rookeries were visited in December and found to be clean and free from droppings.



ROOKERIES IN LANARKSHIRE IN 1922.

South-east Area.—On all occasions when I visited coniferous rookeries I found them totally deserted during Autumn and Winter. They were clean and fresh, and devoid of droppings, and presented a marked contrast to Spring and Summer. We often flushed Owls, both Long-eared and Tawny, and one afternoon in late Autumn we disturbed a party of Ring-Ouzels. Large numbers of the Common Wren frequent

these places in winter. In this area I seldom observed Rooks following the plough, this being evidently left to the Gulls. At all times during winter when Rooks came under observation they were always congregated thousands strong.

Analysis of the above contrasts shows the following points: That while the North-west Area contains fully 80 per cent. of the rookeries, the breeding stock only amounts to 44 per cent.; and we must take into consideration that this area includes at least 90 per cent. of the whole arable land of the county. A large part of this is given up to the growing of hay, and yet another very large part consists of fine old pasture. Land of this nature is admirably suited to carry a moderate stock of Rooks, and to derive no little benefit therefrom. With the three following exceptions, no apprehension need be felt regarding the Rook problem in this area. (1) Garnkirk, Cadder: The coniferous section of this rookery has been in existence many years, but fortunately now shows some decrease. It is built on low misshapen Scots firs, which very probably owe their deformity to the huge piles of nests which they have had to carry. (2) Limekilns, East Kilbride: This rookery contains a very fine deciduous section beside the house, the other two sections, both of which might well be spared, are built on Scots fir, none of which is very old, indeed many of the nests are only ten to fifteen feet from the ground. This departure from the usual Rook habit, probably owes its inception to the cutting down some years ago of a large beech wood which contained a rookery. (3) Calder District, Avondale: The two examples of coniferous sections here are both of recent date; one is situated on the edge of the moor. The causes of fresh settlement here are most probably persecution during the war and, later, insufficient shooting of young in other places.

In the South-east Area the Rook presents a much more serious problem. Here we find not more than 10 per cent. of the county's arable land; but in these narrow valleys 56 per cent. of the Rook breeding stock is congregated during the months from March to September inclusive. A few minutes' flight takes the birds to localities where game-birds'

eggs can be had galore ; indeed on many occasions poisoned eggs put down far out on the moors claim Rooks as victims instead of the Carrion Crow. Immense damage is done to the crops during the whole of the six months which these birds are in their summer residence, and the ground underneath the nests soon becomes absolutely littered with grain husks in the Spring and early Autumn. This point is worth noting, if only to obviate the necessity of shooting harmless Rooks for the purpose of examining the contents of their crops, the not too well-known pellet-ejecting habit of the Rook rendering the detection of grain-eating fairly simple.

The presence of these huge undesirable rookeries is the natural sequence of former persecution on the one hand, coupled with negligence to shoot a reasonable proportion of young on the other, and the fact that Rook has got somewhat out of control in parts of this area has to be faced. It literally seems to thrive and multiply on persecution, and the greater persecution it is subjected to, the more predatory does it become. One landowner, in conversation with my son, confessed to having expended 2000 cartridges during the Spring of 1922, in an unsuccessful attempt to put down one of these rookeries, and was prepared to expend 4000 in 1923. Wood fires seem also to have been tried without success. This does not surprise me, for I am of opinion that a very dense smoke would be required to sicken the Rook. During the taking of my Census, on one occasion I experienced difficulty in the counting of nests enveloped in smoke from a pit chimney, and on another from the smoke emitted from furnaces.

Believing that the breaking up, and ultimate eradication of these large coniferous rookeries could be accomplished in a few years, I make the following suggestions.—(1) That all owners of rookeries should be petitioned to have a reasonable percentage of young shot yearly. (2) That all attempts at nesting on deciduous trees should be encouraged anywhere near human dwellings. It is here that the rookery can be controlled to reasonable dimensions. It is also a fact that a much smaller percentage of young Rooks are reared in these rookeries. (3) Any tendency to establish a rookery

in coniferous plantations should be nipped in the bud. Young fir-trees subjected to these burdens will not grow into good pit-wood. (4) During the months of March to June inclusive, no gun should be allowed near these coniferous rookeries which it is intended to put down. They should be subjected to the minimum of molestation until the last week of April, when with the help of a sectional rod of some light material, such as bamboo or aluminium, every nest should be methodically put down, and the young killed in a humane and expeditious manner. Should nest-building again be proceeded with, the nests should again be put down after an interval of six weeks. The above remedy may sound somewhat callous, but really it is only the stamping out of an abnormal, predatory tendency, which is developing amongst some members of a very useful species of bird. The Rook of normal habits has no more staunch admirer than the writer.

In conclusion, I would tender my thanks for the extreme courtesy and kindness everywhere extended to me during the prosecution of my Census and inquiry.

Great Wood-Wasp on Arthur's Seat—On 12th August I caught two large insects, which have been identified at the Royal Scottish Museum as male specimens of *Sirex gigas*, on the very summit of Arthur's Seat.—GEO. G. SCOTT, Edinburgh.

[The fact that these specimens were both males, and that they occurred together at an unlikely spot, distant from any timber from which they might have emerged, makes this record an interesting one.—EDS.]

Ptinella aptera Guer: a Clavicorn Beetle new to Scotland.—While doing some general collecting near Bishopbriggs on the 17th of March last, I secured several specimens of this Clavicorn Beetle under the bark of an old uprooted pine-stump. It is an extremely small insect, being only about 3.5 mm. in length, yellow in colour, and consequently difficult to detect in its natural habitat and even more difficult to handle. So far as I am aware, no species of *Ptinella* has previously been recorded as having been taken in Scotland, although several species are known to occur in the north of England.—THOS. H. M. GORDON, Glasgow.

THE EIDER DUCK (*SOMATERIA MOLLISSIMA*) IN THE "FORTH AREA."

By the late WILLIAM EVANS, F.R.S.E.¹

THE Eider is common and resident in the seaward portion of the Firth, nesting freely on the sand-dunes or "links" of the East Lothian coast from Aberlady Bay to the mouth of the Tyne near Dunbar, and on the islet of Eyebroughty; also sparingly on the sea-braes eastwards to St Abb's in Berwickshire; the coast of Fife between Largo and Elie; and on the two outer islands, the May and the Bass.

The nesting season over, the birds may be seen in larger or smaller companies off the rocks and skerries in the vicinity of their nesting grounds, where they remain throughout the winter; stragglers, however, occasionally put in an appearance as far up the Firth as the neighbourhood of Leith, or even to the west of the Forth Bridge.

The history of the Eider in the Forth Area can be traced back for two hundred and forty years, and it doubtless inhabited the Firth long before that, for are not the Farne Isles—the ancient home of "St Cuthbert's Duck"—within sight of the south-eastern limit of our area at St Abb's Head and the Isle of May? The earliest record that has come down to us, however, appears to be that in the section on birds in Sibbald's *Scotia Illustrata* (published in 1684), and relates to Inchkeith; his statement (translated) is: "The Dunter Goose also is found in the Orkneys. Its eggs, equal to a goose's are found in Keith Island" (= Inchkeith).² Forth fisher-folk still apply the name "dunter" to this duck; and I have also heard it called "brattach" in East Lothian.

In a subsequent work, his *History of Fife and Kinross*, first published in 1710, Sibbald says that "the Dunter haunts the May," and eighty-two years later the writer of the "Statistical Account" of the parish of Anstruther-

¹ Edited by Miss C. Ethel Evans.

² The work is in Latin; an English translation of the bird section, by Mr Mullens, is given in the magazine *British Birds* for July 1912.

Wester makes a similar remark. Patrick Neill visited the May in the summer of 1811, and he tells us (*Scot's Magazine* for August of that year) that "Dunter Geese or Eider Ducks breed on the east or low side in considerable numbers," a statement which holds true to this day. There is no need to quote further records for this locality¹; but I may say that I still possess two Eider's eggs which were brought to me from the island in 1863, and I have seen many nests there in the course of the past fifty years. A century ago—in 1824—the Eider nested on the Bass (*vide* Fleming's Article on the Zoology contributed to the well-known volume on the Rock, p. 406); and a few pairs have, when not over-persecuted, continued to do so down to the present time. I remember seeing a nest among the ruins of the old fortifications in 1869, and others have come under my observation there in more recent years. On Fidra and the other inshore islands close to North Berwick the species has been known to nest from time to time, but these are too much frequented by people to give the birds a chance of bringing off a brood. The islet of Eyebroughty, or Ibrox, to the west of Fidra, is a favourite haunt—I have known as many as seven nests on it—but it can be raided from the shore during low-water, and the eggs are usually lifted.

As indicated above, the Eider nested according to Sir Robert Sibbald as far up the Firth as Inchkeith in the latter part of the seventeenth century; but it may be noted that he does not repeat this in his later *Fife and Kinross* volume. Pennant, however, makes mention of it nesting even higher up, namely on Inchcolm; in his *Tour of Scotland*, 1769, second edition, published in 1772, there is a footnote to page 37 (on which he describes the Eider Ducks, nests, and eggs which he saw on the Farne Isles), which runs as follows: "Vide *Brit. Zool.*, vol. ii., p. 454. I have been informed that they also breed on Inchcolm, in the Firth of Forth."

But both to-day and in the past the main breeding grounds of this Duck in the Forth Area, are and have been

¹ The above and a few other records are given in a paper entitled "Early References to the Bird-life of the Isle of May," which I contributed to the *Scottish Naturalist* for March 1918.

the sand-dunes on the coast of East Lothian. In June 1807, the principal stretch of these dunes lying between Aberlady and Dirleton was traversed—in the company of Messrs Neill and Ogilvie—by the Swiss geologist, Necker de Saussure; and in his *Voyage en Écosse*,¹ published in 1821, he refers at some length to the Eiders, which were evidently nesting there in very considerable numbers. His account is so interesting that the following translation is given in full:—

“We first visited the great sandy plains which border the sea between Aberlady and Dirleton. These sands form slightly elevated dunes ranged in parallel lines which commence a few hundred feet from the sea, and extend inland a distance of about a mile from the shore. A very large number of wild rabbits inhabit these dunes, which are covered with *Arundo arenaria*. The Eider (*Anas mollissima*), a bird whose most valuable down is known as eiderdown, rears its young there; its nest, placed in the midst of the bent grass on the bare sand, is composed of the greyish down mixed with straw and little fragments of wood. In it the female lays five eggs of an olive green, and similar in size to those of a goose.

“During incubation she appears less wild and remains on her nest, scarcely paying attention to what is taking place around her. It is only when one approaches quite near that she decides to leave her eggs. I saw one which had placed her nest at the entrance of a rabbit’s burrow in such a way that the rabbit in order to enter its hole was obliged to pass under the eider’s nest. These two animals were living on the best of terms. At my approach the frightened rabbit fled precipitately to seek safety under the ground; neither the noise which it made in escaping, nor my approach, appeared to frighten the eider which did not move. I remained for a long time to watch this bird without my presence (though I was no more than four or five paces from it) causing it the least uneasiness.

“It has not occurred to the inhabitants of these coasts to take toll of a down that the Icelanders so advantageously exploit. There exists on these shores a sufficiently large number of eiders to enable them to find some profit by such an undertaking. With the care and precautions necessary they could even attract there a still larger number of these birds, and could thus render productive

¹ *Voyage en Écosse*, by L. A. Necker de Saussure (of Geneva), 1821, vol. i., pp. 162-164.

a soil which is completely sterile, and which will never be of any use for agriculture."

From this interesting extract, and from the other historical evidence which I have given above, it will be seen that the Eider has for long nested regularly and in considerable numbers on the shores and islands of the Firth of Forth. During the time I spent as a boy in East Lothian (in the early "sixties" of last century), I well remember my father pointing out to me the large family parties of Eiders on the coast at Tynninghame. From my personal recollections of this bird, covering more than half a century, I hardly think that its numbers in the Firth of Forth have increased so much as indicated by the Misses Baxter and Rintoul in their recently published paper on "Some Scottish Breeding Duck" (1922).

Information as to the food of the Common Eider will be found in a paper on that subject which I contributed to *British Birds* (*Brit. Birds*, vol. iii., No. 5, October 1909, pp. 165-167).

The following are some dates of Eider's nests with eggs (excluding many with fresh eggs in June, which may be assumed to be second layings) from my note-books:—

- April 30, 1904.—Nest with four eggs near North Berwick.
 May 4, 1912.—Several nests with eggs, Tynninghame Links.
 „ 7, 1888.—Eight or nine eggs brought off Craigeleith, North Berwick.
 „ 8, 1914.—Nest with five eggs, incubation just begun, Isle of May.
 „ 10, 1913.—Two nests, containing five and two eggs, sucked by a badger, fir-wood, Tynninghame, East Lothian.
 „ 11, 1913.—Nest with five eggs, and one lying outside it, fresh, near Fast Castle, Berwickshire.
 „ 14, 1904.—Several nests with eggs on Tentsmuir.
 „ 19, 1887.—Nest with six eggs, perhaps a day incubated, on Tentsmuir.
 „ 20, 1888.—Nest with three sucked eggs on sandhill near Gullane.
 „ 23, 1889.—Nest with five fresh eggs on the Bass Rock.
 „ 24, 1885.—Nest with five eggs on Eyebroughty, near Dirleton.
 „ 24, 1904.—Several nests with eggs on Gullane Links.

- May 25 to 30, 1863.—Nest with five eggs on the Isle of May.
 „ 30, 1886.—Nest with four eggs on Luffness Links.
 „ 31, 1885.—Nest with six eggs on Tentsmuir.
 „ —, 1887.—Three nests, with five, five, and four eggs respectively, on Luffness Links.
 „ —, 1886.—Nest with eggs on the Bass Rock.
 „ —, 1886.—T. Hope, birdstuffer, tells me he knew a man who used to take Eider's eggs on Inchmickery twenty or thirty years ago.
 „ —, 1869.—Empty nest among the ruins on the Bass.
 „ —, 1906.—Several nests near the mouth of the Tyne.
 June 8, 1882.—Nest with five slightly incubated eggs on the May.
 „ 9, 1884.—Saw Eider duck sitting on six deeply incubated eggs on Dirleton Common, fully a quarter of a mile from high-water mark.
 „ 10, 1899.—Four nests with seventeen eggs seen by Harold Raeburn on Eyebroughty.
 „ 24, 1899.—Saw nest with five eggs (forsaken) on the Bass.
 July 12, 1884.—The keeper at Gosford tells me that he has taken from thirty-five to forty eggs in a day on the links between Gullane and Dirleton within the last three or four years.

Some idea of the numbers of Eiders that may be seen in the Firth in summer may be gathered from the following records taken from my note-books:—

- April 26, 1888.—Saw at least seventy or eighty pairs, between North Berwick and Gullane.
 May 12, 1906.—From mouth of the Tyne to Tantallon Castle saw from eighty to a hundred pairs.
 „ 12, 1914.—Saw flock of about sixty Eiders (both adult and immature) at Fife Ness.
 June 4, 1884.—Saw five or six robbed nests on Eyebroughty, and counted about ninety of the birds between the islet and the shore.
 July 15, 1883.—Counted about seventy (all ducks and young), at Eyebroughty, near Dirleton.
 „ 17, 1904.—Ninety in a flock a little to the west of Gullane Point and others scattered about, in all about a hundred and twenty (J. Raeburn).
 „ 20, 1904.—In the lee of Eyebroughty, counted about a hundred and fifty.

- Aug. —, 1887.—Large numbers (at least eighty) mostly females and young) about Eyebroughty.
- Sept. 9, 1897.—Counted about a hundred and twenty in the lee of Fidra to-day; males in one flock, females and young in another.

Goldfinch in Midlothian.—During June 1923, I had a pair of Goldfinches under daily observation for over a week. They frequented the side of the river Esk in the haugh at Musselburgh, and I had reason for believing they would have nested had they been allowed to remain. They suddenly disappeared, however, and I have no doubt this was owing to their being trapped. Local records for the species in Midlothian during the breeding season are not numerous.—DAVID HAMILTON.

Ruff in North Uist.—While shooting Snipe with a friend near Lochmaddy, on 1st September 1923, we flushed from a bog three Ruffs, or to be more accurate, a Ruff, a Reeve, and a young bird. All the birds were very tame.—GEORGE BEVERIDGE, Vallay.

[Ruffs on migration are much more frequently met with on the east than on the west coast of Britain, and Saunders states that the species “has seldom been noticed in the Outer or Inner Hebrides.”—EDS.]

Chiffchaff in Argyllshire.—The Chiffchaff is so generally scarce and local on the west coast of Scotland that it may be worth while to put on record its occurrence this year at Oban. On 10th July a Chiffchaff was singing steadily from a bank of trees on the northern outskirts of the town. I had no opportunity of revisiting the place, but the date and the bird's manner of singing strongly suggested that it was there for the summer. Possibly it is there, or elsewhere in the district, every year.—E. LEONARD GILL, Edinburgh.

Orthezia cataphracta, Shaw, at a high altitude in the Cairngorms.—During one of our excursions on the high plateaux of the Cairngorms, two white insects—resembling small wood-lice—were found on a clump of club-moss at a height of 3000 feet above the sea. The insects were identified by Mr Grimshaw, at the Royal Scottish Museum, as being the well-known Coccid or Scale-Insect, known as *Orthezia cataphracta*, Shaw.—AUDREY GORDON.

[This is a species common on hedge-banks, in moss, among dead leaves, heather, etc. It occurs also on moors and mountains, but little appears to be known as to its altitudinal range, so that the above record is of considerable interest.—EDS.]

CONTRIBUTIONS TOWARDS A LIST OF THE
FAUNA OF THE SOUTH EBUDES.

From the Zoological Laboratory, University of Cambridge.

III. THE TERRESTRIAL COLEOPTERA.

By E. J. PEARCE, F.E.S. (Sidney Sussex College).

THIS paper must only be regarded as a preliminary list, in that the material on which it is based is insufficient for any detailed explanations or comparisons. Collections of land-beetles were made on Islay and Jura, a week being spent on each island. Through the kindness of one member of the expedition, Mr G. E. Hutchinson, one record of interest is given from Jura—namely, *Leptinus testaceus*, Mull.

The time detailed for the land-beetles was further limited owing to time being spent in investigating the aquatic beetles, treated earlier in this series of papers.¹ It may here be stated that the writer intends to visit these islands again, with a view to making additions to this list. When this has been done, attempts will be made to explain the relationships of the fauna of these islands to one another and to the mainland. Until considerably more material has been obtained, if possible at other times of the year and from parts of the islands hitherto not investigated, these comparisons will not be attempted, since if based on the present very incomplete knowledge, they could not fail to be premature and misleading.

At present the complete list of the land-beetles found on these two islands, consists of one hundred and forty-one species and three varieties. Of these, forty-six species were only found on Islay, and forty-five only on Jura, the small number of fifty species being therefore common to both islands. This fact alone indicates that much more work is required before our knowledge is complete enough to warrant any deductions being made from it; since the fauna of these two islands—lying as they do—must be very similar

¹ *The Scottish Naturalist*, pp. 55, 87, 1923.

for like habitats. This great difference in the separate lists of these two islands is mainly explicable by the fact that different types of habitats were examined on the two islands, in order to get a general idea of their beetle-fauna as a whole. For instance, the sand-dunes and Port Ellen distillery were examined on Islay, but no such habitats were examined on Jura, on which the beach-fauna and other types were more thoroughly investigated.

During the time spent in the islands the weather conditions for collecting were rather unfavourable, at anyrate as far as sweeping was concerned.

As far as it was possible to judge from an early morning motor drive to Port Askaig to catch the Jura boat, Port Ellen was on the more barren side of Islay,¹ as regards vegetation and general topographical features. It would be interesting to make a detailed list of the beetles from both sides for comparison. Undoubtedly the greatest factor of the Port Ellen area was provided by the sand-dunes, with their very characteristic fauna. At Craighouse, Jura,¹ however, as far as could be judged, the coleopterist was very well placed, woods, fields, streams, and beach being all within easy distance—the sand-dunes being alone conspicuous by their absence. Here a much more detailed study of the ground-beetles Carabidæ and Staphylinidæ was made.

I should now like to attempt to deal, very briefly, with the habitats worked, mentioning at the same time any species of interest which was obtained. For this purpose I propose to divide the material under the following main headings:—

- (a) Species found on the beach and around the Machrie river-mouth (Islay).
- (b) Mountain species (from both islands).
- (c) Loch and semi-aquatic species (from both islands).
- (d) Islay sand-dunes and the species found in the distillery (Port Ellen).
- (e) General ground-beetle fauna of both islands.

¹ Maps showing the areas worked on Islay and Jura were published in Mr Balfour-Browne's paper in the May number 1923.

(a) SPECIES FOUND ON THE BEACH AND AROUND
THE MACHRIE RIVER-MOUTH (ISLAY).

A short description of the localities comprising this unit must now be given. The beach examined on Islay lies below Port Ellen itself, and runs along to the sand-dunes almost due west of Port Ellen. Very few species of any interest were found in this area compared with a similar stretch at Craighouse, Jura. The following species were found in decaying sea-weed on Islay: *Megacronus cingulatus* Man.; *Stenus speculator*, Lac. (also found on Jura), and *Lesteva sicula*, Er., and other commoner species (*vide list infra*).

The Machrie river-mouth, situated at some distance N.W. of Port Ellen, provided several interesting species. The following species were found under stones, running on the banks, etc.: *Elaphrus cupreus*, Duft., not uncommon; one small specimen of *Dyschirius thoracicus*, Ross.; *Pterostichus nigrita*, F., and *P. strenuus*, Pz., the latter abundant under stones; *Anchomenus fuliginosus*, Pz., etc. (*vide list infra*), very common; *Bembidium bruxellense*, Wesm., etc., on mud-flats by the river; and *B. pallidipenne*, Ill., amongst shore-refuse, one specimen. *Quedius molochinus*, Gr., and *Xantholinus glabratus*, Gr., one specimen each, under stones. One rather macerated specimen of *Necrophorus humator*, Goetz., was taken with the water-net out of the pool on the south side of the river. *Choleva chrysomeloides*, Pz., was taken running about, and *Cyphon coarctatus*, Pk., was very common basking in the sun on stones almost in the water.

The Jura coast was very productive, masses of decaying sea-weed lying stranded at low tide, that part of the coast directly below Feolin Farm, Craighouse, being especially examined. *Carabus arvensis*, Hbst, was taken under a stone a short distance above high-tide mark; *Harpalus latus*, L., one specimen in a similar situation; *Bembidium pallidipenne*, Ill., under decaying sea-weed with various Staphylinids; *Aleochara lanuginosa*, Gr., *Drusilla canaliculata*, F., *Homalota vestita*, Gr., *Philonthus nigrita*, Nor., and *P. puella*, Nor.; *Othius fulvipennis*, F., abundant; *Lathrobium brunnipes*, F., one specimen; *Stenus crassus*, Steph., *S. pallipes*, Gr., and

S. nitidiusculus, Steph., *Oxytelus tetracarlinatus*, Block., and *Lesteva longelytrata*, Goetz., the last two one specimen each; *Homalium leviusculum*, Gyll., and *H. riparium*, Th., both very common; *Micrambe vini*, Pz., and *Cyphon pallidulus*, Boh., not uncommon. The variety *scoticus*, Shp., of *Telephorus figuratus*, Man., was also taken by sweeping *Armeria* on the rocks. In this and in all other surveys, whether any species mentioned are common to both islands, or are confined to one, can be ascertained by reference to the complete list of species taken on both islands, given at the end of this paper.

(b) MOUNTAIN SPECIES.

Very few species were obtained that could, properly speaking, be called mountain species, largely owing to the fact that very little mountain work was attempted. However, a few interesting species may be mentioned. On Islay *Carabus glabratus*, Pk., was taken quite low down on the coast of the Oa of Islay, as was *Nebria gyllenhali*, Sch., both under stones. These two may be cited as examples of species, which in England are usually only found at high altitudes, but which, farther north, are found on low ground. *Corymbites cupreus*, F., was quite common on both islands, but the var. *æruiginosus*, F., was only found on Jura, below the Paps, at an altitude of about 1000 feet. *Donacia discolor*, Pz., was taken on both islands, being very common and very variable in colour; on Islay it occurred at Port Ellen reservoir on reeds, etc., and on Jura at a peat loch, altitude 1300 feet; it was also common in another loch about 200 feet altitude, near Craighouse.

(c) LOCH AND SEMI-AQUATIC SPECIES.

This is another very small component of the complete fauna. *Linnius tuberculatus*, Mull., was taken under a stone in a stream running down into the sea near the sand-dunes at Port Ellen; and *Parnus auriculatus*, Geof., and *P. ernesti*, Des Goz., both occurred at the Machrie river-mouth, Islay. *P. auriculatus*, Geof., also was taken quite commonly on Jura. *Dascillus cervinus*, L., was found floating dead on one of the lowland lochs; and *Helodes marginata*, F., was taken once in the water-net. Perhaps *Donacia discolor*, Pz., might

with equal advantage be included under this heading; however, it is very difficult to draw a distinct line between these two habitats, as several of the species overlap.

(a) ISLAY SAND-DUNES AND THE SPECIES FOUND
IN THE PORT ELLEN DISTILLERY.

These sand-dunes, with their characteristic plant associations, furnish a number of species worthy of mention. Those which I worked, lying as they do, west of Port Ellen, on the sheltered side of the island, afford a haven for many forms, of which the following may be mentioned: *Calathus mollis*, Marsh. (coast form), one immature specimen under a stone; *Ocytus cupreus*, Ross., one specimen under a stone below high-tide mark; *Silpha atrata*, L., and var. *brunnea*, Hbst., both not uncommon, the variety being especially common burrowing in the sand; *Choleva nigricans*, Spence, was shaken out of rubbish in the distillery. One specimen of *Hister neglectus*, Germ. (rather small), occurred burrowing in the sand; as did *Ægialia arenaria*, F., *Rhagonycha limbata*, Th., and *Malthodes marginatus*, Lat., two specimens swept off vegetation; *Niptus crenatus*, F., very common in rubbish in the distillery; *Gastroidea viridula*, De G., *Phædon tumidulus*, Germ., and *Lochmæa suturalis*, Th., were all obtained by sweeping amongst the sand-dunes. Practically all the weevils obtained occurred along here: *Otiorhynchus tenebricosus*, Germ., common; *O. blandus*, Gyll., *O. rugifrons*, Gyll., both found burrowing in the sand. One specimen of the grey form of *Hypera punctata*, F., was taken, and the following occurred all more or less commonly: *Liosoma ovatulum*, Clair., *Cæliodes quadrimaculatus*, L., *Ceuthorhynchus ericæ*, Gyll., and *pollinarius*, Forst., the last two being especially abundant.

(e) GENERAL GROUND-BEETLE FAUNA OF
BOTH ISLANDS.

I am afraid this last is a very miscellaneous and nondescript gathering: *Cicindela campestris*, L., variable (one dark specimen from Islay) occurred on both islands on the lowlands; *Cychnus rostratus*, L., elytra only, found by sifting

moss in a wood near Feolin Farm, Craighouse; *Carabus catenulatus*, Scop., and *C. granulatus*, L., both common under stones on these islands; *Leistus fulvibarbis*, Dj., one specimen at Craighouse Village, under a stone near the beach; *Clivina fossor*, L., common on both Islay and Jura; *Bradycellus sharpi*, Joy., one specimen near Port Ellen; *Pterostichus cupreus*, L., from Islay, and *P. versicolor*, Stm., common on both islands; *P. strenuus*, Pz., very common around Port Ellen and at Craighouse; *P. diligens*, Stm., one specimen from Feolin Farm; *P. vernalis*, Gyll., also occurred there; *Amara bifrons*, Gyll., *A. trivialis*, Gyll., and *A. plebeia*, Gyll., all not uncommon on the Oa and other places; *Bembidium guttula*, F., one specimen from the Oa; *Homalota silvicola*, Fuss., in the wood near Feolin Farm; *Ocyopus morio*, Gr., from the Oa; *Philonthus marginatus*, F., common at Craighouse; *Xantholinus ochraceus*, Gyll., from Feolin Farm, and *X. linearis*, Ol., not uncommon under stones on both islands; *Othius fulvipennis*, F., a few specimens from both islands; *Leptinus testaceus*, Mull., not uncommon on Jura off *Apodemus hebridensis larus*, Mont., *Necrophorus ruspator*, Er., *Silpha thoracica*, L., and *S. atrata*, L., all found on a dead deer below the Paps, Jura, at an altitude of about 400 feet, the two last species being frequently met with on both islands; *Choleva kirbyi*, Spence, met with under a stone on the Oa, Islay; *Aphodius scybalarius*, F., one specimen in dung on the Oa. The four following species all occurred in profusion at the edges of fields on both islands: *Cryptohypnus riparius*, F., *Athous hæmorrhoidalis*, F., *Agriotes obscurus*, L., and *Dolopius marginatus*, L. One specimen of *Corymbites quercus*, Gyll., was taken under a stone near Feolin Farm; *Telephorus bicolor*, F., one specimen from near Craighouse Village, and a single female specimen of *T. paludosus*, Fall., from near the Port Ellen distillery; *Rhagonycha testacea*, L., and *R. pallida*, F., both occurred near Craighouse only, by sweeping in the fields; *Alophus triguttatus*, F., was taken under a stone near the Port Ellen distillery.

Having now completed this short preliminary survey of the beetle-fauna of these two islands, I can only hope that

other coleopterists will be stimulated to visit these and other Hebridean islands, so that our present very incomplete knowledge of their fauna may be increased. I think there is no doubt that they offer a very fascinating field of work to all those interested in distribution, whether botanists or zoologists.

In conclusion, it is my pleasure to thank all those who have very kindly given me their advice and expert assistance. First, I should like to express my thanks to the organiser of our expedition, Mr Frank Balfour-Browne, not only for the opportunity of visiting these islands but also for his continued help and encouragement; the other members of the expedition have also brought me specimens, whenever they had time. Finally, my thanks are due to Commander J. J. Walker, Dr N. H. Joy, and Mr G. C. Champion for correcting and confirming my identification of many specimens.

COMPLETE LIST OF THE TERRESTRIAL COLEOPTERA FOUND ON ISLAY AND JURA.

Notes.—I.=Species only found on ISLAY.

J.=Species only found on JURA.

I.J.=Species found on both ISLAY and JURA.

I may here mention that Mr G. E. Hutchinson took *Leptinus testaceus*, Mull., on Gigha on 2.7.1922, off *Apodemus hebridensis ghia*, Mont. In the following list it is recorded from Jura only:—

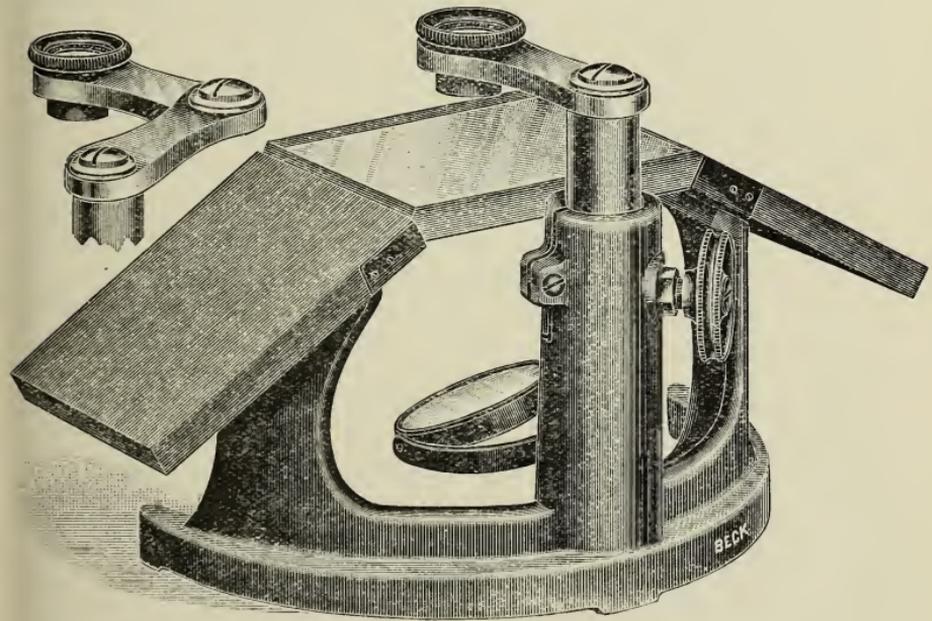
Cicindela campestris, L. (I.J.).	Harpalus ruficornis, F. (I.J.).
Cychrus rostratus, L. (J.).	H. æneus, F. (I.J.).
Carabus catenulatus, Scop. (I.J.).	H. latus, L. (J.).
C. glabratus, Pk. (I.).	Pterostichus cupreus, L. (I.).
C. granulatus, L. (I.J.).	P. versicolor, Stm. (I.J.).
C. arvensis, Hbst. (J.).	P. madidus, F. (I.J.).
Notiophilus biguttatus, F. (I.J.).	P. niger, Schal. (I.J.).
Leistus fulvibarbis, Dj. (J.).	P. vulgaris, L. (I.J.).
L. rufescens, F. (I.J.).	P. nigrita, F. (I.).
Nebria brevicollis, F. (I.J.).	P. strenuus, Pz. (I.J.).
N. gyllenhali, Sch. (I.).	P. diligens, Stm. (J.).
Elaphrus cupreus, Duft. (I.).	P. vernalis, Gyll. (J.).
Loricera pilicornis, F. (I.J.).	P. striola, F. (I.J.).
Clivina fossor, L. (I.J.).	Amara bifrons, Gyll. (I.).
Dyschirius thoracicus, Ross. (I.).	A. trivialis, Gyll. (I.).
Bradycellus sharpi, Joy. (I.).	A. communis, Pz. (J.).

- A. plebeia*, Gyll. (I.).
Calathus cisteloides, Pz. (I.J.).
C. mollis, Marsh. (I.).
C. melanocephalus, L. (I.J.).
Anchomenus dorsalis, Mull. (I.J.).
A. albipes, F. (I.J.).
A. parumpunctatus, F. (I.J.).
A. fuliginosus, Pz. (I.J.).
Bembidium guttula, F. (I.).
B. lampros, Hbst. (I.J.).
B. bruxellense, Wesm. (I.J.).
B. littorale, Ol. (I.J.).
B. pallidipenne, Ill. (I.J.).
Trechus minutus, F. (I.J.).
Cercyon littoralis, Gyll. (J.).
C. depressus, Steph. (J.).
Aleochara lanuginosa, Gr. (J.).
Drusilla canaliculata F. (J.).
Homalota vestita, Gr. (J.).
H. silvicola, Fuss. (J.).
Tachyporus solutus, Er. (I.J.).
T. chrysomelinus, L. (I.J.).
Tachinus humeralis, Gr. (J.).
T. rufipes, De G. (I.J.).
Megacronus cingulatus, Man. (I.).
Quedius fuliginosus, Gr. (I.J.).
Q. molochinus, Gr. (I.).
Q. semiæneus, St. (I.).
Ocypus olens, Mull. (I.J.).
O. cupreus, Ross. (I.).
O. morio, Gr. (J.).
Philonthus proximus, Kr. (J.).
P. decorus, Gr. (I.J.).
P. varius, Gyll. (I.J.).
P. marginatus, F. (J.).
P. nigrita, Nor. (J.).
P. puella, Nor. (J.).
Actobius cinerascens, Gr. (J.).
Xantholinus ochraceus, Gyll. (J.).
X. glabratus, Gr. (I.).
X. linearis, Ol. (I.J.).
Othius fulvipennis, F. (I.J.).
Lathrobium fulvipenne, Gr. (I.J.).
L. brunripes, F. (J.).
Stenus speculator, Lac. (I.J.).
S. crassus, Steph. (J.).
S. pallipes, Gr. (J.).
S. nitidiusculus, Steph. (J.).
S. similis, Hbst. (J.).
Oxytelus tetracarينات, Block. (J.).
Lesteva longelytrata, Goz. (J.).
L. sicula, Er. (I.).
Homalium læviusculum, Gyll. (J.).
H. riparium, Th. (J.).
Leptinus testaceus, Mull. (J.).
Necrophorus humator, Goz. (I.).
N. ruspator, Er. (J.).
Silpha thoracica, L. (I.J.).
S. rugosa, L. (I.).
S. atrata, L. (I.J.).
 var. *brunnea*, Hbst. (I.).
Choleva nigricans, Spence. (I.).
C. kirbyi, Spence. (I.).
C. chrysomeloides, Pz. (I.).
Hister neglectus, Germ. (I.).
Micrambe vini, Pz. (J.).
Limnius tuberculatus, Mull. (I.).
Parnus auriculatus, Geof. (I.J.).
P. ernesti, Des Goz. (I.).
Aphodius fossor, L. (J.).
A. fimetarius, L. (I.J.).
A. scybalarius, F. (I.).
Ægialia arenaria, F. (I.).
Geotrupes stercorarius, L. (J.).
G. sylvaticus, Pz. (I.J.).
Lacon murinus, L. (I.).
Cryptohypnus riparius, F. (I.J.).
Athous hæmorrhoidalis, F. (I.J.).
Agriotes obscurus, L. (I.J.).
Dolopius marginatus, L. (I.J.).
Corymbites cupreus, F. (I.J.).
 var. *ærginosus*, F. (J.).
C. quercus, Gyll. (J.).
Dascillus cervinus, L. (J.).
Helodes marginata, F. (J.).
Cyphon coarctatus, Pk. (I.).
C. pallidulus, Boh. (J.).
Telephorus lituratus, Fall. (I.).
T. figuratus, Man. (J.).
 var. *scoticus*, Shp. (J.).
T. bicolor, F. (J.).
T. paludosus, Fall. (I.).
Rhagonycha testacea, L. (J.).
R. limbata, Th. (I.).
R. pallida, F. (J.).
Malthodes marginatus, Lat. (I.).
Niptus crenatus, F. (I.).
Donacia discolor, Pz. (I.J.).

Gastroidea viridula, De G. (I.).	O. rugifrons, Gyll. (I.).
Phædon tumidulus, Germ. (I.).	Alophus triguttatus, F. (I.)
Lochmæa suturalis, Th. (I.J.).	Hypera punctata, F. (I.).
Otiorhynchus tenebricosus, Hbst. (I.).	Liosoma ovatum, Clair. (I.).
O. blandus, Gyll. (I.).	Cœliodes quadrimaculatus, L. (I.).
O. picipes, F. (J.).	Ceuthorhynchus ericæ, Gyll. (I.).
O. sulcatus, F. (J.).	C. pollinarius, Forst. (I.).

A NEW DISSECTING MICROSCOPE.

FOR the examination of the different aspects of small objects or for their manipulation under the dissecting knife or needle, it is almost essential that both hands of the observer be free and that his



wrists should rest on a firm support. To achieve this end several small dissecting microscopes have in recent years been devised, in which the desired support has been obtained by the addition of a movable or fixed arm rest on each side of the stage. These instruments have added considerably to the ease and pleasure of working with magnifications up to 10 or 12 diameters; but in practice we have found that the release of wrist pressure on one side may result in a sudden and disastrous tilt of the whole instrument to the other, owing to a certain lack of stability in the base. This difficulty has been overcome in the Crescent Dissecting

Microscope just put on the market by Messrs R. & J. Beck, where, as our illustration shows, stability has been gained by supporting the arm rests on an expanded base which does not add greatly to the bulk of the instrument. The microscope may be obtained with single lenses, magnifying 5 and 10 diameters, but by placing a compound microscope in the lens collar a magnification of 62 diameters may be obtained. Prices range from £3, 6s. 6d. for the simplest, to £10, 15s. 6d. for the more elaborate fittings.

A Rare Robber-Fly, *Pamponerus germanicus*, Linn., in East Lothian.—It may be of interest to record the capture in the county of East Lothian of this rare species of Robber-Fly. Unfortunately I cannot give any particulars beyond the fact that it was caught in the county by myself within the last eight or ten years. So far as I can recollect, it was flying around when I was catching some moth and, since it looked to me unusual, I pill-boxed it and kept it. I collect nowhere but in this county, so it was certainly caught in East Lothian.—ALICE BALFOUR, Whittingehame, Prestonkirk.

[Miss Balfour has very kindly presented the specimen to the Royal Scottish Museum. The only other Scottish record known to us is the pair captured on Irvine Moor, Ayrshire, in 1900, by Mr A. Adie Dalglish, and presented by him to the same Museum.—EDS.]

***Catops longulus*, Kell.: a Beetle new to the Clyde Area.**—While collecting on the moors near Cleland on the 1st April last, I came across the carcass of a sheep which had been bogged, on which I secured a number of *Catops*. The commonest species were *C. chrysoloides* and *C. tristis*, but among them I also found one example of *C. longulus*, which is a scarcer insect, and has not hitherto been recorded from the Clyde Area.—D. WOTHERSPOON, Glasgow.

Little Stints in Orkney in Winter.—There must surely have been a mistake in the identification of the flock of 300 small waders seen on Loch Harray on 27th February 1905, and recorded in the last number of the *Scottish Naturalist* (p. 134) as Little Stints. This species is rightly considered in the standard works on British Birds as a passage migrant observed in autumn on rare occasions only after the early days of November, and hence it is most unlikely that a flock of 300 of these birds should have been observed in winter in Orkney.—WILLIAM EAGLE CLARKE.

BOOK NOTICES.

THE BRITISH MARINE ANNELIDS, Vol. IV. Pt. ii. Polychæta (Sabellidæ to Serpulidæ). By Prof. W. C. M'Intosh, M.D., LL.D., F.R.S., etc. London: Ray Society. 1922-1923. Pp. xii. and 251-539. Fourteen plates. Price £2, 10s. net.

The Completion of a Great Work.

The publication of the final part of Prof. M'Intosh's great monograph on the sea-worms marks a stage in the history of British marine zoology. Fifty years ago, when its first part appeared, it began a new phase in the treatment of the fauna of British seas, and now that the whole has been completed it may safely be said that for comprehensiveness and detail, for its observation on natural history, and for the beauty of its coloured figures, it stands alone amongst British works of similar scope. In several respects it recalls another outstanding contribution to marine life, Haeckel's "Die Medusen." Those of us who like to make our identifications easily could have wished that the author, from his full knowledge, had added summary keys to the characters of genera and species, but this is a labour-saving device that had not reached its present vogue when the earlier parts were published.

No expense has been spared in producing these volumes worthily, and it will surprise readers unfamiliar with present-day costs of publication and reproduction to learn that the cost of Part I. of the present volume amounted to £739.

Professor M'Intosh is to be most heartily congratulated on the completion, in spite of many interruptions from his professional and other duties, of his great labour of love; and with him must be congratulated the Ray Society, the publications of which have done so much for the advancement of our knowledge of the British fauna. Only the generosity of such an institution can make available monographs so costly and invaluable, and we trust that additional support though the accession of new members, for which the Society appeals, may be forthcoming. An excellent index to the whole work, and a useful bibliographical collation of the parts, have been compiled with great care by Mr G. A. Smith.

A NATURALIST IN HINDUSTAN. By Major R. W. G. Hingston, M.C., M.B., I.M.S. London: H. F. & G. Witherby. 1923. Pp. 292. Price 16s. net.

This is a volume of observations carried out after the manner and with that precision of detail of which Fabre was a master. His influence is clear in these records, but the field is new, and besides there is ample scope for the naturalist to follow in the steps of the

great French observer to the lasting benefit of science. Major Hingston carried out his observations, checking them here and there with simple and effective experiments, in an arid area of Northern India, which only after the rains of the monsoon forsook its desert character. Here he watched, with patience and an acuteness which is admirable, the lives and ways of ants, spiders, and beetles, discovering the secrets of the ants' path-finding, their methods of sheltering and making use of their different types of "milk kine," the diverse architectural feats of spiders, the accomplishments of the dung-rolling and dung-burying beetles. Moreover, he observed with a purpose, and his interpretations are as interesting and as valuable as his observations. The book makes charming reading, and is a worthy contribution to the natural history of India. The author's method is one that naturalists in this country might adopt with effect.

MITES INJURIOUS TO DOMESTIC ANIMALS (with an Appendix on the Acarine Disease of Hive Bees). By Stanley Hirst. London: Trustees of the British Museum. 1922. Pp. 107. Price 3s.

On former occasions we have had occasion to commend to our readers the excellent series of economic pamphlets, published from the Natural History Branch of the British Museum. The present work is No. 13 of that series, and surpasses many of its predecessors in the wideness of the field it covers, in the abundance and clearness of its illustrations and in the variety of ways in which it touches upon human welfare. There can be few naturalists who have not encountered members of the mite group, either as human parasites (such as "harvestmen"), or as pests of poultry and the larger domestic animals; and these will find the concise descriptions of characters and habits and clear illustrations of this work full of interest, and invaluable as an aid in determining and checkmating the various species.

BOTANY: A JUNIOR BOOK FOR SCHOOLS. By R. H. Yapp, M.A. Cambridge: At the University Press. 1923. Pp. xi. + 199. Price 3s. 6d.

It is significant of the new grasp of the value of nature study, to find a text-book which deliberately aims at avoiding "cramming" and at inculcating a habit of observation and of interpretation of facts. The method is the biological one of the field naturalist, supplemented by apposite experiment, and a few of the chapter headings will indicate the nature and the live interest of the book: roots and their work; how foliage leaves get light; how plants obtain air; how plants pass the winter; fruits and the migrations of plants, and so on. We strongly recommend this fresh and inexpensive work to the notice of the amateur naturalist and to teachers of nature study.

NOTES FROM THE SCOTTISH ZOOLOGICAL PARK

THE KING PENGUINS IN THE SCOTTISH ZOOLOGICAL PARK.

FEW animals in the Zoological Park excite more interest than the King Penguins. In part, doubtless, this is due to the fact that the bird is rarely to be seen in captivity; single specimens have been on view at different times in the London Zoological Gardens, and they have also been exhibited—generally for comparatively brief periods—in other zoological gardens on the Continent, but at the present time the six individuals in the Park are probably the only living specimens in Europe—indeed, it may be that they are the only specimens in captivity in the world, unless perhaps there may be some in Australian zoological collections. The infrequency of its appearance in zoological collections is not due to scarcity of this penguin in its own habitat; for, in spite of much persecution in the recent past (it is, fortunately, now protected over almost the whole of its land range), there are still large numbers of King Penguins to be found on those islands bordering the Antarctic circle in which it breeds, and that the King Penguin has not been more often seen in the zoological parks and gardens of the world, must be attributed chiefly to the difficulty of transporting it alive to so great a distance from the places where capture is possible. The five imported specimens in the Scottish Zoological Park were brought to this country only at the cost of much trouble and expense, and were themselves the comparatively small surviving remnant of two large consignments of birds, the great majority of which died during the long voyage. Apart altogether from its rareness in public collections, the King Penguin is extremely popular on its own merits and by reason of its beauty of colouring, its quaint posture and movements, and its amusing behaviour. There are altogether six King Penguins in the group inhabiting the penguin pool in the Zoological Park. Three of them arrived in the Park in January, 1914, one of the three being a fully-developed adult, and the other two young birds in their nestling plumage. They were obtained for the Society through the kindness of Messrs Chr. Salvesen & Co., on whose steamer, the

Coronda, they were brought from South Georgia, and no trouble or expense was spared, either by the owners or the master of the vessel, to insure their arrival in good health and condition. Subsequently, in 1917, two more young birds were brought by the same vessel (five actually reached the Park, but two of them died soon after their arrival, and one was sold to the London Zoological Gardens). The sixth bird was bred in the Park.

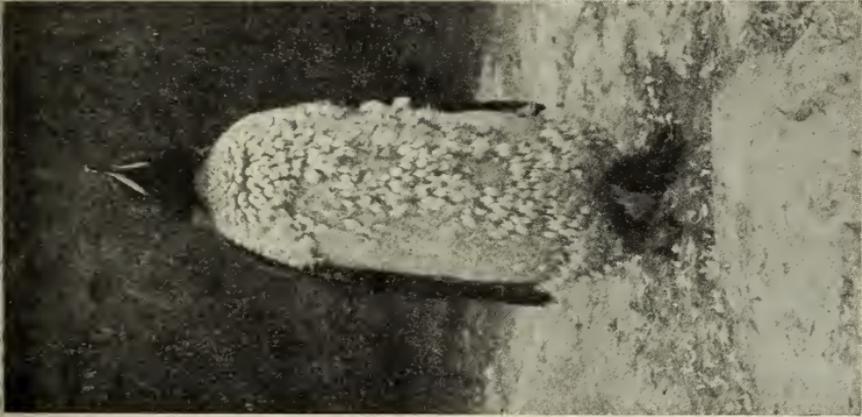
Although there is a belief, based doubtless upon unhappy experience, that the King Penguin is difficult to keep alive and in good health in captivity, those in the Zoological Park have done remarkably well, and, so far, none of the established birds has been lost. Their great enemy in captivity is mycosis—the mould establishing itself in the air-sacs and spreading thence through the whole respiratory system. Poor condition seems to render the birds susceptible, and the safeguard is to maintain their condition by liberal, and, if necessary, forcible feeding. When it is mentioned that one of the birds in the Park has not voluntarily eaten a single morsel of food for nearly four years, it may be judged that to keep them in good health and condition requires some considerable degree of watchfulness and care. In their feeding habits, their moulting, their breeding, and their behaviour generally, these penguins provide a rich and most interesting field of observation.

MOULTING.

The penguin's year may be said to begin with the completion of the annual moult. The moulting itself is a matter of considerable interest. It is a much more serious affair for the King Penguin than most birds seem to find it. In at any rate the great majority of birds, moulting is a fairly gradual process; in many birds there is not only the annual change of plumage at the termination of the breeding season, but one or more partial changes at other parts of the year—indeed it may be that in some birds there is an almost constant gradual shedding and renewal of plumages going on throughout the year—and such birds are little affected by the casting and replacement of their feathers, and are able to go about the business of their lives with, in most cases, very slight interference with their powers. In the case of the King Penguin, however, so far as observation of those in the Park supports a definite conclusion—there is normally only one exchange of plumage in the year, and it is a very thorough and complete one. Moreover, it occupies a relatively short period, and reduces the bird to a very



[T. H. Gill-sprie.
Eighth Day.



Fourth Day.
KING PENGUIN MOULTING.



Second Day.
Photos]

sick and sorry creature. The time usually occupied by the shedding of the old feathers is from about ten days to a fortnight, but before the actual shedding of the old plumage begins, there is a period during which the bird is, in the language of bird fanciers and poultry keepers, "sickening for the moult." Two or three weeks before the actual moulting begins, the plumage of the bird affected has been gradually changing in appearance; the steely grey of the back assumes a rusty brownish tone, the white breast and abdomen lose their glistening whiteness and acquire also a slightly rusty tinge, and the beautiful orange of the throat and ear patches seems to fade—the whole having a shabby, worn-out appearance. Gradually also the bird seems to increase in bulk, its head especially looking very much swollen, and the penguin has every appearance of being ill—so much so, that on several occasions the writer has heard visitors remark that it is "a shame to keep a poor creature in such a condition; it ought to be killed and put out of its misery!" The swollen appearance of the bird is due to the fact that the old feathers are no longer lying closely to the body but are standing out loosely, and are, in fact, being pushed out by the new coat which is growing underneath. The bird is really as sick as it looks; at this time it will seldom feed, or only very lightly (it has probably been feeding voraciously just before), and it stands with its eyes closed or partially closed, and its beak open, breathing in laboured gasps. It takes little interest in the doings of its companions, and though it may try to follow them as they move about, it does so only in a half-hearted way, and is generally left standing by itself. From one to two weeks after the commencement of its "sickness" the old feathers begin to come off. Usually the tail quills are moulted first, then the feathers from the legs and lower abdomen follow; the moult spreads upwards, and by the time the breast feathers are shed, those on the lower part of the back are coming off. The old feathers come off in masses, so that the ground round the bird is covered with fallen feathers, and the line between the old and the new plumages shows as a deep and clean-cut edge. At the last stage, the bird may have a ruffle of the old feathers round its neck, and a tuft or two on its head—the remainder of the plumage having been entirely renewed. The moult includes not only the feathers, but also the pinkish horny sheath which lies on each side of the lower mandibles. Once the shedding of the feathers begins, the bird recovers its health and liveliness, and its appetite rapidly improves.

(To be continued.)

(Authors are responsible for nomenclature used.)

The Scottish Naturalist

Nos. 143 AND 144.] 1923 [NOVEMBER-DECEMBER

THE YOUTHFUL NATURALIST.

ALL naturalists are, of course, youthful; years can never dim the pleasure which stirs the blood at the discovery of a beast or bird unknown, or of an unsuspected trait of habit in a familiar animal. It is not such youthful naturalists, however, but the *young* naturalist that concerns us for the moment. What has become of the young naturalist? He does not frequent museums in the numbers of twenty or thirty years ago, when he was often to be seen pondering over the exhibits, comparing with them his own laborious collections. He is most strikingly absent from the gatherings of many natural history societies, which leave an impression on the mind of a faithful band of youthful naturalists who were boys forty to sixty years ago. He is not indeed extinct, because rarely an enthusiast turns up; but for some reason or other boy naturalists seem to be fewer than they once were.

Now that, if it be true, is a curious situation, as it is a serious one. It is serious when we recollect that it was the growing up of the boy naturalist that gave Scotland its fine band of competent field observers, the names of some of which are known throughout the length and breadth of the land. It is a curious situation, because at no period has the youth of the nation received so much

school instruction in nature knowledge as during the past twenty years. When could it have been claimed, till now, that so large a proportion of the teachers in elementary schools had passed through a qualifying course in nature study, or that so many taught definite nature study lessons to their pupils?

Can it be that the naturalist shares with the genius the distinction of being born and not made, or is there something wrong with our endeavour to create the naturalist spirit? May it even be that the formal teaching of the schoolroom checks rather than encourages the free out-of-door's observation and the enthusiasm which are essential to the growth of an unbounded love of nature. We cannot elaborate the point here, but we set it down as worthy of serious consideration, for we have a suspicion that the training of the teachers themselves may sometimes have been at fault, in tending towards the formal study of details of structure, and away from that education in accurate field observation (natural history as contrasted with formal zoology) which ought to be the aim of nature study.

Of course there may be other causes which have militated against the development of young naturalists. It is possible that the Acts for the Protection of Wild Birds, by discouraging the formation of egg collections, may have stamped out a budding enthusiasm; but we doubt if the schoolboy is much hampered in his pursuits by the accumulated threats of the legalities.

One great abiding certainty remains with those of us who desire to see a wider and fuller appreciation of the many interests of nature: of this we can rest assured, that the average boy or girl starts with a more or less definite naturalistic bent, an interest in the ways and doings of living things. It remains for us simply to give this bent full play, or better to encourage it on wise and simple lines, in order to ensure that the faculty of sympathetic nature study should be added as a lasting boon to the pleasures of living. Should opportunity offer, we hope on another occasion to discuss some of the recent methods

now on trial in this and other countries for fostering the interests of young naturalists.

* * * *

In connection with the Arthur's Seat record of the Great Wood-Wasp (*Sirex gigas*) in our last number (p. 146), Mr Hugh Scott, Cambridge, points out that he recorded the presence of about six males of this species at a height of over 1300 feet on Rough Tor, Cornwall, 3 miles from the nearest woods (*Ent. Mo. Mag.*, 1923, p. 113). We have thus two records of males found apart from females, and in treeless and elevated places.

* * * *

An interesting paper on Pigeon Homing, by Mr B. B. Riviere (*Brit. Birds*, 1923, p. 118), contains facts which may have some bearing on the problem of migration. He reaches the conclusion that pigeons find their way largely by keenness of vision and memorising of landmarks, though outside known territory they appear to travel without visual guidance in the general direction in which they have been accustomed to return to their homes. The fact that racing pigeons go through a rigid course of training in "homing," suggests, however, that caution should be displayed in drawing a parallel between their acquired methods and the ways of uneducated migrant birds.

* * * *

The extension of newly planted forest areas in Scotland has provided some valuable facts regarding the spread of the native insect population. Dr J. W. Munro shows, in discussing "Forest Insects on the Culbin Sands," that various beetle pests of the ancient forest areas have extended their range to the new woods, and lays stress on the importance of natural enemies, amongst which he has observed the Scottish Crested Tit and the Blue Tit, in checking undue multiplication of the pests (*Trans. Scot. Arbor. Soc.*, Vol. xxxvi., p. 112).

Albino Brown Rats in Orkney.—During October there were discovered, in a field in a parish bordering on Stromness, several litters of Brown Rats in which a large proportion of the individuals were partial albinos. In one litter all four individuals were white, another contained four brown and two white individuals, and a third four brown and one white.

I scarcely think it possible for a tame white rat to have escaped in this locality. I notice that the eyes of two specimens I am forwarding to the Royal Scottish Museum are not red, but of the usual black colour.—J. G. MARWICK, Stromness.

[As the ordinary tame white rats are albino examples of the Black Rat, and as the specimens examined by us from Stromness are Brown Rats, there can be no doubt that these litters indicate a natural occurrence of albinism amongst the Brown Rats of the district, a rather rare phenomenon.—EDS.]

Wild-fowl Visitors to Loch of Myrtoun, Wigtownshire.—I have to-day—7th November—been able to add the Little Auk (*Mergulus alle*) to the list of wild-fowl visiting the White Loch of Myrtoun in winter. Under cover of brushwood I got within 60 or 70 yards of a single bird, and kept it under observation with the glass for some time. This lake has been protected as a sanctuary for more than fifty years, and the following species have been noted by myself frequenting it in winter:—

Whooper.	Scaup.	Water-rail.
Mallard.	Tufted Duck.	Common Redshank.
Gadwall.	Golden-eye.	Common Sandpiper.
Shoveller.	Goosander.	Kingfisher.
Pintail.	Great Crested Grebe.	Cormorant.
Teal.	Slavonian Grebe.	Heron.
Wigeon.	Dabchick.	Bittern.
Pochard.	Coot.	Little Auk.
	Water-hen.	

It is possible that Bewick's Swan may have passed for the Whooper on some occasions, but I have never identified it.

Pochards having been somewhat scarce during the last two or three years, I was pleased to see a large flock of them to-day—forty or fifty. They presented a fine show of colour in the rays of a declining sun. Although the Sheldrake nests in numbers half a mile off on the shore of Luce Bay, I have never seen it on the fresh water loch.—HERBERT MAXWELL, Monreith.

BIRD NOTES FROM FAIR ISLE, 1923.

By Surg. Rear-Admiral J. H. STENHOUSE.

IN autumn of the present year I paid a visit to Fair Isle, and remained there from 6th September to 4th October. During that period the weather was almost constantly of a westerly type, and very few migratory birds from the Continent were seen, whilst migrants from the north, such as Meadow Pipits, Skylarks, and Wheatears, appeared to be in smaller numbers than usual. Only four White Wagtails were noted, and the local observers stated that during the spring migration this year birds of this species were equally scarce. It may be of interest to state that among the arrivals from the Continent were two adult Bluethroats (*Erithacus suecicus gaetkei*), at least seven Blue-headed Wagtails (*Motacilla f. flava*), one an adult male, and five Yellow-browed Warblers (*Phylloscopus i. inornatus*).

An adult male example of the Eastern Lesser Whitethroat (*Sylvia curruca affinis*) was obtained on 20th September. It was the only Lesser Whitethroat seen during the visit. The skin was forwarded to Dr Hartert of the Tring Museum, who has kindly examined it, and has confirmed the identification. This is the second recorded occurrence in the British Isles of this Siberian bird: the first was obtained on 3rd October 1921 (vide *Scot. Nat.*, 1921, p. 179).

A female Grasshopper Warbler (*Locustella n. naevia*), a bird which has rarely been met with in this northern isle, was secured on 28th September; this being the second record for autumn. It was found in a field of turnips.

From reports received from the local residents, it may reasonably be assumed that the Common Snipe bred in Fair Isle this year; apparently for the first time. No nest was found, but it was stated that the birds "drummed" up to about the middle of July. They seem to have departed about the end of August; there were none to be found on the island on 6th September; the first immigrant was

seen on 10th September. Of fourteen Snipe shot, one had twelve tail feathers, one sixteen, while the remainder had the normal number, fourteen. One, a female shot on 29th September, belongs to the race *Gallinago gallinago fœrœnsis*, which breeds in Iceland and the Farœ Islands. This form, though named by Brehm as long ago as 1831, has only recently been recognised as a valid subspecies. Its distinctive characters have already been published in this year's *Scot. Nat.* (p. 125); but in addition to the characters there given it is on an average somewhat larger in size than the Common Snipe. In the flesh the greater size of the example obtained was very noticeable; the bill measured 72 mm.; unfortunately its weight was not taken. I beg here to acknowledge my indebtedness to Colonel and Mrs Meinertzhagen for kindly examining this and other specimens of Snipe, and for determining their identity.

Red-breasted Merganser in Ayrshire.—In the Rev. J. M. M'William's most interesting notes in your March-April issue, reference is made to the occurrence of the Red-breasted Merganser on the river Stinchar. This bird has undoubtedly bred on the Stinchar for some years past. In the summer of 1921 my keeper saw a brood about a mile below Barr village, and on 4th June I was shown a nest containing eight eggs on the farm of Bennan, some three miles below Barr village. The duck went off the nest. Mr Murray, the proprietor of Bennan, told me there are three pairs on the river at this place, but on this occasion we only saw the one duck and the drake.—G. HUGHES ONSLOW, Barr.

Great Crested and Red-necked Grebes in Moray.—Although the Great Crested Grebes came to Loch Spynie as usual this season I cannot say for certain that they bred. Last year a couple were shot by an indiscriminating gunner, so we thought we would not fuss them by looking for a nest. They came first in 1912 and nested in 1913 and every year since. A Black-necked Grebe (*P. nigricollis*) turned up in June 1919, but none of this species has been seen since.—ALEX. STABLES (Major), Elgin.

Ptinella aptera, a Clavicorn Beetle new to Scotland.—Mr Gordon draws our attention to the fact that in the note with the above heading in last issue (p. 146), the size of the Beetle should have been recorded as 0.35 mm. and not 3.5 mm.—EDS.

Curious Nesting Habit of Moorhens.—Within recent years a rather remarkable development has occurred in the nesting habits of Moorhens frequenting the Elliot Water in Forfarshire. In its normal state this stream, mainly fed from well-drained lands, is comparatively shallow, its bed being strewn with large stones and here and there isolated clumps of turf. Forty years ago, when the species was less numerous than at present, the nests were usually

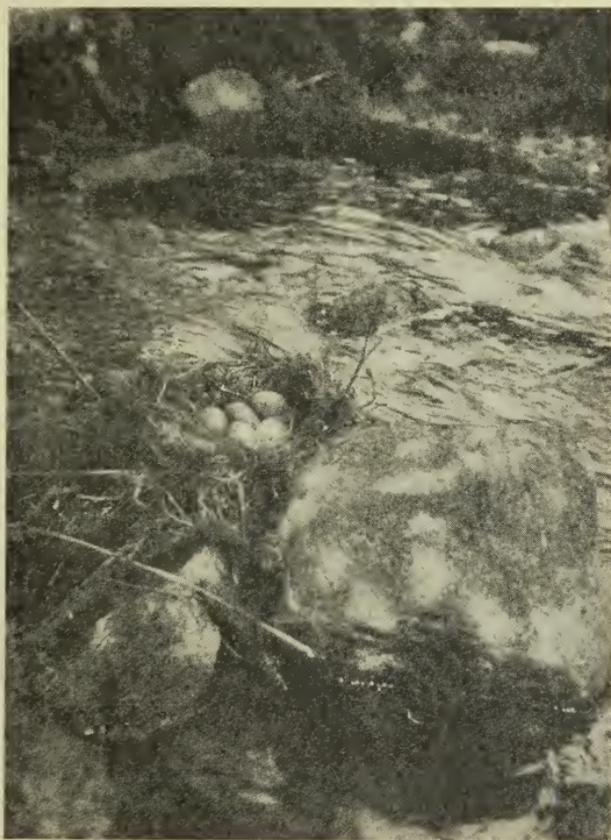


Photo.]

[D. G. H.

NEST OF MOORHEN ON STONES IN ELLIOT WATER.

situated in beds of rushes or irises in boggy pieces of ground in the valley. In May 1911 I observed, for the first time, several nests, within a limited stretch of the stream, built upon stones in its bed; in previous years I may have seen single instances of this new nesting habit. Since then the habit has gradually developed, and in the spring of 1923 some forty nests were situated on stones, usually two or three thrown together by the force of the current, as well as on pieces of turf and broken-off branches of trees, along two miles or so of the course of the burn.

Many of the nests and their contents were quite exposed and easily seen from the banks of the stream. Occasionally they were concealed by vegetation, such as mint, tussilago, or convolvulus. A photograph of a typical nest is inserted. It is not surprising that the nests are frequently robbed, probably by Gulls, Crows, or Rats, but certainly also for human consumption. On the other hand the situation may afford some measure of protection from Stoats, which are sometimes seen along the banks in pursuit of water-fowl. In spite of the heavy toll taken of the eggs, the species has become more numerous in recent years, excellent cover being everywhere available in the form of large masses of whins and tussilago growing by the sides of the stream. Though the nesting sites seem very precarious, they are not really so; for during the breeding season the rainfall is seldom heavy enough to raise the stream more than an inch or two. One nest at the edge of the stream contained the abnormal clutch of fifteen eggs, which were all duly hatched.—D. G. HUNTER, Arbroath.

Stints in Orkney.—I am not surprised that Dr Eagle Clarke doubts my identification of the small waders seen on Loch Harray on 25th February 1905; the reason why I have not placed the occurrence on record sooner being that I knew doubt would be thrown upon it. I am certainly wrong in calling the birds Little Stints (*Tringa minuta*), but they were most certainly Stints of some kind. They may have been *T. temmincki*, *T. minutella*, *T. ruficollis* or *T. subminuta*; I put them down as *T. minuta* as the commonest species. They first rose wild from the rocks at the lower end of Harray, and even then my boatman remarked upon their small size, and that they were neither Dunlin nor Purple Sandpiper, both of which he knew well. They were too dark coloured for Sanderling. On coming down the loch in the afternoon, both busy with the navigation of the boat in a particularly tricky part full of rocks, we suddenly came upon fifty or sixty of them packed upon a rock half awash. They were not 25 yards away, but almost as soon as we saw them we struck a submerged rock. On getting near, only about a dozen remained, and picking up the big gun loaded with BB shot, I fired as we swept past only a few yards away. They were far too close and the result was merely a cloud of feathers.—H. W. ROBINSON.

THE SPREAD AND DISTRIBUTION OF THE
WOODCOCK AS A BREEDING BIRD IN
SCOTLAND SINCE THE BEGINNING OF THE
NINETEENTH CENTURY.

By EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL.

CONTENTS

- I. General Introduction.
- II. Chronological List of Records.
- III. Distribution according to Faunal Areas and Counties.
- IV. List of Works referred to.*

I. GENERAL INTRODUCTION.

IN writing of the Woodcock (*Scolopax rusticola rusticola*), we suffer from having too short a period of notes to draw upon, the first Scottish breeding record, as far as we have been able to discover, having been made less than a hundred years ago. Before the beginning of the nineteenth century the *status* of the Woodcock in Scotland is absolutely unknown to us. We know that it did occur, and was used as an article of food as is indicated, for instance, by an Act passed in 1551 by the Scots Parliament, wherein the price of the "Woode Cocke" is fixed at "foure" pennies, but we have no means of telling whether it bred in the country. Nor have we any evidence to show how the destruction of the native forests, the draining of the marshes, and the advance of agriculture affected the species. What does emerge, however, from the information we have collected, is the scarcity of the bird as a breeding species in the early part of last century, and its great increase as such during the latter half of the nineteenth and beginning of the twentieth centuries.

Turning to the general status in Scotland given by the older writers, we find that Pennant, in 1772, after describing

* The reference numbers refer to the list of works as follows: first number indicates place of work in list, the Roman numeral indicates the volume, and the final number the page.

the autumn arrivals, says : " There is no account of these birds having ever bred in *Scotland*" (42, iii. 24); while in the Old Statistical Account, written at the end of the eighteenth century, the Woodcock is merely referred to as a winter visitor. Selby, giving its general status in Britain, says : " Although instances are not wanting of Woodcocks remaining through the summer, and even breeding in extensive woods in different parts of the kingdom, they are still too few, I think, to warrant its admission as an indigenous species. I have, however, heard it asserted of late, that such instances are increasing, and that there are districts in which these birds may be found at all seasons in the year; amongst others, the extensive woody tracts in the neighbourhood of Dunkeld and Blair Atholl, planted by the late Duke." This was in 1833 (32, ii. 107). In 1837 Macgillivray wrote : " Very considerable numbers breed in Scotland . . . previous to the beginning of the present century, either the bird did not breed with us, or it had been considered altogether migratory; and reports as to its nest or young were neglected. But of late years so many instances have been recorded, that we cannot doubt its perennial residence in Britain, and have ceased to consider a Woodcock's nest as a wonderful thing" (28, iv. 391). A. G. More (31, 1865, 437) says : " Reported as breeding occasionally in nearly every county throughout England and the south of Scotland. Farther north it becomes more numerous, and may be considered to breed regularly from Perthshire northward to Caithness. There is no doubt that many more birds remain to breed now than formerly; and this increase appears to be owing to the great extent of country which has been covered with plantations during the past few years."

In 1871 Gray sums up the situation as follows : " It is probable that it could be traced from north to south in summer, breeding here and there between the counties of Sutherland and Wigtown (12, 309). Seebohm said, in 1885, that the Woodcock "breeds sparingly and locally throughout the British Islands" (29, iii. 231). In 1899 Howard Saunders wrote : " Of late years, owing to the increase of plantations in the vicinity of feeding grounds, the

number of the individuals which remain has been greatly augmented; and nests have been found in most parts of England, Wales, Scotland, and Ireland, except on some of the barest islands" (35, 569).

We have felt justified in making the above quotations, as these notes, though very general in character, indicate clearly the steady increase of the Woodcock as a breeding bird in Scotland within recent times. To-day, as will be seen below, the species breeds throughout Scotland, in some parts in considerable numbers.

An interesting query which arises is: Did the birds increase as winter visitors before beginning to nest? There are indications that it may have been so, but the evidence is not sufficient to admit of this being stated as a fact.

The two factors, which seem to us to have made possible this great increase of the Woodcock as a breeding bird in Scotland, are the much greater extent of plantations since the beginning of the nineteenth century, and the protection afforded to the breeding birds. The first was important, in that it provided more suitable nesting sites, but owing to a lack of statistics as to the area of ground under woodland a hundred years ago, we cannot give exact figures for purposes of comparison. The increase in plantations however is undoubted, the *Old Statistical Account of Scotland* frequently mentions planting operations being lately undertaken by proprietors. This was the beginning of artificial afforestation in Scotland. Many writers, when recording the increase of Woodcock as a breeding species in their own districts, mention the increase in planting as one of the chief reasons.

The second factor, namely protection, has also played a very important part in the colonization of Scotland by the Woodcock. Sir Herbert Maxwell, writing from Monreith, Wigtownshire, says: "In my schoolboy days and for several years later, we used to reckon the Easter holidays as the best time (except hard winter frost) for shooting Woodcock. Here, on a western sea-board, there were more Woodcock in March and April than at any other season, hard winter frost always excepted. We believed the birds collected here

preparatory to spring emigration; whereas we now know that these were immigrants preparing to nest here." Many other observers testify to the indiscriminate shooting, in former days, and add how much the species increased as a nesting bird as soon as adequate protection was afforded it. Dr Harvie Brown well sums up the position when he says (2, 1907, 144): "They are not shot now as formerly; and, indeed, I am one of those who are of the opinion that the well known and vast increase which has taken place in their numbers as a nesting species all over Scotland of late years, has been greatly due to this change in action by our best sportsmen."

These being, in our opinion, the two chief factors which made possible the colonization of Scotland by the Woodcock, it is interesting to speculate as to how this increase took place. Was it a natural spread from its breeding grounds on the Continent, induced perhaps by overcrowding there, or was the species forced to remain and nest owing to stress of weather, as seems to have been Dr Harvie Brown's opinion? Referring to the abnormal numbers of Woodcock which nested in central Scotland, especially in 1902 and 1908, he attributes their abundance to the severity of the weather in May of these two years. This, according to him, caused a crushing down of the species, the individuals of which were thus forced to nest in unusual numbers to the south of their normal habitat. It is doubtful whether abnormal years, such as these, which force birds to nest in unusual quantities in certain districts, have any permanent effect on the number and distribution of the species in the localities invaded.

In England and Ireland a similar increase in breeding birds has been recorded, the dates of increase in the latter country and the reasons given agree very closely with those in Scotland (8, 273).

Abroad, the Woodcock breeds throughout the greater part of Europe and in Northern and Central Asia, ranging north in Scandinavia to the Arctic Circle and thence across Russia and Siberia, south to about 64° N. latitude, to the Sea of Okhotsk; southwards to the Pyrenees, Transylvania, the

Balkans, Caucasus, Tian-shan, Himalaya, above 10,000 feet, and Japan. It is resident in the Azores, the Canary Islands, and Madeira (13, 211).

As our readers will see we have confined ourselves in this paper solely to the *breeding* of the Woodcock in Scotland, and have not touched either on its migrations or its habits.

II. CHRONOLOGICAL LIST.

1827. Penmanshiel, Berwickshire (3, ii. 237).
 1828. Newabbey Parish, Kirkcudbright (44, 19).
 1832. Conon, East Ross (39, 1832, 133).
 1833. Dunkeld and Blair Atholl (32, ii. 108).
 1835. Brahan Castle, East Ross (1, 1837, 121).
 1837 (before). North-west Aberdeen (1, 1837, 201).
 1837 (before). Strathmore, Forfarshire, and Perthshire (*loc. cit.*).
 1837. Monymusk and Castle Forbes, Aberdeen (1, 1837, 337-40).
 1837. Moray (14, ii. 591).
 1841. Tarbat, E. Ross (12, 310).
 1846. Altyre and Darnaway, Morayshire (45, 252).
 1848. Langholm Lodge, Dumfriesshire (15, 25/4/48).
 1848. Sutherland (43, i. 137).
 1849. Dunrobin, Sutherland (9, 103).
 1852. Mull (7, 115).
 1857. Arbroath District, Forfarshire (plentiful) (41, 1887-88, 341).
 1863 (before). Ardnamurchan, Argyllshire (7, 174).
 1864. Drumnadrochit, Inverness (Hargitt Coll.).
 1865. Caithness (31, 1865, 437).
 1865. Near Carness, Inverness (Hargitt Coll.).
 1866. Dunipace, Stirlingshire (46, 1866, 71).
 1867 (before). East Lothian (5, 25).
 1867. Ross of Mull (16, 171).
 1867. Abbotsford, Roxburghshire (30, iv. 196).
 1867. Scone Woods, Perth (Hargitt Coll.).
 1869. Tarlogie, East Ross (40).
 1869. Brodick Castle, Arran (12, 309).
 1869. Dochfour Wood, Inverness (Hargitt Coll.).
 1870 and onwards. Knockie, Inverness (Hargitt Coll.).
 1870. Drumblade and Huntly, Aberdeenshire (41, 1871-72, 48).
 1870. Inverurie, Aberdeenshire (41, 1871-72, 82).
 1870. Roslin, Midlothian (41, 1871-72, 153).
 1871 (before). Islay, Inner Hebrides (12, 309).

- 1871 (before). Dumbartonshire (12, 309).
 1871 (before). Castle Leod, E. Ross (12, 309).
 1871 (before). Morayshire (many parts) (12, 310).
 1873. Kinlochmoidart, Inverness-shire (MS. note by J.A.H.B. in Gray's *Birds of West of Scotland*).
 1873. Shambellie Wood, Kirkcudbright (MS. note by J.A.H.B. in Gray's *Birds of West of Scotland*).
 1873. Inveran, Sutherland (Hargitt Coll.).
 1874 (before). Hermaness, Shetland (11, 200).
 1876 and for a few years before. Bowhill, Selkirkshire (30, viii. 197).
 1876 (before). Banffshire (33, 410).
 1876. Castle-Douglas, Kirkcudbright (41, 1875-76, 337).
 1876. Loch Lomond (37, 1876, 70).
 1878. Moncrieff Hill, Perth (41, 1877-78, 288).
 1878. Near Lochluichart, Ross (Hargitt Coll.).
 1879. Stornoway (22, 130).
 1879. Midlothian (38, v. 136).
 1880. Faskally, Perthshire (plentiful) (41, 1879-80, 305).
 1880. Duns Castle, Berwickshire (10, 538).
 1880. Longformacus, Foulden Hag, Coldingham Wood (with increasing frequency till 1912) (10, 538).
 1885. Galloway (41, 1885-86, 270).
 1885. Berriedale, Caithness (17, 217).
 1885. Fife (41, 1885-86, 373).
 1887 (before). Hoy, Orkney (21, 211).
 1888. Rousay, Orkney (21, 212).
 1888. Applecross, W. Ross (20, 288).
 1888. Banff (abundant) (19, ii. 188).
 1889 (before). Tynninghame, E. Lothian (C. Tunnard, *in litt.* 26/11/22).
 1889. Scorriebreck, Skye (20, 288).
 1890 (before). Loch of Cliff, Unst. (23, 163).
 1891. Increasing on Borders (41, 1891, 158).
 1891. Near Gight, Aberdeenshire (41, 1891, 59).
 1891. North Uist (2, 1892, 73).
 1892 (about). Beith, Ayrshire (John Craig, *in litt.* 28/9/22).
 1893. Dumfriesshire (increasing) (26, 25/2/93, 96).
 1893. Near Stirling (unusual numbers) (2, 1894, 221).
 1895. Weisdale, Shetland (23, 163).
 1896. Drumtochty and Monboddo, Kincardineshire (24, 313).
 1897 (before). Climpy, Carnwath, Lanarkshire (2, 1897, 217).
 1898. Ballinluig District, Perthshire (2, 1899, 13).

1898. Near Linlithgow (John Pagan, *in litt.* 12/1/23).
 1900. Baledmund, Perthshire (24, 314).
 1901. Lamlash, Arran (2, 1902, 194).
 1901. Rannoch, Edinample, and west end Loch Earn, Perthshire
 (24, 313).
 1902. Kintore Parish, Aberdeenshire (2, 1902, 253).
 1903. Bute (2, 1903, 142).
 1903. Dee (breeds in considerable and increasing numbers) (18,
 172).
 1904 (before). Glen Mama, West Inverness (20, 291).
 1904 (before). Assynt, Edderachyllis, Loch Carron, Attadale, Broad-
 ford (Skye), Armadale (Skye), and Raasay (20, 288).
 1904. Dalmeny Park and Hopetoun Estate, West Lothian (2, 1904,
 190).
 1904. Dunipace, Stirlingshire (phenomenal numbers) (2, 1904, 190).
 1904. Polmaise and Touch, Stirlingshire (2, 1904, 246).
 1905. Lesser Cumbrae (2, 1908, 142).
 1905. Shetland (2, 1905, 245).
 1905. South Bute (2, 1906, 200).
 1906. Montreathmont Moor, Forfarshire (24, 315).
 1907. Capenoch, Dumfriesshire (increase) (2, 1907, 249).
 1907. The Hirsell, Berwickshire (The Earl of Home, *in litt.*
 23/11/22).
 1907. Charterhall, Duns, Berwickshire (Colonel A. R. Trotter, *in*
litt. 18/11/22).
 1908. Bothwell, Clyde (considerable numbers) (2, 1908, 256).
 1908. Darvel, Ayrshire (N. Hopkins, *in litt.* 7/11/22).
 1909. Highlands (increasing) (2, 1910, 139).
 1910. Kirkcudbright (abundant) (2, 1910, 247).
 1910. Thirlestane Castle, Berwickshire (Rev. W. M'Conachie, *in litt.*
 20/11/22).
 1911 (before). Peeblesshire (25, 202).
 1911. Saltoun, East Lothian (41, 1919, 52).
 1911. Wigtownshire (M. Portal, *in litt.* 17/1/23).
 1912. Elba, Berwickshire (Rev. W. M'Conachie, *in litt.* 20/11/22).
 1915. Renfrewshire (41, 1915, 271).
 1916. Lauder, Berwickshire (41, 1917, 154).
 1917. Ossian birch wood, West Inverness-shire (41, 1918, 6).
 1918. Glasgow (41, 1918, 242).
 1918. Wigtownshire (increased) (41, 1918, 243).

(To be continued.)

Black-backed Gull and Black Guillemot in Ayrshire.—

In Rev. J. M. M'William's "Notes on Some Birds of Buteshire and Ayrshire" (*Scot. Nat.*, 1923, p. 51), he says regarding the Greater Black-backed Gull that "it appears there is no record for Ailsa Craig that can be regarded as satisfactory," but, on 10th June 1922, I got a clutch of two slightly incubated eggs of this species on Ailsa Craig. I have taken the nest of the Greater Black-backed Gull in Ayrshire, in the same locality as Mr M'William, over twenty years ago, and it nested (two eggs) on the top of a small rock near Dunure in 1922.

For years it has been known that the Black Guillemot was breeding in Ayrshire, as the late Charles Berry of Lendal, near Girvan, had eggs taken from the nest, but he resolutely and wisely refused to reveal the spot where they were taken. I myself have seen the birds for years at the approach of the breeding season, but never had an opportunity of being there when the sea was calm enough to permit of investigation. I have never seen the bird anywhere near the Arran shore during the breeding season, and there are very few places indeed round Arran, precipitous and rocky as it is, that would occur to me as a likely breeding site, except the north-east side of Holy Isle, and there I have never seen it. In June 1921 I saw a pair of birds flying from the Loups on the north-east side of Ailsa Craig. So far as I know the bird has never been reported from Ailsa Craig as a breeding species, but I am inclined to think that it is a great deal more likely to be found there than on Arran.

The mere fact that birds are not seen is not always proof of their not being there, as up till 1922 I had refused to believe the odd reports of the breeding of the Greater Black-backed Gull on Ailsa Craig, because I had never seen it there. So far as I know, however, this was the first authentic case of eggs being obtained.

I have visited Ailsa Craig regularly during the breeding season for over thirty years, and know the birds and the place fairly well.—
JOHN M. CRINDLE, Dunure.

Increase of Goldcrests and Long-tailed Tits in Moray.—

Owing to the mild winter or rather the absence of the winter of 1922-23, in the neighbourhood of Elgin, we were snowed under in spring by millions of a species of *Chermes*, which infested young conifers. The direct result was an unusual number of nesting Goldcrests and Long-tailed Tits. Several families of each were about the place all day and every day.—ALEX. STABLES (Major), Elgin.

CONTRIBUTIONS TOWARDS A LIST OF THE
INSECT FAUNA OF THE SOUTH EBUEDES.

From the Zoological Laboratory, University of Cambridge.

IV. THE HEMIPTERA (RHYNCHOTA).

By G. EVELYN HUTCHINSON, F.E.S.

THIS paper is divided into sections arranged as follows:—

- I. Introduction.
- II. Table of Species Recorded.
- III. Notes on Various Species.
- IV. The Natural History of the Corixidæ found in the Islands.
 - (a) Geographical Distribution.
 - (b) Habitat.
 - (c) Notes on time of Emergence.
 - (d) Variation.
- V. Summary and Conclusion.
- VI. Bibliography.

I. INTRODUCTION.

Mr Balfour-Browne^{1*} has already dealt with the nature and position of the chief localities worked by our party in June 1922; but since my attention for the most part was focussed on the water-bugs, during our visit to Islay, Jura, and Gigha, it may not be out of place to give here a short general account of the inland waters of these three islands.

Gigha, on account of its small size, possesses no large mass of mountains in its centre, as do the other two islands, and is therefore destitute of "alpine" lochs; there are, however, some small lowland lochs in the central part which possess a characteristic hemipterous fauna. We also found two small ponds and a puddle or two in the south of the island.

On Islay and Jura alpine lochs and pools abound; their characteristics and fauna are dealt with in a later section. The wide belt of partly cultivated land lying between the

* The numbers refer to the Bibliography at the end of this paper.

moorland and the coast-line of Islay make possible the existence of several lowland ponds, but the corresponding belt on Jura is narrower and steeper and such ponds are therefore rare.

At the time of our visit to Islay (15th to 22nd June) but few land-bugs had emerged; on Jura a week later many more had appeared. For this reason, together with the difference in the distribution of lowland water on the two islands, more time and attention was given to land-bugs on Jura than on Islay. The few days spent on Gigha were divided between collecting water-bugs and trapping small mammals, the latter being greatly needed for a more complete understanding of the fauna of these islands.

II. TABLE OF SPECIES RECORDED.

All the specimens from Islay were collected in the country around Port Ellen, all from Jura from the neighbourhood of Craighouse. Details of the capture of some of the more interesting species are given in Section III. I have thought it best to use the nomenclature of our latest British Catalogue, based on Oshanin's *Katalog der paläarktischen Hemipteren*, and given by Mr E. A. Butler in his recent work²; this list will no doubt be used in all subsequent work on the British Heteroptera. Mr J. Edwards has very kindly named my Homoptera, and I have used his nomenclature throughout.

Note.—In the list below, the initials I., J., and G. given in brackets after the name of the insect signify Islay, Jura, and Gigha respectively.

HETEROPTERA.

NABIDÆ—	Miris ferrugatus, Fall. (J.).
Nabis ferus L. (J.).	Psallus betuleti, Fall. (J.).
	P. varians, H.S. (? J.).
ANTHOCORIDÆ—	
Anthocoris confusus, Reut. (J.).	DIPSOCORIDÆ—
A. nemorum, L. (I.J.).	Dipsocoris alienum, H.S. (J.).
CAPSIDÆ—	GERRIDIDÆ—
Pithanus mærkeli, H.S. (J.).	Gerris costæ, H.S. (I.J.).
Lygus pratensis, L. (J.).	G. lacustris, L. (I.J.).
Capsus ater, L. (J.).	VELIIDÆ—
Stenodema calcaratum, Fall. (J.).	Velia currens, F. (I.J.).
S. holsatum, F. (I.J.).	

ACANTHIIDÆ—	A. venusta, D. and S. (I.G.).
<i>Salda littoralis</i> , L. (?I.J.).	A. striata, L. (I.J.).
<i>Acanthia scotica</i> , Curt. (J.).	A. distincta, Fieb. (I.J.G.).
<i>A. saltatoria</i> , L. (J.).	A. mœsta, Fieb. (I.).
NEPIDÆ—	A. fossarum, Leach. (I.G.).
<i>Nepa cinerea</i> , L. (I.).	A. scotti, Fieb. (I.J.G.).
NOTONECTIDÆ—	A. fabricii, Fieb. (I.).
<i>Notonecta glauca</i> , L. (I.?J.).	A. carinata, C. Sahlb. (I.J.).
<i>N. furcata</i> , F. (I.?J.).	A. germari, Fieb. (I.J.).
CORIXIDÆ—	<i>Callicorixa præusta</i> , Fieb. (I.J.G.).
<i>Corixa geoffroyi</i> , Leach. (I.J.G.).	<i>Glænocorisa cavifrons</i> Thms. (I.J.).
<i>Arctocorisa hieroglyphica</i> , Duf. (G.).	<i>Cymatia bonsdorffi</i> , C. Sahlb. (I.J.G.).
<i>A. sahlbergi</i> , Fieb. (I.J.G.).	<i>Micronecta minutissima</i> , L. (I.).
<i>A. linnæi</i> , Fieb. (G.).	

HOMOPTERA.

CERCOPIDÆ—	FULGORIDÆ—
<i>Philænus lineatus</i> , L. (J.G.).	<i>Cixius nervosus</i> , L. (J.).
JASSIDÆ—	<i>C. similis</i> Kbm. (J.).
<i>Ulopa reticulata</i> , F. (I.J.).	<i>Delphax distincta</i> , Flor. (I.J.).
<i>Oncopsis avellanæ</i> , Edw. (I.J.).	<i>D. difficilis</i> , Edw. (I.).
<i>Athysanus grisescens</i> , Zett. (I.J.).	<i>D. discolor</i> , Boh. (I.).
<i>Thamnotettix stupidula</i> , Zett. (I.J.).	<i>D. forcipata</i> , Boh. (J.).
<i>Cicadula sexnotata</i> , Fall. (I.).	<i>Stiroma bicarinata</i> , H.S. (J.).
<i>Dicraneura flavipennis</i> , Zett. (I.).	PSYLLIDÆ—
<i>Eupteryx urticæ</i> , Fab. (I.).	<i>Rhnicola ericæ</i> , Curt. (I.).
	<i>Psylla hartigii</i> , Flor. (I.).
	<i>P. peregrina</i> , Först. (I.J.G.).
	<i>Trioza velutina</i> , (Först. I.).

III. NOTES ON VARIOUS SPECIES.

Capsus ater, L. — The two specimens, both from Craighouse, Jura, have black pronota and dark legs.

Stenodema calcaratum, Fall.—Three specimens from Jura, 2 ♀♀ green and 1 ♂ brown, the latter perhaps darker than brown southern specimens.³

S. holsatum, F.—Eight specimens from Jura and three from Islay, all ♀♀, and varying from ochreous to green and ochreous.

Gerris costæ, H. S.—This species occurred in Islay on rock pools above the high-tide mark near Port Ellen, as well as on the ponds in the higher parts of the island. A

specimen was taken in Jura lacking wings and elytra; these structures seem to have been removed by some external agency.

G. lacustris, L.—All the specimens from Islay are brachypterous, those from Jura both brachypterous and macropterous.

Notonecta glauca, L., and *N. furcata*, F.—Both probably occurred in Jura, but I cannot be quite certain of this. Only nymphs were found in Gigha.

Philænus lineatus, L., was emerging in Jura during our stay (22nd to 28th June); *P. spumarius*, L., which presumably is found in the islands, appeared not yet to have emerged.

Trioza velutina, Först.—Mr Edwards considered this to be “perhaps the most interesting insect” among the Homoptera submitted to him.

The species *Nabis ferus*, *Pithanus mærkeli*, *Miris ferrugatus*, *Psallus betuleti*, and the slightly doubtful *P. varians* are admitted to the list on the strength of nymphs kindly named for me by Mr Butler. In addition to these a nymph of *Cixius* sp. was taken near Craighouse in Jura. The doubtful record of *Salda littoralis* in Islay is based on a nymph taken near Port Ellen which subsequently emerged most unsuccessfully as a perfect insect, the latter is too damaged for a satisfactory determination; some nymphs, probably of this species, were taken on the same island.

IV. THE NATURAL HISTORY OF THE *CORIXIDÆ* FOUND IN THE ISLANDS.

This last section is a discussion of various observations which throw light on the biology of some of the *Corixidæ* found in the islands. It has been divided into four subsections.

(a) *Geographical Distribution.*

We may first examine the geographical distribution of the species under consideration. Of the seventeen *Corixidæ* species taken in the islands, only three can be regarded as belonging to the boreo-alpine elements in our fauna, and

the status of one of them is doubtful. The three species are *Arctocorisa carinata*, *A. germari*, *Glænocorisa cavifrons*. At present we can only say of these that, in Britain, they have their chief home in the shallow peaty lochs and tarns of Scotland, N. England, and possibly Ireland, but that they are all found in isolated colonies in the south of England, often in habitats very different from their northern abode. Thus the locality for *G. cavifrons* near Cambridge, mentioned by Mr Butler,² is a pond containing much *Chara* or *Nitella*, among which *Arctocorisa striata* is common, and I have taken a single specimen of *A. germari* in a similar pond in the same district; both localities are very different from those in which these species occur in the north.

Mr Butler² gives as the extra-Britannic distribution of the three species:—

A. carinata.—"Chiefly in Northern Europe."

A. germari.—France, Germany and northern parts of N. America.

G. cavifrons.—"North-eastern and mountainous central parts of Europe" and Greece.

It is possible, therefore, that *A. carinata* and *G. cavifrons* are truly boreal or boreo-alpine insects, while *A. germari* belongs to the small American or circumpolar element in our fauna (*vide* Scharff⁴ and other works on distribution).

Of the other species, *A. scotti* has an interesting distribution in Britain, being apparently absent from the eastern counties of England. It is probably partial to somewhat acid water, which may account for its peculiar range, and outside Britain it is only recorded from France. *Stenodema holsatum*, F., a well-distributed Palæarctic insect, has a somewhat similar, though less restricted, British range.

A. distincta and *C. bonsdorffi* are probably commoner in Northern than in Southern Britain but are sufficiently widely spread to be reckoned as "generally distributed" rather than "northern" species. Possibly the distribution of suitable habitats and lack of competition with *A. fallenii* and *C. coleoptrata* accounts for their increased abundance in the north.

It has not been possible to make a detailed comparison

between the Corixid fauna of the islands, either among themselves or with the fauna of the Scottish mainland. Many weeks collecting would be needed before such a comparison was of any value as indicating the range of species in the area considered. The following short lists indicate differences found when the South Ebudes list is compared with the Perthshire list given by M'Gregor and Kirkaldy,⁵ and the Clyde area list given in the *British Association Handbook*, 1901.⁶

I. Clyde area but not S. Ebudes.

A. fallenii.

C. caledonica, Kirk (= *cognata* D. and S.).

II. Perthshire but not S. Ebudes.

A. fallenii.

A. limitata.

A. semistriata.

C. concinna.

III. S. Ebudes but not Clyde.

A. carinata.

G. cavifrons.

A. germari.

C. bonsdorffi.

IV. S. Ebudes but not Perthshire.

A. germari (perhaps confused with *A. carinata*).

G. cavifrons.

A few scattered records are added here for the sake of completeness, showing what bugs of this family are already known from the Scottish Islands:—

"SCOTTISH ISLANDS"	<i>C. præusta</i> .	Kirkaldy. ⁷
BUTE . . .	<i>A. venusta</i> .	Douglas and Scott. ⁸
" . . .	<i>A. fabricii</i> .	Douglas and Scott. ⁸
" . . .	<i>C. caledonica</i> .	Douglas, <i>vide</i> Saunders. ¹¹
MULL . . .	<i>A. scotti</i> .	Dale, <i>vide</i> Saunders. ¹¹
HARRIS . . .	<i>A. "prominula."</i>	Douglas, ⁹ Saunders. ¹¹
" . . .	<i>A. carinata</i> .	Dale, <i>vide</i> Saunders. ¹¹
" . . .	<i>C. coleoptrata</i> .	Dale, <i>vide</i> Saunders. ¹¹
ORKNEYS . . .	<i>A. venusta</i> .	Reuter, <i>vide</i> Saunders. ¹¹
SHETLANDS . . .	<i>A. distincta</i> .	Reuter, <i>vide</i> Saunders. ¹¹
" . . .	<i>A. fabricii</i> .	Douglas and Scott. ⁸
" . . .	<i>A. scotti</i> .	Reuter, <i>vide</i> Saunders. ¹¹
" . . .	<i>A. carinata</i> .	Reuter, <i>vide</i> Saunders. ¹¹
" . . .	<i>C. caledonica</i> .	Reuter, <i>vide</i> Saunders. ¹¹

(b) *Habitat.*

We may now pass from the "Geographical" to the "Local" Distribution of the *Corixidæ* in the various standing and slowly moving waters of the three islands. It will be convenient to consider a number of types of habitat separately.

(1) Shallow lochs and lochans among the hills of Islay and Jura.

Leorin Lochs, Loch Laoim, Loch Scholum, and Loch na Beinne Brice, all north of Port Ellen, Islay, are good examples. These are all shallow with a peaty bottom, and contain no higher plants except grasses (probably *Glyceria*) at the outflow. The following species of *Corixidæ* were taken in these:—

<i>A. mæsta.</i>	<i>A. carinata.</i>	<i>C. præusta.</i>
<i>A. scotti.</i>	<i>A. germari.</i>	<i>G. cavifrons.</i>
	<i>C. bonsdorffi.</i>	

It is possible that these are distributed differently among the several lochs, but my records are not perfect enough to provide definite information. Similar associations were met with in Jura but were less thoroughly worked. Very similar localities in Westmorland also yield *A. carinata*, *A. germari*, and *G. cavifrons*. It is hoped that further investigations may be carried out on these species in these last localities.

(2) Loch three-quarter mile west of Craighouse, Jura ("Craighouse Loch").

This, though a shallow piece of water in peaty soil at the foot of the hills, yielded a very different fauna from that recorded in the last list. In it were taken:—

<i>A. distincta.</i>	<i>A. germari.</i>
<i>A. striata.</i>	<i>C. bonsdorffi.</i>
<i>A. scotti</i> (abundant).	

(*To be continued.*)

Tunny in Firth of Forth.—On the evening of 2nd November I examined a Tunny, stranded to the west of North Berwick, which had been reported to me as having come in with the tide. It was a fine specimen, measuring 8 ft. 1 in. in length, and having a girth of 5 ft. 5 in., and a spread of tail of 2 ft. 6 in.—W. M. INGLES, North Berwick.

[The Tunny (*Thynnus thynnus*) is a rare visitor to the Firth of Forth from the open waters of the Atlantic Ocean; an example was recorded in 1912 (*Scot. Nat.*, 1912, p. 279), and previously in 1885, 1868, and 1842, all, with one exception, in late autumn (*Ann. Scot. Nat. Hist.*, 1900, pp. 10 and 207).—EDS.]

Snail Slug (*Testacella haliotidea*) in Midlothian, and its Power of Colour-Change.—During 1922 I received, at different times, one dead and two living individuals of the Snail Slug (*Testacella haliotidea*) from a nursery-garden at Murrayfield, within the boundaries of Edinburgh. Although the species has been found in many English counties, particularly south of the line of the Humber and Mersey, Scottish specimens have been recorded only from the counties of Renfrew, Stirling, and Fife. To these county records must now be added Midlothian. The shell of the largest individual measured 7.5 mm. in length by 4.5 mm. in breadth.

The peculiar feeding habit of the slug led to its detection, for Mr E. Gordon, to whom I am indebted for this interesting creature, noticed it devouring an earthworm in characteristic fashion, by swallowing it endwise. Many repetitions of this act were under observation during the three months one of the snails was in captivity in the nursery and in the Royal Scottish Museum, where it eventually escaped. All the snails were found in a cold glass-house, which was never heated until the outside temperature fell below freezing. Here they lived in the ash-beds upon which stood plants in pots, moisture being supplied by a daily spraying with water.

Mr Gordon made an interesting observation, well worth recording, on the power of *Testacella haliotidea* to change colour under conditions of nervous irritation. A large individual, which reached me alive on 10th October 1922, was first observed by Mr Gordon and two companions lying close to a couple of bricks between which the head end was insinuated. The tail part with its shell was exposed to view, and was of a "bright raw sienna colour." On being captured the snail suddenly contracted its body, the brown colour disappeared and was replaced by a "low toned grey." I am not aware that such power of colour-change has before been noticed in *Testacella*, though it is well known in several groups of Mollusca.—JAMES RITCHIE.

BOOK NOTICES.

LINNÆUS (afterwards Carl von Linné). Adapted from the Swedish of Theodor Magnus Fries. By Benjamin Daydon Jackson. London: Witherby, 1923. Pp. xv. + 416. Price 25s.

The monumental life of Linnæus by the late Prof. T. M. Fries of Upsala is here presented in a somewhat abridged translation, which will at once take its place as the authoritative biography of the great naturalist in the English language. Without stressing the point, it shows us Linnæus as a man of altogether exceptional powers and energy. Two hundred years ago the outstanding need of the natural sciences was system, and that need he supplied with astonishing ability. But his own description of himself as a "born methodizer" has been too widely accepted as an adequate summary of his gifts and services. We see him here indeed as a brilliant systematist, but we see him too as a field naturalist and original observer of the first rank.

His path to fame was by no means easy. As a student he had constant difficulties to overcome, and even after he had won a distinguished place in the scientific world there were stormy episodes to pass through before he attained the goal of his ambition, the Professorship of Botany at Upsala University. His manifold activities and the various aspects of his remarkably full life are all dealt with here in the light of the latest biographical research.

English-speaking naturalists are under a real debt of gratitude to Dr Daydon Jackson for making this great work available to them.

SCIENCE AND GOSSIP — ANNALS OF THE COUNTRYSIDE. By Alexander M. Stewart, F.E.S. Paisley: Alexander Gardner, Ltd. 8vo, pp. 175, 4 plates. Price 6s. net.

This is an entertaining and instructive little volume, containing a series of twenty-four sketches on a variety of subjects, mainly zoological, written with decided literary skill and a quaint and humorous style which leads the reader to imbibe a considerable amount of natural history knowledge in the pleasantest manner possible. The scientific names, however, require a certain amount of revision. On p. 110, line 12, *Limna* should be *Limnæa*, and the same word is printed *Limnæ* on p. 159, line 1; on p. 111, line 7, *Aneylus* should be *Ancylus*; on p. 118, line 12, and twice on the plate facing p. 116 the word *pollonium* is used for the pollen-mass of orchids instead of *pollinium*. And we do not like the sentence on p. 110, "in the stream it attains to a much larger size"—why do so many authors insert an English preposition which is already expressed in the prefix of the verb? But in spite of these little flaws we like the author's style—it is on the whole clear and accurate—and we shall welcome further sketches from the same pen.

NOTES FROM THE SCOTTISH ZOOLOGICAL PARK

THE KING PENGUINS.

(Continued from p. 168).

THE moulting of the Penguins in the Park has also been a matter of considerable interest in the sensitiveness of relation it seems to show in the birds to changes in climatic or other stimuli; though as, even in this matter, each Penguin seems to me more or less a law unto itself, it is perhaps wise not to commit oneself to too definite a statement. In the Antarctic islands of their home, the King Penguin may moult at any time during the Antarctic summer, but usually, probably, towards its close, that is to say, about February or March. Of the Penguins in the Park, three arrived in January 1914, one of them being an adult in mature plumage, and the other two young birds in the primitive brown down-like feathers of the first year. These young birds were probably hatched in the summer (Antarctic) of 1912-13, and if they had not been captured they, as well as the adult, would no doubt have moulted somewhere between December 1913 and the following March. They were captured and shipped from South Georgia about November 1913. One of the young birds began to moult about the end of April and the other towards the end of May 1914, but after a small portion of the juvenile feathers were shed the process seemed to be arrested and was not resumed till the late summer (northern), being completed in the one case in August and in the other in September. Both of these birds moulted from the brown nestling plumage into the complete adult plumage and colouring, omitting the intermediate plumage of adult-like but somewhat subdued colouring which the young King Penguin normally assumes on its first moult. The adult showed no inclination to begin its moult when the young ones did, and moulted in a normal way in October 1914. There is just a possibility that it may have moulted during the voyage, but as to this there is no information; there could be no such possibility in the case of the young birds. The inferences from this are that the impulse of established racial habit carried the young birds into the moult near their customary time, but, in the absence of the necessary external stimulus, they were unable to go through it then; and, further, that the lacking factor came into operation in the autumn, about the time of the general autumn moult of northern birds, though some-

what later than they—in the case of the adult bird, very much later, which, however, would be to a great extent explained if this bird had already moulted between capture and its arrival in this country. In the following year, 1915, the moult of the three birds covered the period from 30th July, when the first bird commenced, to 18th September, when the third finished.

From the observations of these two years alone, it seemed that the Penguins, adapting themselves to the reversal of seasonal conditions, were changing the time of the moult from the southern to the northern autumn. This appearance still held good in 1916, though in that year it was a little earlier, the moult of the three birds taking place between the first week of July and the second week of August. In 1917 the three birds moulted between 12th June and 10th August, the interval between the commencement in the different birds being much greater; that beginning on 12th June being finished on 24th June, while the third bird did not commence till 29th July. In the spring of 1917 three more Penguins arrived, being at the time of their arrival in the intermediate or second year's plumage. They had probably moulted from the nestling plumage prior to capture at the end of the summer (southern) of 1916-17, and the first moulting periods in the Park of these three fresh birds were respectively 28th July to 14th August, 14th August to 4th September, and 8th to 23rd September. (One of these new birds was sent to the London Zoological Garden before another moult.) It still seemed as if our autumn might be considered their moulting season, but in the following year the birds upset, in the way they seem to love to do, the conclusions their previous behaviour might have warranted, and commenced their moulting in April, the periods of the three older birds being 20th April to 6th May, 26th April to 12th May, and 1st to 15th June 1918. The two newer birds that year moulted between 16th July to 5th August and 2nd to 20th August respectively. The periods were much the same in 1919, extending from 5th April to 11th August. In 1920 the first of the five birds began to moult on 1st April and the last finished on 19th July. A more surprising change took place in 1921 when the moulting periods for the five old birds were 26th March to 16th April, 31st March to 20th April 18th April to 5th May, 20th April to 7th May, and 23rd April to 12th May. In 1922 the first bird began a little later—on 5th April—and the last of the five finished on 25th May, the period covered by the five birds being practically of the same duration as in the preceding year, but some ten days or so later.

T. H. G.

(To be continued.)

INDEX

A

- Aberdeenshire, Gudgeon introduced in Don, 18
 early records of *Sirex*, 61
Acaudus bipapillata, n. sp. (Aphides), 20
 Animal Life, the open winter and, 1
 Aphides, n. gen. (*Jacksonia*) and two n. sp. described, 19
 Argyllshire, a scarce Beetle from, 95
 Chiffchaff in, 152
 Great Spotted Woodpecker in, 4
 Ashworth, Prof. J. H., 3
 Ayrshire, birds of, 47
 Black Guillemot in, 184
 Great Black-backed Gull in, 184
 Red-breasted Merganser in, 174

B

- BAILEY, Major P. H., The Wild Dogs of Sikkim, 30
 BAIN, JOHN, Manx Shearwaters at the Lantern at Hyskeir, 134
 BALFOUR, ALICE, A Rare Robber-Fly, *Pamponerus germanicus*, in East Lothian, 162
 BALFOUR - BROWNE, FRANK, The Aquatic Coleoptera of the South Ebuades, 55, 87
 Banffshire, Turtle Dove in, 132
 BARTHOLOMEW, JAMES, Young Wood-pigeons in February, 46; A Well-stocked Mouse Nursery, 53
 BAXTER, EVELYN V., and RINTOUL, LEONORA JEFFREY, Birds Singing on Autumn Migration, 17; Report on Scottish Ornithology in 1922, including Migration, 65, 101; Scandinavian Lesser Black-backed Gull on Spring Passage at Isle of May, 134; The Spread and Distribution of the Woodcock as a Breeding Bird in Scotland since the Beginning of the Nineteenth Century, 177
 BEDFORD, DUCHESS OF, Grey Phalarope in Wigtownshire, 4
 Beetles, *see* Coleoptera
 Berwickshire, first records of Wood-wasps (*Sirex*), 61
 BEVERIDGE, GEORGE, Ruff in N. Uist, 152
 Birds, at Fair Isle, 1923, 173
 of Buteshire and Ayrshire, 47
 breeding-range extended (1922), 69
 in winter of 1922, 78
 increase and decrease (1922), 70
 influenced by open winter, 2, 46
 migration in Scotland in 1922, 65, 101
 movements of species in 1922, 104
 nesting in 1922, 72
 nesting influenced by open winter, 2, 46
 new to faunal areas, 67
 notes of food, habits, etc. (1922), 82
 plumage abnormalities (1922), 82
 ringed individuals recaptured (1922), 80
 singing on Autumn migration, 17
 uncommon visitors (1922), 67
 winter visitors to L. of Myrtoun, 172
 BOOK NOTICES: A Perthshire Naturalist—Charles Macintosh of Inver, Henry Coates, 62; The Conservation of Wild Life in Canada, C. Gordon Hewitt, 62; A Text-book of European Archæology, vol. i., R. A. S. Macalister, 63; The Book of a Naturalist, W. H. Hudson, 63; Poultry (Light Breeds) and how to know them, E. C. Ash, 64; Exploration of Air: Out of the World North of Nigeria, Angus Buchanan, 64; *Proc. S. London Entom. Soc.*, 64; Record Bags and Shooting Records, H. S. Gladstone, 96; Sidelights on Birds, H. Knight Horsfield, 96; Fabre's Book of Insects, Mrs R. Stawell, 97; Our Wild Flowers, and how to know them, E. F. DalGLISH, 97; Guide to the University Botanic Gardens, Cambridge, H. Gilbert-Carter, 98;

- Practical Zoology: for Medical and Junior Students, J. D. F. Gilchrist and C. von Bonde, 135; The Badger: Afield and Underground, H. Mortimer Batten, 135; A Handbook of the Larger British Fungi, John Ramsbottom, 136; The Highlands with Rope and Rucksack, Ernest A. Baker, 136; The British Marine Annelids, vol. iv., part 2, Polychæta, Prof. W. C. McIntosh, 163; A Naturalist in Hindustan, Major R. W. G. Hingston, 163; Mites injurious to Domestic Animals, Stanley Hirst, 164; Botany, a Junior Book for Schools, R. H. Yapp, 164; Linnæus (afterwards Carl von Linné), Benjamin Daydon Jackson, 193; Science and Gossip—Annals of the Countryside, Alex. M. Stewart, 193
- BUCHANAN, MARJORY G., Spread of Great Spotted Woodpecker in Argyllshire, 4
- Buteshire, Birds of, 47
- C
- Caithness, black Mountain Hare in, 124
- Carnegie United Kingdom Trust, 137
- Catops*, see under Coleoptera, 162
- Cephalopods, Scottish, 133
- Chiffchaff in Argyllshire, 152
- CLARKE, Dr W. EAGLE, Little Stints in Orkney in Winter, 162
- Clyde Area, *Catops longulus* new to, 162
- Stenocarus fuliginosus* in, 18
see also individual counties in area
- Coates, H., on Molluscs of Perthshire, 93
- Coccidæ, see Scale-Insects
- Coleoptera, aquatic, of South Ebudes, 55, 87
- Catops longulus*, new to "Clyde," 162
- Hoplia philanthus* in Argyll, 95
invading Culbin Sands, 171
- Ptinella aptera*, new to Scotland, 146, 174
- some Perthshire Beetles, 95
- Stenocarus fuliginosus* in "Clyde," 18
- terrestrial, of S. Ebudes, 153
- Colour-change, in Stoat, 33
in *Testacella*, 192
- Colour Variation in Sea-anemone, 84
- CRAW, JAS. HEWAT, Great Spotted Woodpecker in N. Perthshire, 134
- CRINDLE, JOHN M., Black-backed Gull and Black Guillemot in Ayrshire, 184
- CUTHERBERTSON, A., Some Perthshire Beetles, 95
- D
- Danois, E. Le, on Hake Migration, 15
- Deer, Red, abnormal growth of hoofs, 132
- Diptera, *Pamponerus germanicus* in E. Lothian, 162
- DOUGLAS, Brig.-Gen. W. C., Pheasant Nesting in Tree, 124
- Dove, Turtle, in Banffshire, 132
- Duck, Eider, history of, in "Forth Area," 147
- Garganey, in Lanarkshire, 17
- Merganser, in Ayrshire, 174
- Dunfermline Nat. Hist. Soc., 35
- Dunlin, sub-species found in British Isles, 21, 95
- E
- Ebudes, South, insect fauna of, 55, 87, 125, 153, 185
- Edinburgh, *Sirex* on Arthur's Seat, 146
late Swifts near, 139
- Whooper Swans in, 14
- Zoology, a Century of, 5, 37
- Elmhirst and Sharpe on *Tealia*, 84
- Elwes, Henry John, death of, 36
- EVANS, the late WM., The Eider Duck, *Somateria mollissima*, in the "Forth Area," 147
- F
- Fair Isle, bird notes from, 1923, 173
- FALCONER, ALLAN A., First Records of Wood-wasps from Berwickshire, 61
- FERGUSON, A., Additions to List of Clyde Coleoptera (a correction), 18
- Fife, Grey Squirrel in, 93
- rookeries in, 86
- Yellow-browed Warbler in E., 14
- Fishes, Gudgeon introduced in Don, 18
- Müller's Topknot, *Zeugopterus punctatus*, off Shetland, 133
- Tunny in Firth of Forth, 192
- Flycatcher, Pied, in Selkirkshire, 133
- Forfarshire, Great Spotted Woodpecker in, 140
- nesting habit of Moorhen in, 175
- Forth Area, history of Eider Duck in, 147
- Tunny in, 192
- see also individual counties

G

- Garganey in Lanarkshire, 17
 GILL, E. LEONARD, Late Stay of Swifts near Edinburgh, 139
 Chiffchaff in Argyllshire, 152
 GILLESPIE, T. H., The Death of "Brutus," and the Age of Lions, 98; The King Penguins in the Scottish Zoological Park, 165, 194
 GLADSTONE, H. S., Blackgame Damaging Young Larch, 54
Gobio, see Gudgeon
 Goldcrest, increase in Moray, 184
 Goldfinch in Midlothian, 152
 GORDON, AUDREY, *Orthezia cataphracta* at a high altitude in the Cairngorms, 152
 GORDON, SETON, Late Swift in Inverness-shire, 140
 GORDON, T. H. M., *Plinella aptera*: a Clavicorn Beetle New to Scotland, 146, 174
 GOWAN, JANE, Turtle Dove in Banffshire, 132
 Grebes, Great Crested, in Moray, 174
 Red-necked, in Moray, 174
 Grouse, Black, damaging young larch, 54
 Gudgeon in Don, 18
 Guillemot, Black, in Ayrshire, 184
 Common, a new British sub-species, 122
 Gull, great age of, 14
 Greater Black-backed in Ayrshire, 184
 Scandinavian Lesser Black-backed at Isle of May, 134

H

- Haddingtonshire, *Pamponerus germanicus* in, 162
 Tunny in, 192
 Hake, migration of, 15
 HAMILTON, DAVID, Early Arrival and Late Stay of Swifts, 139; Goldfinch in Midlothian, 152
 HANCOCK, G. L. R., The Lepidoptera of the South Ebudes, 125
 Hare, Mountain, black variety, 124
 Hebrides, Inner, aquatic Coleoptera of Southern, 55, 87
 Hemiptera of Southern, 185
 Lepidoptera of Southern, 125
 Manx Shearwaters at Hyskeir, 134
 terrestrial Coleoptera of Southern, 153
 Hebrides, Outer, Ruff in N. Uist, 152
 Hemiptera of S. Ebudes, 185

- Homing of pigeons, 171
 Hoopoe in Kirkcudbright, 94
 in Lanarkshire, 140
 in Midlothian, 94
 Horne, Arthur, death of, 3
 HUGHES ONSLOW, G., Red-breasted Merganser in Ayrshire, 174
 HUNTER, D. G., Nesting of the Great Spotted Woodpecker in Forfarshire, 140; Curious Nesting Habit of Moorhens, 175
 HUTCHINSON, G. EVELYN, The Hemiptera (*Rhynchota*) of the S. Ebudes, 185
 Hymenoptera, see *Sirex*
 Hyskeir, Manx Shearwaters at, 134

I

- INGLES, W. M., Tunny in Firth of Forth, 192
 Insect Fauna of S. Ebudes, 55, 87, 125, 153, 185
 Insects, spread to Culbin Sands, 171
 Inverness-shire, late Swift in, 140
 Great Wood-wasp in, 133
 Lunar Hornet Clear-wing in, 18
 Islay, aquatic Coleoptera of, 55, 87
 Hemiptera of, 185
 Lepidoptera of, 125
 terrestrial Coleoptera of, 153

J

- JACK, JAS., Hoopoe in Lanarkshire, 140
Jacksonia, n. gen. (Aphides), 19
 JOHNSTON, NORMAN M., Some Rookeries in Fifeshire, 86
 JOURDAIN, F. C. R., Supposed Breeding of the Blue-headed Wagtail in Scotland, 53
 Jura, aquatic Coleoptera of, 55, 87
 Hemiptera of, 185
 Lepidoptera of, 125
 terrestrial Coleoptera of, 153

K

- Kirkcudbright, Hoopoe in, 94

L

- Lanarkshire, Garganey in, 17
 Hoopoe in, 140
 the Rook in, 141
 LEARMONTH, W., Hoopoe in Kirkcudbright, 94

- Lepidoptera, *Sesia bembeciformis* in Easternness, 18
of South Ebuades, 125
LESLIE, J. D., A Scarce Lamellicorn Beetle (*Hoplia philanthus*) in Main Argyll, 95

M

- M^CINTOSH, Prof. W. C., A Century of Zoology in Edinburgh, 5, 37
M^CWILLIAM, Rev. J. M., Young Starlings in December, 46; Notes on some of the Birds of Buteshire and Ayrshire, 47
MARWICK, J. G., Albino Brown Rats in Orkney, 172
MATHESON, M., Great Wood-wasp in Westernness, 133
MAXWELL, Sir J. STIRLING, Abnormal Growth of Hoofs in Red Deer, 132
MAXWELL, Sir HERBERT, Wild-fowl Visitors to L. of Myrtoun, Wigtownshire, 172
May, Isle of, Scandinavian Lesser Black-backed Gull at, 134
MEINERTZHAGEN, A. C., The Subspecies of the Dunlin in British Isles, 21, 95
MEINERTZHAGEN, A. C., and MEINERTZHAGEN, Col. R., On the Occurrence of the Farøe Snipe in the British Isles, 123
MELDRUM, N. V., Lunar Hornet Clear-wing in Easternness, 18
Merganser, Red-breasted, in Ayrshire, 174
Merlucius, migration of, 15
Microscope, a new dissecting, 161
Midlothian, Goldfinch in, 152
Hoopoe in, 94
Testacella haliotideia in, 192
Migration of Birds, in 1922, 65, 101
birds singing in autumn, 17
movements of species in 1922, 104
Waxwings in 1921, 23
Migration of Hake, 15
Mollusca, of Perthshire, 93
Colour-change in *Testacella*, 192
Scottish Cephalopods, 133
Testacella haliotideia in Midlothian, 192
Moorhen, curious nesting habit, 175
Moray, increase of Goldcrests and Long-tailed Tits, 184
Great Crested and Red-necked Grebes in, 174
Mouse, large litter, 53
Munro, Dr J. W., on Forest Insects on Culbin Sands, 171

N

- NASH, J. KIRKE, Hoopoe in Midlothian, 94
Naturalist, the Youthful, 169
Nature Study and Books, 137

O

- Orkney, albino Brown Rats in, 172
Little Stints in, 134, 162, 176
Ornithology, in 1922, Report on Scottish, 65, 101

P

- Pamponerus*, see under Diptera
PEARCE, E. J., The Terrestrial Coleoptera of the South Ebuades, 153
Perthshire, Great Spotted Woodpecker in N., 134
land and fresh-water Mollusca, 93
rare beetles, 95
Phalarope, Grey, in Wigtownshire, 4
Pheasant nesting in tree, 124
Pigeon-homing, 171
Plover, Golden, glandular secretion in, 85
Ptinella, see under Coleoptera

R

- Rats, Brown, albinos in Orkney, 172
RINTOUL, LEONORA JEFFREY, Yellow-browed Warbler in E. Fife, 14
RINTOUL, LEONORA JEFFREY, and BAXTER, EVELYN V., see under BAXTER, E. V.
RITCHIE, Dr J., Migration in the Sea, 15; The Great Waxwing Invasion of 1921, 23; Early Records of Wood-wasp (*Sirex*) in N. and S. Aberdeenshire, 61; Spread of American Grey Squirrel in Scotland, 93; Winter Example of Black Variety of Mountain Hare, 124; Müller's Topknot, *Zeugopterus punctatus*, off Shetland, 133; Snail Slug (*Testacella haliotideia*) in Midlothian, and its Power of Colour-change, 192
Riviere, B. B., on Pigeon-homing, 171
ROBINSON, H. W., Little Stints in Orkney, 134, 176
Rook, the, in Lanarkshire, 141
Rookeries, in Fife, 86
in Lanarkshire, 141
Ross-shire, new Aphides from, 19
Ruff in N. Uist, 152
Russell, Dr E. S., on Scottish Cephalopods, 133

S

- St Kilda, Farøe Snipe in, 123
 Scale-Insect, *Orthezia*, at 3000 feet on Cairngorms, 152
 SCOTT, GEO. G., Whooper Swan in Edinburgh, 14; Great Wood-wasp on Arthur's Seat, 146
 Scott, Hugh, on *Sirex gigas*, 171
 Scottish Ornithology in 1922, 65, 101
 Sea-anemone, colour variation, 84
 Secretion, glandular, in Golden Plover, 85
 Selkirkshire, Pied Flycatcher in, 133
 Sharp, Dr David, death of, 3
 Shearwater, Manx, at Hyskeir, 134
 Shetland, Müller's Topknot off, 133
 SIMPSON, J. R., Pied Flycatcher in Selkirkshire, 133
Sirex gigas, 171
 early records from Aberdeenshire, 61
 on Arthur's Seat, 146
 in Inverness-shire, 133
gigas and "*juvencus*," first records from Berwickshire, 61
 SMITH, Dr J. N. DOUGLAS, Glandular Secretion in Golden Plover, 85
 Snipe, Farøe race in British Isles, 123
 Squirrel, Grey, spread in Scotland, 93
 STABLES, Major ALEX., Great Crested and Red-necked Grebes in Moray, 174; Increase of Goldcrests and Long-tailed Tits in Moray, 184
 Starlings nesting in December, 46
 STENHOUSE, Surg. Rear-Admiral J. H., Bird Notes from Fair Isle, 1923, 173
 STEWART, WALTER, The Rook in Lanarkshire, 141
 Stints, Little, in Orkney, 134, 162, 176
 Stirlingshire, Grey Squirrel in, 93
 Stoat, winter colour-change, 33
 Swan, Whooper, in Edinburgh, 14
 Swift, early arrival and late stay, 139
 late in Inverness-shire, 140

T

- TAIT, THOMAS, Gudgeon (*Gobio fluviatilis*) in Don, 18

- Tealia*, colour variation, 84
Testacella haliotidea in Midlothian, 192
 colour-change in, 192
 THEOBALD, F. V., A New Genus and Two New Species of Aphides from Ross-shire, 19
 Tiree, Farøe Snipe in, 123
 Tit, Long-tailed, increase in Moray, 184
 Topknot, Müller's, off Shetland, 133
 Tunny in Firth of Forth, 192
 Turtle Dove in Banffshire, 132

W

- Wagtail, Blue-headed, supposed breeding in Scotland, 53
 Warbler, Yellow-browed, in E. Fife, 14
 Waxwing, invasion of 1921, 23
 Wigtownshire, Grey Phalarope in, 4
 wild-fowl visitors to L. of Myrtoun, 172
 WILSON, R. W. S., Garganey in Lanarkshire, 17
 Witherby, H. F., on a British subspecies of Common Guillemot, 122
 Wood damaged by Black Grouse, 54
 Woodcock, spread and distribution in Scotland, 177
 Woodpecker, Great Spotted, in Argyllshire, 4
 in Forfarshire, 140
 in N. Perthshire, 134
 Wood-pigeons nesting in February, 46
 Wood-wasp, *see Sirex*
 WOTHERSPOON, D., *Catops longulus*, a Beetle new to the Clyde Area, 162

Z

- Zeugopterus punctatus* off Shetland, 133
 Zoological Park, Notes from: The Wild Dogs of Sikkim, 30; The Death of "Brutus," and the Age of Lions, 98; The King Penguins in the Scottish Zoological Park, 165, 194
 Zoology in Edinburgh, a Century of, 5, 37

The Scottish Naturalist

A Magazine devoted to Zoology

With which is incorporated
"The Annals of Scottish Natural History"

EDITED BY

JAMES RITCHIE, M.A., D.Sc., F.R.S.E.,
Keeper, Natural History Department, Royal Scottish Museum

AND

PERCY H. GRIMSHAW, F.R.S.E., F.E.S.
Assistant Keeper, Natural History Department, Royal Scottish Museum

ASSISTED BY

EVELYN V. BAXTER, F.Z.S., H.M.B.O.U.	|	W. EAGLE CLARKE, I.S.O., LL.D.
LEONORA J. RINTOUL, F.Z.S., H.M.B.O.U.	|	ANDERSON FERGUSON, F.E.S.
H. S. GLADSTONE, M.A., F.R.S.E., F.Z.S.		

1924



EDINBURGH: OLIVER & BOYD, TWEEDDALE COURT
LONDON: GURNEY & JACKSON, 33 PATERNOSTER ROW

1924

(Authors are responsible for nomenclature used.)

The Scottish Naturalist

No. 145.]

1924

[JAN.-FEB.

“THE SCOTTISH NATURALIST.”

OVER half a century ago, in 1871, *The Scottish Naturalist*, grandparent of the present magazine, came into being through the energy of Dr Buchanan White, and since that year, without break, loyal Scotsmen have had an opportunity of recording in its own proper place the history of animal life in Scotland. In 1892, by direct descent, *The Annals of Scottish Natural History* succeeded the old *Scottish Naturalist*, and, in 1912, the present magazine fell naturally into the heritage of the former. For thirty years and more, apart from the reversion to an older title and from these changes in editorial personnel which alas! the years are bound to bring, THE SCOTTISH NATURALIST has appeared in the dress of its nativity. And now we venture to deck it in new finery, not because we have anything but deep regard for the simplicity and directness of the old title-page, but because we feel that its austerity may have belied in some degree the character of the themes with which the magazine deals.

What are the objects and aims of THE SCOTTISH NATURALIST? Its aim is to record, with due regard to balance, the animal life of Scotland, to gather information regarding the local range of Scottish animals, to note the changes that are taking place in their distribution and even

in their structure, to unravel life-histories and habits; in a word, to give permanent place to any fact which may add to our knowledge of the elements that make up the fauna of Scotland, in some respects the most interesting assemblage of animals in Europe.

This implies a catholicity of interest which should appeal to the general naturalist, for beasts and birds, fishes and reptiles, insects and the hosts of invertebrates all play their part in the scheme. It also implies that an endeavour is made to ensure that each contribution contains something fresh, some new fact or new point of view, something that adds to knowledge or points the way to new knowledge, and is not a mere repetition of facts already well known and at hand in standard works of reference.

But it does not imply, as readers unfamiliar with the contents of the magazine may suppose, a wearisome series of dry-as-dust articles couched in language familiar only to the specialist. New facts are of interest in themselves, and that their presentation should enhance rather than obscure their interest is one of the aims of this magazine. It is true that useful information may be contained in lists of species, indicating say, the inhabitants of a particular district, but the bare lists of names are falling out of favour, and it is coming to be realised that natural history has more to gain from close observation of the habits and life-histories of animals, and of the relations of animals to their environment and to themselves.

The intense specialisation of most present-day systematic work on animals has discouraged the amateur naturalist, who, absent from reference libraries and the comparative collections of the large museums, finds himself too often at a loss. But a fairer and more interesting field lies open to every dweller in the country who has the patience to watch and chronicle in detail the ways of the creatures of his countryside. This kind of observation *THE SCOTTISH NATURALIST* has endeavoured and will endeavour to encourage, by throwing open its pages to what is, after all, the essence of natural history. We have been too slow in Scotland to grasp the possibilities of the simple method of

observation and experiment so successfully followed in France by Fabre, in America by Beebe, and in India by Major Kingston, as shown by a work recently noticed in these pages.

Finally, we have our own aims as to the further development of THE SCOTTISH NATURALIST as a magazine worthy of the race of Scottish naturalists, and of the service of encouraging a love of nature in our land; but the fulfilment of these depends largely upon the financial support of the naturalists themselves. For our part we shall endeavour to increase the usefulness and attractiveness of the magazine to the naturalist at large, and in this way, as well as by reducing the price as circumstances allow, to widen its appeal. A first step in this direction is contemplated for next year, when we propose to reduce the price from 15s. to 12s. 6d. post free. We would ask readers and contributors, to whom already we owe much, to endeavour, in season and out of season, to induce others interested in nature knowledge to countenance our efforts by becoming subscribers to THE SCOTTISH NATURALIST.

* * * *

Mr Percy H. Grimshaw has been elected President of the Yorkshire Naturalists' Union for 1924, in succession to Dr Smith Woodward, F.R.S.

* * * *

One evidence of the activity of Scottish naturalists is apparent in the series of valuable works which have been produced in recent months by the editorial staff of this magazine. We notice Mr H. S. Gladstone's *Notes on the Birds of Dumfriesshire*, Col. Wardlaw Ramsay's *Guide to the Birds of Europe and North Africa*, brought to fruition by the labour of Dr W. Eagle Clarke in association with Admiral J. H. Stenhouse, and *Fossil Men*, a translation of Professor Boule's outstanding work on early prehistoric man, by Mrs and Dr James Ritchie.

Combat between Heron and Black Water-Vole.—While I was walking over a field on the afternoon of 6th January I was attracted by the shrieks of some animal, accompanied by guttural squawks, and on running to the ditch at the bottom of the field I found a Heron, and hanging on its neck, just above the shoulder, a black Water-Vole. When I got very near the Heron managed to get into the air, and flew a few yards from the ground with its feet hanging down. Before it had gone two hundred yards it suddenly collapsed with a hoarse cry as if it had been shot. For a few minutes there was a fierce struggle, and then the Heron shook off the Vole, and before it could escape gave it a blow on the back of its head, which killed it. It was just able to fly two or three fields off before I came up to it, and then it landed again, evidently in distress. I spent some time hunting for the dead Water-Vole, as I did not think the black ones were very common, and when I had found it I just caught sight of the Heron disappearing over a low wood. It was only just able to fly, and looked much hurt. I imagine the Heron must have struck at the Vole and missed, whereupon the latter bit at the Heron in self defence. I have never seen or heard of this occurring before, and send the black Vole in case it may be useful.—JOHN BERRY, Newport.

[Apart from the interest of the story the presence of one of the combatants in Fifeshire is noteworthy. The Vole, now in the Royal Scottish Museum collections, is a black Water-Vole, *Arvicola amphibius reta*, Miller, and this form is not common south of the Clyde-Tay line.—EDS.]

Coues' Redpoll and Eastern Lesser Whitethroat at Fair Isle.—An adult male example of Coues' Redpoll, *Acanthis hornemanni exilipes*, was obtained by Mr Jerome Wilson at Fair Isle on 22nd October. The bird arrived on the island along with a small number of Mealy Redpolls, *Acanthis l. linaria*. This is the first recorded occurrence in the British Isles of this wanderer from Arctic Europe since 1910. On 16th October the same observer secured an example of the Eastern Lesser Whitethroat, *Sylvia curruca affinis*; the sex was not determined. This is the third record of its occurrence in the British Isles.—W. E. CLARKE and J. H. STENHOUSE.

THE ROOSTING HABITS OF THE ROOKS OF BUTE.

By Rev J. M. M'WILLIAM, B.A.

THERE are three rookeries on the Island of Bute, at Rothesay, Craigmore, and Kingarth. None of these is large, and the Craigmore one, which was established, I have been told, about 1910, is very small and probably declining in numbers. In the autumn and winter the number of Rooks on the island is enormously increased, as will appear further on. I have not been able to get any satisfactory proof that any of these rookeries is used as a sleeping-place during the winter. At the Rothesay and Craigmore rookeries numbers of Rooks and Jackdaws gather in the winter afternoons, and are to be seen, certainly at Craigmore, at dawn; but I do not believe that they normally spend the winter nights at their rookeries. The Craigmore rookery is immediately beside my house.

The sleeping-place for these, and for the immigrant Rooks is in a long pine wood, about a mile and a-half from Rothesay, stretching for a considerable distance from the south end of Ascog Loch. The Rooks assemble in the evening, so far as I know, principally in two places. They are to be seen in the afternoon in great numbers in the neighbourhood of Ettrick Bay, about four miles south-west of the sleeping-place. Very large numbers also gather in the neighbourhood of Ascog Loch. In this locality they have no favourite field for this purpose. I have seen them gather one evening on Ascog Hill, in November 1923, about a mile from the sleeping-place, and the next night I found them on the other side of the loch, about three-quarters of a mile away, and much nearer the sleeping-place. There is hardly, I think, quite the same uniformity in their movements here as Mr E. Harper describes in his remarkable paper on the Yorkshire Rooks.¹

¹ *Bradford Scientific Journal*, No. 1, and reprinted in part in the *Zoologist*, 1904, p. 270. I have not seen the original complete paper.

On 1st November 1923, I left Rothesay at 4.40 p.m. (sunset, 4.36) and walked towards the roosting-place. At 4.50 a flock of about one hundred Rooks and Jackdaws passed me, flying from Rothesay towards their roost. On arriving at the edge of the wood, at about five o'clock, I found a flock of Rooks and Jackdaws congregated close by, on a little hill, but from their situation it was not possible to estimate their number in the time at my disposal. At about five o'clock there came a large straggling flock of Rooks and Jackdaws, flying at a considerable height, roughly from the direction of Ettrick Bay. I estimated the flock at about 3500. These passed over the wood, in the direction of another gathering-place at Ascog Loch, and for a time there was no Rook to be seen or heard. At about 5.15 a very large flock, whose number could not be estimated in the dusk, came back from the direction in which these had gone, and alighted in the wood almost at once. I walked down beside them. Popular writers on natural history would describe the noise that they made as "deafening." I could see numbers flying from tree to tree for the next ten minutes. At 5.35 the noise had practically ceased. I clapped my hands in order to put some of the birds up, to make quite certain that they had finally settled on the trees, and not on the ground, and several rose from the branches beside me. I only noticed the one great flock entering the wood, though, as it stretches for a very considerable distance, I cannot be certain on this point.

On 13th November (sunset, 4.12) I saw a very large flock of Rooks and Jackdaws gathered at Ascog Farm, at the north-east end of the loch, about a mile from the roosting-place. I sat and watched them, along with my wife, for about half an hour, during which time a couple of other small flocks joined them. When they were all collected we tried in various ways to estimate their numbers. We counted isolated parties, and we tried to form an idea of the number from the extent of ground covered. They had settled fairly closely together, and the flock extended for perhaps 200 yards in length by 50 to 150 in width. We estimated their number as certainly not less than 8000, and

if I were to venture a maximum number I should say that there were probably not more than 12,000. The Jackdaws were very much in the minority. There was a flock of a couple of thousand Starlings among them. Shortly before five o'clock they moved towards the sleeping-place.

It is clear from what I have seen that the breeding Rooks do not form a tenth part of the winter Rook-population on Bute. The question arises as to the area on which these flocks feed during the day. I have described previously (SCOT. NAT., 1918, p. 25) how Rooks cross from Bute to spend the day on the mainland of Argyllshire, but I have not seen great numbers do so, and I think it probable that by far the greater number of these Rooks stay on Bute. I have seen some arriving on Bute during the afternoon that may possibly have come from Ayrshire, but I am very doubtful about this. I have never seen any arrive on the side of the island facing Arran. There are always considerable numbers of Rooks to be seen on Bute during the day, usually in moderately large flocks. At Craigmore they commonly feed on the shore.

It will be seen that these observations differ in some respects from those of Mr Walter Stewart in Lanarkshire (SCOT. NAT., 1923, p. 141). The climate in Bute is milder than in many other parts of Scotland, and it is possible that these Bute Rooks collect in the winter from other parts of the country, though it can hardly be doubted that numbers are continental. Obvious reasons have been suggested for this habit of forming winter roosts in sheltered places. Many of the birds are at a great distance from their breeding-places, and shelter would be their only concern. Sir Herbert Maxwell has described the destruction of many Rooks in trees during a gale in Wigtownshire, in December 1905, over 500 dead having been collected in one spot (*Memories of the Months*, p. 71).

In conclusion, I may say that I was led to make this investigation by a conversation with Mr Richard Elmhirst, of the Millport Marine Biological Station.

Iceland Gull on the Argyll Coast in Summer.—The occurrence of this Arctic species in British seas in summer is an interesting event worth recording. The bird was first seen by me on 28th June 1922, and was in company with a number of Herring and Lesser Black-backed Gulls in Oban harbour. My attention was drawn to it by the fact that it appeared totally white. It was wild, never allowing a close approach, and keeping close to the water. It kept beside a flock of the commoner gulls, but did not intermingle with them, indeed they appeared to have a dislike to it. I thought at the time that it was an albino of some species. I subsequently learned that it had been present throughout the winter and spring, and that it had had a companion. The bird remained through the summer, but was found with one of its wings broken on August 1922. It afterwards passed into my possession, and I have presented it to the collection of British birds in Royal Scottish Museum. This white stage of plumage precedes the adult dress with its pearl-grey mantle, which is attained in the bird's fourth year.—HUGH M. S. BLAIR, South Shields.

Pratincole in Morayshire.—On 17th August, 1923, while I was watching duck at Loch Spynie, in Moray, there were a lot of Black-headed Gulls and Swifts hawking flies and so forth. Suddenly I saw what seemed to be a giant swallow of sorts, which when it got within range I saw was a Pratincole. It never flew directly overhead, so I couldn't see the under wing coverts. For about an hour it cruised about, then disappeared. Every day thereafter I had it watched for, when I myself was unable to be on the lookout, but it was never seen again.—ALEX. STABLES (Major), Elgin.

[The Pratincole (*Glareola pratincola*) has occurred very rarely in Scotland, only some three visits being on record; this observation is the first from the mainland north of Fife.—EDS.]

Colours of Grey Lag-Geese.—When shooting Grey Lag-Geese in Perthshire in November 1923, I paid particular attention to the colours of the bill and legs, and I found these to agree with Mr F. W. Smalley's description in THE SCOTTISH NATURALIST of June 1918. The pink colour of the bill and legs was very pronounced in the case of an adult, with black markings on the abdomen and a small border of white feathers round the base of the bill. The geese were shot at the morning flight, so I saw the colours distinctly before they faded at all.—JAMES BARTHOLOMEW, Torrance.

THE LESSER SNOW-GOOSE IN THE OUTER HEBRIDES.

By WM. EAGLE CLARKE, I.S.O., LL.D.

A SPECIMEN of this native of the Arctic regions of eastern Asia and western North America was obtained on the Island of Barra, on 9th October 1917, by Mr W. L. MacGillivray, who reported it as a Snow-Goose at the time, and promised that its final resting-place should be the Royal Scottish Museum—a promise which he has most kindly fulfilled. On its arrival in Edinburgh it was found to be an example of the lesser species, *Chen hyperboreus* (Pallas). This is the first authentic specimen obtained and preserved in Scotland. It is true that a "Snow-Goose" was captured on the Solway at Newlie, Dumfriesshire, in the autumn of 1884, which, though not preserved nor examined by a naturalist, was assigned to this species. But it may have been an example of the Greater Snow-Goose, *Chen nivalis*, an eastern Arctic American bird, several of which have since been obtained on the Solway (SCOT. NAT., 1921, pp. 48 and 69). As the young of the Lesser Snow-Goose takes, according to Alpheraky (*Geese of Europe and Asia*), not less than four years to gain adult plumage, the birds whitening at each moult, it is desirable to add a short description of the Hebridean bird, since it appears to be in an interesting stage of adolescent plumage. The forehead, cheeks and chin are white, hind cheeks and sides of neck pale silvery white; crown, nape and hind neck pale grey, narrowly fringed with white; front and sides of neck greyish white, with slightly darker edgings; breast, abdomen and under tail-coverts white; sides of upper breast grey mottled darker; flanks greyish buff; back drab with paler edgings; scapulars grey in centre with broad whitish edgings; lesser wing coverts conspicuously white, rest of coverts grey with paler edgings; secondaries dark grey in the centre with conspicuous silvery grey edgings and black shafts; primaries black; tail white; wing 15.8 in. (401 mm.); sex not noted.

Great Snipe in Shetland.—I have forwarded to the Royal Scottish Museum a female example of the Great Snipe (*Gallinago media*), which was shot in Fetlar, Shetland, on 20th September 1923. In Evans' and Buckley's volume on the vertebrate fauna of Shetland, there appears to be no certain evidence that the species has been identified in Shetland, so that it is possible that this may be the first definite record from these islands.—A. J. NICOLSON, Fetlar.

[Since the date of the work referred to, Dr Eagle Clarke has obtained and added to the collections in the Royal Scottish Museum, a male individual of the Great Snipe from Fair Isle, where he observed several specimens; and politically the isolated Fair Isle is attached to the Shetland group.—EDS.]

Nesting of the Great Spotted Woodpecker in Linlithgowshire and in Inverness-shire.—Mr David M'Diarmid, Head Gamekeeper to the Earl of Rosebery, informed me that he discovered the nest of a Great Spotted Woodpecker in Dalmeny Park about the 18th June, 1923. I visited the nest, which was situated in the decayed limb of a beech tree about 40 ft. from the ground, on the 6th July last, and had the pleasure of watching, for over an hour, the young birds being fed, with clock-work regularity every five minutes, by the parents. Four days later I again visited the nest and found that the young birds had flown. Great Spotted Woodpeckers had been frequently noticed in Dalmeny Park during several years previously.

In August 1922 I was shown an alder tree near Sluggan, Carr Bridge, where a pair of Great Spotted Woodpeckers had successfully reared a brood in June 1921.—BRUCE CAMPBELL, Edinburgh.

Partial Migration of Grouse.—A correspondent writes, from an Argyllshire estate: "During the late winter months a lot of hen Grouse leave the moors for the edge of the cultivated ground. I think this is a fact and accounts for the apparent preponderance of cock birds in late November, December, and January. I noticed small packs moving north-east from here in early November, and there were on 22nd November, 1923, before the snow came, fewer birds but a greater proportional number of cocks in the moor than there were in October. I am inclined to think that those same hens come back in February, staying in their own ground when there are cocks sufficient to mate them. If the cocks are killed out I think they go on to other ground."

A NATURALIST'S NOTES ON THE OLD REDFORD OR BAVELAW WOOD.

By the late WILLIAM EVANS, F.R.S.E.*

UNTIL the winter of 1919-20, a pine-wood of special interest to the naturalist stood on the north side of the channel which connects Threipmuir Reservoir with its upper expansion at Wester Bavelaw. Many a happy hour have I spent among its old pines, searching out its faunal and floral treasures; and to many another naturalist, past and present, it has been the source of interest and enjoyment.

There, in the spring, the entomologist could count on finding the Pine Beauty (*Trachea piniperda*) nestling in crevices in the bark of the pine-trees, and digging for its pupæ among the pine-needles at their bases afforded an occupation in the autumn and winter months. A ramble through the wood disturbed many a Geometer, and an hour's "treacling" at the proper season could usually be counted upon to produce a variety of Noctuids. A hibernated Brindled Ochre (*Dasypolia templi*) once revealed itself to me on a tree trunk along with the Pine Beauties. A large patch of luxuriant blaeberry grew in the wood, which, when in flower in the month of May, was alive with humble-bees and their "cuckoos." A dozen queens of the handsome red-tailed *Bombus lapponicus* might be seen extracting the nectar from the newly-opened bells, while a few *B. jonellus* and *B. muscorum* could be detected among the crowd of commoner species. There, too, the interesting *Andrena lapponica*, one of the smaller bees, might be seen in profusion. Other insect groups also had their less common representatives.

The Long-eared Owl, the Tawny Owl, and the Kestrel (when permitted) nested in the thick tops of the pines, and in the opener part at the west end of the wood I have seen the nests of Teal and Mallard. A stray female Capercaillie

* Edited by Miss C. Ethel Evans.

was once shot in the wood in 1887, and the Grey Hen has been known to nest within its precincts. Occasionally a Sandpiper would select for its nest a spot on a sunny bank on the margin of the wood. The old ruin of Redford at the western extremity of the enclosure was the annual home of a pair of Pied Wagtails, while I have seen the Redstart there, and Tree Pipits and Spotted Flycatchers frequented its immediate vicinity. Among the pine-trees one could hear the cheery twittering of Coal Tits and Goldcrests, and from the bushes and undergrowth the sweet (though common) song of the Willow Wren.

For the botanist this fine old wood had also special attractions. At one time it was a habitat of *Linnæa borealis*, and I have seen *Listera cordata* within its bounds. In a somewhat damp spot near the centre of the wood, there were several patches of the Prince of Wales's Feather Moss, *Hypnum christacastrensis*. I gathered it there as late as 1917.

Perhaps the wood looked its best when the westering sun poured its ruddy glow on the red trunks of the pine-trees, penetrating in chequered light and shade into its furthest recesses. But, alas, this hundred-and-fifty-year-old wood (like many another) is now a thing of the past, and we must realise that economic necessity cannot allow sentiment to bar its way.

THE SPREAD AND DISTRIBUTION OF THE WOODCOCK AS A BREEDING BIRD IN SCOTLAND SINCE THE BEGINNING OF THE NINETEENTH CENTURY.

By EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL.

(Continued from 1923, p. 183.)

III. DISTRIBUTION ACCORDING TO FAUNAL AREAS AND COUNTIES.

SOLWAY.

DUMFRIESSHIRE.—Although no definite record of the Woodcock nesting in the county is forthcoming until the middle of the nineteenth century, still, if evidence of place-names be trustworthy, it would seem to have been known there as long ago as the fourteenth century. H. S. Gladstone (4, 383) writes: "In this connection the place-name, Woodcockair (Annan) is specially interesting. In a charter dated 3rd March 1334, appointing John de la Forest bailiff of the Park of 'Wodecok Heyr,' the name is thus spelt. The Rev. James B. Johnstone (author of *Place-names of Scotland*, 1903), who has kindly written to me on the subject, is of the opinion that the termination 'Heyr' is equivalent to the word 'aire,' the older form of 'aerie' = bird's nest; so that we have here a very early reference to a Woodcock's nest." Though this cannot be accepted as a definite record of the Woodcock having nested there in ancient times, it is of very great interest.

The first nest recorded as having been found in this county is that near Langholm Lodge in 1848 (15, 25/4/48). By 1892 we find that it was nesting and increasing in Dumfriesshire (26, 1893, 296); a great increase is recorded there in 1900, and the species continues to nest plentifully up to the present time, though owing to the felling of woods, some diminution is recorded from 1919 to 1922.

KIRKCUDBRIGHT.—One of the oldest records of Woodcock nesting in Scotland is that mentioned by Robert Service, who says he saw an egg of the species taken at Loch Kindar, Newabbey Parish, in 1828 (44, 19). Thereafter no definite record occurs till that in Dr Harvie Brown's annotated copy of Gray's *Birds of the*

West of Scotland, where, in a MS. note, he records a nest found in Shambellie Wood in 1873. In 1876 a Woodcock's nest was found at Orchardton, near Castle Douglas (41, 1875-76, 337), and the writer adds, "a considerable number of Woodcocks visited this district last autumn, after having apparently almost deserted it; formerly they were very common." In the beginning of this century Mr Service writes of them as a fairly common breeding species; and Mr Gladstone says: "Captain G. Hutchison writes me from Balmaghie, Castle Douglas, that this season his keeper has come across (without purposely looking for them) no less than twenty-seven Woodcocks' nests in the home coverts there" (2, 1910, 247). Colonel P. G. Anstruther, on making enquiry for us, was told that Woodcock nest in fair numbers in Kirkcudbright at the present time (1923).

WIGTOWNSHIRE.—Although we have not succeeded in discovering the exact date at which Woodcock began to nest in this county, some indication is afforded by the information kindly sent us by Sir Herbert Maxwell, who writes that in his school days he never saw a Woodcock's nest, nor did he remember hearing of one at Monreith, though he was "constantly in company with a faithful old gamekeeper who served there for fifty years." Since then, however, the species has begun to nest, and the same authority tells us that he can, with confidence, testify to a very large increase in the number which breed in his district.

In 1885 an unfledged Woodcock was procured in Galloway in June (41, 1885-86, 270), and Mr Maurice Portal has found the Woodcock breeding on the west side of Wigtownshire since 1911, and says it has increased as a breeding species. In confirmation of the above, we find a large increase recorded in this county in 1918 (41, 1918, 243).

TWEED.

BERWICKSHIRE.—Mr Muirhead (3, ii. 237) mentions a nest near Penmanshiel found by Mr Abraham Mack in the summer of 1827; it contained two eggs and he saw the old bird sitting on the nest several times. There does not seem to have been any very great increase in the county till about 1880, since when nests in increasing numbers have been found at Penmanshiel, Duns Castle, Foulden Hag, Longformacus, and Coldingham Woods (10, 538). In 1895 Woodcock are reported to be much more frequent as a breeding species in the districts adjoining Berwick-on-Tweed than they were a few years before (2, 1896, 79). Since the beginning of the present century the species has become much more widely distributed and

more plentiful as a breeding bird in Berwickshire. We have records of this from Elba, from various places about Thirlestane Castle, from The Hirsell and Bonhyle, from Charterhall, Drygrange, East Addinston, Glenburnie, and Lauderdale, from Reston, Spottiswode, and Cowdenknowes. We are much indebted to Colonel C. T. Menzies for his kindness in gathering so many of these records for us. An interesting little note of cause and effect is that contributed by the Rev. W. M'Conachie who writes: "From this year (1918) onward, through timber-cutting, there has been a rapid decrease of nesting Woodcock in this part of Lauderdale. Mr A. Maclean, headkeeper, Thirlestane, has only seen one nest in 1922."

ROXBURGHSHIRE.—The first record we can discover of the Woodcock nesting in Roxburghshire is that of a brood of young ones found at Abbotsford in 1867 (30, iv. 196). Next we find Mr A. H. Evans states that before 1911 "a few pairs at least" nested in Roxburghshire (25, 202); while in 1912 Mr Bolam writes that it is well known to breed in the county (10, 538).

SELKIRKSHIRE.—In 1876 we learn that Woodcock had been breeding for a few years commonly about Bowhill, and Mr James Keress, headkeeper to the Duke of Buccleuch, writes that the increase was very noticeable after the Duke gave an order that none was to be shot after the 1st of March (30, viii. 197). That they have continued to nest at Bowhill is shown by the fact that in 1898 they are recorded as breeding there (2, 1898, 26). No doubt Woodcock nest in other parts of the county, but the above are the only definite records which we have been able to discover.

PEEBLESSHIRE.—In 1911 a few pairs of Woodcock are said to breed in this county (25, 202), while Mr A. C. Gairns, Broughton, writes to us: "During recent years it has become fairly common and breeds regularly, and has certainly increased steadily." Mr Young, gamekeeper, Dawyck, near Stobo, writes recording a large increase of nesting Woodcock in 1922 and 1923, not only on the estate of Dawyck, but also in the surrounding district. This increase he attributes to "all shooting being stopped in Ireland for some years past."

FORTH.

EAST LoTHIAN.—Turnbull, in 1867, referring to the Woodcock, wrote, "a few remain during summer to breed" (5, 25). Mr Tunnard tells us that in 1889, a few pairs were breeding at Tynninghame, where they have increased, until in 1914 they are recorded as numerous (41, 1915, 157). In 1911 the Woodcock was breeding at Saltoun (41, 1919, 52), and in 1918 at Presmennan,

as we are told by Mr M'Conachie. It now nests in many suitable localities in the county.

MIDLOTHIAN.—In 1870 the Woodcock was described as not very numerous as a breeding species at Roslin (41, 1871-72, 153), while a note by Mr Evans (38, v. 136) records a nest in 1879 in a wood about a mile and a half above Penicuik. At the present time, as Dr Eagle Clarke has kindly informed us, it nests in all suitable localities in the county.

WEST LOTHIAN.—Mr Pagan has kindly written to us regarding the Woodcock in West Lothian, that in summer of 1898 he found a nest near Linlithgow, and he has no hesitation in saying that it is becoming more common as a breeding species in the district. Mr Evans records the nesting of the Woodcock at Dalmeny Park and Hopetoun estate in 1904 (2, 1904, 190).

STIRLINGSHIRE.—In 1865 the first Woodcock's nest is recorded from Dunipace (46, 1866, 71), but it was not until 1893 that we find that numbers began to breed in this neighbourhood. In that year unusual numbers near Stirling are recorded, as many as twenty-two nests being found on one hill (2, 1894, 221). Further increases took place early in the twentieth century: in 1902 and 1904 we find phenomenal numbers breeding in Dunipace and neighbourhood, and in the latter year also at Polmaise and Touch (2, 1904, 190 and 246). In 1908, again, abnormal numbers are recorded at Dunipace and district, and throughout north-west Stirlingshire it was "a great year for nests" (2, 1908, 142 and 145).

SOUTH PERTH.—Woodcock were suspected of breeding at Balquhiddy in 1873 (41, 1873-74, 10); they have obviously established themselves in this district, as Mrs Carnegie informs us that they now nest regularly and not uncommonly about Stronvar. The species seems now to breed fairly generally in South Perth, nesting regularly in various localities, as at Braco, Doune, and Blair Drummond.

KINROSS.—Woodcock breed regularly in this county and have increased there of late years.

SOUTH FIFE.—Mr J. J. Dalglish believed that Woodcock began to breed about Tulliallan, Culross, about 1860, and they have continued to do so in increasing numbers (6, vii. 626 and 34, 10). Mr F. S. Beveridge says: "The first nest that I found was at Calais Muir three miles east of Dunfermline, in 1903, and I have no information of its nesting there prior to that. At Keavil, near Crossford, and in the Dean Wood between Cairney Hill and Luscar, it bred fairly commonly in 1900 and has increased as a resident since." The first nest was discovered at Gilston about the beginning

of this century; they have continued to nest, and an unusual number bred there in 1922. Further east we find that Woodcock nest sparingly in the coverts at Balcarres, Kilconquhar, Elie, Balcaskie, etc., but cannot ascertain when they first began to do so.

CLYDE.

WEST STIRLINGSHIRE.—Large numbers of Woodcock are reported as breeding in West Stirling in 1908 (2, 1908, 142), and Woodcock now breed commonly about Milngavie and Strathblane, as also on Loch Lomond side.

DUMBARTONSHIRE.—Gray tells us that by 1871 Woodcock had frequently bred in this county (12, 309), and in 1876 Mr James Lumsden says that a few pairs nest every year in the neighbourhood of Loch Lomond (37, 1876, 70). In 1895 it is recorded as breeding there in considerable numbers (27, 55), and at the present day Mr John Robertson tells us that it breeds commonly on the Dumbarton side of Loch Lomond and about Garelochhead.

SOUTH ARGYLL.—Mr Mallock says Woodcock seemed very plentiful in April 1919 in Benmore Wood, Kilmun, and Mr Robertson tells us that he has found the Woodcock common in the nesting season about Tighnabruaich; while Major Norman says that the species nests regularly on the east side of Kintyre. Mr Cuthbertson also kindly informs us that it nests on the estates of Ardgoil and Drimsynie, but not in any great numbers.

RENFREWSHIRE.—Mr Robertson says Woodcock breed generally, though perhaps not numerous, in West Renfrew. In 1895 the bird was not known to breed in East Renfrew (2, 1895, 229); a nest was found by Mr Mallock a few years later, "perhaps 1899, but the exact date is not available." In 1910 a nest was found in Skiff Wood, Howood, and the species has since bred there; by 1915 Woodcock were breeding in certain districts in East Renfrew, and they seem to have continued to do so (41, 1915, 171). In 1918 a nest was found in Merrylee Wood within the city boundaries of Glasgow (41, 1918, 242), but owing to building operations the experiment has not been repeated.

LANARKSHIRE.—Before 1897 Woodcock nested near Carnwath, and Mr Paterson says that they formerly bred in Carmichael Parish, but have not done so for some years (2, 1897, 217). In 1908 considerable numbers bred about Bothwell (2, 1908, 256), and a few continue to do so.

AYRSHIRE.—Mr John Craig, Beith, tells us that he found "a Woodcock's nest with five eggs, that is one more than the usual

number, about thirty years ago," or, say, about 1892, and on several subsequent occasions he found the species nesting sparingly, but has never known it to be common in his district. Mr Nicol Hopkins has kindly sent the following, "*re* the Woodcock, in the Glenfield Ramblers' *List of Ayrshire Birds*, published in 1907, the following note occurs 'chiefly a winter visitor, though it breeds occasionally in Ayrshire. The nest has been found near Beith, and, according to Mr Alston, it nests in Lanfine Woods, near Darvel.' About 1908 I saw my first Woodcock's nest in the Bank House Wood, Darvel; since then I have seen and been informed of quite a number, and from my own observations I consider it fairly common though not numerous round Darvel, and I think it has steadily increased since 1908." In 1912 we learn that it also breeds in Calder Glen, Lochwinnoch, and Mr J. Robertson says that "the species now breeds commonly at Fairlie and near Ayr, and more sparingly at Beith and Lendalfoot."

CLYDE ISLANDS.—In 1869 Woodcock bred at Brodick Castle, Arran (12, 309). Thereafter there is a long gap in the records, the next being from near Lamplash Lighthouse in 1901 (2, 1902, 194), and it now breeds regularly on this island. In 1903 we have the first record of nesting in Bute (2, 1903, 142); further records of breeding come from this island in 1905 and 1908 (2, 1906, 200, and 1909, 211); and Mr Robertson informs us that it is now common as a breeding species in Bute. Quite a number of Woodcock bred on the Little Cumbrae in 1905 (2, 1908, 142), and Mr Robertson says they continue to do so, although there is no covert on the island but bracken.

ARGYLL.

NORTH ARGYLL AND MULL.—As long ago as 1852 the Woodcock was found breeding in Mull (7, 115); in 1867 it was nesting on the Ross of Mull (16, 171); while Gray (12, 309) says that it breeds occasionally on this island. On the mainland of Argyll we find that before 1863 considerable numbers bred in Ardnamurchan (7, 174); while Dr Harvie Brown (16, 171) says that from 1872 to 1892 Woodcock nested in ever-increasing numbers from Arisaig to Kintyre. At the present time, 1923, they nest in many suitable localities in North Argyll; in the neighbourhood of Loch Awe and Loch Etive they are not uncommon, and they breed regularly from West Loch Tarbet to Campbeltown.

INNER HEBRIDES.

ISLAY.—Before 1871 a few Woodcock are reported to have bred on this island (12, 309), and on 21st March 1893 a nest and eggs

were found there (26, 1/4/93). Mr Ramsay, Kildalton, kindly informs us that they now breed regularly and plentifully on Islay.

TIREE.—Woodcock did not nest on Tiree up to 1913 (41, 1913, 221).

NORTH-WEST HIGHLANDS AND SKYE.

W. INVERNESS.—The Woodcock has nested at Kinlochmoidart since at least 1873 (MS. note in J.A.H.B.'s *Birds of West of Scotland*), and has become more plentiful as a breeding species recently. Before 1904 it bred in Glen Mama (20, 291), and in 1917 one or two pairs were found breeding in the Ossian birch woods (41, 1918, 6).

WEST ROSS.—In 1888 the Woodcock is said to be "rare as a breeding species in Applecross" (20, 288), while in 1894 it was resident and not uncommon, nesting regularly in the woods around Loch Torridon (38, xii. 410). About 1904 it was scarce at Loch Carron, while in Attadale only a "pair or perhaps more" were known to nest at that date (20, 288). Mr Fraser, Gairloch, tells us that the Woodcock nests about there and has increased since 1907; while Major N. E. Baxter was told by the keepers at Coulin that Woodcock nest sparingly in suitable localities throughout the district.

SKYE.—In 1889 the Woodcock was found breeding at Scorbreck (20, 288), and before 1904 it was nesting at Broadford, Armadale, and many on Raasay (*loc. cit.*). Mr Paton has kindly informed us that a few breed steadily about Duisdale, but that his keeper, who has been a keeper in Skye for twenty-five years, thinks they are rather less numerous than they used to be; this he attributes to the greatly increased severity of the heather-burning which has left little covert except in patches.

WEST SUTHERLAND.—In 1887 the Woodcock bred commonly in Assynt, and is said to have increased in Sutherland of late years (17, 216), while before 1904 it was nesting at Edderachyllis (20, 288).

TAY.

NORTH PERTH.—One of the early breeding records comes from this division, as before 1833 the Woodcock was found nesting at Dunkeld and Blair Atholl (32, ii. 108), and it is possible that they may have bred here even earlier, as a Woodcock shot on 12th August 1798 at Dowally may have been bred in the neighbourhood (36, xx. 473). In 1837 it is stated that Woodcock breed in Strathmore (1, 1837, 201), by 1867 they were nesting in Scone Woods

(Hargitt collection), and by 1878 they were breeding on Moncrieff Hill (41, 1877-78, 288). In 1880 they nested plentifully at Faskally, near Pitlochry, and at Scone (41, 1879-80, 305), while by 1885 they were breeding commonly in the county (41, 1885-86, 373). Woodcock were breeding plentifully in the Ballinluig districts in 1898 (2, 1899, 13), a pair or two at Baledmund, above Pitlochry, in 1900 (24, 314), where they continue to nest in small numbers. In 1901 they were breeding sparingly at Rannoch, Edinample, and at the west end of Loch Earn (24, 313), and at the east end of Loch Earn in 1908.

NORTH FIFE.—The earliest record we have been able to find in North Fife is that kindly sent us by Mr Berry who writes (7/1/23): "It was in 1890 that I took over Scotsraig shootings, and I remember John Foulis, the old keeper, telling me of his having found two nests one year on the west hill, as I understood, in the days before my tenancy." Since then Woodcock seem to have established themselves in North Fife; from information kindly sent us from various places in the district they now appear to nest fairly commonly in all suitable localities.

FORFAR.—In 1857 the species bred plentifully in the Arbroath district (41, 1887-88, 341); it looks, however, as if this had been one of these irregular irruptions of which we have record in more than one part of Scotland, as in 1887 we find that it was only breeding locally there. In 1906 it was breeding commonly at Montreathmont Moor and neighbourhood (24, 315), and now seems definitely to have established itself in the county and nests pretty generally. Here, too, we find considerable fluctuation in the numbers nesting, for instance, Mr W. Norman Boase says: "In, I think, 1913 one of the keepers at Panmure told us that he had found on his beat more Woodcock nests than Partridge nests, and it was a good Partridge beat, so the next year we decided we would go and see those Woodcock nests. Several of us went, but could not discover any Woodcock nests at all." An interesting instance of the variation in numbers of breeding birds.

KINCARDINE.—There seem also to have been fluctuations in this county, as in 1885 it is described as resident (41, 1885-86, 373); in 1896 eggs were obtained at Drumtochty and Monboddo and "considered rarities" (24, 313), while in 1900 we learn that it breeds regularly in Kincardineshire (2, 1900, 200).

(To be concluded.)

CONTRIBUTIONS TOWARDS A LIST OF THE
INSECT FAUNA OF THE SOUTH EBUDES.

From the Zoological Laboratory, University of Cambridge.

IV. THE HEMIPTERA (RHYNCHOTA).

By G. EVELYN HUTCHINSON, F.E.S.

(Concluded from 1923, p. 191.)

(b) *Habitat of Corixidæ*—(continued).

(3) Large deep lochs with stony bottoms in valleys among the hills.

I may mention Loch na Bhaile Mhargaidh and Loch ant Siob, in Jura. In the first no water-bugs were found, in the second a single *Arctocorisa*, probably *A. fabricii* or *A. fossarum*; unfortunately the specimen was lost.

The lakes of the English Lakes District, poor in water-bugs, may probably be classified with the above two pieces of water.

(4) The lochs on Gigha, in the middle of the island. These were fairly deep and contained various water plants, such as *Potamogeton* sp. The bottom was probably muddy and stony. They contained:—

<i>A. distincta.</i>	<i>C. præusta.</i>
<i>A. fossarum.</i>	<i>C. bonsdorffi.</i>
<i>A. venusta.</i>	

The smallest (S. W.) loch was not examined.

(5) In a little muddy pool close to one of these lochs on Gigha, and containing an abundant growth of *Menyanthes*, were found:—

<i>Notonecta</i> , sp. (nymphs)	<i>A. scotti.</i>
---------------------------------	-------------------

[The other species from Gigha were taken in two small ponds and a puddle in the southern half of the island.]

(6) Of special interest are the pools on the tiny islet of Pladda, half-mile from the coast opposite Craighouse, Jura.

This islet contained many little fresh-water and salt-water ponds, and in the former *A. venusta* was common. I am not certain of the occurrence of this species on the mainland of Jura, so I have included the Pladda record in the table of species. I believe *Velia currens* also was living on these pools.

The above somewhat disjointed account has, it is hoped, indicated the kind of habitat chosen by some of the more interesting bugs found in the islands.

(c) *Life-Cycle.*

In general it was found that the specimens from the islands belonged to the 1921 or over-wintering generation. The *G. cavifrons* in Islay and *C. bonsdorffi* in Jura were certainly, and most of the other species probably, breeding in the second half of June. In the two small ponds at the south end of *Gigha*, possibly warmer than any other localities investigated, full-grown nymphs of *C. geoffroyi* and freshly-emerged adults of *A. linnæi* and *A. sahlbergi* were common.

(d) *Variation.*

The variation exhibited by the Corixidæ from the islands when compared with specimens from other localities, is often marked, but without series from the adjacent mainland it is difficult, if not impossible, to decide if it be due to isolation on islands or a northern habitat. The following remarks may serve to show the complexity of the problem.

It has long been known that specimens of Corixidæ from northern parts of the British Isles tend to be darker than those of the corresponding species from the south. It has usually been supposed that this is due to a staining action of the peaty water from which many such specimens have come. Very similar phenomena occur among the water-beetles, and here the "darkening" has been attributed to dark peaty surroundings, lack of sunlight, etc. As might be supposed the principal variations observed in the Corixidæ from Islay, Jura, and Gigha affect the dark pigmentation of the insects.

We may examine the darkening and other variations

exhibited by the several species in turn. In *C. geoffroyi*, *A. hieroglyphica*, *A. sahlbergi*, *A. linnæi*, *A. mæsta*, and *A. carinata* no darkening was detected. Of two of these species, however, *A. hieroglyphica* and *A. linnæi*, the material is not good enough nor sufficient for accurate comparison, while I have no southern specimens of *A. carinata* to compare with my Westmorland and Scottish series.

C. distincta occurred in all the islands as a small dark form, smaller and darker than specimens from Cumberland, which in turn are darker than an over-wintered individual from Cambridge. The lochs on Gigha, where the species was taken, were not unlike the Cumbrian locality. The dimensions of my series are as follows:—

Cumberland	♂ 7.6-8.0 mm.	♀ 7.5-8.5 mm.
Islay . . . . .	...	♀ 7.5 mm.
Jura	♂ 7.0-7.2 mm.	♀ 7.6-7.7 mm.
Gigha	♂ 7.2-7.6 mm.	♀ 7.5-7.9 mm.
Mean from Cumberland	♂ 7.7 mm.	♀ 8.3 mm.
Mean from S. Ebudes	♂ 7.3 mm.	♀ 7.6 mm.

The dark appearance of the specimens is due to an extension of the black markings of the elytra, especially on the inner edge and centre of the clavus and on the inner angle of the corium. An elytron mounted in balsam indicates a deepening of the yellow ground colour, this is perhaps due to the age and condition of the specimen.*

A. striata affords an interesting example of darkening. Specimens from a pond in the sandhills at the side of the golf links near Kintra Farm, Islay, are quite normal individuals, very little, if any, darker than those found in the south of England. Other specimens from several localities in Islay are dark. This is well marked in the series from the pond near Port Ellen Distillery; the pond-bottom is a black mud, probably formed from peat.

The darkening results from an extension of the black markings, as in the preceding species, and not from a general staining of the chitin. Specimens from a peaty ditch

* Whenever possible, over-wintered specimens should be used in such comparisons.

at Waterbeach, on the edge of the Cambridgeshire Fens, show no extension of pigment as compared with individuals from other localities in the same county; the black colour however, seems more intense. While the peaty water of the north is probably acid, that of the Cambridgeshire Fens is stated to have an alkaline reaction; I suggest, therefore, that it is acidity rather than mere presence of peat that is responsible for the spread of the dark markings. An attempt is being made to test this provisional hypothesis experimentally.

A. venusta is represented by a number of specimens showing some variability, but, on the whole, distinctly darker than a series taken in the spring in South Devon. The darkening in this species is due to extension and intensification of the black markings. I have similar dark specimens from Cumwhitton Moss, Cumberland.

A. fabricii and *A. fossarum* also show extension of the dark markings. My material of these variable species is not adequate to permit a detailed discussion.

A. scotti is represented by a very dark form, contrasting in a striking way with an over-wintered specimen from South Devon. A series, however, from Little Sea, Studland, Dorset (a lake containing much decaying wood), is very similar to that from Gigha. Jura specimens from Craighouse Loch, and some from Islay, are still darker.

The specimens of *A. germari* from the three islands and from Westmorland are darker than the single Cambridgeshire specimen in my collection.

C. præusta is variable in the Hebrides as elsewhere; a number of the obscurely marked var. *wollastoni* give the series a darker appearance than is usual. The species requires further investigation.

G. cavifrons provides an interesting problem already considered by Mr E. A. Butler in his *Biology*,² pp. 598-599. Mr Butler has examined my material of this species, but the following description, slightly more detailed than his, may be inserted for the sake of completeness.

The specimens from Islay are very dark, almost uniformly black, the pale markings being very obscure. The intense

black makes the insect appear more shining than any other Corixid found in Britain. The Islay specimens are somewhat variable in size, but on the whole are longer than the English forms. They are also distinctly broader. The legs are dusky and the vertex of the head black, fading to brown between the eyes posteriorly. One or two Islay specimens approach those from Jura in the paler legs and head and less obscure markings. They were taken in various shallow, peaty lochs. The Jura specimens—I have but three before me—are paler than any from Islay and have testaceous legs. The colour of the head is variable, but in none is the vertex black. Two of the Jura specimens are as broad as those from Islay. In Jura the species occurred in a small peaty pond several feet deep, and Mr Balfour-Browne gave me one from an upland loch. Specimens from Westmorland are, on the whole, paler and brighter than those from Jura; the legs are paler in some, while other specimens are very near the Jura ones in all characters. The Cambridgeshire specimens are similar to those from Westmorland, but on the whole are paler; the legs are yellowish. These individuals seem smaller and narrower than the others, but I have not enough material to decide this with certainty. The specimens taken by Buchanan-White and others in Inverness-shire were probably similar to those from Islay. Mr Butler was unable to detect any appreciable differences in the form of the ♂ genital capsule or the palæ of the various races; he remarks, however, on the slightly longer hind tarsi of the Scottish (*i.e.* Islay and Highland) form.

C. bonsdorffi occurred on all the three islands, the specimens being darker than those from Cambridge and Cumberland, though this is perhaps due to the immaturity of some of the English individuals. The wider dark markings of the clavus in the island specimens suggests that darkening does occur in these.

The few specimens of *Micronecta minutissima* from Islay represent a dark race.

The observations on the dark forms of *Corixidæ* recorded above may be summarised as follows:—

- (1) The dark appearance of many northern specimens

of certain species of *Corixidæ* (viz. *Arctocorisa distincta*, *A. striata*, *A. venusta*, *A. fabricii*, *A. fossarum*, *A. scotti*, *Glænocorisa cavifrons*, and perhaps *Cymatia bonsdorffi*) is due to a spreading, and in some cases an intensification, of the black pigment and not to a staining of the chitin.

(2) Evidence is brought forward showing that, in the case of *A. striata*, this darkening is not racial, but produced by external conditions. It is suggested that the acidity of the water is one of the factors involved.

(3) On the other hand, with *G. cavifrons* and possibly *A. distincta*, external conditions do not seem sufficiently diverse to account for the differences in specimens from the various localities. In these two cases, therefore, it would seem that races have been differentiated, perhaps comparable to the many races of *Microtus*, *Evotomys*, *Apodemus* and *Sorex*, now recognised by mammalogists as inhabiting the smaller British islands.

V. SUMMARY AND CONCLUSION.

1. The paper deals with the Hemiptera, chiefly aquatic, collected during a short visit to Islay, Jura, and Gigha (South Ebudes) during June and July 1922. In the Introduction (Section I.) a few relevant features of the islands are considered.

2. A list of species observed in the islands is given (Section II.), and some of the more interesting ones discussed (Section III.).

3. The natural history of some of the *Corixidæ* taken in the islands is considered (Section IV.). Three species are provisionally classified as boreo-alpine. The life-cycle and habitats of some species are described, and finally the variation of the family as exhibited by South Ebudes material considered at length.

My best thanks are due to Mr F. Balfour-Browne for much help and friendly criticism, both in the field and in the preparation of this paper; to Mr E. A. Butler who, with his customary kindness, has examined many of my specimens,

and has given me much valuable information on a number of points, and to Mr J. Edwards who most kindly determined my Homoptera. I am also greatly indebted to a number of Cambridge naturalists especially Mr E. J. Pearce, Mr J. Omer Cooper, and Miss J. Barrington, who have given me specimens of Corixidæ from various English localities, enabling me to make this small contribution to the study of the geographical variation of these insects.

VI. BIBLIOGRAPHY.

- ¹ Balfour-Browne, F., "Aquatic Coleoptera of the South Ebudes," *Scottish Naturalist*, 1923, p. 55.
- ² Butler, E. A., *A Biology of the British Hemiptera Heteroptera*, 1923.
- ³ Butler, E. A., "On a Small Collection of Hemiptera from the Isle of Arran, Scotland," *Scottish Naturalist*, 1921, p. 159.
- ⁴ Scharff, R. F., *European Animals*, 1907 (for American or Circumpolar Elements, see pp. 34-39 and pp. 122-24).
- ⁵ M'Gregor T., and Kirkaldy, G. W., "List of Rhynchota of Perthshire," *Trans. Perth Soc. Nat. Sci.*, iii., p. 4-5.
- ⁶ Murphy, J. E., Hemiptera in the *Brit. Ass. Handbook of the Natural History of Glasgow*, etc., edited by G. F. Scott Elliot, Malcolm Laurie, and J. Barclay Murdoch, 1901.
- ⁷ Kirkaldy, G. W., "Guide to the Study of British Water-bugs," *Entom.*, xxxix., p. 61, 1906.
- ⁸ Douglas, J. W., and Scott, J., "British Hemiptera, etc.," *Ent. Mo. Mag.*, v., p. 265-67.
- ⁹ Douglas, J. W., "British Hemiptera Heteroptera, etc.," *Ent. Mo. Mag.*, xii., p. 224.
- ¹⁰ Douglas, J. W., and Scott, J., "British Hemiptera, etc.," *Ent. Mo. Mag.*, v., p. 293.
- ¹¹ Saunders, E., *The Hemiptera Heteroptera of the British Isles*, 1892.

White-fronted Geese in North Uist.—A small flock of Geese, seven in number, have been under my observation from 5th October. I can never get within shot of them and so cannot describe them very well. They are what I would describe as Black Geese. They are certainly neither Brents nor Bernicle, with which I am perfectly familiar. They are bigger than Brents and about the size of Bernicle; perhaps a little bigger if anything. Their heads and necks appear to me to be black, and the back dark brown, white on rump. Their cry is a sort of squeal. They are extremely shy. I have seen them both on land and on the shore.—GEORGE BEVERIDGE, Lochmaddy.

[I have little doubt that the Geese described are immature White-fronted Geese which show no white frontal band and have dark necks and breasts. I have recently seen similar birds on the southern shores of the Firth of Forth.—W. E. C.]

Goldfinches in Perthshire.—My friend William Smith, M.A., Dunfermline, informed me that he noticed a pair of Goldfinches near the distillery, Aberfeldy, on 21st August, 1923.—BRUCE CAMPBELL, Edinburgh.

The Rare Robber-Fly, *Pamponerus germanicus*, Linn., in Forfarshire.—With reference to the editorial note appended to Miss Balfour's record (SCOT. NAT., p. 162), of the capture of this rare insect in East Lothian, I would draw attention to my note in the SCOTTISH NATURALIST, 1919, p. 63, recording a single female taken in my garden here on 24th June 1917.—A. E. J. CARTER, F.E.S., Monifieth.

Some Entomological Papers.—The present issue of the *Proceedings of the South London Entomological and Natural History Society* (1922-1923) contains several papers of interest, one of the most important being "A Brief Review of the Indigenous Coccidae of the British Islands," by E. Ernest Green, containing summaries of the structural characters, general appearance and habitat of all the British species. The author remarks that "the distribution of species in Scotland and Ireland is practically unknown." Let us hope that this statement, if justified at present, may not long remain so! Other contributions of general interest in this volume are "The Lepidopterous Enemies of Man," by R. Adkin; "The Labium of the Paraneuroptera (Odonata)," by W. J. Lucas; and "Notes on the Genus *Zygæna*," by T. H. L. Grosvenor.

BOOK NOTICES.

GUIDE TO THE BIRDS OF EUROPE AND NORTH AFRICA. By Col. R. G. Wardlaw Ramsay. With a Biographical Memoir by William Eagle Clarke, LL.D. Gurney & Jackson, London and Edinburgh, 1923. Pp. xii. + 355. Price 12s. 6d. net.

Dr Eagle Clarke and Admiral J. H. Stenhouse are to be congratulated on completing the work planned by Col. Wardlaw Ramsay, and carried by him well on the way to completion before his death in 1921. We well remember the assiduity with which he laboured, in the midst of many preoccupations, at the material in this volume, and now the finished work forms a fine memorial to one who found in the study of bird-life a constant source of interest and pleasure. The Guide is primarily intended to be a handy companion to the traveller who takes a real pride in the identification of the birds he observes, but it will serve a much wider purpose, for its concise descriptions of the distinctive characters and distribution of birds, and particularly of their racial forms, so freely described in recent years, makes it an invaluable reference book to all workers interested in this aspect of ornithology. To British observers it will make a special appeal, since it includes not only all the racial forms which have occurred, but practically all the forms which are likely to occur on migration in these islands.

OUR BUTTERFLIES AND MOTHS, AND HOW TO KNOW THEM. By E. Fitch Daghlish, F.L.S., F.Z.S., F.R.H.S. London: Thornton Butterworth, Ltd. Cloth, $7\frac{1}{2}$ in. \times $4\frac{1}{2}$ in. Price 6s. net.

This handy little volume of 126 pages offers to the beginner a simple method of identifying the commoner Lepidoptera of the British Isles by means of a classification founded upon size and colour. Fifty-one species of Butterflies and ninety-three of Moths are dealt with, most of them being depicted faithfully on half-tone plates (two in colour), and described in simple language in all stages of their life-history. Many illustrations of larvæ and pupæ are given in the text, but these are for the most part extremely crude and badly drawn. No scientific names are used, so that there is no clue whatever to the relationships of the various species, but a good deal of information is gathered together for the benefit of those who desire an elementary knowledge of our native Lepidoptera. The book cannot be taken very seriously, but it may serve as an introduction to more pretentious volumes on the subject. On p. 11, lines 2-3, "is all" should read "all is."

PETS FOR BOYS AND GIRLS. By A. J. Macself. London: 1923.
Thornton Butterworth, Ltd. Pp. 302. Price 5s. net.

Almost every boy, at one stage or another, keeps living pets, and none such but is occasionally at his wits' end regarding the feeding or management of his small stock. This book should be a great boon to boys (and their elders), for it offers guidance as to the varieties of pets they may choose, from dogs and cats, rabbits, cavies, and tame rats and mice to canaries, pigeons, and bantams, even to silkworms, tortoises and the inhabitants of the aquarium, such as gold-fishes. It suggests the most suitable tenements for these, and discourses simply on the best methods of feeding, on breeding, and on the treatment of the illnesses that each kind of pet is heir to. There are many helpful illustrations.

FARM LIVE STOCK OF GREAT BRITAIN. By Professor Robert Wallace, M.A. Fifth Edition. Edinburgh: Oliver & Boyd, 1923. Pp. xx + 868. Price 30s. net.

This well-known work, first published in 1885, appears in a revised and much enlarged edition, in the preparation of which Professor Wallace had had the advantage of the assistance of his successor, Professor Scott Watson. The volume contains detailed accounts of the various breeds of live stock in this country, traces the history and evolution of the breeds, not only in Britain but in the lands of their adoption beyond the seas, and gives hints for their management. It is impossible to indicate here the mass of valuable information contained in this great work; it is sufficient to say that it is outstanding on account of its comprehensiveness, its fine illustrations (comprising 232 half-tone plates and 111 text-figures), and its scientific discussions of heredity and of the origins of the various domesticated races.

PLANT AND FLOWER FORMS. By Esther J. G. Kirkwood, B.Sc. London: Sidgwick & Jackson, Ltd. 1923. Pp. xvi. + 80. Price 7s. 6d. net.

This interesting volume consists of a series of eighty plates bearing line illustrations of plants and flowers and of the significant details of their structures. Miss Kirkwood's drawings are not only beautifully simple and artistic in themselves, but they convey with wonderful directness and accuracy the facts which she has chosen to emphasise. The characteristics of the natural orders of flowering plants are illustrated clearly and concisely, but the sections that are most original, and that will appeal most to naturalist, teacher, and student, offer pictorial comparisons of such biological phenomena as pollination, fruits and seed dispersal, germination, vegetative reproduction, climbing plants, and so on. The illustrations are accompanied by short explanatory notes, and together these make a charming guide to the study of the plants and flowers themselves.

NOTES FROM THE SCOTTISH ZOOLOGICAL PARK

THE KING PENGUINS.

(Continued from 1923, p. 195.)

IN 1923 the moulting began on the 3rd of April, and the last to moult of the five adult birds completed its moult on the 26th of May. In October 1919 a chick was hatched, and upon considerations of age and climate it ought not to have moulted its nestling feathers till the following autumn—August 1920 would have been a fit and becoming time for the operation—but the moult was completed in May, a time well in keeping with the average period covered by its elders that year. In 1921 it was later, beginning on 20th June, while in 1922 it completed its moult in the second half of May. In 1923 this young bird moulted between the 8th and the 31st of May.

The foregoing record of dates is surprising as well as very interesting. The protracted and interrupted moulting of the three birds during their first year in this country, in 1914, seems, at first sight, to suggest that the moulting of a bird owes much to external conditions, so that the hereditary season of the moult may have to give place to the climatic season. This suggestion gained confirmation from the moulting periods of the following two years, from which it appeared that the Penguins then in the Park had definitely adopted the northern late summer to autumn as their moulting season. Mr Murphy states ("The Penguins of South Georgia," by R. Cushman Murphy) that King Penguins were moulting during the whole period of the observations made by him, extending from December till the following March, and this, while showing the individual variation of the birds in this matter, indicates the corresponding seasonal part of the southern year as their regular moulting season. When exiled to a land where the seasons as compared with those in their original home in the Southern Hemisphere were upside down, they simply, it seemed, moved their moulting calendar six months back to suit.

The second lot of birds, which arrived in the spring of 1917, it will be noted, also moulted the first time in our autumn, though without the apparent struggle which the first three birds seemed to have in adapting themselves to the changed environment.

It was, after all this, a matter of considerable surprise when, in the succeeding few years, it was noted that the moulting period of the five adult birds was gradually changing till, in 1921, it was four months earlier than in 1915, and therefore drawing near to the normal season of moulting in the Antarctic. If, therefore, the original deferring of the moult was due to the presence or absence of some external condition, it would seem that that had later to yield to the force of the racial factor.

Perhaps, after all, such conditions as temperature and the succession of seasons had little to do with the matter; it may be a possible explanation that the birds were upset by the fact of capture and the strain of the long voyage (which began, in the case of both lots of birds, just before the period when naturally they might have been expected to moult), and so were unable to carry through their moult until they had had time to recuperate. If this were the case, however, it would still seem that an impulse to moult at an interval of a year, was at war with the impulse to moult at the racially established time irrespective of hemisphere.

It is to be noted that the young King Penguin, hatched in the Park in October 1919, completed its first moult not, as one might have expected (from the observations that have been made in South Georgia), when it was ten months to a year old, and near the general moulting season of northern birds, but in the early part of May when it was only six months or so old.

The period of moulting in these captive Penguins has, moreover, a very surprising relation to another important period in the Penguins' year—the breeding season.

BREEDING.

In South Georgia Mr Murphy found King Penguins incubating in mid-December, while others were still mating in January; and he mentions that freshly laid eggs have been taken as late as March. He thinks it probable that the breeding season may extend over the greater part of the southern summer, but evidently December and January are the principal months for egg-laying and incubation in South Georgia. The first observation of any behaviour relating to breeding on the part of the Penguins in the Park was made on 7th November 1915 when two of them were seen mating. No egg was laid at that time, but the date would correspond roughly with the season of mating of the Penguins in their own home.

(To be continued.)

(Authors are responsible for nomenclature used.)

The Scottish Naturalist

No. 146.]

1924

[MARCH-APRIL

SHALL THE BITTERN BE ALLOWED TO RECOLONISE SCOTLAND?

FROM records that appear in the following pages and others in our contemporaries it is evident that there have been unusual numbers of Bitterns on the move in Britain. The majority of these are no doubt visitors from the Continent, but it is just possible that the successful rearing of broods, which has been taking place in the Norfolk Broads from 1918 onwards, may be beginning to make itself felt in the return of British bred birds. If this be so, there is the greater likelihood of attempts on the part of this interesting former inhabitant of Scotland to recolonise its ancient kingdom, and every effort ought to be made to protect the spring arrivals in the hope that some may make a breeding settlement. We would draw particular attention to the fact that the Bittern is protected in many counties all the year round, and that in the Wild Birds Protection Bill, which recently passed through the House of Lords, it is scheduled as so protected throughout the land. There are still too many records of the wanton or ignorant destruction of this visitor, and it cannot be too widely known that even now its destruction in many areas is a punishable crime.

The influence of man's actions upon the lesser creatures is seldom so convincingly shown as in the observations of Mr A. Roebuck on the effect of cultivation upon the numbers of wire-worms in the soil (*Journ. Ministry Agric.*, 1924, p. 1047). He found that when a pasture which, in 1915, contained 900,000 wire-worms per acre was converted into arable land there was a steady diminution in the numbers of the pest, until a count in 1922 gave only 6000 per acre. Similar results were observed in other pastures similarly treated. Such a computation gives a glimpse of the magnitude of the changes in the fauna of the soil which must everywhere have accompanied the development of man as an agriculturist.

* * * *

For the first time aeroplanes have been used in a deliberate attempt to destroy pests of cultivation, and the trials, made in U.S.A., have been so successful that the method is likely to undergo further tests. The aeroplanes, as the photographs clearly show, flew low over groves of catalpa trees attacked by the larvæ of a sphinx moth, and over cotton fields infested by the boll weevil, dusting the foliage with the appropriate poisons, lead and calcium arsenates and Paris green. The results were excellent, and the cost is said to be less than that involved in the use of ground dusting machines.

* * * *

A third record has been received of the occurrence of male Wood-wasps, *Sirex gigas*, at a high altitude and distant from woodland (see SCOT. NAT., 1923, pp. 146, 171). Mr George Bolam writes: "On 24th June 1921 I found three examples of this insect buzzing round the 'poll' on the summit of Killhope—2208 feet above sea-level—the hill on which the boundaries of Northumberland, Cumberland, and Durham meet. One which was captured proved to be a male, and I believe the others were of the same sex. The 'poll,' it may be mentioned, is of cement, and the nearest wood must be quite two miles away."

We congratulate the Dundee Naturalists' Society on attaining its fiftieth year, a long period well spent in encouraging inquiry into the ways of Nature.

* * * *

Since the opening of the year two Scottish naturalists, of very different character and accomplishments, have dropped from the ranks. Mrs Robert Gray, widow of the author of *Birds of the West of Scotland*, was in her ninety-third year, and had spent a long life in collecting, with extraordinary skill and insight, fossils from the Palæozoic rocks of Girvan. Her knowledge of the technical characteristics of the material she gathered was profound, and her labours resulted in many additions to science. Some of her material is housed in the Royal Scottish Museum, but the bulk of her collection, more than 40,000 specimens, was acquired by the British Museum of Natural History.

* * * *

Mr Tom Speedy was an observer of a different stamp. He delighted in the open air and in the life of mountain and moor, and his interests were shown in his *Sport in the Highlands and Lowlands of Scotland with Rod and Gun*, published in 1884. He died on 27th February at the ripe age of seventy-eight years, having done much, by his forceful descriptions, to interest the general reader in those aspects of Nature that appealed so strongly to him.

Bean Geese in South Fife.—As the Bean Goose, *Anser fabalis fabalis*, is not very common on the East Coast, I think it may be worth recording that my keeper shot three here on the 10th of January 1924, out of a flock of forty. The flock had been noticed frequenting a field on Kilconquhar Mains, about a mile from the sea, for several days. Those shot all had the typical orange legs, black bill with orange bar, and black nail. The heaviest weighed 8 lb. 8 oz.—LINDSAY, Kilconquhar, Fife.

Northern Golden Plover in Scotland.—The statement of the distribution in Britain of the Northern Golden Plover, *Charadrius apricarius apricarius*, in "Practical Handbook of British Birds," vol. ii. p. 535, gives no definite record, though we

read "the winter-visitors and passage-migrants . . . are probably of this form." We think it therefore worth reporting that a male Northern Golden Plover was killed at the lantern of the Isle of May on 7th May 1909, and sent to us. The bird, which is in beautiful plumage, is now in the St Andrews University Museum.—LEONORA JEFFREY RINTOUL and EVELYN V. BAXTER.

Weasel killed by Barn Owl; and Note on the Hatching of Young Barn Owls.—A friend who is fortunate in having a pair of Barn Owls always occupying a dove-cot at her house, told me that she cleaned out the cot one day last summer and found in it a dead Weasel. She also mentioned that each year the female laid five eggs, beginning to incubate from the laying of the first egg. The young hatched out accordingly in a graded series. She has come to the conclusion that the two latest to hatch out are eaten by the first-born or the parents, as they always disappear, year after year only three being reared to maturity.—T. THORNTON MACKEITH, Kilmacolm.

Extensive Immigration of Wood-Pigeons.—During the past winter I have noted the arrival of phenomenal flocks of Wood-Pigeons in Moray. On 20th December such a flock made its appearance, and I estimated it to be about fifty yards wide, while at either end it extended beyond the limits of vision.—ALEX. STABLES, Elgin.

Recovery of Ringed Woodcock.—I ringed four young Woodcock here in Grange Wood on 20th June 1922, putting pigeon rings on two and a piece of common tying wire on the other two. This wood was shot on 2nd January 1924, and a good bag of Woodcock was got, among them two of my ringed birds, one with a pigeon ring and one with the wire on. I may say the wood was shot last year without getting any of the four. I think this is ample proof that if our home bred birds migrate they return again to their breeding grounds.—ADAM WHITE, Reston.

Glaucous Gull in East Lothian.—On 9th February 1924, in company with Mr Charles Connell, W.S., I obtained the somewhat decomposed body of a Glaucous Gull (*Larus glaucus*) on the shore between Longniddry and Aberlady in East Lothian. The bird was in immature plumage. A few feathers of the mantle had assumed the pearl grey colour of the adult. The sex was not definitely ascertainable but the bird was probably a male, the wing measurement being 470 mm.—OLIVER H. WILD, Cheltenham.

OBSERVATIONS ON A PILOT WHALE
STRANDED IN THE FIRTH OF FORTH.

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

ON 2nd February a Pilot Whale, Blackfish or Ca'ing Whale (*Globicephala melæna*), was left stranded alive on the shore at North Berwick. Through the prompt action of the Coast-

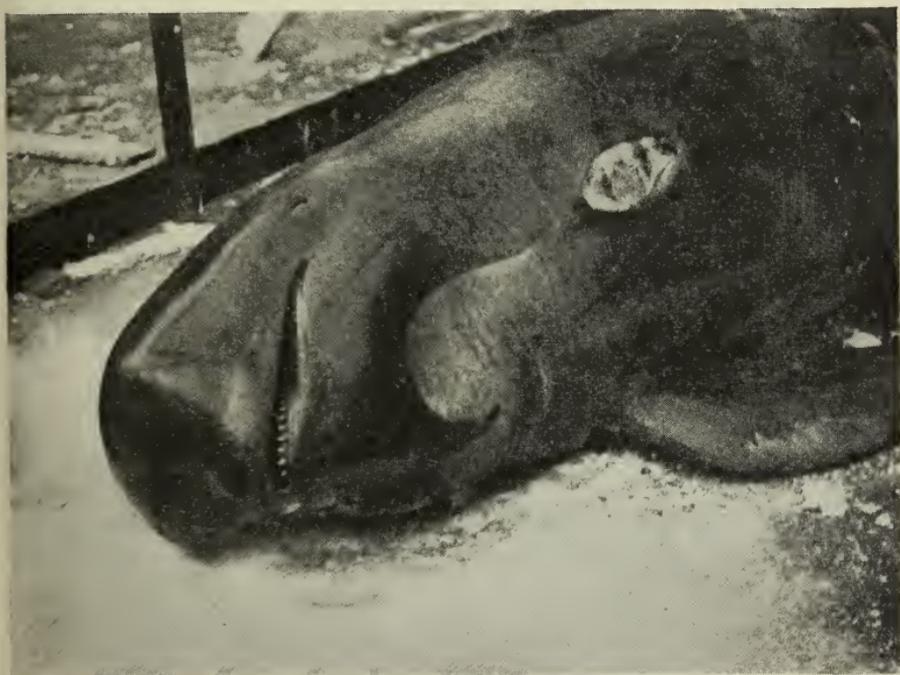


FIG. 1.—Head and throat of Pilot Whale, showing bulging forehead, short beak, and heart-shaped throat mark. The left flipper has been removed, its base showing as an oval white mark.

guard Officer, Mr Patey, the Royal Scottish Museum was at once informed, and Mr R. H. Reid and myself were present before the Whale, which had been shot through the head, had ceased to breathe. A wound on the right side, which had been bleeding freely, indicated perhaps that the Whale had been struck by a ship's propeller, and accounted for its inability to avoid being stranded.

The Whale was conveyed to the Royal Scottish Museum, and after a cast had been taken of its external form and

various portions had been removed for further dissection, it was cut up and its internal structures were subjected to a cursory examination. Various parts of the organs, the food content of the stomach, and the skull are in course of preparation for exhibition in the Museum, where also a full-sized replica of the Whale itself will ultimately be placed on view.

In the course of our examination we found practically nothing to add to Dr Murie's fine account of the anatomy of this species (*Trans. Zool. Soc. Lond.*, 1874, vol. viii., p. 235), and give here simply a short account of the more striking features, a few individual measurements, and some notes on the occurrence of a well-marked sex dimorphism in the species.

External Features.—The specimen was a full-grown male Pilot Whale, 19 ft. 10 in. in length, black in colour, except for the characteristic creamy-white heart-shaped patch under the throat (see Fig. 1). This shaded away backwards and continued as a narrow pale area along the belly, strengthening into white again in the region surrounding the vent and genital fissure. The only other traces of colour were a few rays of faint white, or rather of a whitish lustre, running backwards and upwards from behind the eyes.

The species is readily distinguished from all other British whales by its very long narrow flippers, which in the North Berwick specimen measured along the outer edge 5 ft. 1 in., and by its round head and bulging forehead which almost overhangs the insignificant beak. The vertical height of the back fin was 1 ft. 4 in., and the distance from the middle of its base to the middle of the tail measured 13 ft. 8 in.

Internal Features.—On the ridge of the back, behind the back fin, the skin measured 4 mm. in thickness, the cuticle being no thicker than cartridge paper, and underneath, blubber intermixed with dense glistening fibro-elastic tissue was 7 to 10 cm. in thickness. The stomach and small intestine, both remarkable for their irregular internal ridges, were examined for parasites, but only a number of small nematode worms were found free in the stomach. They may be parasites of the fish upon which the Whale had been feeding.

The most interesting of the internal parts examined were the two short bones, lying one on each side well below the backbone, which hint at the ancestry of whales. For these bones are all that remain to represent the pelvic girdle of the land ancestor from which the whales are descended. Each is roughly sickle-shaped, one, the right, being $11\frac{3}{4}$ in. (30 cm.) in length measured along the curve, $10\frac{1}{8}$ in. (27 cm.) along the chord, the other (left) 11 in. (28.5 cm.) along the curve. The anterior end was somewhat flattened and expanded and had an irregular contour, its breadth was 4.5 cm. (right), 5 cm. (left). The bones lie close above and parallel with the posterior portion of the large muscular penis.

Dissection showed that these bones had no ligamentous connection with the backbone, nor had they any ligamentous connection with each other, such as occurs in female individuals of this species according to Murie (*loc. cit.*). They lay simply embedded in muscle. This fact gives additional interest to another feature which must be regarded as mainly of archaic interest. Along two-thirds of the length of the pelvic bones was attached in two bundles a strong fibrous elastic ligament, the suspensory ligament of the penis. Now, in a typical mammal this suspensory ligament is similarly attached in the neighbourhood of the pubic symphysis, and here the reason is obvious, for the substantial and strongly moored pelvic girdle forms a solid unyielding support. But in the Whale the support or resistance afforded by the small pubic bones, simply embedded in flesh, must be little more than negligible. It would almost seem, therefore, that the suspensory ligament in the Whale is rather an interesting relic of past history than a connection of prime importance at the present day. And yet the great area of attachment of the suspensory ligament relative to the length of the degenerate pelvic bones themselves, suggests that this connection may have been a factor in the survival of these relics, hindering the total disappearance of the pelvic girdle. Support seems to be given to this suggestion by the fact that in female individuals the pelvic bones are considerably smaller than those of the male just described,

if the few observations made hold true in general. Murie found that in a female 10 ft. 10 in. long, the pelvic bones were only 4 in. in length; in our 20 ft. male they reached $11\frac{3}{4}$ in. The Royal Scottish Museum possesses a skeleton 14 ft. 4 in. long, from one of the Granton school of 1867, having pelvic bones $4\frac{3}{4}$ in. long, and I assume, therefore, that this also is a female skeleton.

Food.—The stomach of the North Berwick Whale was almost empty, containing no soft parts of its food; and this is probably to be accounted for by the long period which elapsed between its last meal and its death. The hard portions which remained, however, give a glimpse of the nature of its food (Fig. 2). They comprised many inter-neural rays and the long symmetrical bone ("post-abdominal," Mr E. L. Gill suggests as a designation) which bounds the body cavity of a flat-fish, probably a Plaice some 15 ins. long. (This bone is mistakenly labelled "post-clavicular" in the figure.) There were two unidentifiable eyeballs of fishes, four partly dissolved ear-stones or otoliths, of which two probably belonged to the Horse Mackerel (*Caranx trachurus*), and a fragmentary Gasteropod shell. The greater part of the food must have been made up of small Cephalopods, for there were found upper and lower portions of beaks, twenty-seven in number, representing the remains of some twenty individuals. They belong to at least two small species, which, in our present knowledge of the specific characters exhibited by cephalopod beaks, cannot be determined further than that some closely resemble the beaks of Squids and others those of an Octopus.

Whether or not it can be taken as a general habit of the species I do not know, but our Pilot Whale had not attacked the larger species of Cephalopods, such as leave scars on the skin of the Sperm Whale, for very careful examination of the skin about the mouth and head revealed no trace of sucker marks of any kind.

Indications of Sex Differences in the Skeleton.—Of the pelvic bones mention has already been made. There are marked differences between the sexes in regard to their size and general development as well as to their ligamentous

adhesions. In the males the bones are much larger and more strongly developed, and the suspensory ligament which

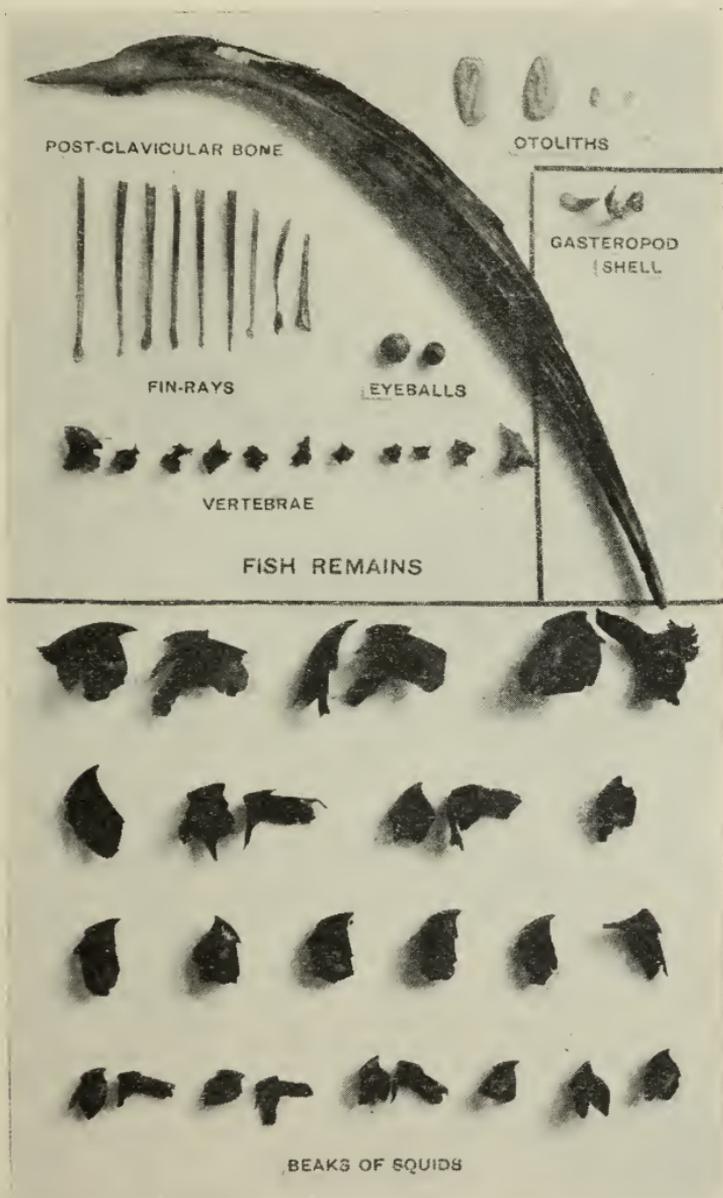


FIG. 2.—Remains of food of Pilot Whale. Slightly reduced.
For "post-clavicular" read *post-abdominal* bone.

attaches to them in males seems to be replaced in females by a well-developed ligament connecting the two bones with each other.

The skeleton of the flippers possessed fewer phalanges than might have been expected in so elongated an organ. They numbered as follows: 1st digit 7, only 3 ossified; 2nd digit 13; 3rd digit 10; 4th digit 2; 5th digit 1. Total length of skeleton in a straight line from head of femur to tip, 4 ft. 11 in., greatest breadth 1 ft. 2½ in. The numbers in the skeleton in the Royal Scottish Museum, which, on account of its small pelvic bones, I regard as a female, were 1st, 4; 2nd, 13; 3rd, 10; 4th, 2; 5th, 1 or 0; and the total length of the flipper 3 ft. 1¼ in., its breadth 7¾ in. There is here clear evidence of sexual dimorphism in size, though not in the constituent elements of the flippers. The male flipper is not only much larger, but it is slightly broader in proportion to its length. The female flipper is shorter and rather narrower in proportion.

Many skulls of the Pilot Whale are to be found in museum collections, but the sex of the individuals to which they belonged is seldom known. Sir Sidney Harmer informs me that the late Mr William Taylor of Lhanbryde sent him a series of photographs tending to show that there are distinct cranial differences between the males and females, a possibility vaguely hinted at by Sir William Flower in 1883 (*Proc. Zool. Soc.*, 1883, p. 509). I give, therefore, some of the more important dimensions of the skulls of a male and a female, the former the North Berwick individual 19 ft. 10 in. long, the latter the Granton individual of 1867, whose skeleton is 14 ft. 4 in. long. The measurements are in centimetres.

	NORTH BERWICK.	GRANTON.
	Male.	Female.
Total length of skull from tip of beak to occipital crest	69	62
Length of beak, to maxillary notches	36·5	35
Breadth of beak at maxillary notches	29	26
" " middle	23	20·5
Length of maxillary tooth line . . .	23	21·5
Tip of beak to anterior margin of superior nares	52	46
Breadth of skull between orbits . .	49	45
Temporal fossæ, greatest diameter .	18·5	14·5
Mandible, length	58	54
" length of symphysis	7	6·5
" length of tooth line	17·5	19
" angle to coronoid process	18·5	15·5

From these measurements it would appear that while the beak or rostrum of the smaller female is almost as long as that of the larger male, it is distinctly narrower. The breadth of the female skull is also somewhat less in proportion to its length. In the lower jaw the depth in the male is considerably greater proportionally than in the female.

In carrying out these observations I have been greatly helped by Miss G. H. Jacob, Mr E. L. Gill, and Mr R. H. Reid.

The Bittern in Berwickshire and East Lothian.—A very fine female specimen of the Common Bittern (*Botaurus stellaris*) was picked up dead on the golf course, Ayton, Berwickshire, on the 16th of January 1924. The bird was in good condition and in excellent plumage. A small minnow in a lateral position was adhering to its tongue, but this had nothing to do with the death of the bird. The Bittern was first observed by the greenkeeper to the golf club on the 15th of January. It was then alive amongst some coarse grass close to the edge of the river Eye. The greenkeeper was uncertain what kind of bird it was, and on his approaching it, it showed fight and offered considerable resistance. It kept on stamping with its feet on the ground, occasionally jumping up about a couple of feet, and shaking its partially extended wings. The ruff was erect, only the beak and eyes showing inside the ruff, and the bird persistently faced the man from whatever angle he approached it. Next day the greenkeeper brought the bird to me in a very bedraggled condition for identification.

From a series of records it would appear that the Bittern migrates north about the end of January, but whether in quest of suitable nesting haunts it is impossible to say. Perhaps it is more probable that occasional straggling migrants lose their way and eventually succumb through starvation, or get shot by some enterprising novice who does not realise exactly what he is shooting.

Of recent years one Bittern was shot at Wylicleugh, Leitholm, Berwickshire, on the 25th of January 1921, and another was seen at The Hirsell, Coldstream, on the 18th of January 1922. The Bittern already mentioned was found at Ayton on the 16th of January 1924, and another captured at Thornton Bridge, Innerwick, East Lothian, on the 23rd of January 1924. Going further back one was seen at Tynninghame on the 4th December 1903; one was

captured at Luggate, Prestonkirk, on the 15th of May 1908, and another was observed at Gullane between the 26th and 30th of May 1908. There is a still more distant record of one being shot on the Whitadder, near Gainslaw, Berwick-on-Tweed, on the 23rd of December 1890, and this specimen is now included in the fine collection of Mr Peter Cowe, Oldcastles, Chirside.

It would be interesting to know whether these occasional migrants come from the Continent or from the Norfolk Broads. It would appear from observation that the Bittern has been increasing in numbers and nesting in the latter area during recent years.—
J. P. F. BELL, F.R.S.E., Ayton.

Bittern and Smew in Kirkcudbright.—A Bittern was picked up dead not far from Crossmichael on 25th January 1924, and shortly afterwards an adult male Smew was shot near Greenlaw, Castle Douglas: the weather at the time was unusually stormy.—
HUGH S. GLADSTONE.

[The following note refers to the same Bittern, but gives additional details.—EDS.]

When in Castle Douglas on 28th January I saw a Bittern hanging in a game-dealer's shop, and on making inquiries, found that it had been killed by a motor-lorry at Shirmers on the banks of Loch Ken on 25th January. My friend the factor for Shirmers told me he knew there were Bitterns there occasionally.—
W. M. RUSSELL, Castle Douglas.

Bittern in Ayrshire.—A Bittern was observed on the public road two miles inland from Girvan on the 9th January. The bird was in a very emaciated condition, scarcely able to move, and could not possibly have lived long. After being shot it was taken to Mr Graham, chemist in Girvan, a very keen naturalist; it only weighed 12 oz. He is having the bird preserved to exhibit in his window, as is his custom with anything unusual in this line that may come his way.

After hearing our description of the bird some neighbours of ours are of opinion that they saw a similar bird about the same time at the river about half a mile distant.

Mr Graham also tells me that about two years ago two Bitterns were observed in this district about a mile away and one of them was shot.—
KATE W. MEIKLE, Girvan.

A NOTE ON THE HEDGE SPARROWS (*ACCENTOR MODULARIS*) OF THE BRITISH ISLANDS.

By Col. R. MEINERTZHAGEN, D.S.O.

THROUGH the kindness of the authorities of the British and Royal Scottish Museums, I have been able to bring together large series of Irish, English, and Scottish Hedge Sparrows, and these in conjunction with birds in Mr Witherby's and our collection form the basis of the following remarks:—

In all 38 Irish, 67 English, and 58 Scottish, including 4 Hebridean specimens have been examined, not counting the large series of continental specimens in the British Museum.

English Specimens.—Throat and chest slightly darker than in continental birds, abdomen less whitish and flanks slightly darker, so that streaks are more prominent.

Upper parts not so bright as in continental specimens.

2nd primary variable, but in 70 per cent. of cases slightly longer than the 7th.

This form has been named "occidentalis," the type having come from Tring Museum.

Scottish Specimens.—Under parts more nearly resemble continental than English specimens, especially on the abdomen and flanks. Considerable variation is shown.

Upper parts brighter than in English specimens, and more nearly approaching the continental form. Sometimes, however, they resemble Irish birds.

Wing formula as in the English race.

Irish Specimens.—Under parts indistinguishable from Scottish birds.

Upper parts still brighter and foxier red than either Scottish or continental birds, and very much redder than English birds.

2nd primary usually equals 7th, and only exceeds it in some 40 per cent. of cases.

Outer Hebridean Specimens.—Throat and chest slightly darker than any other form. Flanks more heavily and distinctly streaked.

Upper parts more nearly resemble the Irish birds, but are more heavily and distinctly marked on the mantle and head, which produces a darker appearance.

Of four examined, in three cases the 2nd primary is much longer than the 7th, thus resembling the continental form, whilst in one case the 2nd primary equals the 7th.

Wing on the large side, 70 to 71 mm.

The above facts may be summarised thus:—

Irish birds are foxier and brighter on the back than English specimens. Outer Hebridean birds are darker than Irish birds being more heavily marked on upper parts and flanks. Perhaps also larger. From English birds they are very distinct in being brighter and darker all over. Scottish birds are not constant and resemble sometimes continental, English, Irish, or even Hebridean specimens.

More specimens from the Outer Hebrides are badly needed before the true meaning of the races can be properly understood and recognised.

THE SPREAD AND DISTRIBUTION OF THE WOODCOCK AS A BREEDING BIRD IN SCOTLAND SINCE THE BEGINNING OF THE NINETEENTH CENTURY.

By EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL.

(Concluded from p. 20.)

DEE.

ABERDEEN.—As long ago as 1837 the Woodcock was found breeding at Castle Forbes and Monymusk in this county, and Mr Fairholme, who records the occurrence, states that he had seen both eggs and young ones more than once (1, 1837, 337-340). Corroborative evidence of early nesting in this county is that supplied by P. J. S. (*loc. cit.* 201), who says we are “informed by a gentleman who rents a shooting district in the north-west of Aberdeenshire, that this season there are several pairs breeding upon the property, though they were not known to do so a few years ago.” Macgillivray, in 1852, gives an account of the breeding of the species near Loch of Skene (28, iv. 393), while in 1870 it was nesting at Drumblade, Huntly, and Inverurie (41, 1871-72, 48 and 82). The Woodcock is described as resident in Aberdeen in 1885 (41, 1885-86, 373), nests were found near Gight in 1891 (41, 1891, 59), and Kintore parish in 1902 (2, 1902, 253); in 1903 Mr Sim writes, “breeds in considerable and increasing numbers in Dee” (18, 172).

Admiral Sir Arthur Farquhar, writing on 5th December 1922, says: “I was much about the woods near Kincardine O’Neil as a boy, sixty years ago and onwards, and I do not remember a single nest being found by myself or my brothers in those days, within the last twenty or thirty years, however, I have known of many nests up and down Dee, Aboyne, Durriss, Blackhall, etc. etc.”

MORAY.

EAST INVERNESS.—Gray, in 1871, says, “have always bred at Beaufort, near the Beaully Firth” (12, 310). The earliest definite records, however, are all of eggs in the Hargitt collection, these are from Drumnadrochit in 1864 and 1865, near Carness in 1865,

Dochfour Woods in 1869, and Knockie in 1870, 1872, 1875, 1876, and 1878. By 1895, when Dr Harvie Brown wrote his *Fauna of the Moray Basin*, the Woodcock is described as an abundant breeding species in all suitable localities.

NAIRN.—Mr Maurice Portal has kindly sent us the following note, "has nested for years at Cawdor and many nests; I got sixty-seven young ringed there in 1910 and 1911."

MORAYSHIRE.—The earliest record of breeding in this county is given by Yarrell, who says that two nests were found there in 1837 (14, ii. 591). St John says (45, 252) that numbers bred at Altyre and Darnaway in 1846, while Gray, writing in 1871, says: "In many parts of Morayshire, especially in the neighbourhood of Darnaway Forest, considerable numbers remain to breed" (12, 310), and this seems to be the case up to the present time.

BANFFSHIRE.—Before 1876 a few pairs of Woodcock nested in Banffshire, and by 1888 it is described as abundant there as a breeding species and still on the increase (19, ii. 188). It continues to breed freely up to the present time.

EAST ROSS.—In 1832 four nests of the Woodcock were found at Conon (39, 1832, 133). A very interesting early record is that by W. L., who says: "The Woodcock, twenty years ago, was a migratory visitor of our wild woods and copses; any surmise, at that time, of its breeding in the country would have been held as visionary and ridiculous; but, for some years past, the Woodcock is as well known annually to bring out her young as the Curlew or Green Plover. . . . On the 10th of April 1835 the gamekeeper at Brahan Castle . . . offered to show the writer of this two nests upon which the birds (Woodcocks) were still sitting. We found one of these by the side of a road . . . and, about 250 paces off, we were shown another" (1, 1837, 120). The above was printed under the misleading title of Breeding of Woodcock in Selkirkshire, but later the author pointed out the mistake (1, 1838, 347). About 1841 the Woodcock bred at Tarbat (12, 310), and in 1869 at Tarlogie, near Tain (40). Before 1871 Woodcock were nesting at Castle Leod (12, 309), in 1878 a clutch was taken at Coolin Wood, near Mossford, Lochluichart (Hargitt collection), and they continue to breed in the district at the present time.

EAST SUTHERLAND.—In 1848 the Woodcock is described as breeding in most of the large woods of late years (43. i. 137), and in 1849 Hancock saw many breeding birds, and found that they nested regularly near Dunrobin (9, 103). Mr E. C. Buxton discovered that they were breeding plentifully in this part of the county in 1853 (46, 1853, 4017); an egg in the Hargitt collection

was taken at Inveran in 1873, and in 1887 Woodcock are said to have increased still further in this division (17, 216).

SUTHERLAND.

NORTH SUTHERLAND.—In 1849 St John says: "The Woodcock, of late years, has commenced breeding . . . in most of the large woods" (43, i. 137); while Harvie Brown and Buckley, in 1887, say that the Woodcock is "resident and common; as a breeding species has much increased of late years; rare in the central and north-east districts. . . Breeds regularly also around Tongue" (17, 216-217).

CAITHNESS.—The Woodcock was known to breed in Caithness as long ago as 1865 (31, 1865, 437), and twenty years later it is recorded as breeding at Berriedale (17, 217), and it has continued to nest in this district, as Mr J. Harling Turner kindly informs us that Mr Anstey, headkeeper at Langwell, says from twenty to thirty pairs, on an average, nest regularly on that estate.

OUTER HEBRIDES.

The first record of the breeding of the Woodcock in the Outer Hebrides is from Stornoway in 1879 (22, 130), and the only other note of breeding which we have been able to find is that of two nests in North Uist in 1891 (2, 1892, 73). On asking Mr George Beveridge whether Woodcock had continued to breed in North Uist he tells us that as far as he has been able to ascertain, they do not nest on the island though he has seen them there as late as May.

ORKNEY.

Under date of December 1887, Mr Moodie Heddle says that Woodcock are becoming more numerous, and "a few now remain to breed in Hoy" (21, 211). In 1888 Dr Harvie Brown was told by the Rousay keeper that there were at least two nests there that year (*loc. cit.*, 212), and it has continued to nest in this group of islands.

SHETLAND.

In 1874 Saxby records that he saw a nest and eggs of the Woodcock on Hermaness, North Unst, and that the shepherd in charge of the hill told him that they had bred there for several years before. Unfortunately, he does not mention the year in which he saw the nest (11, 200).

Before 1890 it was found breeding on the hill to the west of the Loch of Cliff, also in Unst, and in 1895 near Weisdale, Mainland (23, 163). In 1905 Mr R. C. Haldane records having seen a Woodcock "evidently brooding" near Collafirth, and on 3rd August of that year two half-grown Woodcock near Uyea, both these places are on the Mainland of Shetland (2, 1905, 245).

We are well aware that our records are not complete; in the nature of things it always must be so, but we have tried to make as comprehensive a survey as possible, and we think that a sufficient amount of material has been gathered to warrant the conclusions at which we have arrived. These are three in number—(1) that the general trend of advance has been from the east and north-east; (2) that the increased area under woodland has helped the spread of the Woodcock throughout the country by providing more nesting sites for the birds; (3) that the protection afforded the birds during the breeding season has been a most important factor (possibly *the* most important factor) in rendering this increase possible.

We cannot conclude this paper without acknowledging our indebtedness to our many correspondents who have so very kindly sent us many valuable statistics from all over Scotland. We thank them all most warmly, and assure them we most thoroughly appreciate the trouble they have taken and the help they have given us.

IV. LIST OF WORKS REFERRED TO.

The following abbreviations have been used in this paper: where no reference to published matter is given the information is contained in letters written in reply to inquiries made by us, or is the result of our own observations.

1. *Annals and Magazine of Natural History.*
2. *Annals of Scottish Natural History.*
3. Muirhead, G., *The Birds of Berwickshire*, 1889-95.
4. Gladstone, H. S., *The Birds of Dumfriesshire*, 1910.
5. Turnbull, W. P., *The Birds of East Lothian and a portion of the adjoining Counties*, 1867.
6. Dresser, W. E., *Birds of Europe*, 1871-81.
7. Graham, H. D., *Birds of Iona and Mull*, 1890.
8. Ussher and Warren, *Birds of Ireland*, 1900.
9. Hancock, J., *Birds of Northumberland and Durham*, 1874.

10. Bolam, G., *The Birds of Northumberland and the Eastern Borders*, 1912.
11. Saxby, H. L., *The Birds of Shetland*, 1874.
12. Gray, R., *The Birds of the West of Scotland*, 1871.
13. *British Birds*, B.O.U. List of, 1915.
14. Yarrell, W., *History of British Birds*, First Edition, 1843.
15. *Dunfries Courier*.
16. Harvie Brown, J. A., and Buckley, T. E., *A Fauna of Argyll and the Inner Hebrides*, 1892.
17. Harvie Brown, J. A., and Buckley, T. E., *A Fauna of Sutherland, Caithness, and West Cromarty*, 1887.
18. Sim, G., *A Vertebrate Fauna of Dee*, 1903.
19. Harvie Brown, J. A., and Buckley, T. E., *A Fauna of the Moray Basin*, 1896.
20. Harvie Brown, J. A., and Macpherson, H. A., *A Fauna of the N.-W. Highlands and Skye*, 1904.
21. Buckley, T. E., and Harvie Brown, J. A., *A Fauna of the Orkney Islands*, 1891.
22. Harvie Brown, J. A., and Buckley, T. E., *A Fauna of the Outer Hebrides*, 1888.
23. Evans, A. H., and Buckley, T. E., *A Fauna of the Shetland Islands*, 1899.
24. Harvie Brown, J. A., *A Fauna of the Tay Basin and Strathmore*, 1906.
25. Evans, A. H., *Fauna of the Tweed Area*, 1911.
26. *The Field*.
27. Lumsden, J., and Brown, A., *Guide to the Natural History of Loch Lomond*, 1895.
28. Macgillivray, W., *History of British Birds*, 1837-52.
29. Seebohm H., *History of British Birds*, 1883-85.
30. *History of the Berwickshire Naturalists' Club*.
31. *The Ibis*.
32. Selby, P. J., *Illustrations of British Ornithology*, 1821-34.
33. Smiles, S., *Life of a Scotch Naturalist*, 1876.
34. Dalgleish, J. J., *A List of the Birds of Culross and Tulliallan*, 1885.
35. Saunders, H., *Illustrated Manual of British Birds*, 1889.
36. *The Old Statistical Account of Scotland*, 1791-99.
37. *Proceedings of the Natural History Society of Glasgow*.
38. *Proceedings of the Royal Physical Society*.
39. *Proceedings of the Zoological Society*.
40. Booth, E. T., *Rough Notes on Birds observed in the British Isles*, 1881-87.
41. *Scottish Naturalist*.
42. Pennant, T., *A Tour in Scotland*, 1771-76.
43. St John, C., *A Tour in Sutherlandshire*, 1849.
44. Service, R., *Vertebrates of Solway: a Century's changes*, 1905.
45. St John, C., *Wild Sport and Natural History of the Highlands*, 1846.
46. *Zoologist*.

Breeding of Sandwich Tern in Shetland.—In 1923 the fishermen brought me an egg of what they call the “Rippeck Maw” from one of the outlying islands near the Out Skerries Lighthouse, Shetland. I sent it for identification to the Royal Scottish Museum, and am informed that it is “undoubtedly an egg of the Sandwich Tern.” Only one pair nested on this island. This is not the first year they have been seen here, and though I cannot say if they nested here before or not, I have observed a pair almost every summer since I came here, five years ago. The fishermen say they have been nesting on the outlying rocks or isles for a good while back; not in flocks but just a pair here and there. I am told that there is no previous record of the Sandwich Tern having nested in Shetland.—HENRY JAMIESON, Out Skerries Lighthouse.

[The word “rippock” or “rittock,” according to various etymologists, is a local name applied in Orkney and Shetland to the Common Tern. Its use by our correspondent in the form “rippeck maw” or rippeck gull, perhaps indicates that the term is applied to Terns in general rather than to a particular species of Tern.—EDS.]

The Hawfinch in Renfrewshire.—Writing to me from his house in Kilmacalm, Mr R. Oswald Blyth says: “I saw a Hawfinch on the lawn of Moorcote as I passed this morning. It was hopping away from me when first noticed and puzzled me greatly, but flew into a tree and I got a fine view of the unmistakable head.” I think I am correct in saying that this is only the second record for “Clyde.” It certainly is the first for Renfrewshire.—T. THORNTON MACKETH, Kilmacalm.

Smew in Renfrewshire.—The rare occurrence of the Smew (*Mergus albellus*) in the Clyde Area seems worth recording. On 21st February a pair were on Castle Semple Loch, Renfrewshire, when I had a splendid view of them with the glass as they swam past at no great distance with the sunlight upon them. The white plumage of the drake with black face and oddly projecting beak give clear meaning to the name “White Nun.” The crest and the black bands running down from the shoulder were also plainly to be seen. The white throat of the dingy female was its most distinct marking. In swimming, the stern sloped down to the water, and the duck led the way.—T. MALLOCH, Johnstone

OBSERVATIONS ON THE HUMBLE-BEES
OF BUTE.

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

THE following account of Bute Humble-Bees is made mainly from observations obtained during the period 25th August to 26th September 1923.

Effect of Climate on Humble-Bees.—During the period of just over a month, there was not a single day on which some rain did not fall. On about five days some bright sunshine was experienced, but mostly dull and showery weather prevailed. Bute, situated in the Clyde Estuary, has normally a large rainfall, and it is of interest to note, therefore, certain habits of Bute Humble-Bees which appear to bear some relation to the wet climate.

It was noticed repeatedly that *immediately* after a rain storm the worker bees were on the wing, engaged in obtaining pollen and nectar. The significance of this observation seems to lie in the fact that no time can be wasted by bees in such a climate in waiting for ideal spells of weather. Directly the rain is over the bees get to work at once. In more congenial climes bees often wait for an hour or more (probably for the herbage to dry) before resuming work after a storm.

Return of Drones to Nest for Shelter.—On the open moor of Birgidale I was watching a populous nest of *Bombus lucorum*; a heavy storm following a period of bright sunshine caused the worker bees to flock to the nest for shelter *en masse*. I noticed among these workers several drones entering the tunnel. One of these drones I caught. Up to this time I have never noticed a drone return to a nest once it had left, though I have kept under close observation many colonies of *B. lucorum* and other species. I think it possible that, since there is so little shelter on the open moor in Bute, a drone on leaving the nest takes landmarks (as is the habit of the workers and queens), so that it may return to the shelter and warmth of the colony

should occasion arise. Sladen in his work *The Humble-Bee*, p. 52, states that "The young males leave the nest as soon as they are able to fly, and do not return again for food or shelter." The incident related is therefore an exception to the rule.

Modifications in Nest-building.—It was not difficult to find nests of the bees. Turf walls are common on the moors, and these provide nesting sites with adequate drainage. In these we found a number of nests of the subterranean building species. The surface of the moor was frequently water-logged, and I soon came to the conclusion that the ideal spot to search for the nests was in these walls. The nest-walls of surface breeding species, *B. muscorum* and *B. agrorum*, were sometimes three inches in thickness. Now these bees have the habit of foraging for additional nest-wall material, which is gathered by drawing the material by degrees towards the nest-site, the insect walking backwards. The nest-walls of these two species in Bute were much thicker than any I have found elsewhere—a necessary precaution on the part of the bees to keep out damp and maintain heat.

A nest of *B. muscorum* was found embedded in sphagnum moss. The nest-wall was composed of the carded moss, and the dome of the nest projected above the surface of the growing moss about three inches. I could scarcely believe that a nest could possibly be placed in such a situation and yet come to maturity. On removing the nest, water trickled into the cavity to the depth of about two inches. Yet the brood was dry and warm and queen brood was being reared. The nest-wall possessed the property of being waterproof, though very little wax had been used. One had indeed to look closely to see that any wax had been employed. This nest is in the collection of the Forest Entomology Department of the University of Edinburgh. The moss is still present at the base of the nest.

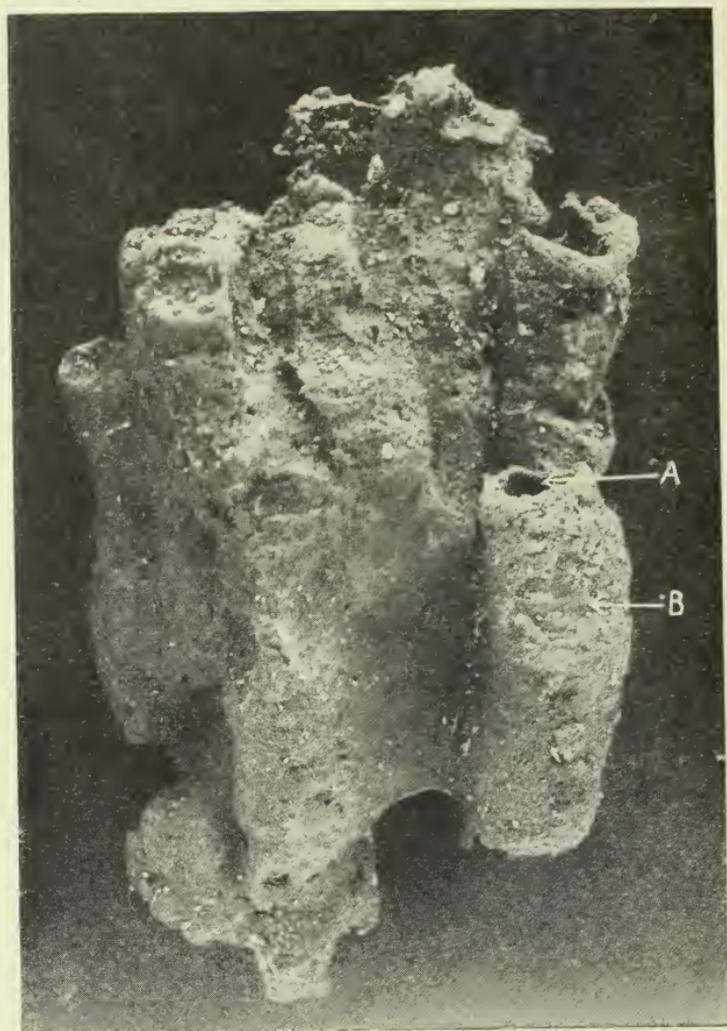
Altitude as a Factor restricting the Range of a Species.—A fact which struck me forcibly was the distribution of certain species in relation to altitude. *B. agrorum* and *B. muscorum* are two closely related species common on

Bute. It was found that *B. agrorum* was almost confined to the lower levels, above which its place was taken by *B. muscorum*. On Birgidale Moor in South Bute and Kames Hill in North Bute, above the 300 foot level, only *B. muscorum* was found, though at the foot of these hills *B. agrorum* was common. A possible explanation lies in the fact that *B. muscorum* is a larger and more powerful species than *B. agrorum*, and is therefore better adapted to stand the rigours of the higher altitude. Again *B. soroensis* was found only at high levels, its range coinciding very nearly with that of *B. muscorum*. *B. hortorum* is mainly a low level frequenting species, though a few drones were found feeding on bramble blossom at 500 feet on Kames Hill. I believe the long tongue of this species to be ill-adapted for obtaining nectar from heather, which is the predominant food plant at this level.

Occurrence of Pollen Cylinders of Hoffer in Nest of B. lucorum on Bute.—Sladen (*The Humble-Bee*, p. 202), under the heading *Bombus pomorum*, states that "Hoffer took three nests of the red-tailed form on the Geierkogel in Styria. They were all under the ground, and in two of them he noticed what he called 'pollen cylinders.' They always stood at the end of a group of cells." Neither Hoffer nor Sladen seem to have made any attempt to throw light on the structure or purpose of the cylinders. It would seem, therefore, that Sladen never met with them, for if he had done so, he would at least have attempted some description in his work. It may be of interest to record that I discovered a structure in a nest of *B. lucorum* on Bute, and another in a nest of *B. terrestris* at Cheltenham, which closely answer to the description of the pollen cylinders of Hoffer. I now describe the English specimen because of its larger and more finished condition. (See Fig., p. 56.)

The specimen was obtained from a very populous nest of *B. terrestris*. I had caught and counted over four hundred workers; there were at least one hundred young queens and many drones, and the brood was very large and consisted of about 500 cocoons and many larvæ. At one side of the mass of cocoons, and partially embedded in them, I found

ten cylinders of pollen. They varied in length from 2 to 3½ inches, and the diameter of each was about half an inch. In every case the long axis was vertical. The foundation of the cylinders consisted of vacated cocoons. The upper extremity



POLLEN CYLINDERS FROM NEST OF *Bombus terrestris*. Slightly reduced.

A. Cup containing pollen pellets.

B. Outer thin wall of wax removed to show layers of pollen.

of each cylinder was free and showed a cup-shaped surface, the concavity of which was about $\frac{3}{8}$ inch deep. The sides of the cylinders were in direct contact with each other, forming a solid mass, but the individual cylinders were recognisable by differences in coloration.

The components of the cylinders consist of pollen, which is disposed in layers of varying thickness and colour, according to the amount and kind of pollen stored. A thin coat of wax forms the outer wall of each cylinder. The concavities at the superior free extremity contain pellets of pollen.

The Probable Purpose of the Cylinders.—I regard the cylinders as storehouses for excess supplies of pollen. It is the habit of many species of Humble-Bees to store pollen in vacated cocoons. In very populous nests a supply of pollen may be gathered in excess of the immediate need of the colony. The available vacated cocoons having been utilised to their utmost capacity, the mouths of these cocoons are extended with wax to hold more pollen, so that a cylinder of pollen is formed, which would be a reserve against a dearth brought about by inclement weather.

Great Numbers of Humble-Bees on Bute.—On the great tracts of heath land I was struck by the great numbers of Humble-Bees to be seen. I have never seen so many elsewhere. A square yard of heather would sometimes contain six or eight individuals. It is not likely that the bees congregated to the one spot from other places to feed on the heather. Heather covers a large proportion of the area of Bute and everywhere, both in North and South Bute, bees were more numerous than I have seen them in the South of England or in East Scotland.

Period of Maturity of Nests.—In the South of England the majority of the nests have come to maturity by the end of August; when the colonies have broken up the fertilised queens are seeking for winter quarters preparatory to hibernation. It was interesting, therefore, to find in Bute at this time that the bee colonies were only approaching their full strength: workers were still being hatched and in their full bloom, drone and queen brood was still in the larval stage and thousands of workers were foraging in the heather. Again Humble-Bees have not thrived this year either in East Scotland or South England. In Bute the colonies were very large, and numbers of queens were produced.

Occurrence of Bombus cognatus (?) on Bute.—Eight queens

of a very large type resembling *B. muscorum* were taken at a height of 350 feet among heather in South Bute from a very limited area. I was at once struck by the great size (length 22 mm.), tawny coloration, powerful sting, and bristly coat of these bees. The coats were contaminated by some adhesive substance which was readily cleaned off by benzene. There were *no black hairs* on these bees. Specimens were forwarded to the Royal Scottish Museum, Edinburgh, where they were examined by Dr J. Ritchie and Mr Grimshaw. They pronounce them to agree closely with Schmiedeknecht's description of the form *Bombus cognatus* (which is not the *cognatus* of Stephens), but in the absence of the male it is impossible to come to any definite conclusion.

The German author Schmiedeknecht states that *B. cognatus* is to be found almost everywhere in Europe, and everywhere is a rare or extremely rare species.

Sladen includes *B. cognatus* with *B. muscorum*. He gives the dimensions of the latter species as 18 to 19 mm. in length. The Bute specimens in question measure 20 to 22 mm. in length, and are therefore considerably larger than typical *muscorum* specimens, and coincide with the dimensions of *B. cognatus* as given by Schmiedeknecht.

I have presented two specimens of this bee to the Royal Scottish Museum.

LIST OF THE HUMBLE-BEES OF BUTE.

Genus *Bombus*.

<i>B. lapidarius</i>	. . . .	Not so common as one would expect.
<i>B. terrestris</i>	. . . .	Rather rare.
<i>B. lucorum</i>	. . . .	Very common.
<i>B. soroensis</i>	. . . .	Common at higher altitudes North and South Bute. This species has been recorded from Ayrshire, so it is not very surprising to find it on Bute.
<i>B. pratorum</i>	. . . .	Very common.
<i>B. jonellus</i>	. . . .	Very local, on high moors only.
<i>B. hortorum</i>	. . . .	Common at low levels, a few males at high levels on blackberry.
<i>B. agrorum</i>	. . . .	Very common at low levels.
<i>B. muscorum</i>	. . . .	Common high altitudes.
<i>B. cognatus</i> (Schmiedeknecht)	. . . .	One locality South Bute only. Very limited range.

Genus *Psithyrus*.

<i>P. distinctus</i>	. . . .	Very common.
<i>P. barbutellus</i>	. . . .	Very common.
<i>P. quadricolor</i>	. . . .	One specimen only, ♂, South Bute.

The specimens of *B. soroensis* differed from Gloucestershire specimens in the almost total absence of the rosy blush found in the terminal segments of the drone and worker. The Bute specimens of *B. muscorum* are richer in colour than any I have seen from other localities, the orange of the thorax and abdomen being peculiarly intense. Again, the anterior part of the thorax is of a pale lemon yellow which merges posteriorly into the orange.

Apparent Absence of Bombus lapponicus from Bute.—*Bombus lapponicus* is a species of Humble-Bee which frequents moors. I therefore expected to find it on Bute, but failed to obtain it. It is a species which is easily recognisable even when in flight and therefore not likely to be overlooked. It has been recorded from the adjacent counties of Ayr and Argyll. I offer the following explanation to account for its apparent absence from Bute. *Bombus lapponicus* is dependent upon the nectar obtained from Blaeberry (*Vaccinium myrtillus*) in May and early June. This plant is the only nectar-bearing flower in bloom in quantity on the moors when *Bombus lapponicus* emerges from hibernation. I am of opinion that the species is not able to exist or colonise areas where *Vaccinium* is rare or absent. There is proof that it can reach islands, for it has been recorded from the Isle of May and the Bass Rock (Evans), therefore it is not the sea which acts as a barrier. I found isolated clumps of *Vaccinium* on Bute, but in no locality could it be called the dominant plant. Mr White, Secretary to the Bute Natural History Society, who is a keen botanist, has kindly informed me "that there is no place in Bute where blaeberreries grow in sufficient quantity to make it worth while for children to gather them, with one exception, viz., a narrow fringe of the plant exists round the boundaries of a quarry near Rothesay." This locality was searched for the bee without success.

My thanks are due to the Rev. J. M. M'William and to Mrs M'William, through whose kindness I was able to make the observations recorded. I wish also to acknowledge the kindness of Dr Ritchie and Mr Grimshaw of the Royal Scottish Museum, for the identification of *B. cognatus* and for information regarding continental specimens.

Curious Capture by Halibut.—I am sending to the Royal Scottish Museum on behalf of Mr John Simpson a large piece of herring-net found by him in the stomach of a Halibut (*Hippoglossus vulgaris*). The fish, a large individual, 5 ft. 10 in. long, weighing 128 lb., was caught on 4th March in some 30 fathoms depth about a mile west of Stroma. The portion of herring-net it had devoured measures roughly six feet square, and with the exception of one or two rents at one of the corners, the meshes are intact. It shows little signs of its curious adventure; probably it was swallowed along with dead herrings entangled in it.—D. LAING, Mey, Thurso.

[The record is interesting because Halibut are, as a rule, ground feeders, many examples of bottom fauna such as mollusca, crabs, and flat-fish having been found in their stomachs, and few pelagic creatures. But Halibut show a curious taste; there are at least two records of their having swallowed the lead "sounders" on fishermen's lines.—EDS.]

Spread of the Larch Longicorn Beetle.—This pest of growing timber, first recorded in Britain in 1903, is gradually spreading, and though no record is yet forthcoming from Scotland, it is highly probable that this beetle, *Tetropium gabrieli*, may yet occur here, since it is regularly distributed with larch timber. Timber yards are one of its main breeding grounds. It causes considerable loss to the forester owing to the reduced growth and value of wood in which the larvæ have been boring. Woodpeckers are its most efficient natural enemies. Foresters should be on the look-out for the appearance of the Larch Longicorn (Forestry Commission, leaflet No. 13).

BOOK NOTICES.

NOTES ON THE BIRDS OF DUMFRIESSHIRE: A CONTRIBUTION TO THE BIRDS OF DUMFRIESSHIRE. By Hugh S. Gladstone, M.A., etc. Dumfriesshire and Galloway Natural History and Antiquarian Society, 1923. Price 10s.

In 1910 Mr Gladstone published an authoritative work on the *Birds of Dumfriesshire*. In the following year he issued an "Addenda and Corrigenda" thereto; while in 1912 he treated the Birds, in an epitomised form, in his Catalogue of "The Vertebrate Fauna of the County." Since these contributions to the Dumfriesshire avifauna appeared, Mr Gladstone has amassed additional information, and this, with some corrections, forms the subject-matter of the book under notice. It is arranged under the following and other headings: The Ornithologists of Dumfriesshire; Physical Features and Climate; Migration; Protection; Recovery of Ringed Birds; and further information, relating to about 170 species and especially to the Waxwing, Pied Flycatcher, Jay, Hawfinch, Greater Spotted Woodpecker, Hen-Harrier, and Glossy Ibis. Lists of rookeries and gulleries are also given. All these sections are treated of with the care that characterises all Mr Gladstone's writings.

A BIOLOGY OF THE BRITISH HEMIPTERA-HETEROPTERA. By Edward A. Butler, B.A., B.Sc., F.E.S. H. F. & G. Witherby, 1923. With drawings in colour, photographic plates and numerous text illustrations. Pp. 666. Price £3, 3s. net.

Mr Butler in this volume, which he says is intended to supplement Saunders' Hemiptera-Heteroptera of the British Islands, has given us a very interesting and complete account of all that is known about the early stages (ova and larvæ), the life history, habitats, habits and distribution of the British Hemiptera-Heteroptera. He not only gives a clear and concise description of individual ova and larvæ where known, but also, as regards each species, a great deal of interesting information as to its mode of life, the plants it frequents, its probable food, and its seasonal occurrence. The tables at the end give the distribution for all the English and Welsh counties, and for Scotland and Ireland; also a list of plants with the associated bugs. Collectors of this interesting group will find this book a most useful and reliable guide to them in their field work.

FLOWERS: A GARDEN NOTE-BOOK. WITH SUGGESTIONS FOR GROWING THE CHOICEST KINDS. By the Right Hon. Sir Herbert Maxwell, Bart., F.R.S., LL.D. (Glasgow), D.C.L. (Durham), V.M.H. Glasgow: Maclehose, Jackson & Co., 1923. 4to, pp. 250, with 12 coloured plates from drawings by the Author. Price 25s. net.

This is a charming book in every respect. The author is an experienced horticulturist, and the advice given by him as to the choice and culture of the various bulbs, herbaceous plants, and flowering shrubs mentioned in these beautifully printed pages will prove of great value to the gardener, be he amateur or professional. Although the text bristles with scientific names the whole volume is eminently readable, with a good deal of valuable information regarding the idiosyncrasies of the various plants in relation to soil, position, climate, and other factors, which should be carefully noted by the florist. Space forbids allusion to several interesting matters discussed by the author, but attention may be drawn to the extremely interesting remarks on the species of rhododendron and their antipathy to lime or chalk (pp. 111 *et seq.*). Only two misprints have caught our eye, viz., p. 44, l. 15, *crimsom* for crimson, and p. 185, l. 23, *Helianthimum* for Helianthemum. The usefulness of the work may be gathered from the fact that the Index contains the names of over 800 species. The coloured plates are delightful, and show the author to be as accomplished an artist as he is a writer.

THE PEAKS, LOCHS, AND COASTS OF THE WESTERN HIGHLANDS. By Arthur Gardner, M.A., F.S.A. London: H. F. & G. Witherby, 1924. Pp. xi + 169. Price 15s. net.

If the traveller who has once made acquaintance with the mountains and lochs of Western Scotland needs further inducement to return to them, he will receive it from the magnificent and unusual photographs which illustrate this book. These pictures, one hundred in number, are the hub round which the text revolves. They betray the west in garb unfamiliar to the summer visitor, in the glory of spring snow and April clouds, and lend vivid support to the plea made by the author for spring-time rambles in these solitudes. While the text discusses in easy style the scenes portrayed, it also includes useful hints regarding stopping places and the best methods of attaining the objectives in their neighbourhood. We are entirely at one with the author in his desire to see a "tract of this splendid country presented to a Scottish equivalent of the National Trust. What a glorious national park could be formed of the country between Loch Broom and Loch Torridon," not only for the traveller but for the relics of the old fauna as well.

NOTES FROM THE SCOTTISH ZOOLOGICAL PARK

THE KING PENGUINS.

(Continued from p. 32.)

AGAIN in the late autumn of the following year there were indications, somewhat less conclusive than those of the previous season, that two of the birds were interested in each other; probably they were the same two birds. The writer finds in his notes made at this time the conclusion that the King Penguins had changed their moulting season to suit the northern climate, but that their breeding season appeared to be unaffected by the change from south to north, which, as will be shown, was a premature conclusion that the subsequent conduct of the penguins disproved. The chief point in the note was, however, the fact that in these years, 1915 and 1916, the pairing of the birds followed almost immediately upon the completion of the moult.

In 1917 matters developed considerably, for in the first place one of the three original birds began to adopt the pose of incubation about the beginning of September and continued in it for about three weeks; and a little later the other two were seen mating, the first time on 14th September and again on 8th October. This season, therefore, marked an advance of the period at which a tendency to breed was shown by something like six weeks to two months, and brought it still nearer to the completion of the moulting. It was thought that so far no egg had been laid, though it is possible that an egg might have been produced and broken without being observed, subsequent experience having shown that the time required by the Penguins for the laying and complete obliteration of an egg is to be measured by minutes rather than hours.

These repeated if rather trifling manifestations of the breeding impulse raised hopes that the Penguins might eventually breed, and in 1918 a further stage was reached, for on 8th July one of the Penguins was seen with an egg. It was incubated for over a fortnight and then, one day, it was seen that the shell was broken, and in another day the bird had nothing left but a fragment of shell. In this year (1918), it will be noted, another advancement of the breeding season by several weeks took place, the moult

having in the same year occurred some two to three months earlier than in 1917. No other egg was seen in 1918.

In the following year an egg was laid on 18th July. As soon as it was observed, the pair of birds to which the egg belonged, or was believed to belong, were guarded from the troublesome attentions of their neighbours by the removal of the others to a separate enclosure; but an hour afterwards it was found that the egg had disappeared, whether broken by the parents in a struggle for possession of it and trampled into the sand, or stolen by some visitor, could not be determined. This was a great disappointment, and all one could do was to hope that as there were three adult birds there might still be a chance of another egg being laid. That did in fact occur, the second egg being laid on 1st September and hatched on 24th October.

Before describing the habits and behaviour of the Penguins in regard to breeding and the rearing of the chick it may be convenient to complete the record of breeding dates. In 1920 the two which reared the chick were seen mating in the middle of June, and in this month the two younger birds, imported in 1917, were also seen mating. Two eggs were laid during this season, the first on 10th and the second on 23rd July. They were incubated for a considerable period: one for six weeks, when it was abandoned by the bird which had it, and the second, after seven weeks of incubation, when the time of hatching should have been near, being found floating in the pool.

In 1921 three eggs were laid, the first on the 6th and the second on the 7th June. The first of these was broken by the birds within a few days. The second was incubated for the full period of eight weeks, and as no indication of hatching was to be seen it was opened and a dead chick found inside. A day or two after, on 5th August, a third egg was laid, but was broken the next day through its possessor letting it fall while she or he was climbing over the rocks. It was thought at the time that these three eggs were laid by three different birds, but subsequent observations throw some doubt on the point.

In 1922 four eggs were produced on the following dates, 15th June, 13th July, 1st and 19th August. (It is believed that the third and fourth of these eggs were produced by the birds which laid the first and second respectively.) The first two were fertile; the third and fourth were clear.

T. H. G.

(To be continued.)

(Authors are responsible for nomenclature used.)

The Scottish Naturalist

No. 147.]

1924

[MAY-JUNE

THE EGG-LAYING VAGARIES OF BIRDS—A PROBLEM FOR THE FIELD-NATURALIST.

A VALUED contributor to this magazine has suggested to us a problem, the solution of which might profitably engage the attention of field-naturalists. It is an egg-collectors' problem, and yet it is a problem that involves no collecting of eggs, for the best results are likely to follow from examination of the egg-laying habits of species that are common everywhere. Furthermore, it offers the naturalist who is interested in this particular field a real chance of adding to the sum total of scientific knowledge.

Let us state the problem as briefly as possible. We are all familiar with the text-book statements of the numerical variation that occurs in the clutches of any species. To take a few cases at random: the Blackbird lays four to six eggs, the Song Thrush four or five, the Redbreast five or six, the Wren usually five to eight, Red Grouse seven to ten, and so on. But this does not mean that in any area these alternative numbers are laid with equal frequency. It is possible that in one area the majority of the Blackbirds may lay only four eggs, in another area five, and in yet another area six; or that at any rate the average taken over a large number of nests in one area may differ sensibly from the average of a similar large number in another area. Not only is this a

possibility; there are strong indications that it is a fact. But the data are meagre, and if the problem is to be submitted to scientific analysis in the hope that a solution may be forthcoming, a fresh collection of data is essential. We must make sure of the fact before we begin to speculate as to the cause of the discrepancy.

Of course speculations, and interesting speculations, have already been made, but none, in our opinion, meets all the facts. Perhaps various causes operate in different cases, but it would be well before we accept any notion as final to test the matter on wider ground than has yet been attempted. Is it a question of abundance of food? Seven is said to be an unusually large clutch for the Short-eared Owl, yet during the Volè plague in southern Scotland in 1891 and 1892, nests containing eight to thirteen eggs were found. Is it a question of season? The average number seems to vary in the same district in different years. Is it a question of restricted distribution, a characteristic of island faunas? Mr A. G. Bennett, a resident in the Falkland Islands, recently drew our attention to his observations that certain birds common to the islands and to the mainland of South America laid smaller clutches in the former, and the distinguished Irish ornithologist, Richard Ussher, stated that many Irish birds behave in the same way compared with their British sisters. Is it a question of geographical range? Are species more prolific in the centre of their range of distribution and less prolific as they approach the limit of their range? If so, why should the Hedge-Sparrow and Mistle Thrush lay fewer eggs in Portugal than in southern England?

These are a few of the possibilities. Can we say that any one holds the field?

Our suggestion is that a wide survey of the egg-laying propensities of certain common species of British birds should be undertaken. Each observer would do no more than record with precision the number of eggs in as many full clutches of the selected birds as he could observe in a defined area, the location and nature of which would also be carefully recorded. It is desirable that such an inquiry

should extend over as wide an area as possible, if the full range of variation is to be made use of, and in order to achieve this end we would invite the co-operation of our contemporary *British Birds*, and through it of its numerous English correspondents.

The first step, however, is to select a few common species of British birds, observation of which would seem to offer the most promising results, and we accordingly invite our correspondents to send us any observations and suggestions bearing on this problem of clutch variation which might help towards a first selection of test cases.

* * * *

We venture to draw the attention of our readers to Mr Stewart's article on the "Roosting Habits of Lanarkshire Rooks" in this number, a sequel to his earlier county census of the species (SCOT. NAT., 1923, p. 141). These papers together form the most complete history known to us of a complex Rook community, and illustrate how much simple but persistent observation may contribute to our understanding of the habits even of the commonest of creatures.

* * * *

We are thoroughly in agreement with the plea of *The Field* (8th May 1924, p. 636) for the preservation of the Wild Cat. It is now a rare species which, once widely spread over the country, has gradually been driven into the remoteness of a few northern counties in Scotland, and if some security of tenure be not granted it in one or other of its haunts, it is not likely to survive for long.

* * * *

In view of recent controversy on the subject of the protection of Lapwings' eggs, the Editors would be glad to receive (on a signed post-card) the opinions of readers on the following two points:—

- (1) Do you consider that if the taking of Lapwings' eggs were altogether prohibited, the species would benefit? Or,
- (2) Do you consider that the taking of Lapwings' eggs up to 15th April is detrimental, neutral, or beneficial to the species?

Dr Nelson Annandale, a distinguished Scottish naturalist, Director of the Zoological Survey of India, has been cut off at the height of his scientific career. His energy and enthusiasm gave a new aspect to the investigation of the land and freshwater fauna of India, and his own researches considerably advanced our knowledge of many compact but little known groups of invertebrate animals. Since his appointment as Superintendent of The Indian Museum in 1907, he had little opportunity of studying the animal life of the home country, but during his last furlough, in 1921, he spent much of his leave in comparative investigations of the land and freshwater mollusca of two very different areas, and some of his results have already appeared in these pages (SCOT. NAT., 1922, p. 19).

Unusual Litter of Foxes.—On 21st April my head-keeper found an exceptionally large litter of foxes at Blackhillock, Glen Dye, Kincardineshire. The litter contained ten cubs, and these as well as the vixen were obtained, and were seen by me a few days after. A normal litter is regarded as containing from three to five cubs.—JOHN R. GLADSTONE, Fasque.

Buff-coloured Common Hare.—While shooting near Penicuik on 25th January I obtained an unusually coloured Common Hare. The Hare was adult, but had none of the colour characteristics of an ordinary individual. The eyes were pink, there was no black on back, ears, or tail, the general coloration of head, back, and flanks was rather dark sandy, or rusty red, and the under surface, apart from the throat which was sandy, was of purest white, shading gradually at the margins into the general body colour.—C. W. BADGER, Penicuik.

[The colour of this Hare, which Dr Badger has kindly presented to the Royal Scottish Museum, lies between the "cinnamon" and "pinkish cinnamon" of Ridgway's "Color Standards" (Pl. 29). Such ochreous individuals are rare, and suggest the colour of the Irish race of Common Hare, though in the latter case the coloration is not due to a condition of semi-albinism.—EDS.]

ROOSTING HABITS OF LANARKSHIRE ROOKS.

By WALTER STEWART.

THAT Rooks first appeared in Clydesdale in very remote times, there is little reason to doubt, therefore it does not surprise us to find that Lanarkshire Rooks show a large degree of uniformity in all their movements and roosting habits, which we would not expect in a country where they had only recently become established.

Careful observation in this and adjacent Rook territory goes to show that the entire Rook population is divided into integral tribes, each possessing its headquarters, or winter roost, and its tribal feeding grounds, within which is situated the nidification quarters, or rookeries. Rarely do these rookeries extend beyond a radius of 13 miles from the winter roost; and at many places where the territories abut on each other, a very short distance separates rookeries belonging to different tribes.

Within the city of Glasgow three of these territories meet, and in the north-east corner of the county and adjacent district, four. Correct allocation of these rookeries to their respective tribes requires much patient and careful observation, which is best accomplished in late February and early March, when nest-building is taking place and roosting at the winter roost is still indulged in. This may incur a wait of an hour or more at the rookery in the evening, before one's patience is rewarded by the departure of the Rooks—usually in pairs—always in a direction which leaves no doubt as to their destination. On several occasions we have found our preconceived ideas at fault; but this uncertainty has but added zest to our observations, and taught us to take nothing for granted.

The accompanying rough diagram map, it is hoped, will render some assistance to the following short descriptive notes on the respective tribes:—

(1) *Hamilton Palace*.—This winter roost, which is adjacent to the Hamilton-Bothwell road, is entirely deciduous. Nest-

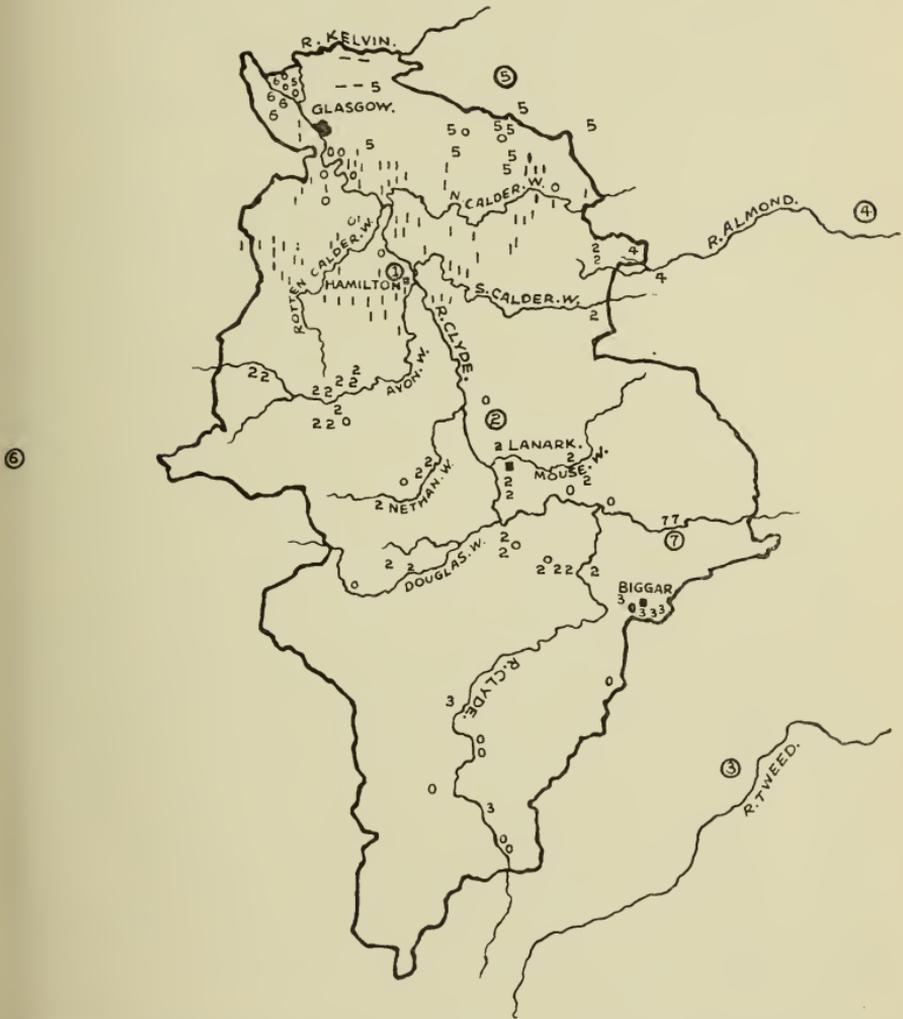
building ceased about the year 1920, since when several new rookeries have been established in the ducal burgh, and some of the existing ones have been augmented. The tribal nidification territory extends north, to the burghs of Airdrie and Coatbridge; south, to Fairholm on the home parish boundary; east, through Dalziel and Cambusnethan into Shotts; west, through Blantyre, East Kilbride, Cambuslang, Rutherglen, and Carmunnock, into Glasgow and East Renfrewshire. Outpost rookeries occur at Auchengray, New Monkland, north-east, $9\frac{3}{4}$ miles; Queen's Park, Glasgow, north-west, $9\frac{1}{2}$ miles. These distances may be exceeded by rookeries situated in East Renfrewshire.

At Limekilns, East Kilbride, a very large Rook settlement, temporary roosting takes place during the second and third weeks in March, many of the Rooks from rookeries farther west spending these nights at this place instead of proceeding to Hamilton.

This tribe, whose general behaviour is exemplary, in 1922 had a total of some 74 rookeries, containing about 4880 nests, and although less than 5 per cent. of the young are shot, it is barely holding its own in numbers. Living their lives almost unmolested and under natural conditions, these birds divide their year into two seasons: summer, which may be said to commence about 20th March, when the winter roost is deserted, and winter, which commences about 20th September, when they are again in winter residence.

Notes taken daily for a whole year at one of these rookeries, showed that on not one day did small or large numbers fail to visit the rookery trees. In spring, from about 10th March, one or two pairs were observed to remain at the nests overnight, and every succeeding evening the number increased, until about the 20th none departed for the winter roost. Where no shooting of young takes place, roosting at the rookery is general during the summer period. About 7th September a slight change of habit is observed, one or two pairs are seen to leave in the evening and fly in the direction of the winter roost, and on each succeeding evening the numbers increase, until, as stated above, 20th September

finds the rookeries entirely deserted in the evening long before the foliage has commenced to fall.



WINTER ROOSTS AND THEIR ASSOCIATED ROOKERIES IN LANARKSHIRE IN 1924.

The winter roosts are indicated by an encircled number, the contributing rookeries by the same number plain. 1, Hamilton Palace, Hamilton. 2, The Lee, Lanark. 3, Mossfennan, Broughton, Peeblesshire. 4, New Liston, Kirkliston, Linlithgowshire. 5, Bar Hill, Kirkintilloch, Dumbartonshire. 6, Caldwell, Beith, Ayrshire. 7, Ogg's Castle, Libberton.

° Rookeries now defunct. - - Scattered nests.

In October an exodus of young birds takes place, only a small number remaining, no doubt to fill the wastage gaps, which in this tribe, however, cannot be very great.

If we allow that each nest produces two young birds, that 5 per cent. of the total are shot, and that 7 per cent. are retained to fill the wastage gaps, there remain some 8000 or more to migrate in October. Might not the influx of Rooks into Bute in winter, which Rev. J. M. M'William, B.A., writes of, be accounted for in this way? (SCOT. NAT., 1924, p. 5.)

(2) *The Lee, Lanark*.—A coniferous winter roost, which is also the site of the county's largest rookery, having had a total of 2564 nests in 1922. The nidification territory extends north, through Carluke and Cambusnethan into Shotts; south, through Lesmahagow into Douglas; east, through Carmichael and Covington into Libberton; west, through Stonehouse and Glassford into Avondale. Out-post rookeries are Forrestburn, Shotts, north, $12\frac{1}{2}$ miles; Douglas Castle, Douglas, south, $9\frac{1}{2}$ miles, and Carmacoup, Douglas (now defunct) $12\frac{1}{4}$ miles; Quothquan, Libberton, east, $9\frac{1}{4}$ miles; Parkfield, Avondale, west, $12\frac{3}{4}$ miles.

In 1922 this tribe had a total of 31 rookeries, containing some 9500 nests, and in nearly all a large percentage of young are shot, yet the tribal strength is increasing. This winter roost, having also a large summer population, observation on roosting habits is rendered somewhat difficult. Flocking takes place on a much greater scale, and in the winter months many of the rookeries are never visited. A much higher percentage of young birds are also observed to remain, but, of course, the wastage and casualties must be greater than those of the Hamilton tribe.

The aerial routes, or flightways, of this tribe are remarkably well defined, until within a mile or two from home, when much convergence takes place, and the various flocks seem to mix and lose their identity. During the greater part of the winter season a large section finds its way to the neighbourhood of Symington, where slaughtering for the London flesh market is conducted on an extensive scale. No doubt they are attracted thither by the offal.

(3) *Mossfennan, Broughton, Peeblesshire*.—A coniferous winter roost, which is also the site of a large rookery. The Lanarkshire part of the nidification territory extends north-

west, through Biggar and Libberton, into Carnwath; west, through Coulter, into Wiston; south-west, through Wandel, into Crawford. Outpost rookeries are at Newbigging, Carnwath, north-west, $10\frac{1}{2}$ miles; Crawford Castle, Crawford, south-west, 12 miles. At Newton House, Crawford, south-west, 13 miles, a very large rookery was put down in 1900. Attempts at re-establishment are made every year.

In June to September inclusive, small parties of Rooks pass their time on the Crawford hills, often roosting on the ground. This also takes place during the same period of the year on hilly ground between Biggar and the winter roost; and as all rookeries in this district are heavily shot, even including the winter roost, it is no uncommon sight to see Rooks remain about these hills until it is dark before venturing home. In conjunction with this tribe must be taken

(7) *Ogg's Castle, Libberton*, from the fact that we have not really been able to establish their separate identity. This colony has made an abnormal increase in the past two years; and there is no doubt that it is presently a winter roost, but with this peculiarity, that at the end of the summer season, in late September, its population leave it for the Mossfennan roost.

After a lapse of about three weeks roosting is resumed; but we have a suspicion, not wholly confirmed, that these birds are really migrants, which have penetrated through Haddingtonshire from the east coast. Probably only a coincidence is the fact that it is along hilly ground in this neighbourhood that the Grey Crow also sometimes penetrates at this season of the year.

In 1922 the nine rookeries of these eastern roosts had some 2820 nests in Lanarkshire, but in 1924 we should not estimate them at less than 4000, the whole increase having taken place, as above stated, at Ogg's Castle and district.

(4) *New Liston, Kirkliston, Linlithgowshire*.—While taking our rookery census in 1922, in north-east Lanarkshire, we found three rookeries—in marked contrast to others in the district—showing very pronounced grain-eating habits. This at first was very puzzling, but sometime later, while reading

up the "Rook" in our "Macgillivray" we happened on the following passage: "The distance to which they fly almost every day to procure their food is astonishingly great. The Rooks from Kirkliston have, during most part of this winter, flown every morning to the neighbourhood of Shotts, a distance of at least 20 miles, and returned late in the afternoon to the place of their abode." Thus wrote Mr Weir, esteemed correspondent of the great ornithologist. Here was, in all likelihood a solution of the puzzle, and on consulting our map we found the distances as follows: Forrestburn, 15 miles; Treesbank, $14\frac{3}{4}$ miles; and Southrigg School, nearly 13 miles from this winter roost. Our first inquiry, although interesting, proved disappointing, in that the two first mentioned were of the Lee tribe, but there yet remained the small rookery of Southrigg School. Further inquiry soon set our mind at rest, and the sight of these Rooks winging their homeward journey eastward along Almond valley was very gratifying. In 1922 there were 28 nests at Southrigg School.

(5) *Bar Hill, Kirkintilloch, Dumbartonshire*.—A deciduous roost at which nest-building ceased some years ago. The nidification territory extends into Lanarkshire so far south as a line drawn from the Botanic Gardens, Glasgow, in the west, to almost the borders of Airdrie burgh in the east. The former is the outpost rookery, distance, south-west, 10 miles. In 1922 there were nine rookeries with a total of 1275 nests. There is very little shooting of young Rooks, and in the aggregate a decrease is shown. During winter we have often seen a muster of this tribe, about 2 miles direct south from the winter roost, on many occasions, it being almost dark before a departure was made.

(6) *Caldwell, Beith, Ayrshire*.—We have not visited this winter roost, but are informed by Mr William Ralston, Glasgow, that it is also a very large rookery, although by no means up to pre-war strength, when a few thousand young were shot yearly. Only a very small part of the nidification territory extends within our county boundary, the few rookeries being really outposts, the distances from the winter roost ranging, north-east, from $10\frac{1}{2}$ to $11\frac{1}{2}$ miles.

White-beaked Dolphin in Firth of Forth.—On 30th April the *Edinburgh Evening News* recorded the occurrence of “a young whale washed up on the sands at Seafield, near Kirkcaldy, during the week-end.” Unfortunately before this news appeared the specimen had already been removed and destroyed, so that there was no opportunity for examination on the spot. But from information supplied by Mr Thomas Law of Kirkcaldy, and from two excellent photographs which he was good enough to bring me, it can be safely stated that the specimen was a White-beaked Dolphin, *Lagenorhynchus albirostris*, Gray. It was a full-grown individual, 8 ft. long, stranded on 26th April, and a number of deep cuts indicated that it had been seriously wounded perhaps by a ship’s propeller.

The White-beaked Dolphin can scarcely be said to be a common visitor to the coasts of Scotland. During the ten years covered by Sir Sidney Harmer’s annual reports on Cetacea stranded on the British coasts (1913-1922), only four Scottish individuals are there recorded—one from Lewis, 1920, one from Aberdeen, 1921, and one from each of Arbroath and Carnoustie in 1922. In the Firth of Forth the species has previously been recognised from Cramond, 26th March 1907 (*Ann. Scot. Nat. Hist.*, 1907, p. 65), from Blackness, Linlithgowshire, two specimens, 3rd and 4th February 1911 (*Ann. Scot. Nat. Hist.*, 1911, p. 111), and on the north shore, from near St David’s, Fife, 22nd November 1913 (*Scot. Nat.*, 1915, p. 355)—a record which seems to have escaped Harmer’s series.

It is a point of some interest that the majority of the Forth specimens have appeared so early in the year. Mr. Evans in his “Mammalia of the Edinburgh District,” 1892, p. 112, made the generalisation that the species is “observed on our coasts only during the months of July, August, and September,” and Harmer’s records show that this is a close approximation to the truth. It is remarkable, therefore, that of five individuals found in the Firth of Forth, four should have occurred in spring-time—two in February, one in March, and one in April.—JAMES RITCHIE.

Wood-lark in East Fife.—On 7th April, when at Balcomie, we saw a Wood-lark (*Lullula arborea arborea*) on the links. Our attention was first drawn to it by its characteristic note which we had learnt to know well on the Isle of May. Thereafter we watched it walking about within a short distance of us, and we also saw it on the wing. This record is referable to both Forth and Tay, as it was close to the boundary and flew to and fro from one side to the

other. Previous Scottish records come from the Isle of May, the Outer Hebrides, Orkney, and Fair Isle.—LEONORA JEFFREY RINTOUL AND EVELYN V. BAXTER.

Black Redstart in Midlothian.—On 1st May I saw, in the Royal Botanic Garden, Edinburgh, on the south side of the rock gardens, a pair of Black Redstarts. The hen I only saw for a short time, but the cock I was able to watch for several minutes at a distance of a few feet. I had no doubt what they were at the time, but confirmed my opinion by looking at the specimen exhibited in the Royal Scottish Museum.—D. A. WAUCHOPE, Lt.-Col.

The Little Owl in Berwickshire.—A Little Owl was found on Lamberton Moor, Berwickshire, caught in a trap in the entrance to a rabbit burrow on 4th April 1924.

The bird was brought to me dead, and little difficulty was experienced in identifying it as a Little Owl. The discovery was put on record by me in *The Scotsman* of Saturday, 5th April, and my identification was confirmed by Mr Jas. Hewat Craw, F.S.A. (Scot.), West Foulden, Berwick-on-Tweed, and by Dr James Ritchie. It is, of course, known that Little Owls are increasing in certain areas in the south of England, and may possibly be gradually extending their range; but specimens are rare so far north, and the species has not hitherto been found in Berwickshire.—J. P. F. BELL, F.R.S.E.

[At our request Mr Bell kindly presented this specimen to the Royal Scottish Museum. The Little Owl is extending its range northward in Britain, the latest records showing that it has bred in southern Yorkshire. The SCOT. NAT. and its predecessor contain records from Kincardine, 1902, Fife, 1910, and Roxburgh, 1921, but it is doubtful whether these indicate casual northward movements of British birds or rare cases of migration from the continent.—EDS.]

OBSERVATIONS ON THE SWIFT.

By J. KIRKE NASH, L.D.S. Ed.

THIS communication is based on records of several years' personal observation made by my friend Mr David Hamilton on Swifts nesting under the roof of a tenement in the Warrender Park district of Edinburgh. I was fully aware of the investigations as they proceeded, but the circumstances under which they were made precluded me from taking an active part in them.*

The wonderful flight and the wide distribution of this species, its apparently all but perpetual aerial existence, its arrival almost to a day at the beginning of our summer, and its equally constant early departure, have ever made it of interest to observers. The bird seems to be the very embodiment of life at high tension. It is a complete master of the air and never seems to tire. During late May and June evenings little parties of Swifts—for the bird is eminently sociable—mount high into the air, until they appear as mere crescentic specks in the sky. There they remain and ultimately become invisible in the dusk. Sharing a common belief, even one of our latest writers observes "whether they sleep on the wing or return to some roost after dark is still unknown." This problem greatly interested my friend the late Mr William Evans, who felt sure that the birds darted down with lightning speed to the nesting hole, just as it became almost too dark to distinguish them.

Perhaps the most marked anatomical character in the genus *Cypselus*, to which our Swift belongs, is the curious structure of the foot, all the four toes being directed forward. This arrangement is unique, and accounts for the belief that the foot is only of service in enabling the bird to cling and to drag itself with difficulty into the nesting hole.

The records that follow throw some light on these points. The first record is that of 30th May 1913: "For many years

* An abstract of Mr Hamilton's notes by Rev. Wm. Serle, appeared in *British Birds*, 1923, p. 110.

back I have been aware of Swifts nesting under the roof of the house here. To-night I went up to see if I could get at them and came across two pairs sitting. One pair was resting on the straw of a Starling's old nest, and the other about a foot from it on a small nest consisting of a few feathers, evidently the work of the birds. In both cases the birds of each pair were sitting side by side. My presence did not appear to disturb them in the least, not even when I placed a lighted candle near them, and they only made a slight movement when I felt under them for eggs. There were none. Then one bird from each nest—presumably the males—scrambled to the hole giving access to the loft and flew out. The other two birds remained all the time I was there and I left them sitting. This visit was paid in the early evening in good weather, so we have here clear evidence that Swifts indulge in rests during the day, notwithstanding their wonderful power of flight.

“Six days later I made another visit. Each nest had one sitting bird and each contained two eggs. I lifted one bird off and placed it alongside the nest whilst I removed the eggs. It remained there all the time. On the 17th June the nests were again visited and I found the bird whose eggs I took had laid another egg. I then went along the garret to another place where I had noticed Swifts entering, and there I found another nest with two highly incubated eggs. Both birds were sitting on the nest but went out immediately. It is generally supposed that incubation is performed by the female only. The male bird was either helping in the process or indulging in a rest.”

No further observations were made that year or the following, and then occurred the upheaval of the Great War, which entirely prevented further investigations whilst it lasted. We now come to the year 1919 when a visit was paid on 7th June. The note reads: “Went up to the roof to-night and looked at the places where the Swifts nested six years ago. The same three sites were again in use.

“Two nests had two eggs each and the other had three. In each case the birds were sitting and showed no concern when I lifted them up and placed them on their eggs again.

I put one bird in my pocket and went out to the light and examined it. Even this did not seem to disturb it as it never moved. On taking it from my pocket it clung to the palm of my hand so tenaciously that I had some difficulty in removing it without hurting the bird. I then placed it on a flat part of the roof when it flew off without any difficulty. Revisiting the nests on 12th June I found that all the nests had sitting birds, which shows that the unusual treatment had not greatly disturbed them."

Another interval of years again elapsed, bringing us to the year 1923, and the first thing of interest to record is the very early arrival of the Swift, on 4th April, the earliest date on record for Scotland. On that day Swifts and Swallows were seen together at Musselburgh, the weather at the time being settled and warm. Weather conditions then underwent a change, a cold spell intervening and no Swifts were seen again until 25th April, this time at Duddingston. On 2nd May the main body of Swifts arrived.

Once more quoting from Mr Hamilton's notes:—

"11th May 1923.—Very cold weather with high winds has caused the Swifts to disappear. I paid a visit to the loft where the Swifts annually nest, and there I found five or six birds huddled together on a Starling's nest. They allowed me to place a lighted candle beside them and stroke them on the back without showing the slightest fear. I hardly think the influence of cold weather made them so indifferent, but rather the fact that they seldom or never come directly into contact with man. The Starling's nest is there every year and last week it had three eggs. I felt carefully under the Swifts but no eggs were there.

"On 1st June one Swift's nest had two eggs, and on 12th June another nest had also two eggs. Making an early visit on the morning of 20th June I found that the eggs of nest No. 1 had hatched. Both nests had the pair of birds sitting side by side on the nest. I lifted them off and laid them down again and none of them left whilst I was there. On 30th June the eggs of nest No. 2 had also hatched, showing that the period of incubation was eighteen days. The young were blind, helpless-looking creatures.

"On 14th July the young of nest No. 1 seemed full grown, having the white on the chin and forehead very distinct. Yet, although the wings looked well developed, the nestlings were unable to fly and simply crawled about. They are now twenty-four days old. The young in nest No. 2 still had the wings quite short.

"20th July.—When I went up this morning I found all the parent birds at home. I sent them out to see if the young would follow, and although I placed the latter at the entrance hole they at once scuttled back to the nest. I experimented by removing them to various positions, and in every instance they immediately sought the nest again. They are now thirty-one days old, and apparently cannot fly yet. The young in nest No. 2 are thriving.

"21st July.—Thinking there would be more chance of the young Swifts being out in the middle of the day, I went up at 1 o'clock P.M., but found they were still in the nest. 24th July.—When I went up this morning the young in nest No. 1 were gone. This gives a period of thirty-five days since they were hatched.

"25th July.—The old birds from both nests and the young from nest No. 1 flew out when I approached this morning. I think they are beginning to resent so much disturbance. I could hear them shrieking outside when I was at the nest. The time was 4.30 A.M. (summer-time).

"28th July.—All the Swifts were on the wing this morning, with the exception of the young birds in nest No. 2. They were very restless when handled and crawled rapidly about, whirring their wings, but they made no attempt to go out. The birds from nest No. 1 were never seen in the loft after this date.

"1st August.—I again visited nest No. 2. As it was hardly 3 A.M. and very dull with pouring rain I found all the family at home, but on going near with a light the old birds uttered a subdued screaming, although it is stated that Swifts are always silent at the nest. They then ran as fast as mice to the entrance hole and launched into the air. After this date I watched the Swifts hawking about one night until it was too dark to see them a few yards away.

“On 8th August I was early astir and got into the loft at 3.30 A.M. I silently made my way along in absolute darkness to nest No. 2, and when I got there I flashed on the light of an electric torch and found all the Swift family, young and old, sitting side by side, sound asleep. I counted them and touched them before they were aware of my presence. When they awoke the old birds were startled and blinded by the light, but they went right out into the almost darkness. The young made no attempt to follow.

“11th August.—When I went up this morning I heard a scuffling as I neared the nest, which was empty when I got there. This makes the fledgling period of this brood forty-one days, practically six weeks.

“On 12th August all the Swifts were flying round their nesting quarters, and by the 14th they had left this neighbourhood.”

I shall now refer to a few of the outstanding features of these observations. I have no doubt that many readers were sceptical of the notion that Swifts sleep on the wing in the upper regions of the air, and their scepticism is justified by Mr Hamilton's discovery that both parent birds were always at home when he visited the nests during the night. Still we would like to know the reason for the strange habit of mounting so high into the atmosphere shortly before daylight disappears. I have never seen any definite reason advanced, and I now venture to suggest one.

Either one or two factors seem to influence the birds in their evening soaring. I feel sure that they are induced to mount higher as the sun sinks below the horizon, in order to keep in the sunlight, which is still illuminating these upper regions, and it is just possible that many flying insects are drawn higher up by the same influence. If this is the case, then the Swifts have a double reason for making their high aerial excursions—prolonged enjoyment of the light and a continued quest for food. To prove that insects reach these heights it would be necessary to use a collecting net from an aeroplane—a rare opportunity for an enterprising entomologist.

The next point of special interest is Mr Hamilton's remark that the Swifts ran as quickly as a mouse on leaving the nest. Here we have proof that the feet of the Swift are not so useless for progression as is generally supposed.

Again we have the extraordinary habit of the parent birds sitting together on the nest, both when it contained eggs and young. They always sat with their heads in the same direction—a habit exhibited by no other species, so far as we are aware.

The utter indifference of the birds to the proximity of human beings is also very striking; and the finding of five or six birds huddled together during a spell of cold weather clears up a point which has puzzled many observers. The early appearance of Swifts and their sudden disappearance when they encounter cold weather has given rise to much speculation as to what became of them. The prevalent notion is that they had returned south. But I could never accept a view which ignores the wonderful instinct which impels the bird to make a great journey of thousands of miles for the main purpose of rearing its offspring. It would be absurd to think that, under such an influence, the creature would almost immediately undertake a return journey because it found adverse weather conditions on its arrival here.

A further important point is that with regard to the lengthened fledgling period of the Swift. If anyone acquainted with the nesting habits of our more familiar birds were asked how long he thought the young Swift would remain in the nest, I have little doubt the answer would be "two or three weeks at most"; but we have the astonishing fact that the fledgling period lasts from five to six weeks, and our astonishment is increased by the marked variation in the length of the period.

Necessity for the full development of wing power in this species doubtless supplies the reason for such a prolonged stay in the nest, which is vacated only a few days before the great journey to the south is undertaken. Why Swifts should leave this country in the middle of August, when

food is apparently so plentiful, no one has discovered. This strange habit attracted the attention of Gilbert White, and his classical words on the subject are worthy of quotation. "This early retreat is mysterious and wonderful since that time is often the sweetest of the year. Are they regulated in their motions with us by a failure of food or by a propensity to moulting, or by a disposition to rest after so rapid a life, or by what? This is one of those incidents in natural history that not only baffles our researches but almost eludes our guesses." Whether a satisfactory solution of this problem will ever be found, these words are as true to-day as when they originally came from the pen of their gifted author.

Swallow's Nest on Branch of Tree.—There has recently been placed on exhibition in the British Hall of the Natural History



Photo.]

[R. H. Reid.

SWALLOW'S NEST BUILT ON BRANCH OF SYCAMORE TREE, IN ROYAL SCOTTISH MUSEUM.

Department in the Royal Scottish Museum a Swallow's nest, which on account of its rarity and architectural skill is worthy of permanent record. The nest is constructed exactly in the manner of an

ordinary Swallow's nest as regards the accretion of the clay pellets with which the walls are made, but its general architecture is quite different from that of an ordinary nest, for since it has no lateral but only a basal support, the usual semicircular form has had to be abandoned, and the nest assumes the circular cup-shape of most birds' nests. The nest rests on a thin twig, and the building, on so slender a basis, of walls strong enough to carry their own weight in addition to that of a sitting bird is a feat of some skill. The nest weighs $\frac{3}{4}$ lb. It was found by Philip Hall at Brandon Parva, Norfolk, on 21st August 1916, and was presented to the Royal Scottish Museum by Lord Garioch, to whom our gratitude is due. The nest was built in a Sycamore tree, in the thickest part of the foliage, about 20 ft. from the ground, and when found contained a freshly laid egg.

Tree-built Swallows' nests are not unique. During the unusual war conditions in some parts of the western front, Swallows were deprived of the buildings which they had been so long accustomed to use, and were driven to attach their nests to trees. The SCOT. NAT. (1918, p. 21) recorded a case, where in a single Poplar tree, the only tree left in the district, at least a dozen Swallows' nests had been built. But even under such conditions nests were built where the birds "could get a lodgment," which probably means against stout stems or in forked branches, as in the case figured by Yarrell (*History of British Birds*, vol. ii. p. 348), where the mud walls receive a certain degree of outside support. The Norfolk nest, of which a photograph is reproduced, on account of its isolated pitch upon a slender branch, presents a rare and perhaps unique degree of skill in architectural construction and balance.—JAMES RITCHIE.

Alpine Swifts in Wigtownshire.—About the middle of September last a small party of Alpine Swifts remained for some days in the neighbourhood, *i.e.*, about the buildings of the Corsewall Lighthouse, Stranraer.

One bird settled on the open window of one of the rooms in the Lighthouse, and the lightkeeper's wife at once noted the large size, lighter colour, and white chin and belly. They were seen many times during their visit.—M. BEDFORD.

ON THE DISTRIBUTION OF THE OX WARBLE FLIES (*HYPODERMA BOVIS* AND *HYPODERMA LINEATUM*) IN SCOTLAND.

By R. STEWART MACDOUGALL, M.A., D.Sc.

THE females of the Ox Warble Flies lay their eggs on the legs (chiefly) of cattle. The whole of the larval life is spent on the affected animal. The larva in its last stage is found in swellings or "warbles" in the back of the beast, and from these the larvæ, when full-grown, press themselves out through holes in the hide and drop to the ground for pupation. There is much loss every year in our country due to "warble," loss to the leather-merchant owing to holes in the hide, to the butcher, and to the dairyman and farmer. In Denmark, by law, cattle owners must take measures to rid their cattle of the pest, and in 1923 the Commonwealth of Australia, to prevent the introduction of *Hypoderma*, issued a proclamation forbidding the entry of cattle from Great Britain, Ireland, the United States, and the Dominion of Canada, except in the case of those shipped in specified months.

During 1923 I made a series of notes on the distribution of the above two flies in Scotland, and more intensive observation will be continued in 1924. The determination of species has been made in all my recorded cases from examination of the final stage larva. The adult flies are difficult to rear except in special circumstances, and the catching of the flies for examination would call for one's whole time in summer and would present such difficulty, that examination of the larvæ has to be relied upon if the records are not to remain very incomplete. Fortunately the Ox Warble Fly larvæ in Britain have characters that prevent them from being confused with any other fly larvæ, and the characters relied on for the distinction between the larvæ of *Hypoderma bovis* and *H. lineatum* are so well defined that the worker is on sure ground. In all the numbers recorded in this communication the larvæ have been examined by

myself, the species being separated according to the very satisfactory differences given in the following table:—

DISTINGUISHING CHARACTERS OF LARVÆ.

HYPODERMA LINEATUM.

Spiny Armature.—Under side (the convex side) of second last segment with distinct spines on its hind edge.

Last or Spiracular Segment.—Examined end on or looked down on appears flat or level, *i.e.*, not hollowed out in the centre so that the central boss is conspicuous.

HYPODERMA BOVIS.

Under side (the convex side) of second last segment without spines.

Examined end on looks depressed or slopes inwards like a saucer or funnel, with the central boss more compressed.

For such examination a lens should be used and the hind end of the larva dried or cleared of pus.

The larvæ of both species of *Hypoderma* are common in Scotland. Speaking generally from my notes of past years *Hypoderma* larvæ may be found from Shetland to Wigtown. During 1923 I gave special attention to distinguishing the species, and the following table summarises the results* :—

SEASONAL DISTRIBUTION OF LARVÆ IN 1923.

		H. LINEATUM.	H. BOVIS.
March	10	99	0
"	12 to 20	246	0
"	22 " 30	378	0
April	2 " 5	172	0
"	6	13	1
"	7 " 9	145	6
"	10 " 14	47	8
"	15 and 16	64	13
"	17 " 18	102	9
"	19 to 21	126	49
"	22 " 25	81	66
"	26 " 30	55	206
May	1 " 10	77	209
"	11 and 12	15	134
"	13 to 18	0	107
"	20 " 24	1	104
"	24 " 30	0	74
June	1 " 3	0	12
"	9	0	16

* The great majority of these larvæ are from counties other than East Lothian where special experiments were being conducted.

It will be gathered from the above table that the larvæ of both species of *Hypoderma* are present in Scotland, and further that *Hypoderma lineatum* is rather earlier in the season than *H. bovis*; indeed, the females of *lineatum* are busy with their egg-laying three weeks or a month before *H. bovis*. No *H. bovis* larvæ in their final stage were got before 6th April, and it was only towards the end of April that the *bovis* numbers reached those of *lineatum*. From the last week of April onwards the larvæ of *bovis* were found in the ascendant, and *bovis* larvæ continued to be encountered while those of *lineatum* had completed their development, no *lineatum* last stage larvæ being found from 24th May onwards.

There is no month in the year in which *Hypoderma* larvæ may not be obtained in the skin of cattle, but at certain times in the year one must have access to the hides of slaughtered animals in order to find the larvæ. From February to May the presence of the larvæ in the skin of the back of infested animals is easy to tell by touch and the eye; but in January, June, and July one can also find examples on the living animal. During 1923 I was unable to watch the larvæ intensively in the field after about the middle of June, but having access to the hides of slaughtered animals I found larvæ present right on to August, when my observations ceased. Only on one day in June (29th June) were no larvæ found. Larvæ were found sporadically in July. My last recorded observation is on 9th August, when I removed for examination a larva which proved to be that of *H. bovis* in an early period of its last stage.

In 1923 *Hypoderma lineatum* larvæ were taken in the following counties: Midlothian, East Lothian, Berwick, Roxburgh, Selkirk, Bute, Fife, Perth, Forfar, Aberdeen, Banff, Moray.

Hypoderma bovis larvæ were taken in the counties of Midlothian, East Lothian, West Lothian, Berwick, Dumfries, Kirkcudbright, Wigtown, Ayr, Bute, Fife, Perth, Aberdeen, Banff, Moray, Inverness. In a considerable percentage of cases the larvæ both of *lineatum* and *bovis* were taken from

cattle that, though they showed the presence of larvæ in the county named, had been infected not in that county, but in Ireland or the north of England, or even in another county in Scotland. From the last the cattle may have been bought in the previous October or November, so that they had really walked into their new home already infected from their previous summer's grazing area. The numbers of both species of larvæ found in such cases, however, make it almost certain that from such as completed their development and fell away for pupation, some adults would appear.

I hope to make the records more complete in 1924, but meanwhile it is sure from our 1923 records from animals grazed in the counties named, in spring and summer 1922, that adult *Hypoderma lineatum* and *H. bovis* are both to be found at work in East Lothian, Bute, Forfar, Aberdeen, and Banff; that *Hypoderma bovis* flies are also present in Ayr and Fife.

Incidentally, I may say that my 1923 records give *H. lineatum* larvæ from Durham (home-bred), Cumberland (home-bred), Lancashire, Surrey, Gloucester, Radnor, Dorset; and *H. bovis* larvæ from Surrey and Radnor (home-bred).

The year 1923 saw the Cattle-from-Canada Import Restrictions removed. An examination of the first consignment of Canadian cattle to reach Glasgow revealed "warble" among them. Some of these cattle were bought into East Lothian. A larva removed for examination on 10th April proved to be *H. lineatum*. Mr Thomas Gibson, B.Sc., reported other two *lineatum* to me on 13th April. Through the courtesy of Mr Dale of Auldham, I received twenty larvæ on the 4th of May taken from Canadian cattle bought by him. Six of these larvæ were *H. lineatum* and the other fourteen were *H. bovis*, one of the latter being not in the last but the second last stage.

Again, at my request, Mr W. Jackson Young, F.R.C.V.S., D.V.S.M., obtained for me, on 23rd June, six *Hypoderma* larvæ from Canadian cattle inspected by him at Dundee Wharf. All six proved to be *Hypoderma bovis*.

Great Bustard in the Orkney Islands.—On the night of 4th January 1924 a great Bustard was captured by a rabbit-catcher on Newark Farm. The bird was put in a large box for a few days and became quite tame. It was given bread, raisins, turnips, cabbage, and water, and fed out of the rabbit-catcher's hand. When he was cleaning his rabbits the bird used to come up to him and partake of the entrails. It appeared to be flourishing, but died unexpectedly on 20th February 1924.—HUGH S. GLADSTONE.

Alleged Scottish Record of Green Woodpecker.—In the SCOT. NAT., 1912, p. 43, I reported that a Green Woodpecker was shot at Buncle, near Duns, in the autumn of 1900, by Mr John Barrie, gamekeeper, the bird at the time I sent in the report being in the possession of Mr J. Simpson, gamekeeper, Manderston, from whom I received the particulars of its capture.

A short time ago I mentioned the occurrence to Mr Johnston, forester to the Earl of Home, and he was sceptical as to the bird having been shot in Berwickshire, as he had sent Barrie a specimen of the Green Woodpecker from Hampshire about the time mentioned, and he thought that this would likely be the bird.

As there appears to be doubt as to the authenticity of the record, I think it is advisable to state the doubt in the SCOT. NAT.—T. G. LAIDLAW, West Linton.

Hag-fish in Firth of Forth.—On 4th April I picked up on the shore at North Berwick an example of the Glutinous Hag, *Myxine glutinosa*, 17½ in. long. It came ashore where a Conger Eel came in two days before, so that it may have been feeding upon the Eel. The specimen has been sent to the Royal Scottish Museum.—W. M. INGLES, North Berwick.

[Notwithstanding the common occurrence of the Hag in the northern North Sea, it has been very rarely met with on the coasts of south-eastern Scotland. The only Firth of Forth records known to us are those of Goodsir, Mr F. M. Balfour, and Dr C. W. Peach—the last made at Dunbar in 1877 (*Ann. Scot. Nat. Hist.*, 1900, p. 17.—EDS.)]

Record of a migrant rush at Holy Island, Northumberland, between 8th and 11th November 1923.—On the 8th November the wind was moderate and veered from south to west. Except for several Blackbirds and Redwings, three Bramblings and the first Hooded Crow of the season, bird-life

on the Island was normal and unattractive. However, during the following night, a strong easterly wind, accompanied with rain, came away and the increase in the number of migrants was most marked the next morning. Scores of Blackbirds fluttered out of every conceivable piece of cover; Redwings were numerous, while several Chaffinches and Woodcocks put in an appearance, and a decided increase in the number of Redbreasts was noted. It is, possibly, worth while mentioning that only a few Song-Thrushes and neither a single Fieldfare nor Golden-crested Wren came under observation. Of the rarer species, I shot a male Fire-crested Wren and noticed a single Black Redstart. The wind continued easterly throughout the day.

On the 10th, the wind was very slight and from the west. The morning was commenced by an examination of the gardens in the village. Redbreasts simply swarmed; each garden, hedge and turnip-field, the bents and every few yards of foreshore supplied their quota, but Blackbirds were noticeably less in number. Golden-crested Wrens, on the other hand, were not uncommon. The first waif to be noticed was a Warbler which I put out of a turnip-field and, as it settled on a stunted hedge, I was struck by its pale under-parts. Dr W. Eagle Clarke has kindly identified this bird for me at the Royal Scottish Museum as the Siberian Chiffchaff (*Phylloscopus collybita tristis*); it is, I believe, the first definite record of its occurrence in England. Golden-crested Wrens, ever restless, provided difficulties in my search for further examples of the Fire-crested Wren. I, however, managed to detect by means of binoculars two of the latter together, one being secured. There is little room for doubt that others beyond those mentioned above occurred but could not definitely be identified.

The afternoon showed a great falling-off in the number of migrants, although there appeared to be more Woodcocks. A Great Grey Shrike, with a single wing bar, and a Black Redstart, undoubtedly the same individual as recorded above, completed observations for the day.

On the 11th, the birds had practically all disappeared, leaving only a few Redbreasts and Blackbirds and a single Golden-crested Wren.—W. G. WATSON.

BOOK NOTICES.

THE RED DEER OF SCOTLAND.

- (1) THE DEER AND DEER-FORESTS OF SCOTLAND: HISTORICAL, DESCRIPTIVE, SPORTING. By A. Inkson McConnochie, F.Z.S., London: H. F. & G. Witherby. 1923. Pp. 336. Price 25s. net.
- (2) DEER STALKING IN SCOTLAND. WITH AN INTRODUCTION BY HIS GRACE THE DUKE OF ATHOLL, K.T. Same Author and Publisher. 1924. Pp. 208. Price 10s. 6d. net.

Scotland regards its Red Deer as a peculiar possession—the finest of the survivors of an ancient fauna which included other and larger Deer. But while the others, except the Roe, have long since vanished, the Red Deer has been preserved through the fortunate chance that it was the favoured object of the hunting nobility of old. To the sportsman, therefore, Scotland is indebted for the continued existence of one of its most valued natural possessions; and these two volumes happily combine a tribute at once to the Red Deer and to its saviour the sportsman.

(1) The larger and more weighty of the two volumes deals very thoroughly with a wide range of subjects. It includes a list of Scottish deer-forests, with a valuable series of descriptive notes, and many short notices of outstanding events in the author's experience of various deer-forests at all seasons of the year. But the chapters in which most readers will probably take the liveliest interest are the author's personal observations regarding the nature and habits of the Deer themselves, his account of Highland superstitions regarding Deer, and his description of poaching and of the history of the forests from the eleventh century onwards. In the two chapters last mentioned Mr McConnochie makes excellent use of his wide knowledge of ancient historical records and of the old Scottish laws. The publishers have made of this a very handsome volume.

(2) Mr McConnochie's second book is less a serious contribution to our knowledge of the present status and history of Red Deer and their interests, than a chatty account of various aspects of his long experience of Deer-stalking, and of "stalking yarns" he has picked up by the way. The book is well written and makes interesting reading; it is clearly intended for the sportsman rather than the naturalist.

THE BIRDS OF PORTUGAL. By William C. Tait. London: H. F. & G. Witherby. 1924. Pp. xii + 260. Price 18s.

In his knowledge of the birds of the western portion of the Iberian Peninsula Mr Tait has no equal, and it is with great pleasure that we welcome this work from his pen. Living as he does in the northern

part of Portugal, many of his records refer to the neighbourhood of Oporto, but he has fully noted occurrences elsewhere, besides dealing with the origin of uncommon birds in the National Museums. That great attention has been paid to the southern provinces is shown by the numerous references to Algarve, where so recently as last year, evidence was found of a hitherto unsuspected extension of the breeding range of Audouin's Gull, the rarest of our European Laridæ. In the book are many references to folk-lore, and the local Portuguese names of the birds, to which are added many from the neighbouring Spanish province of Galicia, will be found invaluable to future workers. Of special interest to British ornithologists are the Migration Notes and Appendix II., where a complete list is given of birds ringed abroad and subsequently captured in Portugal. The library of every worker in European birds should contain this book.

A MONOGRAPH OF THE BRITISH DESMIDACEÆ. By the late W. West and the late G. S. West, M.A., D.Sc. Vol. V. By Nellie Carter, D.Sc. London: Royal Society. 1923. Pp. xxi + 300. Plates.

The task of bringing to a conclusion this invaluable monograph has been ably accomplished by Dr Nellie Carter. The series of volumes forms an appropriate and lasting memorial to the Wests, father and son, neither of whom survived to see the full fruit of their life-long studies. Like the previous volumes this contains succinct descriptions of species and locality records, and it is profusely illustrated by Professor West's drawings, supplemented by others by Dr Carter, in all 38 plates. It also contains an index to the completed monograph.

OUR BIRDS' NESTS AND EGGS, AND HOW TO KNOW THEM. By E. Fitch Daglish, F.Z.S., etc. London: Thornton Butterworth, Ltd. 1924. Pp. 127. Price 4s. net.

The author of this well-produced little book has attempted a difficult task, that of guiding inexperienced nest-hunters in identifying their finds by the characters of the eggs, nests, and nesting sites alone. For this purpose he divides the eggs into main groups according to ground colour, with sub-groups for size and for plain eggs, speckled eggs, and so on. This will prove a handy method for beginners, who will certainly find the book useful and interesting. But Mr Daglish's arbitrary method has its difficulties. For example, the eggs of Common and Arctic Terns appear in quite separate groups, though no one can tell them apart. The short notes on the habits and distribution of the birds themselves are freshly written and usually sound, but Scottish naturalists will be surprised to find the Sea Eagle still appearing as a British breeding bird and the Crossbill described as "a late summer migrant, arriving from June to August." Other mistakes in detail might be pointed out, but the book as a whole is serviceable for its purpose, and the illustrations are well reproduced.

NOTES ON RARE LAND BIRDS FROM TRISTAN D'ACUNHA IN THE ROYAL SCOTTISH MUSEUM.

By Surg. Rear-Admiral J. H. STENHOUSE.

THE island group of Tristan d'Acunha is situated in the South Atlantic about 1550 miles west of the Cape of Good Hope and about 2000 miles from the nearest point of the South American continent. It consists of the main island, Tristan d'Acunha proper, and Inaccessible and Nightingale Islands, which lie roughly in a triangle about 20 miles equidistant from each other. Only the main island is inhabited.

In 1919, through the generosity of Mr J. G. Gordon of Corsemalzie, Wigtownshire, there were presented to the Royal Scottish Museum two consignments of birds' skins from Tristan d'Acunha, chiefly sea birds; but amongst them were two skins of a Thrush peculiar to the group, and one of an American Rail which had straggled there. This year, in March, another small collection of skins arrived, and amongst them are examples of all the land birds at present recorded from Inaccessible Island.

These birds are extremely interesting, not only because they are peculiar to the group, but also because they are members of a long isolated avifauna, which has shown itself as extremely liable to die out when brought under the influences of the modern outside world. On the main island all the peculiar land birds are now extinct, and it is feared that, if ships' rats obtain a footing on the two other islands, the land birds there will share the fate of their former neighbours. From the whole group only five species are known, all peculiar; one, the Rail of Tristan d'Acunha, is now extinct.

Nesospiza acunhæ acunhæ. TRISTAN FINCH.—This bird was first described in 1873 by Cabanis from a skin now in Berlin. At one time it was abundant on the main island,

but by 1873, when the *Challenger* expedition visited Tristan d'Acunha, it had died out. It is, however, still abundant on Inaccessible Island. Its local name is "Canary." It is about the size of our Greenfinch, which it resembles to some extent in plumage, but the bill is quite different. On Nightingale Island it is represented by a somewhat smaller subspecies, *N. a. questii*, named after the *Quest*, by which expedition skins were recently brought home to the British Museum. On both Nightingale and Inaccessible Islands there is reported to be another Finch similar in colour but larger in all dimensions; only one example of this has been captured, and that on Nightingale Island. There is no record of this larger species ever having been seen on Tristan d'Acunha.

Nesocichla eremita. TRISTAN THRUSH.—This bird was first made known to science in 1855 by Gould, who described it from a skin brought home by Mr MacGillivray, the naturalist on H.M.S. *Herald*. This, the type, is now in the British Museum. When the *Challenger* visited Tristan d'Acunha eight examples were obtained, and are now also in the British Museum: the bills of these specimens unfortunately have been gnawed by rats. When the *Quest* called there in 1922, the bird was reported to be extinct. There is said to be at least one example of this bird in the Cape Town Museum, and the two received in the Royal Scottish Museum in 1919 can be looked on as the last of their race available for scientific purposes. These birds are slightly smaller than our Song Thrush, and are of a more tawny colour with short rounded wings. The measurements of the two skins, which are not sexed, are in millimetres:—

Wing	98	110	Bill (exposed)	20	20.5
Tarsus	37	38	„ (from feathers)	18	18
Tail	85	87	„ (from anterior end of nostril).	16.5	16

From Inaccessible Island three skins have been received. They are very similar to those from Tristan d'Acunha, but the measurements are larger and their plumage is darker, especially on the abdomen. The most striking distinction, however, is in the bill, which is longer, higher, and broader,

and I have no hesitation in saying they should be regarded as belonging to a separate race, for which I propose the name of *Nesocichla eremita gordonii*, subsp. nov., after their donor. Type (not sexed). Inaccessible Island 26.4.23. No. 1924.68.13 Royal Scottish Museum. The measurements of these three birds are in millimetres:—

Wing	.	.	115	110	110	Bill (exposed).	.	21.5	23	22.5
Tarsus	.	.	36	39	38	„ (from feathers)		20	21.5	21
Tail	.	.	96	93	87	„ (from anterior end of nostril)		17	18.5	18.5

This Thrush is reported to be still abundant on both Inaccessible and Nightingale Islands, and there is said to be no appreciable difference between the birds from these two islands.

Atlantisia rogersi. INACCESSIBLE ISLAND RAIL.—The occurrence of this remarkable little bird, locally called the “Island Hen,” on this island, was first recorded by the naturalists of the *Challenger*. They found two Germans living there, and from them it was learned that there was a peculiar Rail at the north-west end; but it was found impossible to visit that district and a specimen was not obtained. The description given of it to Sir Wyville Thomson by the Germans is so good that it may be quoted here: “Like a black chicken two days old, its beak and legs black, the beak long and slender, head small, wings useless for flight.” When the *Quest* went there in 1922, an attempt was made to reach its habitat, again unsuccessfully, but later two examples were obtained and sent to the British Museum. The one now in the Royal Scottish Museum makes the third to reach this country. The bird is about the size of a Little Crake, and is of a uniform, slightly glossy, sooty-black colour: the irides are stated to be red. In its plumage the bird shows evidence of a reversion to its ancestral type, if the appearance of the young of all Rails can be taken as an index. The wing is short, the quills are hidden by the long attenuated wing coverts, and in all likelihood the bird is incapable of even a short flight. The skin is probably that of a male; its measurements are:

wing 60; tarsus 24; tail 34; bill 19.5; middle toe with claw 33; being in every way slightly larger than the type in the British Museum. The only information on the label which came attached to the skin was: "This is the hardest little bird to catch on Inaccessible." No Rail has so far been recorded from Nightingale Island, and the now extinct Tristan d'Acunha Rail (*Porphyriornis nesiotis*), though closely allied to the Rail on Gough Island, 200 miles away, was no near relation of this new bird.

Porphyrio martinicus. MARTINIQUE GALLINULE.—An immature specimen of this bird was included among the skins received in 1919. It was obtained on Tristan d'Acunha Island by Mr Tom Rogers (date not stated), who writes: "It is the only one we ever saw on the island, and I only got it by chance when going to the other side of the island called the 'rooky.' I did not have a gun but knocked it down with a stone." This bird has a wide distribution both in North and South America, and its occurrence in this oceanic island, at least 2000 miles from its native land, is of interest in connection with its reported occurrence in the British Islands. It is stated to have once been met with in England, but the record has not been accepted; another record of its capture in Ireland was an error. There is, however, no reason whatever why this bird should not, unaided, reach the British Isles: it is a good swimmer, and in this instance its passage over 2000 miles of sea shows what it is capable of doing in the way of long-distance flying.

Age of Common Gull.—Mr Collingwood Ingram records in *Country Life*, 9th February, the death of a Common Gull that lived for twenty-seven years in captivity. It was in adult plumage when brought with a broken wing to its owner, Dr F. Treves of Margate, in 1897; so that in all probability it was at least thirty years old when it died a natural death a few days before the letter was penned.

(Authors are responsible for nomenclature used.)

The Scottish Naturalist

No. 148.]

1924

[JULY-AUGUST

THE WILD CAT.

IN recent days the columns of *The Times* and *The Scotsman* have contained many letters protesting in the strongest possible words against the slaughter of Scottish Wild Cats, which is still in progress. As has been pointed out time and again, this combined slaughter can have only one end—the total disappearance of the Wild Cat. The published accounts of such occurrences, appearing now and again in the public press, indicate that a few men still glory in the killing of numbers which, in view of the present status of the Wild Cat, must be regarded as large. Surely it must be that they do not appreciate the final outcome of their action, or do not apprehend the general desire of proprietors regarding the preservation of this rare species. The Wild Cat is so interesting because of its history, it stands so perilously near the brink of extermination in Scotland, the good that it does compares so favourably with the damage, that practically every owner of land where it occurs values its presence as that of something rare and irreplaceable. The difficulty lies not here, but in the inordinate desire for big bags of rarities, shot on one pretext or another, which still animates a few of the less enlightened gamekeepers.

Perhaps public opinion also is to blame in the matter. Perhaps public opinion ought to express more strongly its desire that the Wild Cat should be saved from extinction, and should demand that wild mammals of the disappearing species should share with birds the protection of the law. It should suggest that if the inanimate ancient monuments of the country can command a Commission for their protection, surely the animate relics of our ancient fauna ought to be under the guardianship of a Nature Monuments Commission. But the law can be evaded, and commissions work heavily. The best protection that the survivors of the Wild Cat could ever hope for, is simply that proprietors and tenants of estates upon which they exist should give utterance to an interest in their survival and definitely prohibit needless slaughter.

* * * *

We suggest a small way in which naturalists holidaying by the seaside may further scientific knowledge. For many years little has been done to advance our meagre information regarding the distribution of Sea-Anemones around the shores of Scotland, and many of the older records require to be revised in the light of present-day knowledge. Moreover, several of the species known to Gosse and his collaborators have not been seen in life since their first discovery and require further investigation. Among other places, Loch Ryan, the islands and lochs of the north-west, Wick and the Moray Firth are areas from which information is especially desired. Anyone willing to search for and forward specimens will obtain full information and instructions for collecting from Mr W. Edgar Evans, B.Sc., 38 Morningside Park, Edinburgh, whose aquarium contains all but a few of the British species, and who will gladly defray cost of postage. Readers willing to assist in this good work may be assured that their help will be of service in adding to the comprehensiveness of a monograph of British Sea-Anemones now in course of preparation.

THE LOGGERHEAD TURTLE IN SCOTLAND.

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

THE Loggerhead Turtle (*Thalassochelys caretta*), young or adult, is an extremely rare visitor to these shores, for its range of wandering from the tropical and sub-tropical seas which it frequents seldom brings it northwards even to the coast of Portugal. The following record, therefore, is of more than usual interest, and for my knowledge of it I am much indebted to Mr John Mackenzie of Dunvegan, who not only promptly telegraphed the news of the Turtle's arrival and later sent an account of his own observations, but after the death of the Turtle presented its carcase to the Natural History Department of the Royal Scottish Museum, where it will be placed on exhibition in due course.

On 13th December 1923, a large Turtle was discovered on the shore at Pool Roag near Dunvegan, at the landward end of a bay opening southward into Loch Bracadale, approximately in lat. $57^{\circ} 24' 30''$ N.; long. $6^{\circ} 32' 10''$ W. It lay partly hidden under seaweed growing between tide-marks in a sheltered corner of the bay, and "seemed to be asleep," giving no sign of active movement, but it showed a weak reflex action in withdrawing a hind limb when it was pulled out.

Mr Mackenzie had the animal removed to the lawn in front of his house for closer observation, but this led to its undoing, for its removal was followed by a bitterly cold day and a night of frost and sleet. The animal was probably in a moribund condition when discovered, but its exposure to a temperature much lower than that of the Atlantic water to which it was accustomed, hastened its end. On the succeeding morning Mr Mackenzie noted that a change in coloration was in progress, the slight hue of pink, which had been distinct on parts of the under surface, under the chin and behind the front flippers, gradually fading away. It was at once packed and forwarded at

my request to Messrs Charles Kirk and Co., Glasgow, for preparation as a museum specimen.

Dimensions of Turtle.—On Monday, 17th December, I examined the specimen in the flesh in Glasgow. It was a fine adult female Loggerhead Turtle of great size, and in a state of preservation so fresh as to confirm Mr Mackenzie's account of its recent death. It weighed in the flesh 309 lb. Its length from snout to tip of tail in a straight line was 4 ft. 5 in. The length of the carapace along the curve was 3 ft. 5 in., its breadth along the curve 3 ft. 1½ in., and in

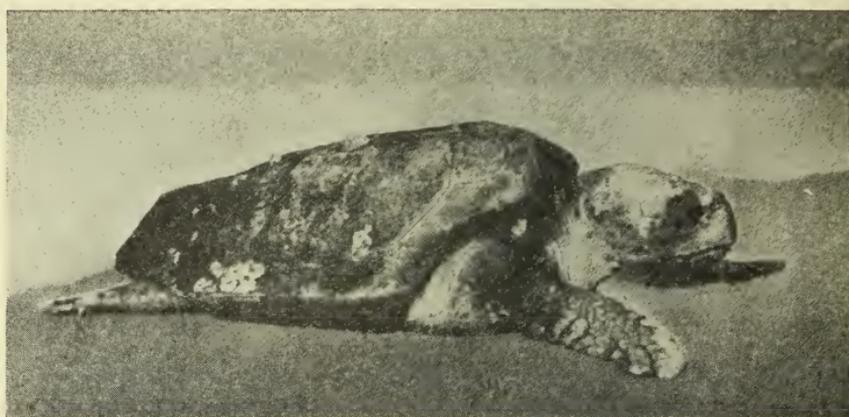


FIG. 1.—LOGGERHEAD TURTLE, FOUND ON SKYE.
(About $\frac{1}{10}$ natural size.)

a straight line 2 ft. 7½ in. and its greatest height 1 ft. 2 in. The diameter of the neck was 2 ft. 1 in., the length of a fore flipper 1 ft. 11½ in., and the spread from tip to tip of the fore limbs measured 5 ft.

Its Living Freight.—That the creature was an ancient wanderer in the seas was indicated by its encrusted carapace. Many barnacles studded its shell at more or less well-defined areas. They belonged to two very different species. That most common was a sessile or Acorn barnacle, of which there were some fifty-seven individuals on the upper and under surfaces and at the margin of the shell near the tail. Some of these may be seen in the photograph illustrating this note. The other was a stalked barnacle, *Lepas*, the individuals of which hung especially about the edge of the carapace

on the under surface. The upper surface of the carapace was also well coated with a slimy green seaweed.

Food and Egg-Masses.—The body of the Turtle was forwarded to the Royal Scottish Museum for further examination. Here it underwent a general dissection with the following results. Although the Loggerhead is said to be carnivorous, feeding upon cuttle-fishes and other

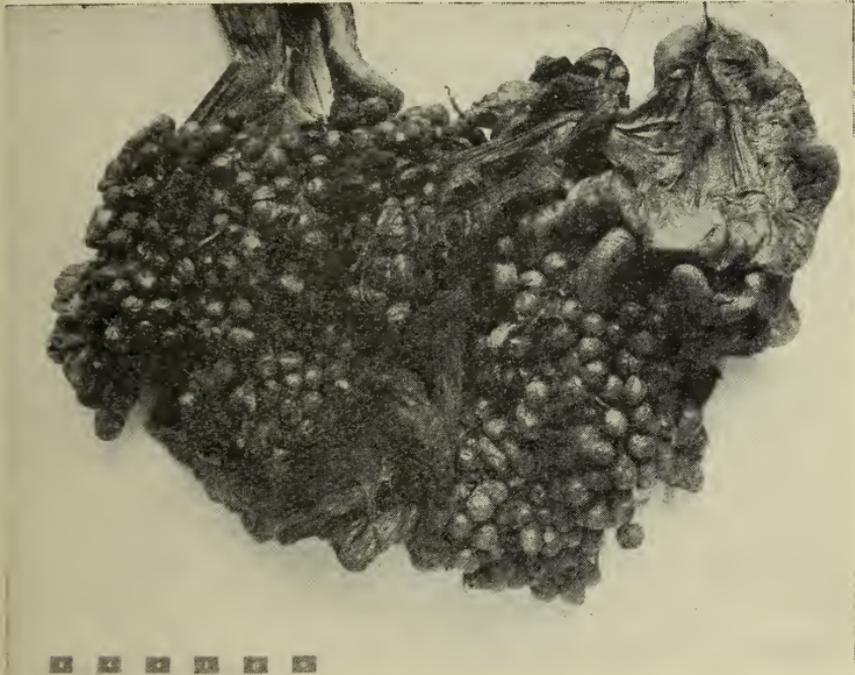


FIG. 2.—EGG-MASSSES OF SKYE LOGGERHEAD TURTLE, CONTAINING OVER 1000 EGGS. (A foot-rule marked in inches is shown for comparison.)

molluscs, no trace of animal food was found in its stomach or intestine. The only material discovered was a pulpy mass of green seaweed, which appeared to be well digested, showing that the Turtle's last meal had been made some considerable time before its death.

More interesting was the fact that it was a ripe female, and that its two ovaries were packed with enormous masses of eggs, which must have filled every cranny of spare space in its body. They are well shown in the accompanying illustration. The eggs had scarcely reached their final stage of development since none possessed the tough "shell"

which envelops laid eggs. They were wonderfully uniform in size throughout the masses, spherical in shape and about $1\frac{1}{8}$ in. in diameter. Counted by Miss G. H. Jacob and Mr R. H. Reid, the total number of the eggs was found to be about 1020, the number in each of the two ovaries being practically equal.

Possible Wanderings of the Skye Loggerhead.—Usually the Loggerhead Turtle confines its activities to tropical or subtropical seas. Its permanent establishment nearest to our area is in the Mediterranean Sea, and northwards of this it can be regarded only as an accidental visitor, its visits occurring at longer and longer intervals of time as the distance northward increases. Records from Western Portugal and the Bay of Biscay are not rare, but it is seldom that individuals reach the shores of Britain, where the majority of the specimens recorded have been found, as was to be expected, on the coasts of Cornwall and Devon.

The Skye specimen may have been incapacitated in some way, though it showed no sign of injury, and may have been wafted helplessly north-eastwards from the tropical Atlantic in the north Atlantic drift. Or perhaps it followed its food-supply beyond the bounds of safety, and on reaching waters cooler than those to which its vital processes were attuned, lost the power of feeding and ultimately became listless and moribund, the condition in which it was found. I have already mentioned that the food remains in its stomach suggested that it had not fed for some time.

Previous Scottish Records of the Loggerhead.—So far as I know, only two occurrences of this species in Scotland have been recorded, and strange to say both chanced in the same month of the same year, August 1861. This year was further distinguished by the arrival at Banff on 29th July, almost in the record month, of another Turtle identified by Thomas Edward as a "Hawk's-Bill Turtle, (*Testudo imbricata*).” But Edward also regarded the Pennan Loggerhead, to be mentioned later, as a "Hawk's-Bill.” This was a most unusual series of events, indicating perhaps an exceptionally strong Atlantic drift during the summer of that

year. Since 1861 no Turtle would seem to have been identified on Scottish shores till the arrival of the Skye specimen last year. The earlier records possessed some interesting features. Both the specimens (and Edward's also) were small compared with the last arrival, the largest being that caught by the fishermen, on 1st August 1861, in a stake net at Pennan near Banff. Its shield, according to Prof. Robert Dyce of the University of Aberdeen, was $19\frac{1}{2}$ in. long and 18 in. broad, and the whole animal weighed about 25 lb. (*Ann. Mag. Nat. Hist.*, ser. 3, vol. viii., p. 351). It was "very lively and pugnacious." The second recorded in the same volume was found on 22nd August 1861 in an exhausted condition lying upon its back on the beach of Loch Lomond. It was smaller than the Banff specimen, its length being $11\frac{1}{2}$ in., and breadth 10 in. No explanation was offered of its appearance in this strange situation, except that the loch was at flood level, 8 ft. higher than usual, and that the young Turtle may have reached it by leaving the sea-coast and proceeding up the swollen river which forms the outlet of the lake—a very unusual sort of journey for such a creature.

BOOK NOTICES.

THE BIOLOGY OF BIRDS. By Professor J. Arthur Thomson, M.A., LL.D. London: Sidgwick & Jackson, Ltd. 1923. Pp. xi + 436. Price 16s. net.

In ornithology, more than in most natural history fields, the amateur observer has played his proper part in adding to the stores of knowledge. But knowledge is broad and deep, and both he and his professional brother are none the worse of being reminded of the danger of specialism, and of the need of interpreting observations from a wider basis. In this work Professor Thomson offers the wider basis of ornithological knowledge, for he discusses all the features of birds from the point of view of their value in an organism adapted to make the most of many different conditions of existence. The vital functions of birds, their structures, their distinctive habits, migration, flight and the like, their intelligence and parental care, are all reviewed in the light of the most recent knowledge. Here there is a philosophy of birds' eggs as well as

of birds' courtship, and a wider field is touched in the discussions of the pedigree of birds and the factors involved in their evolution, as well as in a very interesting chapter dealing with the relationship of birds to the world at large. It would be a mistake to suppose that Professor Thomson limits his remarks to birds alone, for part of the value of the book lies in the simple way in which he links bird activities with those of the rest of animate creation. On these accounts his volume may be heartily recommended not only to ornithologists, who will find that it adds a new savour and a new understanding to their field observations, but to the general reader who is interested in the interpretation of the phenomena of life.

A PRACTICAL HANDBOOK OF BRITISH BIRDS. Edited by H. F. Witherby. London: H. F. & G. Witherby. 2 vols. bound in three. Price £4, 10s. net.

Mr Witherby and his colleagues are greatly to be congratulated on the completion of this important work. The high standard set at the beginning has been consistently maintained, and the book fills a felt want. The whole plan of the book is excellent, has been carefully thought out, and shows much painstaking work. There are minute descriptions of all stages from the nestling onwards, as well as brief notes on characters and allied forms. Field Characters, Breeding Habits and Food are other headings which are briefly but adequately dealt with. The paragraphs on British and Foreign Distribution are very much compressed but are comprehensive, and we are glad to see the Scottish records so carefully and accurately given. The book is printed in good type on good paper, and this and the size of the volumes make it agreeable to use, an important point in a book intended for students and field-workers. We confidently recommend the Practical Handbook to all who are interested in British Ornithology.

VIVARIUM AND AQUARIUM KEEPING FOR AMATEURS. By A. E. Hodge, F.Z.S. London: H. F. & G. Witherby. 1924. Pp. 128. Price 5s. net.

In this little work Mr Hodge has set out to describe some simple types of vivaria and aquaria, and the creatures, British and foreign, which make suitable inhabitants for them. The first part of this task is somewhat summarily dealt with, and a large proportion of the book is given up to cataloguing the distinctive characters and habits of the animals. Since this information is already available in many published works, it would have been better curtailed in favour of more detailed instruction as regards keeping, feeding, and tending. Here the facts are often meagre. One of the questions most often asked by the beginner concerns the tending of common frog tadpoles from egg to adult, and he would get little help from Mr Hodge's pages.

REPORT ON SCOTTISH ORNITHOLOGY IN 1923.

By LEONORA JEFFREY RINTOUL and EVELYN V. BAXTER.

INTRODUCTION.

AGAIN we have received a most satisfactory series of records from our correspondents all over Scotland. These have brought out the salient features of a very interesting year, showing, perhaps unusually clearly, the relations between climatic conditions and the movements of birds. We thank our recorders very heartily for the steady returns which they send us, which make it possible to compile the Report from year to year and to compare one year with another. We mention, with regret, the loss of two most faithful recorders. Mr John Craig sent regular and interesting notes for many years, and we shall miss his kindly help. Mr William Begg, too, sent valuable records from various lighthouse stations and was always ready to give any help in his power.

We hope all our recorders will continue to send us reports, and we shall greatly welcome anyone who will send us notes on any ornithological subject. Our thanks are due in the Northern group of localities, to: Henry Jamieson, Out Skerries; Admiral J. H. Stenhouse, and Jerome Wilson, Fair Isle. In the Eastern group, to: George Stuart, Forglan; — Wyness, Dunlugas (per Dr A. E. Mahood); Major A. Stables, Elgin; Miss J. Gowan, Cullen; A. Macdonald, Aberdeen; John Ritchie, Perth; Professor M'Intosh, Nevay Park; R. W. Thomas Ewart, Montrose; H. G. Watson, Arbroath; H. R. Colman, Broughty Ferry; Henry Boase, Dundee; A. H. R. Wilson, Moncrieffe; William Berry, Tayfield; C. H. Guild, St Andrews; J. H. Gaskell, Balchrystie; Z. G. Wedderburn, Balhousie; D. J. Balfour Kirke, Burntisland; N. M. Johnson, Kinglassie; M. Sutherland, Isle of May; J. Muir and C. Maceachern, Bass Rock; the Lightkeepers, Bell Rock; Patrick Murray, Edinburgh;

Dr W. Eagle Clarke, Edinburgh; Francis Magee, Ratho; R. Rintoul, Dunbar. In the Western group, to: George Beveridge, Vallay; Seton Gordon, Connel; John Bain, Hyskeir; J. Bartholomew, Glenorchard; William Rennie, T. Hill, J. N. Hislop, C. A. Vynne, W. Jamieson, H. Cumming, P. Goodfellow, D. Macdonald, Nicoll Hopkins, S. Hopkins, John Robertson, M. Galloway, Mrs C. C. Graham, R. Wilson, G. Macalister, all of Glasgow; the Andersonian Naturalists' Society; T. Malloch, Johnstone; Walter Stewart, Airdrie; T. Thornton Mackeith, Kilmacolm; E. Richmond Paton, Hareshawmuir, and Sim Baigrie, Ailsa Craig. In the Southern group, to: Rev. W. M'Conachie, Lauder; Right Hon. The Earl of Home, The Hirsell; A. White, Reston; T. G. Laidlaw, Duns; Gilbert Davidson, Melrose; Mrs Robertson, St Boswells; J. R. Simpson, Selkirk; A. C. Gairns, Broughton; H. S. Gladstone, Capenoch; J. G. Gordon, Corsemalzie; and The Right Hon. Sir Herbert Maxwell, Monreith.

The year 1923, in common with most other years, had interesting features of its own. During a mild March and early April very early arrivals of some of our summer migrants were recorded, and the main movement continued on normal lines, but some of the arrivals tended to be late. Owing to the weather conditions prevailing, no great number of uncommon visitors or great rush is recorded at either migration period. The autumn movement proceeded on normal and steady lines, except for the very late occurrence of some summer migrants. The influence of the mild weather in the early part of the year is also shown in some very early records of nesting and by the fact that some of our winter visitors were heard in good song. Satisfactory notes come of the increase and spread of some of our Scottish breeding birds, though there are also records of local decreases in some species.

The following abbreviations are used in this Report:—

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

BIRDS NEW TO FAUNAL AREAS AND UNCOMMON VISITORS.

Though the list of birds under this heading is not as long in 1923 as in some years, it contains much that is of interest. Two female Golden Orioles are reported, one caught near Ruthwell, Dumfriesshire, on 4th May, the other picked up nearly dead near Dumfries in early June (2. xvii. 83). Coue's Redpoll appeared on Fair Isle on 22nd October, an adult male (1. 1924, 4); Ortolan Buntings on the Isle of May on 13th May and 1st October, a Little Bunting at the same station on 4th and 5th October, and a Lapp Bunting, an immature female, at Fair Isle on 3rd October. On 29th October a Shore Lark visited Fair Isle; two were there on 2nd November and one next day. At least seven Blue-headed Wagtails are reported from this station on 26th and 27th September, one being an adult male (1. 1923, 173). A Red-breasted Flycatcher is recorded from the Isle of May on 4th October, two Yellow-browed Warblers at Fair Isle on 21st and 28th September, and one on 22nd September (1. 1923, 173), and one at the Isle of May on 25th September. The second British specimen of the Eastern Lesser Whitethroat is recorded from Fair Isle on 20th September (1. 1923, 173), and another there on 16th October (1. 1924, 4), and Black Redstarts at the Isle of May from 3rd to 6th May. Two Norwegian Bluethroats appeared on Fair Isle on 28th September, an adult male and female (1. 1923, 173), and one on the Isle of May on 4th October. A small party of Alpine Swifts stayed about the buildings of Corsewall Lighthouse, Stranraer, for some days in mid-September (1. 1924, 84). During the second week of April a Hoopoe was shot at Carrick, Kirkcudbright (1. 1923, 94), and single birds are reported from Balerno on 15th April (1. 1923, 94), near Airdrie on 7th May (1. 1923, 140), and the Isle of May on 6th and 7th October. An Osprey was seen in summer at a loch in the Cairngorms, and on 6th January a Bittern is reported at Blackford, Perthshire, and another in Southern Scotland in the same

month. A Great Shearwater is noted on 22nd June in the Firth of Lorne (2. xvii. 87), and a Sooty Shearwater at sea off Fair Isle on 9th August. The first record of the Pratincole for Moray comes from Loch Spynie on 17th August (1. 1924, 8); two Green Sandpipers are reported near Buddonness on 3rd September, and three Spotted Redshanks on the shore of Loch Elrig (Mochrum) on 4th September. A female Great Snipe was shot at Fetlar on 20th September, the first record for any of the Shetlands except Fair Isle (1. 1924, 10); and the first record for Shetland of the Faroese Snipe comes from Fair Isle on 29th September (1. 1923, 174). The record of the Sandwich Tern breeding in Shetland is also the first of the occurrence of the species in that area (1. 1924, 52). Two Little Gulls are recorded from Tentsmuir Point on 28th April.

EXTENSION OF BREEDING RANGE.

One of the features of the last half century, in the ornithology of Scotland, has been the extension of the breeding range of various species. This is still in progress, as will be seen by the following notes. The Pied Flycatcher nested in Selkirkshire in 1923, this being the first record for the county (1. 1923, 133); while the first breeding of the Great Spotted Woodpecker in West Lothian is recorded from Dalmeny Park (1. 1924, 10), and in Forfarshire from Gannochy estate, near Edzell, and at woods of Craigs near Montrose (1. 1923, 140). The first record of the Gadwall breeding in South Fife shows a spread from the well-known nesting place on Loch Leven, and a pair which bred in North-west Fife probably also came from there. Common Snipe are reported on Fair Isle throughout the summer, and "may reasonably be assumed" to have bred there for the first time, though the nest was not found (1. 1923, 173). An important extension of breeding range is that of the Sandwich Tern, which nested in Shetland this season. It would appear to have done so for a year or two, but this is the first time that its nesting in this group of islands has been definitely proved (1. 1924, 52).

INCREASE AND DECREASE OF SCOTTISH BREEDING
BIRDS.

Local increases of some of our breeding birds are recorded. These we give below. Greenfinches are increasing at Hareshawmuir, while Reed-buntings, Wheatears, and Whinchats are more numerous in the Rannoch district, and the last species at Hareshawmuir "owing to young plantations, which are used for nesting until trees close up their ranks." Stonechats and Goldcrests are increasing at Corsemalzie, Goldcrests and Long-tailed Tits have increased in Elgin (1. 1923, 184), and Ring Ouzels about Rannoch. House-martins were more numerous at Tummel Bridge and Swifts very plentiful in Perth, while Tawny Owls had increased at Kilmacolm. Our correspondent on Ailsa Craig believes the Gannets to be getting more numerous there, and there is pleasing evidence of the increase of the Slavonian Grebe as a nesting species. More Oystercatchers now nest inland at Corsemalzie, mostly in young corn, and a large increase in the number of Redshanks, nesting on the moors and meadows, is noted there. During the last few years Curlew have become more plentiful as a breeding species in Shetland (2. xvii. 116), and in 1923 nesting Woodcock showed a marked increase at Kilmacolm. There are now an excessive number of Black-headed Gulls on the moors at Hareshawmuir, where "persecution has caused them to spread over the whole moor and leave the lochs."

Turning now to the other side of the picture, there is no evidence of any general diminution in Scotland of any of our breeding birds, but a good many notes of local decreases have been sent. Rooks are considerably reduced in the Rannoch district and about Dundee, and Jackdaws are scarcer at the former place. Yellow-hammers, Pied Wagtails, Willow-warblers, and Whitethroats were all below the average about Dundee, while all the Tits were exceptionally scarce. In the Rannoch district, Skylarks were much below their previous numbers, and Tree and Meadow Pipits had decreased, especially in exposed places. Here, too,

Mr Boase found Willow-warblers less common, Whitethroats very scarce, Sand-martins much reduced, Golden Plover scarce, and Moorhens and Coots below the average. There was a marked scarcity of Yellow Wagtails at Hareshawmuir (2. xviii. 55); while Grey Wagtails are recorded as very scarce in the Dundee district, Glen Tilt, and Glen Clova, the Garry, Glen Lyon, and Loch Tay. Whitethroats were scarce at Possil Marsh, and Sedge-warblers and Whinchats at Kinglassie, where, too, Swallows and House-martins were scarce and Sand-martins were not seen. Wheatears, Swallows, House-martins, Whitethroats, Spotted Flycatchers, Cuckoos, and Corncrakes were all scarce at Corsemalzie. Swifts were scarce at Possil Marsh and at Forglen in Banffshire, and a decrease in resident Wood-pigeons is noted at Hareshawmuir, probably owing to cutting of timber during the war. Greater Black-backed Gulls were much scarcer than usual this year at Vallay, Outer Hebrides, and Corncrakes were very few this year at Kinglassie (Fife) and Cullen (Banff). Puffins were less numerous on the Isle of May and Ailsa Craig.

SUMMER AND NESTING.

Nesting in 1923 followed a very normal course in spite of the cold summer. The warmth of the winter and early spring induced some birds to begin nesting very early; but as a whole the dates are ordinary, and there is no report of any disasters, except to the Sand-martins at Dunlugas and the young Teal at Hareshawmuir. At Out Skerries, Shetland, the sea-birds had a very successful nesting season, there being abundance of small fish all about the shore. The first nests of the Eider were very much harried by the Gulls, Ravens, and Hoodie Crows; the lightkeepers, however, erected little shelters for them which "saved some of them." The Terns did not arrive till 29th June; they began to nest at once and "kept off the Gulls and other marauders after that, so the Ducks got a chance, and although late, twenty or thirty of them got away with young ones." About a thousand pairs of Terns nested on the rock as well as

nine pairs of Oystercatchers, and quite a lot of Ringed Plover nested on the shore island.

Satisfactory reports come of the nesting of the Great Skua at Hermaness.

A nest of Carrion-Hoodie Crows is recorded from Forfarshire (2. xviii. 53), and two pairs of Pied Flycatchers nested near Duns, and a pair bred by the Yarrow in Selkirkshire (1. 1923, 133). A Blackbird's nest with four eggs at Moncrieffe (incubation began on 15th April) was visited on 21st April, when all the Blackbird's eggs had gone and a single Starling's egg was in their place. Many Sand-martins were destroyed about 26th May at Dunlugas, Aberdeenshire, by the overflowing of the Deveron. Great Spotted Woodpeckers were seen in summer at Glen Tilt, Aldcharmaig, near the head of Loch Tummel (1. 1923, 134), in Strath-tummel and Glen Lyon, and near Kingenny, Forfarshire. About Loch Rannoch Long-tailed Tits and Goldcrests are reported numerous and nesting freely, and a Garden-warbler was again seen there. A pair of Herons nested at Balcaskie (East Fife), and Eider nested on the rock-bound coast near Portpatrick, "numerous mothers with three, four, and five ducklings" being reported from there. At Maryculter on 13th May there was discovered in the decayed part of an old sycamore a Stockdove's nest containing three Stockdove's eggs, one highly incubated, the other two fresh, and a fresh egg of a Starling. Mr J. G. Gordon writes from Corsemalzie: "An Oystercatcher always nests near Garheugh Rocks, Luce Bay, and always lays one heavily zoned egg and two ordinary. I took it first in 1910 and it was still nesting in 1923, so it must be fourteen or fifteen years old at least." A Lapwing's nest with five eggs was found at Hareshawmuir, four of the eggs hatched, one being infertile. Quite a number of Dunlin bred at Vallay, Outer Hebrides. In 1923 the Great Black-backed Gulls, for the first time, as well as nesting on the small islets and edge of the Castle Loch, Mochrum, took to nesting on rocks and hills at least a mile from the water. One nested on a large isolated rock on Anahaglish Moss and two or three pairs on the top of a rocky hill 500 ft. high. There is satisfactory

evidence of the continued nesting of the Whimbrel in Shetland.

By 13th January Rooks were building at Largo. About the middle of the month Starlings were going in and out of their nesting holes near Colinsburgh, Fife, and on 31st at Cullen, Banffshire. A Wood-pigeon at Mertoun, Roxburghshire, had eggs on 27th January; another at Blairadam, Kinross-shire, had two hard-set eggs next day, and a nest of the same species with two eggs was found at Friars Carse, Dunscore, on 31st January. On 1st February a Chaffinch's nest, finished but without eggs, was found near St Boswells; on the 5th a Thrush's nest with fully fledged young was found on the Black Devon, Fife, and about the 10th a newly fledged Thrush was seen in Perth. Early in February a Blackbird's nest with young was found at Corsiehill, near Perth; while young Starlings were ready to fly at Avon-bridge, Stirlingshire, on 6th February. On the 13th a Wood-pigeon hatched two young at Glenorchard, and about the same time this species had young at Torrance, which, however, died during the cold weather of the week after the 17th (I. 1923, 46); two young Wood-pigeons, two or three weeks old, were found on 16th February near Redhills, Torthorwald, Dumfriesshire. In March we have the usual records of the nesting of our earlier breeding species: by 10th March Great Spotted Woodpeckers had begun to nest, and on the same date Pied Wagtails and Jays began to nest at Moncrieffe, Perthshire. On 17th March Rooks were seen gathering moss for their nests at Cullen; on the 24th the first Lapwing's nest was found at Hareshawmuir, which is 800 ft. above sea-level; while on the 31st a Tawny Owl had one egg in a potato barrel, set up in a tree at Johnstone, Renfrewshire.

Records sent for April show that nesting followed a very normal course. Crossbills nested at Contin, Ross-shire, young being seen with their parents on the 3rd; on the 8th Woodcock had hatched at Moncrieffe, and on the 25th at the same place a Woodcock was seen to come to its nest and change places with the sitting bird. On the same day a Long-tailed Tit was sitting on a full clutch there; while on 29th April a

Blackbird's nest with seven eggs was found at Callander, and on the 17th a Carrion Crow at Corsemalzie had a clutch of six eggs.

Further notes of nesting come throughout May. The earlier breeding birds had young, and we have records of young Kingfishers, one pair of which had seven young. Great Crested Grebes also had young by the beginning of the month, and Sandwich Terns returned to one of their breeding places and began to nest towards the end of the month. Dunlin had eggs on 19th May, and on 26th May a young Black-headed Gull nearly full fledged was seen on Tentsmuir, although eggs were still common there on 7th July, and on 11th August a young bird incapable of flight and carrying much down was on the shore at Tentsmuir Point. On 29th May young Stockdoves at Hareshawmuir had already flown; and during the month we have records of Lapwings, a pair of which had a clutch of four, three eggs being of normal size, and one a dwarf, at Barr, Dumfriesshire, while another pair at Hareshawmuir had five eggs. June shows little that is out of the common. Dunlins at Hareshawmuir had hatched by 3rd June, and from the same place a great mortality of young Teal on the lochs is recorded on 11th June. Common Terns had eggs inland, in Renfrewshire, by 4th June; but from Tentsmuir we hear "Common Terns were very late in laying, not till the end of June were eggs common." House-martins at Cullen did not begin to build till the middle of the month, and 400 to 500 Black-headed Gulls were nesting in Glen Tilt on the 29th; most of the young were swimming in the peat bogs and pools, but there were a few eggs still.

On 1st July one Meadow Pipit was feeding two young Cuckoos at Hareshawmuir; Common Gulls at Loch Esk, Glen Clova, had young swimming about on 16th July; Arctic Terns hatched in Shetland on 22nd July, and on the same day young Lesser Redpolls left the nest at Forglen, Banffshire. In Forfarshire Tufted Duck had newly hatched young on 27th July, and a female with a duckling a week or so old was seen on 20th August.

In August and September we still have a few records

of nesting: on 1st August a Nightjar with two young a few days old was seen on the moor at Corsemalzie; while on 4th August a Woodcock was sitting on eggs in Strathspey, and a Snipe at Vallay was sitting on four eggs on the 15th. On 20th August a Great Crested Grebe had young "about a week old," and on 23rd a pair of Wood-pigeons was building in a lime tree in a garden at Johnstone; this nest, however, was not finished. On the last day of the month two House-martins in Largo went into their nest and threw out two perfectly fresh eggs. On 2nd September a Wood-pigeon had a nest and two eggs at Corsemalzie, and on the 8th two pairs of these birds were feeding young in the nest at Hareshawmuir. Greenfinches had young in the nest there on the 8th, while a late brood of Swallows left the nest at the same place on 15th September.

WINTER.

The winter of 1922-23 was unusually mild and this had a distinct influence on our bird life; this was well brought out in the editorial in the January-February number of the SCOTTISH NATURALIST. In the beginning of 1923 we still have records of birds which usually leave, lingering in their breeding haunts. Numbers of Meadow Pipits are reported from Glenorchard in January; a Ring Ouzel on moorland at New Monkland, Lanarkshire, on the 11th of that month; Gannets at Ailsa Craig in January and February; and Curlew on the uplands of Fife. Numbers of Redwings wintered at Melrose, East Fife, and Cullen. There are a good many records of Whooper Swans; while Grey Lag-Geese were unusually abundant at Glencaple, Caerlaverock, and Wigeon very plentiful on the estuary of the Nith, where Pintail, Mallard, and Teal were scarce. Very large flocks of Wood-pigeons and Lapwings were seen about Largo this winter, and Snipe and Jack Snipe were more than usually numerous at Melrose. A Mallard shot at Glenorchard on 1st January weighed 3 lb. $\frac{1}{4}$ oz., and a Woodcock there on the 4th weighed 13 $\frac{1}{2}$ oz. Other winter visitors were present in normal numbers.

1923-24 was cold and inclement, a great contrast to the preceding winter. Starlings were below average numbers in East Fife and the Tay Estuary; Redwings and Fieldfares are reported in many parts, but nowhere in abnormal numbers. We have a good many records of Continental Thrushes from both the east and west coast; also a goodly number of immigrant Blackbirds. "Thrushes and Peewits" stayed all winter near Elgin. A Great Spotted Woodpecker was seen at Duneaton (Lanarkshire) "in the Christmas holidays." Whooper Swans visited Loch Spynie and Castle Semple Loch; the usual records of wintering Duck and Geese have been received. Several Geese shot on the Lake of Menteith all proved to be Grey Lag, and a Bean Goose shot at Hareshawmuir at Christmas weighed over 8 lb. Phenomenal flocks of Wood-pigeons are reported near Elgin on 20th December (1. 1924, 36). "Thirty foreigners" were at Hareshawmuir on the 1st December, and Wood-pigeons in unusual numbers are reported from Lahill, Fife, during the month.

RINGING.

There are several interesting returns of ringed birds this year; a Meadow Pipit ringed at Kilmacolm, Renfrewshire, on 8th July 1921, as a nestling was reported from St Medard-en-Jalles, Gironde, France, on 26th March 1923 (2. xvii. 78). Three Gannets were ringed as young birds on Ailsa Craig on 17th July 1923: one was reported on the north coast of Sines, 50 miles south of Lisbon, on 19th November, the second at Portbail (Manche), France, on 12th October, and the third at Isle d'Yeu (Vendée), France, on 18th September (2. xvii. 240-241), interesting evidence of the distance travelled by these birds in their first autumn. Evidence of winter movement to Ireland is shown in the returns of Lapwing. Two ringed as young birds at Torrance (Stirlingshire), on 7th June 1917 and 25th May 1923, were reported from Garristown, Co. Meath, on 28th November 1923, and near Limerick on 27th November (2. xvii. 241); one ringed at Kilmacolm

(Renfrewshire) on 9th July 1921 was reported from Quoile, near Downpatrick, Co. Down, on 24th November 1923 (*loc. cit.*), and another ringed at Kinnordy Lochs, Forfarshire, as a young bird, on 10th June 1922, is reported from Templemore, Tipperary, on 10th February 1923 (2. xvii. 81). Further interesting records are Starlings ringed at Torrance in 1920 and 1921, Kingoldrum, Forfarshire, and Kilmacolm in 1922, all recovered at or near the place of ringing in the spring of 1923 (2. xvii. 77). A Greenfinch ringed at Torrance on 23rd June 1919, and recovered there early in January 1923 (2. xvi. 300); while a Chaffinch ringed at Torrance as an adult in June 1920 was recovered there in May 1923 (2. xvii. 78). A Song-thrush ringed at Torrance as a nestling in June 1917 was found at Cadder, also Stirlingshire, on 4th March 1923 (2. xvii. 79); and another bird of this species at Broughty Ferry on 19th May 1922 was reported from the same place on 21st November 1923 (2. xvii. 237). Blackbirds ringed at Broughty Ferry and Torrance as nestlings in 1922 were recovered at the place of ringing in 1923, spring and summer (2. xvii. 79); while two young birds ringed in 1923, one at Torrance on 25th May, was reported from Cadder in August; the other ringed near Pitlochry on 17th May as a young bird was recovered 18 miles from the place of ringing on 15th September (*loc. cit.* 237 and 238). A Robin ringed at Broughty Ferry as a nestling on 18th May 1922 was reported at Gilston (Fife) on 15th July 1923; another ringed at Bridge of Earn as a young bird on 4th July 1923 was reported from Wormit, Fife, in late October 1923 (2. xvii. 80 and 239). Birds of this species ringed at Broughty Ferry as adults in December 1921 and January 1922 were reported where ringed in April and December 1923 (*loc. cit.*), and another ringed as a nestling at Torrance in June 1922 was reported there in February 1923. Four Hedge-sparrows ringed at Broughty Ferry as adults in 1921 and 1922 were reported at the place of ringing in April and December 1923 (*loc. cit.*). A Swallow ringed at Kilmacolm on 4th July 1921 was found nesting at Heathfield Farm, Lochwinnoch, about 7 miles from place of ringing,

on 4th July 1923 (2. xvii. 80). Sparrow-hawks ringed at Kingoldrum, Forfarshire, as nestlings in July 1922 were reported from Cortachy, Forfarshire, on 3rd April 1923, and Murthly, Perthshire, in July 1923 (2. xvii. 80). A Cormorant ringed as a nestling at Castle Loch, Mochrum, on 14th June 1919 was recorded at Ross, Kirkcudbright, in June 1923. Three Shags ringed at Handa and the Badcall Islands, Sutherland, as nestlings in June 1923 were recovered, one near the Isle of Scalpa, Inverness-shire, in October, another in the Sound of Harris (O.H.) in November, and the third off Skye in December 1923 (2. xvii. 240). A Wood-pigeon ringed at Torrance as a young bird in June 1922 was reported from Bearsden, near Glasgow, in April 1923 (2. xvii. 81); while Lapwings ringed as nestlings or young birds at Kilmacolm in June 1922 were recovered at Bridge of Weir, Renfrewshire, in November 1923, at Glen Clova, Forfarshire, July 1923, reported 13 miles north of where ringed in October 1923; and one ringed at Macrihanish, Mull of Kintyre, in July, and reported near Campbeltown, Argyll, in December 1923 (2. xvii. 241). Young Woodcocks ringed at Lann and Thornhill, Dumfriesshire, in May and July 1922, were reported within a mile of the place of ringing on 10th and 27th December 1923—interesting evidence of wintering at or near the place where they were bred (2. xvii. 242); while a Ringed Plover ringed at Gairloch, Ross-shire, as a nestling in July, and recovered at Loch Maddy (O.H.) in November, had not travelled very far (2. xvii. 241). Lastly, of three Guillemots marked on Ailsa Craig as young birds in July 1923, two were reported from Loch Fyne in October and December, and the third near Dover, Kent, on 9th December (2. xvii. 242).

PLUMAGE.

Three aberrant Starlings were seen on Fair Isle in autumn, one wholly cream, one with head and neck cream, and one with white wings; a male House-sparrow with white wings was reported from Broxburn on 14th September,

and a cream-coloured Skylark was seen at Muirfield on two consecutive days in the beginning of June. A beautiful albino Redwing was shot at Nevay Park (Forfarshire), on 16th October; the plumage of this bird was entirely white, having no colour about it at all. A Blackbird with head almost entirely white was in Edinburgh on 11th November; while from The Hirsell, Coldstream, we have a most interesting record of a "Yellow Robin"; it was seen on 31st January, and was "sand yellow except for the red breast." Lord Home only saw it one day and "watched it close." A Robin with a pure white breast was noted at Kincardine-on-Forth in January, and another in the same plumage was seen at Lauder; a white Robin fledgeling was found in Invernessshire, while a semi-albino of the same species, with much white on the breast, back, and belly, occurred at Corsiehill, Perthshire, on 23rd April. A Mallard, light cream colour all over except for brownish patches on the sides, was seen at Duns Castle Loch; it had a bright orange bill.

A white Gannet was noticed on the Bass on 28th April, after which it was seen several times. We have been sent the following interesting observations by Mr Gladstone: "The white Curlew which was first observed at the head of Shinnel Water (Tynron), in the spring of 1904, and which I myself saw on 6th June 1910, has continued to visit the vicinity annually since its first appearance. I again saw it in 1922, and this year (1923) it arrived on 4th March. A white Curlew was seen at Garwald, Eskdalemuir, in 1919, and has since been seen there every spring. In 1923 it was first noticed on 9th March, and on 20th April I saw it personally. It appeared to be white with the exception of a very few brown feathers on the forehead, crown, and back of head; its eyes were black and its legs and feet were light-coloured. It was attended by two Curlews of normal plumage, and from the attentions it paid to them I should guess the white bird was a male. This Garwald bird seems to be more leaden-white colour than the bird which haunts the head of Shinnel Water, and which is more cream-colour in appearance." Woodcock at Corsemalzie, in autumn and winter 1923, "varied in plumage, one or two being

remarkably dark and others unusually red, and one very large bird with pale legs and bill was pied, red and white." Lastly, a Red Grouse on Remony, Perthshire, was shot on 14th August, very light coloured with buff markings on the feathers; another was shot on 21st September. There were three or four of them in the covey, and they looked very white when flying.

HABITS, ETC.

An interesting paper on the roosting habits of the Rooks in Bute was contributed to the SCOT. NAT., 1924-5, by the Rev. J. M. M'William.

At Hareshawmuir in November Carrion Crows were seen eating corn from stooks, "along with Grouse," and on the 12th of that month at the same place Greenfinches came and tapped at the window to get in; three allowed themselves to be caught. At Johnstone holly berries remained on one or two trees until eaten by young Starlings and Blackbirds at the end of June. Another tree was cleared by a flock of Redwings in early spring. A House-sparrow was eating dandelion seed at Cullen on 21st May, while at the Hirsell, Coldstream, a Wren's and Willow-warbler's nests were found joined to each other about 6 feet from the ground on a wall. Both nests had eggs and both were in use, although one was built on the back of the other. At Melrose Redwings were heard singing in flocks all January, and at Lahill, Largo, both in flocks and individually; while in May a Robin at Strathblane, Stirlingshire, fed its mate with hawthorn berries (2 xvii. 24). From our correspondent at Reston, Berwickshire, we have the following interesting note: "Coming down a ride in the wood here one night at 8.30 P.M. I came on two Nightjars, and it was a wonderful sight to watch their antics when trying to decoy me away from their young. They tumbled about on the ground, the best make-believe I have ever witnessed, and sometimes they almost touched my head as they flew round and round me. Of course, I knew all about it, and went back two nights later and concealed myself among the heather and saw the

young birds come down into the ride to be fed by the parents; on my approach the same antics were repeated." A Barn Owl took up its abode, in May, under the eaves of a villa in Kilmacolm; the owner hoped it would bring a mate and nest with him. A nest of the Common Buzzard in Argyllshire had sixty-four young rabbits lying at the edge of the nest; while a Kestrel was seen in Princes Street Gardens, Edinburgh, on 9th January. It was first noticed near the Scott Monument, then swooped along the grass, and continued its flight westward. The species is said to have been common in the county this winter, and a pair were seen at the experimental hen-runs at Liberton (*Scotsman*, 13th January 1923).

A dead Weasel was found in a dove-cote occupied by a Barn Owl at Kilmacolm (1. 1924, 26); and a cock and two hen Sparrow-hawks were shot on 11th May beside one nest in the Glen of Scrape, Stobo, Peeblesshire. The nest contained ten eggs, and one of the hens was about to lay another; the two clutches in the nest could be easily distinguished by their markings (*Field*, 24th May 1923, p. 756, and 2. xvii. 288).

On 21st January two Mute Swans came in contact with the electric power cables which are suspended across the Nith, between the power station on the Maxwellton bank and Dumfries. The smaller of the two cables was broken by the impact, and the birds instantly fell dead into the river (*Dumfries and Galloway Courier and Herald*, 24th January 1923).

(*To be continued.*)

ON THE IDENTITY OF THE SEA-ANEMONE
ACTINIA ELEGANS, DALYELL.By W. EDGAR EVANS, B.Sc., F.R.S.E., Royal Botanic
Garden, Edinburgh.

THERE can be little doubt that the sea-anemone obtained by Sir John Dalyell on the Scottish coast about the year 1845, which he described under the name *Actinia elegans*,¹ is clearly conspecific with that detected some eight years later by P. H. Gosse and subsequently called by him *Sagartia miniata*.² That this is so has been virtually admitted by Gosse himself;³ while Andres,⁴ for example, has adopted the same view but has retained the specific name *miniata*, being of the opinion that the earlier account given by Dalyell is inadequate. In the present paper an attempt is made to show that, though the latter author's description lacks the precision and arrangement characteristic of that of Gosse, it is yet sufficiently full, especially when taken in conjunction with the excellent coloured figure which accompanies it. If this be accepted, it follows that the present species, now regarded as the genotype, should in future bear the name *Sagartia elegans* (Dalyell).

Sagartia miniata was first observed by Gosse, so he informs us, at Weymouth in the year 1853, "adhering to the shells of oysters and pectens, brought to market by the trawlers." Since then it has been shown to be widely distributed and frequently very abundant on the south and west coasts of Britain and around Ireland; while it would appear to be equally at home between tide-marks and in comparatively deep water at considerable distances from land. In 1848, when Dalyell published his description of *Actinia elegans*, he would appear to have been devoting

¹ *Rare and Remarkable Animals of Scotland*, ii. (1848), 225; t. xlvii., fig. 9.

² *Actinologia Britannica* (1858-60), 41 and 122; t. ii., figs. 2, 3, and 4.

³ *Actinologia Britannica*, Appendix, p. 355.

⁴ *Fauna und Flora des Golfes von Neapel, etc.*, ix. (1884); *Le Attinie* (Monografia).

himself with diligence to his observations on marine life for close on a quarter of a century, since the famous *Actinia*, "Granny," originally a native of North Berwick, had then been in his aquarium for twenty years. His notes make it clear that he had obtained living sea-anemones from Arran¹ and probably other localities on the west of Scotland at which *Sagartia miniata* is known to occur, and one might therefore reasonably expect that one or other of his careful descriptions would prove to be a previous account of that common west-coast species.

Before proceeding further, it may be well to attempt a brief indication of what seem to be the salient characteristics of *Sagartia miniata*. In a group of creatures notoriously subject to colour variation, this species is outstandingly so, and while certain features of its tint and markings should be kept in view, undoubtedly more reliable characters can be found in its habits, mode of reproduction, and structure. Perhaps the following six points may be regarded as the most outstanding:—

1. Each tentacle normally bears, close to its base, two distinct, dark, transverse bars, of which the uppermost is much the broader.
2. The column is typically of a deep, rich brown, having a distinctly reddish cast, and conspicuously spotted above with large, pale, suctorial warts and cinclides.
3. The copious, white acontia can be discharged both through the mouth and the cinclides which, though few, are well developed.
4. Emission of the acontia commonly takes place on even the slightest irritation.
5. The ova, though apparently they may be fertilised prior to discharge, are not long retained, and so-called "viviparous" production of young has not been observed.
6. New individuals are commonly formed from spontaneously separated portions of the base, usually of a mature specimen, in the same way as in *Metridium*.

¹ *Rare and Remarkable Animals of Scotland*, ii. (1848), 227 and 234.

In addition to the fact that the above characters are all either stated definitely or clearly implied by Gosse in his account of *Sagartia miniata*, I can personally vouch for their reliability as the result of several years' study of numerous individuals of that species kept in confinement. These included, amongst others, five of the six varieties described in the *Actinologia Britannica*, all of which were collected by myself in those English, Welsh, and Scottish localities which Gosse cites as their home, and of which, in many cases, he has given such graphic pen-pictures.

Of the generally accepted species, including in *Sagartia* the sub-genera *Thoe* and *Cylista*, about thirteen are known to occur in British waters. Of these, in addition to *S. miniata*, I have been fortunate in obtaining many examples of no less than ten, all of which have thriven in captivity. It can be confidently asserted that only three other British sea-anemones share that combination of habits, structure, and reproduction which has been indicated above to be characteristic of *S. miniata*. These three, *S. rosea* (Gosse), *S. nivea* (Gosse), and *S. venusta* (Gosse), have been shown to differ from it only in coloration, not having any distinct pattern on their disc and tentacles; in all other respects they are identical with it. In fact, so closely are they linked to it, through its varieties *roseoides*, *niveoides* and *venustoides* respectively, that their claim to be regarded as specifically distinct is extremely doubtful. Assuming, however, that the peculiarities in coloration which they show are of specific value, they are, on that ground alone, ruled out of the present problem, since they do not correspond with the description given of *Actinia elegans* with its "belted" tentacles.

Turning now to the latter creature, it will be found, as indeed one would expect from so devoted and thorough an observer as Dalyell, that in his description, details are given regarding five of the six points listed in the case of *Sagartia miniata*, thus providing an exceptionally good chance of satisfactorily comparing the two anemones. Taking these data in the same order as

previously, the characteristics of *Actinia elegans* are as follows:—

1. "The tentacula are belted black and reddish alternately, from the root upwards." In an excellent coloured figure¹ they are shown to have, near the base, a pair of distinct, dark, transverse bars, of which the uppermost is much the broader.
2. "For the most part, the body is reddish-brown or orange colour, the upper part spotted white."
- 3, 4. "When suffering pressure, or any annoyance, long, slender, white filaments protrude from all parts of the body; and when the water is poured off, they issue from the mouth."
5. "Two days after three of these Actiniæ had fed on mussel, a multitude of minute, dingy yellow, homogeneous, flattened, ovoidal corpuscula lay motionless in the vessel containing them."
"Specimens have survived three years in my possession, without producing living young."
6. Unfortunately, nothing is recorded regarding this.

I have preferred, as will be seen, to quote the exact words used by Dalyell. Their significance and their remarkable coincidence with the characters given by Gosse in respect of *Sagartia miniata* need no comment beyond this, that many a question of synonymy has been settled on much less convincing evidence than is here available.

There remains but one argument against the interpretation of this evidence in the way I believe to be correct, namely, the treatment of *Actinia elegans* adopted by Gosse. In the *Actinologia Britannica* it is included, but only with doubt, among the synonyms of *Sagartia undata* (O. F. Müll.).² That his doubt regarding the propriety of this was considerable may be gathered from his statement:³ "I refer with hesitation the *Actinia elegans* and *A. explorator* of

¹ *Rare and Remarkable Animals of Scotland*, ii. (1848), t. xlvi., fig. 9.

² Throughout the *Actinologia Britannica* this species is called *Sagartia troglodytes* (Price).

³ *Actinologia Britannica*, p. 100.

Sir John Dalyell to this species." As a matter of fact, the two anemones have no connection whatever with one another. This will be seen at a glance from the following notes on *Sagartia undata*, arranged as before:—

1. Each tentacle has normally at its base a single, broad, dark, transverse bar below which are two dark curves, side by side, giving somewhat the appearance, when viewed laterally, of a capital B.
2. The column is typically olive of a greenish or brownish cast, usually marked with pale longitudinal lines and inconspicuous pale suctorial warts.
3. The acontia are only discharged through the mouth, or in the event of injury, through actual ruptures in the column or base.
4. Emission of the acontia only occurs in the case of very severe irritation.
5. The ova are commonly retained within the parent during their development subsequent to fertilisation, consequently "viviparous" production of young is characteristic.
6. New individuals have never been observed to be produced by spontaneous separation of portions of the base.

In conclusion, I would again refer to the virtual admission by Gosse of the identity of *Actinia elegans*, Dalyell, with his *Sagartia miniata*. His actual words are these: "A friend (E. W. H. Holdsworth) thinks that the *Act. elegans* of Dalyell is this species. If so, my name must give place to his." Despite the fact that changes in nomenclature are from certain points of view undesirable, there would seem to be good and sufficient reasons in this case for giving effect to what was, after all, foreshadowed by Gosse himself.

A Third Record for Britain of the Subalpine Warbler.—

On the 30th of May 1924 a Subalpine Warbler (*Sylvia cantillans cantillans*) appeared on the Isle of May. The wind was a little north of east and light, and there had been some fog. This is the first record for the Forth area and the third for Britain, the other two having also been in spring.—LEONORA JEFFREY RINTOUL and EVELYN V. BAXTER.

Late Migration of Swifts.—About 3 P.M. on 22nd June, when I was at 3000 feet on the west slope of Braeriach, I was interested to see eleven Swifts pass over. They steered N.W. and were evidently on migration. I had noticed their late arrival at our house at Aviemore; they kept increasing in numbers up to about 20th June.—SETON GORDON, Aviemore.

Great Black-backed Gull breeding in Buteshire.—I have to put on record that I found a nest of Great Black-backed Gull this year, on 7th June, on Inchmarnock. The nest was on open shingle, and contained one egg. This is the first published record of this species breeding in Buteshire. Last year in the SCOTTISH NATURALIST (1923, p. 51) I stated that I had heard that it had bred in this place in recent years. A short time ago Mr J. P. Ritchie of Johnstone, who has visited Inchmarnock on several occasions, told me that there were three nests of this Gull on the island last year. I have no doubt that it has bred there regularly for some years. I am placing the egg in the Bute Natural History Museum at Rothesay.—J. M. M'WILLIAM, Craigmore.

Great Black-backed Gull nesting in Clyde Area.—I wish to report the breeding of the Great Black-backed Gull on the Little Sgat Island, at the entrance to Loch Fyne. I found a nest there on 18th June with one addled egg, and saw the birds in the neighbourhood. This is the fourth breeding station of this Gull reported in the Clyde area in the last couple of years. I believe that for a number of years this bird has been thinly distributed over the Clyde as a breeding species.—J. M. M'WILLIAM, Craigmore.

Greenshank breeding in Aberdeenshire.—This year during my wanderings I saw a Greenshank breeding at . . . in Aberdeenshire, an interesting record.—SETON GORDON, Aviemore.

[We regret that owing to the persistent harrying of Greenshanks' nests in Scotland by collectors, we are compelled to delete the locality of this interesting occurrence.—EDS.]

Willow-Wren building in Tree in Perthshire.—I herewith enclose a nest and one egg, and wonder if you would be kind enough to confirm the identification as that of a Willow-Wren. The nest was found by Lord Scone in a fir plantation, about 4 feet high, in a spruce tree. There were six eggs in the nest, three of which hatched out.—JOHN RITCHIE, The Museum, Perth.

[The domed nest and the egg are typical of the Willow-Wren.—EDS.]

Colour-variety of Rook.—On 19th July one of the keepers shot, at Glenorchard, Torrance, near Glasgow, an uncommonly coloured "crow." It is a young bird which still retains some of the nestling down, and from its general appearance might be regarded as either a Carrion Crow or a Rook. The bird has been presented to the Royal Scottish Museum, where it has definitely been identified as a Rook.—JAMES BARTHOLOMEW, Torrance.

[The plumage of this bird is for the most part of a warm brown, the "fuscous" of Ridgway's Color Standards, pl. 46, fig. k, shading on the cheeks, wing, and tail into blackish brown, Ridgway's "fuscous-black." The inside of the mouth was of the pale flesh-colour, characteristic of a normal Carrion Crow; but the fact that primaries 2nd to 5th are emarginate on the outer web, and that the 2nd primary is longer than the 6th, clearly indicates a Rook.—EDS.]

Abnormally shaped Ptarmigan's Eggs.—I am sending for the Royal Scottish Museum collections, two curiously shaped Ptarmigan's eggs. They were found, in the mid week of July, in a deserted nest on the west side of Braeriach, 3925 feet above sea-level. An interesting thing about their discovery is that I had seen a nest last year at almost the identical place and height, and the eggs were curiously thin and elongated like these now forwarded. There is, I think, no doubt that they are the product of the same hen, and it is interesting that she should nest each spring at the same level and place.—SETON GORDON, Aviemore.

[The eggs measure 47.5×28.5 mm. and 46.5×28.5 mm. Hartert (p. 1868) records the maximum egg as 48×31 mm., and *The Practical Handbook* (vol. iii., p. 868) one which measured 49.5×29.6 mm., as contrasting with the average of 100 Scots eggs— 43.58×31.02 mm. Mr Gordon's eggs while not longer, are narrower than any recorded, and this emphasised the unusually long oval of their shape.—EDS.]

Local Scarcity of the Stone Humble Bee.—Ten years or so back there were generally one or more nests of the Stone Humble Bee (*Bombus lapidarius*) on the premises of this station each year, and the species was noticeably common on Cumbræ. Recently the reverse has been the case. During the last five years I have not found one single nest, and the bees have been very scarce—*e.g.*, in 1922 I saw one individual, in 1923 two, and to date this year I have not seen one. It would be interesting to hear other people's observations on this change.—R. ELMHIRST, Marine Biological Station, Millport.

Dragonfly (*Æschna juncea*, Linn.) in Leith Docks.—A female specimen of this Dragonfly was brought to the Royal Scottish Museum on the 5th July by Mr R. B. Henderson, who had captured it in Leith Docks at 4 P.M. on the previous day. A certain amount of interest arises in connection with this capture. In the first place, the date is unusually early for the appearance of the species, and I only know of two other records so early in the month, the insect being more often seen in August and September. Secondly, there appears to be only one other record of the species in the county of Edinburgh, namely, a male example taken in George Street, Edinburgh, on 13th August 1909. Is it possible that the Leith Docks specimen was introduced with cargo from the Continent, or can it have flown over or been carried by the wind?—PERCY H. GRIMSHAW, Royal Scottish Museum, Edinburgh.

BOOK NOTICE.

CHARLIE MACINTOSH: POST-RUNNER, NATURALIST, AND MUSICIAN.

By Henry Coates, F.S.A. Scot. London: T. Fisher Unwin.
1924. Pp. 142. Price 3s. 6d. net.

This is a much abridged edition of a work, already noticed in our pages (SCOT. NAT., 1923, p. 62), telling the life-story of one of Scotland's born naturalists. For the general reader the book has gained by its severe cropping, since somewhat luxurious detail has been shorn away, and the tale of Macintosh's achievements as botanist, ornithologist, geologist, meteorologist, and archæologist stands out all the more clearly and impressively for its condensation. Many naturalists and prospective naturalists will enjoy the reading of this simple story.

The Scottish Naturalist

No. 149.]

1924 [SEPTEMBER-OCTOBER

THE TYRANNY OF NAMES.

"A FAMOUS name will never die," wrote Hans Andersen on one occasion. Would that the statement held in the zoological as in the humanitarian sphere, for nothing has been more confusing than the changes of recent years, which have cast on the waste-heap many names familiar to the older naturalists. The changes are due to a laudable desire to reach bed-rock in specific names, many, to what we can hardly regard as other than an unfortunate and belated decision to replace the 12th and revised edition of Linnæus' *System* by the immature 10th edition, as the basis of binomial nomenclature. This change, however, is now *fait accompli*, and must be accepted as such, at any rate in every case where clearness and not confusion is likely to result.

Every one is agreed that one species, one name, is the ideal to be aimed at. How often, in everyday talk, one encounters the difficulties that arise owing to the local misapplication of names. In southern Scotland the stoat is almost universally termed the weasel, and the carrion crow is often known as the "hoodie." It is the effort to avoid such confusion, in the more technical region of scientific names, that has led to an attempt to reach stability by fixing upon the first name indubitably applied to any species. And so far as the method is applied reasonably and on irrefutable evidence, no fault can be found with it.

But there is one aspect of the strict acceptance of priority against which we would protest, and that is the perpetuation of inaccuracies in spelling. A couple of examples will illustrate the point. The long-snouted Ganges Crocodile is known to the natives as the Garial, and this name was adopted by Englishmen resident in India. Every one knows with what ease, in printer's pie, the letter "r" becomes "v," and by a clerical error, it is said, Garial was once written Gavial. Unfortunately the mistake took root and reached its climax when the generic name of *Gavialis* was bestowed upon the creature, a meaningless, inaccurate transliteration of the true name.

A less excusable blunder casts its shadow over the British Tree-creeper. Professor Ridgway, a distinguished American ornithologist, recognising its distinctness, desired to give this bird a new specific name. But Professor Ridgway's ornithology was better than his spelling; indeed he committed a blunder for which many a schoolboy has suffered ere now, he spelled Britain with two "t's," and his name *brittanica* has been perpetuated in some standard works. We feel sure that the author of the name could have no desire to go down to posterity as the man who made a "howler" at which schoolboys would giggle; and it is putting an undue tax upon ornithologists to expect them to remember in which case, amongst the British birds possessing the appellation *britannicus*, the name should be deliberately misspelled.

Such blunders should be despatched off-hand, no good word can be said for them; and the execution should be the easier since the rules of the International Congress on Nomenclature (1905), state definitely that "The original orthography of a name is to be preserved, *unless an error of transcription, a lapsus calami, or a typographical error is evident*" (Art. 19).

Sometimes we seem to be in danger of forgetting that names are for the convenience of science and not for its encumbrance; they are good servants, but uncommonly tyrannical masters.

OBSERVATIONS ON THE HATCHING OF THE
FIELD SLUG, *AGRIOLIMAX AGRESTIS*, LINN.

By HERBERT W. MILES, N.D.A., Dip. Agr. Hons.
(Harper Adams), University of Bristol.

PROBABLY the most recent work on *Agriolimax agrestis*, L., is that carried out by Lovett and Black¹ of the Oregon Agricultural College. Since very little has been published on the detailed life history of this species in Britain, it is thought that a few notes collected during the winter of 1921 may be of interest.

The Egg and Changes observed prior to Hatching.—Clusters of eggs were collected on 18th November from the soil beneath the leaves of strawberry plants in the beds at the Agricultural and Horticultural Research Station, Long Ashton; they were placed on damp filter paper in a petri dish and kept under observation. In shape they were practically spherical, with an average diameter of 2 mm.; their colour was densely white, and each egg had a darker area in the centre. This dark mass extended and became very dense as embryonic development proceeded. The micropyle or nib, as described by Lovett and Black, was not observed in the eggs collected, but these workers point out that it is "frequently considerably reduced or vestigial."

Development and segmentation were observed to proceed slowly until, four days prior to hatching, the eye spots, with the lesser pigmented areas around them, could be seen, and the head and caudal portions distinguished. From two to three days before emergence the embryonic Slugs were seen to be active and took up various positions, frequently getting into such an attitude that the part of the head where the radula is located could be pressed against the inner surface of the shell. About twenty-four hours before escaping from the shell the young mollusc became exceedingly active, and

¹ Lovett, A. L., and Black, A. B. (1920) *Bull.* 170, Oregon Agricultural College.

made continuous and sustained movements, thrusting out the radula against the shell membrane, which it rasped in small local areas. These efforts were applied apparently indiscriminately whenever the head came into definite contact with the membrane, but whether to rasp away portions and so render the whole enveloping tissue less resistant, or to find some particularly weak area could not be decided. By this time the eye spots were very distinct and the tentacles, streaked with very minute pinkish pigment spots, could be seen. Continued efforts accompanied, probably, by the hardening up of the radular denticles, at length resulted in the head and mouth parts being thrust through the shell membrane and the whole body being slowly drawn out. Many specimens effected this emergence with ease, but others, possibly through extra thickness or toughness of the enveloping membrane, experienced considerable difficulty. In one instance (Fig. 2) the head and tail were thrust through in diametrically opposed positions: the tail was thrust out until, apparently, it could go no further nor be withdrawn, whereupon the head was drawn back into the shell membrane and worked round to rasp the tissue in the region where the tail was gripped; this having been freed the young Slug slipped out backwards. This specimen, when fully extended immediately after emergence, measured 4 mm., this being considerably above the average, which was found to be 2.75 mm.

The eggs collected on 18th November all hatched during the two days 7th and 8th December; they were estimated to be from two to three days old when collected, this would, therefore, give the period of development as from three to four weeks, agreeing with that given by Theobald.¹

Description of the Newly-emerged Slug.—The immature Slug, immediately on emergence (Fig. 3), is protoplasmic white with traces of pink. On careful examination, the portion anterior to the shell is seen to be of a dirty pinkish white; the shell appears much darker as it bears around the edges innumerable brownish spots; its central area being only sparsely spotted, appears much lighter. The portion from

¹ Theobald, F. V. (1909) "Insect Pests of Fruit."

the posterior edge of the shell to the tip of the tail is evenly spotted, the sides just above the sole appearing darker owing to the aggregation of the colour spots into streaks. On emergence the eye tentacles can only be extruded for a short distance and the eye spots do not reach their apices. The tentacles are proportionately large and pinkish in colour, the fine pink pigment spots collecting into

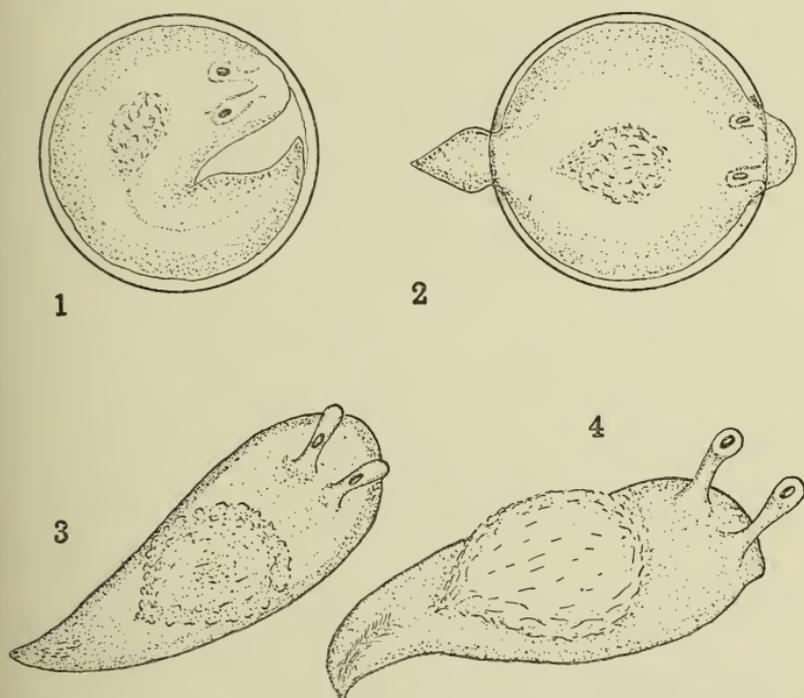


FIG. 1.—Embryo Slug in egg three hours before emergence. $\times 15$.

FIG. 2.—Abnormal hatching; thirteen minutes before emergence. $\times 15$.

FIG. 3.—Young Slug fully extended immediately on escape from the egg shell. $\times 12$.

FIG.—4. Young Slug twenty-four hours after hatching. $\times 12$.

streaks laterally. With continuous effort the tentacles are protruded further and further, the eye spots attaining nearer and nearer their apices, until, about fifteen minutes after emergence, they are completely extruded and the eye spots occupy their normal positions (Fig. 4).

In from three to four days the reticulation can be distinctly seen and the respiratory orifice can be located.

The central area of the shell is now whitish and protoplasmic, being denser and darker towards its posterior edge. The tail is seen to be keeled dorsally: the sole is protoplasmic and translucent.

After the emergence of the young Slugs from the eggs, water was absorbed by the oval envelopes, the exit holes closed up, and the size of the normal egg was attained.

Feeding Habits of Young Slugs.—Upon hatching, the Slugs were placed in petri dishes with entire leaves of clover and ryegrass, but feeding was not observed to take place, neither could any feeding punctures be found in the leaves on subsequent microscopic examination. Next day they were removed to dishes with finely sifted soil containing much humus and some pieces of cabbage leaf. Here the Slugs began to feed freely on the leaf tissue, rasping at the cut edges but not attacking the unbroken tissue. About two days after this they were observed to feed readily on the sound tissue, making openings through the epidermis into the mesophyll. The evidences of their having fed were to be found in the form of small penetrating circular holes in either leaf surface, but as the Slugs got older the holes went right through the leaf and were very irregular and ragged in outline. In specimens about four days old, observed while feeding, it was seen that the usual position taken up was one of about three-quarter body extension, with the eye tentacles slightly more than half protruded and the lower tentacles fully extended; the radula was seen to be rasping at the rate of twenty-four times per minute.

Growth is comparatively rapid, the average length at one month old being 10.5 mm., fully extended, and the average width 2.2 mm. The young Slugs fed freely day and night during the first three weeks, but then gradually ceased feeding during daylight and hid in crevices and holes in the soil, coming out only at night to feed.

A NOTE ON SCOTTISH WRENS (*TROGLODYTES*),
WITH CHARACTERISTICS OF A NEWLY DE-
FINED HEBRIDEAN RACE.

By Col. R. MEINERTZHAGEN, D.S.O.

It has long been known that Wrens from the Outer Hebrides show differences from either the Shetland or mainland form. Thanks to the loan of specimens in the Royal Scottish Museum, I have now been able, in conjunction with three in our collection, to examine fourteen birds from the Outer Hebrides.

From *Troglodytes t. troglodytes* these differ in being darker and more heavily barred underneath. In size they are similar.

From *Troglodytes t. zetlandicus* they do not differ in the colour of the upper parts, but on the whole the barring of the underparts is more confined to the abdomen, whereas in *T. t. zetlandicus* the barring usually extends from the abdomen to the breast. The bill in similar sexes is invariably smaller than in Shetland birds, and resembles the mainland form.

The Hebridean race, therefore, shows characters intermediate between Scottish and Shetland birds, but as the Outer Hebrides cannot be said to be geographically intermediate between the Shetland Islands and Scotland, the race is worthy of a name. I therefore propose:—

TROGLODYTES TROGLODYTES HEBRIDENSIS, subsp. nov.

Type in the Royal Scottish Museum. ♂. Butt of Lewis Outer Hebrides. 1.10.1914. Reg. No. 1914.168.23.

Rooks Removing Nests.—During the nesting season this year seven instances of Rooks' nests being removed came under my notice. All these nests were fully built and some must certainly have had eggs. Four cases occurred at Duddingston Rookery, the others at Musselburgh, and as I pass both places twice daily, I was

quite familiar with most of the nests. In most cases the nests were there one day and entirely gone the next. Rooks seem to resent outlying nests at a rookery for some reason and these very often disappear. One such nest was built in the Haugh at Musselburgh, a good distance from the nearest rookery. Towards the end of April several other Rooks frequented the tree and I expected to see other nests built. On passing one morning I found everything gone. The disappearance of other nests built in the main colony is not so easily accounted for. Young inexperienced birds are often robbed of their building material, but I hardly think this is the solution. A nest at Duddingston, in a fairly easy position, to which I intended climbing, disappeared just when I expected it to have the full clutch.

It would be interesting to hear of similar cases at other rookeries.

Incidentally, I may mention, that for two years I have seen Rooks building at Duddingston during September. One nest was an entirely new structure and not merely a case of repairing. Unfortunately I could not get near enough to see how far on it went.—
DAVID HAMILTON, Edinburgh.

Sandwich Tern Breeding on the Clyde.—Both in 1923 and 1924 I found the Sandwich Tern nesting on the Clyde Estuary, each time in the same locality. Here I first saw the birds on Saturday, 2nd June 1923, and got one nest with one egg; the egg was on the bare rock and there was no sign of a formal nest. On 7th June 1924 I returned and found four nests, two with two eggs each and two with one egg. I showed one of the eggs to the Rev. J. M. McWilliam, and he states that it is a typical egg of the Sandwich Tern. The Sandwich Tern was reported as breeding on the Clyde in 1913 by Mr MacKeith, but this is the only record of recent years, and I believe that my locality is not the same as his. For obvious reasons I do not wish to name the place; Arctic and Common Terns also nested there.—
JOHN P. RITCHIE, Johnstone.

Slaughter of Bitterns in Solway Area.—I regret that I have heard of no less than five of these birds having been killed in the Solway area during the winter and early spring of 1924: 1. Lochmaben (Dumfriesshire); 2. Newcastleton (Roxburghshire); 3. Castle Douglas (Kirkcudbright); 4. Abbey Town (Cumberland); and 5. Kirkbride (Cumberland). A Bittern was seen at the end of January 1924 near the Barony, Kirkmichael, Dumfriesshire, and was unmolested.—
H. S. GLADSTONE.

REPORT ON SCOTTISH ORNITHOLOGY IN 1923.

By LEONORA JEFFREY RINTOUL and EVELYN V. BAXTER.

*(Concluded from p. 120.)*HABITS, ETC.—*continued.*

A Mallard nested in a lime tree about 30 feet above the ground quite close to the house at The Hirsell; while on 28th April, at the Isle of May, a Gannet was seen to dive down on a Cormorant which was trying to swallow a flat fish, apparently trying to take the fish from its captor. The latter "went for the Gannet and they pecked at each other, until at last the Cormorant got the fish down. The Gannet sat dejectedly on the water for some time." An Oystercatcher's nest, built of dead heather stems, was found near the River Dee at Dinnet, Aberdeenshire (2. xvii. 41). On the 16th October a Redshank was seen to fly out at full tide and alight on a raft of sea-weed which was floating in the sea near Cardross (Clyde), its legs sank through so that its body touched the water in a kind of sitting posture. After pecking around the bird turned to the shore again, and "its support giving way, the bird launched itself and seemed even to swim a short distance before rising and flying back to land." Herring Gulls, on the Bass Rock, killed and carried off young Rabbits, and were also seen carrying away Gannets' eggs whole.

Moorhens in Forfarshire built their nests on stones in the Elliott Water (1. 1923, 175); this would appear to be a local habit of Moorhens, as about fifteen years ago we found their nests in similar positions in burns near Forfar. At Charleton (Fife), a Moorhen's nest was found decorated with daffodil flowers (2. xvii. 89), and a Pheasant bred in a tree at Brigton, Forfarshire (1. 1923, 124). Grouse at Johnstone were seen on 14th November at the corn-stooks, "which were banked with snow." Blackgame in Dumfriesshire did much damage to a plantation of young larch, nipping off the side shoots, and in many cases the leader also (1. 1923, 54).

MIGRATION—SUMMARY OF MOVEMENTS.

January.

A mild and open January with almost continuous north-westerly to south-westerly winds showed, as one might expect, no weather movements. The warmth encouraged our nesting birds to remain at their breeding stations; we have records of Swans and Ducks, and two Bitterns are recorded during this month.

February.

In the first half of February we have returns of our breeding birds to their nesting places, and during the second week some signs of emigration; the wind was south to south-easterly, and the weather mild. During the second half these movements became intensified; there was a marked departure of winter visitors. The wind was consistently south-east.

March.

In the first half of March we have a great many notes of returns to breeding places, a northward movement of Redwings, and an arrival of Lesser Black-backed Gulls. During the first week the wind was mainly from some southerly quarter, thereafter it was variable. By the third week we find the higher grounds occupied, Curlew to 1500 ft., Snipe to 700 ft. Arrivals of Wheatears are recorded, and departures of winter visitors. The wind was north-east to north-west light. During the last week there was quite an unusually early arrival of summer visitors. Winter visitors were leaving and one or two passage migrants were noted. The wind was south and south-east, the weather mild.

April.

During the first three weeks of April the wind blew consistently from between N.E. and S.S.E.; in the last week the wind was chiefly westerly and the weather was colder. In the first week of April there was a decided arrival of summer visitors, many of the species noted being much earlier than usual. There was a strong departure of winter

visitors and some passage migration. The next week brought an intensification of these movements. During the rest of the month the arrivals of summer visitors became more marked; but there was a diminution in the departures of winter visitors and in the passage migration.

May.

There was a big arrival of summer visitors in the first week of May; this continued till the end of the month, slackening in volume as the month progressed. Winter visitors in small numbers were moving throughout the month. Only slight passage movements are recorded, the wind being almost entirely from some northerly to westerly quarter, and there being a very cold snap in the middle of the month.

June.

June was a cold month with much northerly to westerly winds; little movement is recorded though some winter visitors lingered as late as the third week of the month. A few late summer visitors were arriving during the first week, and there were one or two passage migrants up to the third week. During the last week we have the first returns of Wader to the shore and flocking of Missel Thrushes, Oystercatchers, and Curlew.

July.

The first fortnight was warm with variable winds chiefly from some westerly quarter; there were movements of Wader from inland to the shores, and during the second week the beginning of the arrival of Wader from overseas. By the third week autumn movements of our summer visitors was becoming apparent, and there was a decided departure of Swifts, the wind being west and south-west; while during the last week there were arrivals of overseas Wader and a little passage migration. The wind was light and variable chiefly N.E. to S.E.

August.

The first week of August shows departures of Swifts, Cuckoos, and Common Sandpipers, movements of summer

visitors through the country, and more returns of our Wader to the shores. The wind was variable, and thereafter to the end of the month it was from N.N.W. through west to south. The departure of summer visitors continued, becoming intensified in the last week, and a few passage migrants are recorded. Sea-birds were leaving their breeding cliffs in the second week, the first arrivals of Geese are recorded in the third week, and during the last week there were distinct movements of partial migrants and of Duck. Arrivals of Wader from overseas continued throughout the month.

September.

Throughout September the wind was from some westerly quarter, and all through the month we have a steady stream of departure of summer visitors, this lessening towards its close. There was also a little passage migration and a few uncommon visitors, but nothing in the nature of a rush. During the second week arrivals of winter visitors are recorded, these increasing as the month advanced. Up to the end of the month great flocks of Common and Sandwich Terns are recorded on the East Coast.

October.

In October the wind was chiefly from some westerly quarter and often strong. Considerable arrivals of winter visitors are recorded throughout the month, especially in the last week. There were a few late summer visitors right up to the end of the month, a few uncommon visitors, and a few passage migrants.

November.

The wind in November was chiefly westerly in southern Scotland, with a greater tendency to east and north-east in the north in the second half of the month. In the first half of November there was a decided arrival of winter visitors, and there are very late records of summer visitors to the 21st. During the last half, winter visitors continued to arrive but in steadily diminishing numbers.

December.

Up to the 22nd we have very little record of migration; the wind was from some westerly quarter. Thereafter to the end of the month, with northerly winds, frost, and snow, there was a distinct weather movement.

MOVEMENTS OF BIRDS IN SCOTLAND IN 1923,
ARRANGED UNDER SPECIES.

HOODED-CROW, *Corvus cornix cornix*.—Northward movement is noted during March; last seen Buddon Ness on 10th April, Isle of May on 28th April, and the Bell Rock on 14th May. On 10th November three were seen at Corsemalzie and two at Largo on 24th November.

CARRION-CROW, *Corvus corone corone*.—One was seen on Ailsa Craig on 26th March and several at the East Neuk of Fife three days later, while small numbers stayed about Buddon Ness till 16th April. Had returned to this station by 1st August, and a few were seen there till 4th October, when a good many were present; all had left by 6th October. One was seen on Ailsa Craig on 15th December.

ROOK, *Corvus frugilegus frugilegus*.—Considerable northward movement is recorded from our Northern Isles from 13th February to 2nd April; a Rook was seen on Ailsa Craig on 7th April, and one on the Isle of May on 28th April. About 100 arrived on Fair Isle on 10th November and stayed a week there.

JACKDAW, *Colæus monedula spermologus*.—Small numbers visited Fair Isle frequently between 13th February and 22nd March, two were at Outskerries on 4th March, one on Ailsa Craig on 10th March, and two at the last station on 1st October.

STARLING, *Sturnus vulgaris vulgaris*.—Single birds visited Hyskeir on 1st and 15th February, a few arrived at Ailsa Craig on 21st February, and four at the Bell Rock on 3rd March. From 22nd March to 16th April considerable movement is reported from Bell Rock, Buddon Ness, and Hyskeir, and two or three at the Bell Rock on 10th, 20th, and 31st May, and 9th June. A few are recorded at Hyskeir from 6th to 16th July, from 20th August to 20th September a lot of movement is recorded at Buddon Ness, passage to S.S.W. was seen over the Isle of May on 24th and 28th September, and numbers there on 20th October. Intermittent movement is reported from Ailsa Craig and Hyskeir from 23rd October to 28th November, as well as from many of our mainland stations.

GOLDEN ORIOLE,¹ *Oriolus oriolus oriolus*.—See p. 107.

HAWFINCH, *Coccothraustes coccothraustes coccothraustes*.—On 23rd June a male Hawfinch was found exhausted at Bowhill, Selkirkshire.

GREENFINCH, *Chloris chloris chloris*.—Single birds were seen at Hyskeir on 31st March, and going N.W. over the Isle of May on 29th April. Movement is noted at Hareshawmuir on 17th September, and at Buddon Ness on 20th and 24th September, while an increase took place at Hareshawmuir on 7th November.

GOLDFINCH, *Carduelis carduelis*.—Goldfinches, no doubt of the British subspecies, are reported from Moncrieffe on 7th January, Allanton (Berwickshire) on 26th February, Musselburgh in June (1. 1923, 152); Letham (Forfarshire) on 4th July; Leuchars (Fife) on 9th July; Aberfeldy on 21st August (1. 1924, 28); Corsemalzie on 1st September; Kirkinner (Wigtownshire) on 3rd November, and Moncrieffe on 21st November. Single birds on Ailsa Craig on 10th November, and the Isle of May on 27th November, may have belonged to the typical form.

SISKIN, *Carduelis spinus*.—A pair was seen in Duns Castle Woods on 7th May, one or two on the Isle of May from 26th to 28th September, and a number west of Dundee during November. A flock of fifteen appeared near Mochrum on 1st November, and a male on Hyskeir on 8th November.

TWITE, *Carduelis flavirostris flavo-rostris*.—Numbers were on Ailsa Craig on 21st February, and single birds on Hyskeir on 4th, 5th, 12th, and 31st March. Flocks again on Ailsa Craig on 16th September and 10th November, and a lot of movement at Hyskeir from 4th October to the end of the year.

MEALY REDPOLL, *Carduelis linaria linaria*.—On 31st March three Mealy Redpolls were at Buddon Ness. A good deal of movement is recorded from Fair Isle from 15th October to 2nd November, about one hundred being seen on 22nd October, two at Hyskeir on 28th October, and one there on 30th November.

LESSER REDPOLL, *Carduelis linaria cabaret*.—Flocks are reported at Cullen on 21st February, and Corsemalzie on 2nd March.

COUES REDPOLL, *Carduelis hornemanni exilipes*.—See p. 107.

LINNET, *Carduelis cannabina cannabina*.—On 10th September

¹ On page 107 we record two female Golden Orioles from Dumfriesshire. This is an error, the two records refer to the same bird.

a big flock passed up river at Buddon Ness, and flocks were going south at Ratho from 16th to 23rd September.

CHAFFINCH, *Fringilla œlebs œlebs*.—Single birds were at the Ailsa (L.) 14/15th February, on Ailsa Craig 21st February, Outskerries on 25th March, and Fair Isle on 29th March. A good deal of movement is recorded from Fair Isle and Buddon Ness between 5th and 14th April, and a cock Chaffinch on the Isle of May on 12th and 13th May. Single birds, hens, are noted on Fair Isle on 14th and 28th September and 2nd October, and a movement at Hareshawmuir on 17th September. A large immigration took place on Fair Isle on 27th October, and some Chaffinches stayed there till 26th December. The Tay Estuary records arrivals on 28th October, Ailsa Craig on 30th October, and Outskerries on 1st November.

BRAMBLING, *Fringilla montifringilla*.—Much departure is noted all over Scotland during April, last seen Hyskeir 27th April, and the Isle of May 9th May. The first autumn records come from the Isle of May on 4th October, Fair Isle next day, and Hareshawmuir on 21st October. After this arrivals are reported to 20th November.

TREE-SPARROW, *Passer montanus montanus*.—Single birds are recorded near Monikie on 3rd July, and Glen Clova on 11th July.

CORN-BUNTING, *Emberiza calandra calandra*.—One is noted at the Bell Rock on 22nd March, and a few on Ailsa Craig, 5th May.

YELLOW-BUNTING, *Emberiza citrinella citrinella*.—Single birds are reported from Ailsa Craig on 1st January, and 14/15th February (L.), a few on Fair Isle on 23rd February and 16th May, a male on the Isle of May on 30th April, and two next day, and one on Ailsa Craig on 28th May. Two were on Fair Isle on 29th October, and one on Ailsa Craig on 13th and 14th December.

ORTOLAN, *Emberiza hortulana*.—See p. 107.

LITTLE BUNTING, *Emberiza pusilla*.—See p. 107.

REED-BUNTING, *Emberiza schœniclus schœniclus*.—Arrived to breed at Lundie Lochs on 25th March; three were at Vallay (O.H.) on 19th June. Left their breeding grounds in Forfarshire in the last week of July and beginning of August; one was on the Isle of May on 4th and 8th October, five on Fair Isle on 2nd November, and a flock of fifteen at Moss of Cree (Wigtownshire) on 19th November.

LAPLAND BUNTING, *Calcarius lapponicus lapponicus*.—See p. 107.

SNOW-BUNTING, *Plectrophenax nivalis*.—Northward movement is recorded during March and April; last seen Fair Isle on 1st June. Reappeared on Fair Isle on 12th September, Hyskeir on 14th, Vallay (O.H.) on 19th, Outskerries on 22nd, and the Isle of May on 25th September: after this many arrivals are recorded up to 20th November.

SKYLARK, *Alauda arvensis arvensis*.—On 12th January thirteen Skylarks visited Hyskeir, and this station and Ailsa Craig report constant movement in February and March, while inland stations note arrival of breeding birds during the latter month. From 17th March to 12th April there are a good many notes from the Bell Rock (and L.), and a few from Hyskeir to 13th April. A distinct passage took place between 27th April and 5th May, on 9th June a Skylark visited the Bell Rock, and one was on Hyskeir on 27th June. Much movement is reported from 13th September to 9th November, chiefly to the S. and S.W., but westward passage is recorded from the Tay Estuary during the third week of September, and the Isle of May on 15th October. From 23rd to 30th November some Skylarks were passing Hyskeir, and a weather movement is noted from 22nd to 29th December at Buddon Ness, E. Fife, Hareshawmuir, and Ailsa Craig.

SHORE LARK, *Eremophila alpestris flava*.—See p. 107.

TREE-PIBIT, *Anthus trivialis trivialis*.—Arrivals are recorded from Pollokshaws on 18th April, Duns on 22nd, Loch Goil on 27th, and Contin (Ross-shire) on 28th April. After this, immigration is noted up to 13th May. Autumn movement had begun by 5th August and continued throughout the month, last seen Loch o' the Lowes on 1st September, Balgay (Forfarshire) on 2nd, and Buddon Ness on 3rd September. Passage migrants visited Fair Isle on 26th and 27th September, two were on the Isle of May on 26th, 27th, and 29th September and 1st October, and one on 2nd October.

MEADOW-PIBIT, *Anthus pratensis*.—Numbers were at Glenorchard on 4th January, three at the Bell Rock on 3rd March, and one at Hyskeir on 6th and 7th March. From 14th March to 4th May steady movement is recorded; many of these related to returns to nesting places in Scotland, but some of the later ones were obviously passage migrants. A Meadow-pipit was on the Bell Rock on 20th May, and one at Hyskeir on 15th June. By 4th August, autumn movement had begun, and continued steadily till 5th October, direction of flight where noted being chiefly to S.W. and S.S.W. A few at Hyskeir till 16th October, at Tay Estuary to 11th

November, Johnstone on 19th November, Hareshawmuir on 30th November, and Balcomie on 4th December.

ROCK-PIBIT, *Anthus spinoletta petrosus*.—Two or three are recorded from the Bell Rock on 17th and 30th March, 1st April and 14th May, and many on Ailsa Craig on 7th April.

BLUE-HEADED WAGTAIL, *Motacilla flava flava*.—See p. 107.

YELLOW WAGTAIL, *Motacilla flava rayi*.—Is noted at Ailsa Craig on 13th and 16th April, Muirend (Cathcart), on 19th, Bridge of Weir on 24th, and Summerston on 28th April, while a male visited the Isle of May on 3rd May. Last seen near Alticig (Wigtownshire) on 24th September, and Ailsa Craig on 13th October.

GREY WAGTAIL, *Motacilla cinerea cinerea*.—Single birds are noted in January from Largo Bay and Oban, and from Dunlugas (Aberdeenshire) on 7th February. Returns to breeding-places are reported during March and up to 9th April, and autumn movement from 21st August to 24th September. Single birds visited Rednock (Port of Menteith) on 16th November, and Airs (Appin) on 3rd December.

WHITE WAGTAIL, *Motacilla alba alba*.—Is recorded on 31st March from Cullen, on 2nd April from Buddon Ness. From 14th April to 13th May there are constant records of the passage of White Wagtails from both east and west coast stations, and from 7th to 30th May at Fair Isle. Return movement is reported from Vallay (O.H.) on 28th July, and Fair Isle on 9th August, and from this time to 26th September steady passage is recorded from east coast stations and Fair Isle, while the last seen were two near Dundee on 13th October.

PIED WAGTAIL, *Motacilla alba yarrelli*.—About 1st February a flock of twelve Pied Wagtails was seen at Lundin Links. Arrivals for breeding are recorded steadily from 4th March to 16th April, and by 11th August autumn movement was already apparent. This grew in volume during September and continued to 17th October; unusually large flocks were seen during the first half of October at Lahill, Largo, Cameron Bridge, Buddon Ness, etc. Southward movement in frost was noted at Lahill on 26th December, and a Pied Wagtail walking about on the ice when curling was going on at Colinsburgh on 29th December.

BLUE TITMOUSE, *Parus caeruleus subsp.?*—Single birds are reported from Hyskeir on 14th July, and on the Bass Rock on 22nd October.

BRITISH WILLOW TITMOUSE, *Parus atricapillus kleinschmidti*.—Two were seen at Moncrieffe (Perthshire) on 5th January.

BRITISH LONG-TAILED TITMOUSE, *Aegithalos caudatus roseus*.—A good deal of local movement is noted in October and the first half of November.

GOLDCREST, *Regulus regulus*.—A Goldcrest is reported at Buddon Ness on 7th April, and one at the Bass Rock on 24th April. Considerable movement of our British *R. r. anglorum* is recorded from the Isle of May (and L.) from 20th September to 6th October; a number were seen in gorse by the shore at Barnhill (Forfarshire) on 11th October, and a good many on Ailsa Craig on 13th October, while three visited the Bass Rock on 23rd October: these *may* have been the continental form.

GREAT GREY SHRIKE, *Lanius excubitor excubitor*.—One is noted in mid-January at Dunkeld.

RED-BACKED SHRIKE, *Lanius collurio collurio*.—On 22nd May one was found dead on Fair Isle.

SPOTTED FLYCATCHER, *Muscicapa striata striata*.—Is first recorded from Balgay (Forfarshire) on 4th May, the Isle of May and Kinclaven on 8th, and Melrose on 9th; after this many records come of arrival, though in some cases the main body of Spotted Flycatchers were late in coming: thus Hareshawmuir records arrivals on 29th May, and at Balgay the chief arrival took place during June. By 8th August autumn movement was apparent and departure took place from this time up to 5th September; late records come from Isle of May lantern 20/21st September, Corsemalzie and Balgay on 23rd, and Fair Isle on 24th September.

PIED FLYCATCHER, *Muscicapa hypoleuca hypoleuca*.—Four males appeared at Duns on 10th May and one bird was on Fair Isle on 14th and 15th May. On 14th September four visited Fair Isle, and single birds were at this station and the Isle of May from 21st to 26th September.

RED-BREASTED FLYCATCHER, *Muscicapa parva parva*.—See p. 107.

CHIFFCHAFF, *Phylloscopus collybita collybita*.—Is recorded from Rothesay on 5th April, Duns on 15th, and Loch Goil on 18th April. One at Oban on 10th July (1. 1923, 152) and one or two on the Isle of May on 23rd, 24th, and 30th September and 2nd October.

WILLOW-WARBLER, *Phylloscopus trochilus trochilus*.—A very early arrival is recorded from Contin (E. Ross.) on 7th April; the

next is from Fair Isle on 13th, Strathblane, The Hirsell (Berwickshire) and Hyskeir on the 14th. Thereafter much movement is noted, but it was not till mid-May that full numbers were present at various inland stations. At Fair Isle passage migrants are recorded pretty steadily up to 23rd May. On 9th August a few appeared on the Bass Rock, and after this, movement of our own Willow-Warblers is noted constantly up to 14th September. From 23rd August to 28th September passage migration is reported from Fair Isle, many being there on 1st September. The last mainland record is from Balgay on 23rd September, and the last for the year is from the Isle of May on 29th September.

WOOD-WARBLER, *Phylloscopus sibilatrix sibilatrix*.—Is noted from Darvel on 25th April, Loch Goil on 5th May, Rouken Glen next day, and Johnstone on 14th May. The only autumn record is from Balgay on 5th August.

YELLOW-BROWED WARBLER, *Phylloscopus humei præmium*.—See p. 107.

GRASSHOPPER WARBLER, *Locustella naevia naevia*.—On 6th May one arrived at Darvel, and one was near Loch Fyne on 19th May. A Grasshopper Warbler appeared on Fair Isle on 28th September (I. 1923, 173).

SEDGE-WARBLER, *Acrocephalus schænobænus*.—Is first noted at Loch Elrig (Wigtownshire) on 3rd May, Hareshawmuir next day, Merrylee, Cathcart, and Possil Marsh on 5th May. After this the spread was rapid, though records of arrivals come as late as 27th May. All the Sedge-Warblers had left Lundie Lochs (Forfarshire) by 5th August; last seen near Westferry (Forfarshire) on 16th August, Johnstone on 1st September, and Loch Elrig on 10th September.

GARDEN WARBLER, *Sylvia borin*.—Arrived at the Hirsell (Berwickshire) on 21st April, Johnstone on 3rd May, and one was found dead at Joppa on 7th May; arrivals are recorded to 17th May. In autumn passage migrants visited Fair Isle on 18th, 21st, and 26th September.

BLACKCAP, *Sylvia atricapilla atricapilla*.—Is recorded from Dunlugas (Aberdeenshire) on 15th April and Duns on 12th May. Passage migrants visited Fair Isle on 19th, 20th, 21st, and 28th September, 2nd and 5th October.

WHITETHROAT, *Sylvia communis communis*.—Very early White-throats are noted at Outskerries on 3rd April and near Kingennie (Forfarshire) on 7th April. During May steady arrival is recorded

up to the 30th, and passage migrants at Fair Isle on 15th and 30th May and 4th June. Departure is first recorded from Kingennie on 15th August and continued into September; last seen Kames (Berwickshire) on 7th September and Loch o' the Lowes on 10th September. Passage migrants occurred on Fair Isle and the Isle of May between 19th and 25th September.

LESSER WHITETHROAT, *Sylvia curruca curruca*.—Single birds are noted at Fair Isle on 16th May, Isle of May on 5th October, and Hyskeir on 15th October.

EASTERN LESSER WHITETHROAT, *Sylvia curruca affinis*. See p. 107.

FIELDFARE, *Turdus pilaris*.—By the end of March, restless flocks of Fieldfares were seen making their way to the north, and throughout April much northward movement is recorded. Last seen Isle of May on 5th May, Bass Rock on 8th, and Hareshawmuir on 20th May. The first autumn arrival recorded is from Derrie (Mochrum) on 5th October; the next is on 20th October at the Isle of May, and thereafter many notes come of immigration up to 26th November. From 24th to 26th December, in hard frost and snow, a weather movement took place.

MISSEL-THRUSH, *Turdus viscivorus viscivorus*.—One visited the Isle of May on 5th May, and the species had begun to flock by 29th June. Single birds are noted at the Isle of May on 29th September and the Bass Rock on 28th October.

CONTINENTAL SONG-THRUSH, *Turdus philomelus philomelus*.—Considerable movement of Thrushes is recorded from Hyskeir and Ailsa Craig from 14th to 25th February; those at Hyskeir proved to be the typical form, and it seems likely that those on Ailsa Craig were also this race. Song-Thrushes at the Bell Rock lantern on 19th, 22nd, and 30th March may have been emigrants to the Continent; those at Hyskeir, Buddon Ness, and Fair Isle from 13th to 21st April certainly were.

On 13th September the first continental immigrant arrived on Fair Isle, some were on the Isle of May on 25th September and on 4th and 5th October, while from 16th October to 23rd November considerable arrivals are noted, all obtained being of this form. On 26th December a few Thrushes appeared on Fair Isle.

BRITISH SONG-THRUSH, *Turdus philomelus clarkei*.—Returns to inland nesting-places are reported in early March. Autumn movement had begun by 27th July and continued throughout August, while from 21st September to 8th October there are steady notes of British Song-Thrushes on passage on the Isle of May.

REDWING, *Turdus musicus*.—From 5th March to 21st April continuous northward movement is noted from stations in all parts of Scotland; last seen, Fowlis on 23rd April, Isle of May on 27th April, and Fair Isle on 6th June. First recorded in autumn from Fair Isle on 28th September, Derrie (Wigtownshire) on 2nd October, and the Isle of May on 4th October. After this a big immigration took place all over the country lasting till 20th November. A weather movement is recorded from 22nd to 26th December from Forfarshire, Fife, and Fair Isle.

RING-OUZEL, *Turdus torquatus torquatus*.—An adult male was seen at New Monkland, Lanarkshire, on 11th January, a very unusual date. Arrivals are noted at Fast Castle on 30th March, and Glen Tilt on 9th April, and passage migrants at Fair Isle on 6th, 9th, 14th, 21st, and 26th April, and the Isle of May on 3rd May.

BLACKBIRD, *Turdus merula merula*.—Small numbers are reported from Ailsa Craig on 14/15th (L.) and 21st February, Fair Isle on 9th and 29th March, Hyskeir on 10th March, the Bell Rock on 19th (L.), 30th (L.) March, and 10th April. Numbers at the Ailsa Craig lantern on 11/12th and 12/13th April, and two on the Bell Rock on 9th June.

A big arrival took place in autumn and is recorded from many stations from 4th to 9th October, and 20th October to 28th November. A weather movement is noted on 26th December.

WHEATEAR, *Ænanthe ænanthe ænanthe*.—Early arrivals are recorded from the Bell Rock on 17th March, Ailsa Craig on 20th, and Moncrieffe on 22nd March. After this much movement is reported steadily up to 14th May, the height of the arrival being during the last week of March and first of April. Late birds are noted at the Bell Rock on 20th and 31st May and 9th June, at Ailsa on 28th May, and Hyskeir on 23rd and 24th June. By the end of July movement through the country is reported, and departures were in full swing during August and September. Last seen, Buddon Ness on 6th October, Isle of May next day, and Hyskeir on 17th October.

GREENLAND WHEATEAR, *Ænanthe ænanthe leucorrhœa*.—A bird of this race is noted on 9th April above Glen Tilt, passage migrants at the Isle of May from 1st to 13th May, and at Glenorchard on 5th and 7th May. A few at Buddon Ness on 25th August and 3rd to 18th September, Hyskeir on 22nd September, and the Isle of May on 21st, 26th, and 28th September, and 4th October.

WHINCHAT, *Saxicola rubetra rubetra*.—Arrivals are noted at Loch Goil on 27th April, Blanefield, Mearns, and Isle of May on

29th April. After this the spread was rapid and breeding-places seem to have been filled by 20th May. Autumn movement was apparent by 16th August and continued steadily during September. Last seen, Buddon Ness on 23rd, Fair Isle and Isle of May on 28th September.

BRITISH STONECHAT, *Saxicola torquata hibernans*.—A pair returned to the previous year's nesting-place in Renfrewshire on 29th March. A little movement is noted at Buddon Ness between 20th September and 8th October, one was on Fair Isle on 13th October, and several at Vallay (O.H.) on 25th October.

REDSTART, *Phœnicurus phœnicurus phœnicurus*.—Very early arrivals are recorded at Buddon Ness on 3rd April, Hyskeir (L.) on 7th, Hirsell and Coldstream on 10th April. After this arrivals at breeding-places are noted up to 5th May, and Redstarts were on passage at the Isle of May to 13th May. Autumn movement had begun by 22nd July and continued steadily to 10th September, when Redstarts were last seen at Balgay; Fair Isle records passage from 14th to 27th September, and birds at the Isle of May during this period were probably also passage migrants. Very late records come from Jedburgh, where a male was seen on 12th November, and Berwick-on-Tweed, where a male appeared on 21st November, and two others were seen in that neighbourhood about this date.

BLACK REDSTART, *Phœnicurus ochrurus gibraltariensis*.—See p. 107.

NORWEGIAN BLUETHROAT, *Luscinia svecica gaetkei*.—See p. 107.

CONTINENTAL REDBREAST, *Erithacus rubecula rubecula*.—Throughout April records come of northward movement of the Continental Redbreast from the Isle of May, Buddon Ness, Hyskeir, and Fair Isle. From 9th October onwards return movement is noted from Fair Isle and Outskerries.

BRITISH REDBREAST, *Erithacus rubecula melophilus*.—One of this subspecies appeared on the Isle of May on 28th April, and small numbers are constantly noted there from 20/21st September (L.) to 8th October.

HEDGE-SPARROW, *Prunella modularis subsp.?*—Small numbers are reported from Ailsa Craig on 21st February, Isle of May on 27th April, Ailsa Craig on 14th September, Isle of May 29th September to 8th October, and Hyskeir 23rd to 29th October.

WREN, *Troglodytes troglodytes troglodytes*.—On 21st February some Wrens visited Ailsa Craig, single birds were on the Isle of May on 27th and 30th April and 1st May, and three on 3rd May.

In autumn small numbers visited Ailsa Craig on 14th September, Isle of May from 23rd September to 4th October, Buddon Ness on 8th October, Hyskeir on 15th and 19th October, and the Bass Rock on 29th October.

SWALLOW, *Hirundo rustica rustica*.—Early arrivals, which however mostly did not stay, are recorded from the River Esk at Musselburgh on 4th April (i. 1923, 139), the Hirsell (Berwickshire), and Pot Loch (Selkirkshire) next day, Duns Castle Loch and Largo on 7th, Possil Marsh and Bute on the 8th. From 13th April onwards many notes of return to breeding-places come from all parts, but the full numbers appear not to have been in till 29th May. Much passage N.N.W. was seen on the Isle of May 29th April to 8th May, and from 4th May to the end of June passage is recorded every now and again from Hyskeir, Vallay, and Fair Isle.

By 20th August Swallows were flocking and many records of departure come throughout September and the first half of October; passage migrants were at Fair Isle on 22nd and 24th September, and late birds were seen at Largo on 16th October, Duns on 30th October, and Perth on 5th November.

HOUSE-MARTIN, *Delichon urbica urbica*.—An early bird is reported on 5th April from Laighmuir, Fenwick. On 15th April House-Martins appeared at Invergowrie and Newport (N. Fife), next day at Dunlugas (Aberdeenshire), and Melrose and Largo on the 19th. After this there are many notes of arrival, but in this species too the full numbers were not in till late, viz., the beginning of June. On 20th June a few were on passage at Fair Isle. By the early days of August autumn movement was apparent, and departures took place during this month and September. Last seen, Pitcur on 1st October, Westferry next day, Forglen on 7th October, and Largo on 15th October.

SAND-MARTIN, *Riparia riparia riparia*.—On 25th March this species is recorded from Ailsa Craig, on 27th March from the Hirsell and Kilmacollm, and near Musselburgh on 5th April (i. 1923, 139). There are a few more notes of arrival up to 8th April, then nothing more till 20th April, when the chief arrivals seem to have begun and continued till 6th May. Autumn movement was evident by 13th August and continued steadily; last seen, Elliot on 15th September, Fair Isle and Kingoodie next day, and Duddingston on 17th September.

ALPINE SWIFT, *Apus melba melba*.—See p. 107.

SWIFT, *Apus apus apus*.—Three Swifts were seen over the Esk,

near Musselburgh, on 4th April, a very early date (1. 1923, 139), one at Moncrieffe (Perthshire) on 18th April, Duddingston Loch on 25th (1. 1923, 139), and the Hirsell on 28th April. Many arrivals took place during the first week of May, but the full numbers were not present till the end of the month. On 4th July several were seen at Fair Isle, and four at Hyskeir on 6th July. Departures had begun by 16th July, and much movement is noted up to mid-September. Last seen, Fair Isle on 16th September, Duddingston next day (1. 1923, 139), and Largo on 20th September; two were seen at Aviemore on 1st October and 12th November (2. xvii. 166).

NIGHTJAR, *Caprimulgus europæus europæus*.—A Nightjar was seen on the shore near Portpatrick on 15th May, two near Oxendean on 6th June, and one found dead at Melrose on 17th June. On 18th September one was on the moor at Corsemalzie.

HOOPOE, *Upupa epops epops*. See p. 107.

KINGFISHER, *Alcedo atthis ispida*.—One was sitting on a boat on Tayport shore on 10th November.

CUCKOO, *Cuculus canorus canorus*.—Arrivals are reported from Nisbet on 25th April, Earn Water and Strathavon (Lanark) next day, Broughton (Peeblesshire) and Corsemalzie on 27th April. Thereafter a steady stream of arrivals up to 20th May. Passage migrants are noted at Fair Isle on 12th and 30th May, and a Cuckoo on Ailsa Craig on 1st and 12th June. Last seen at Montrave and Gilston (both E. Fife) on 16th August.

LONG-EARED OWL, *Asio otus otus*.—One on the Isle of May on 3rd May and one on Fair Isle on 6th September.

SHORT-EARED OWL, *Asio flammeus flammeus*.—Single birds at Buddon Ness on 30th March and at Vallay on 6th June. From 20th September to 9th November immigrants are noted at Fair Isle, Isle of May, Hyskeir, and Vallay; two at Moss of Cree (Wigtownshire) on 19th November, and three at Corsemalzie on 6th December.

BARN OWL, *Tyto alba* subsp.? One was caught in an out-house on the Bass Rock on 25th July.

MERLIN, *Falco columbarius aesalon*.—Single birds are reported at Hyskeir on 14th April, Balcormo (E. Fife) on 24th, and Vallay on 25th April. From 4th September to 1st October there are several records of Merlins from Fair Isle and the Isle of May. One was seen at Lahill on 11th October, and one at St Andrews on 22nd November.

KESTREL, *Falco tinnunculus tinnunculus*.—At Fair Isle single birds are noted on 13th, 21st, and 25th April and 22nd May, and two females going north at the Isle of May on 3rd May. On 12th August one is reported on Ailsa Craig, one or two on Fair Isle and the Isle of May from 26th September to 5th October, one at Outskerries on 10th October, and one at Hyskeir on 24th November.

BUZZARD, *Buteo buteo buteo*.—One was seen at intervals at Montrave (E. Fife) from May to August.

HONEY BUZZARD, *Pernis apivorus apivorus*.—An immature bird was shot near Elie (Fife) about 21st November.

OSPREY, *Pandion haliaëtus haliaëtus*.—See p. 107.

HERON, *Ardea cinerea cinerea*.—One or two were seen daily at Hyskeir after 7th July, three on Fair Isle on 17th August, one on the Bass Rock on 29th, and four on Ailsa Craig on 30th August, and a few on Fair Isle on 4th, 6th, and 25th September.

BITTERN, *Botaurus stellaris stellaris*.—See p. 107.

WHOOPEE SWAN, *Cygnus cygnus*.—In January Whoopers are noted at Castle Semple Loch, Corsemalzie, and Fair Isle. One was seen going south at Vallay on 17th September, and a good deal of movement is reported from this station, Hyskeir, Fair Isle, and Lochwinnoch from 5th October to 17th November. On 20th December five were seen on the banks of Loch Chesney (Wigtownshire).

BEWICK'S SWAN, *Cygnus bewickii bewickii*.—One is recorded from Hyskeir on 24th November.

GREY LAG-GOOSE, *Anser anser*.—On 29th March a flock of Grey Lags was seen at Forglen (Banffshire), and at least 3000 in the estuary of the Nith on 13th April. A flock of thirty (probably non-breeding birds) is noted at Vallay on 2nd June; Hyskeir records a few on 12th October and 23rd November.

Much northward movement of "Grey Geese" is reported from 28th February to 29th April, and return southwards from 17th August (Hareshawmuir) to 5th November.

WHITE-FRONTED GOOSE, *Anser albifrons*.—On 2nd May about a hundred and fifty were seen flying due north at Vallay; seven are noted there on 5th October (i. 1924, 28) and twenty-five going south on 29th October.

BEAN-GOOSE, *Anser fabalis fabalis*.—Two were on the moor at Corsemalzie on 16th February and thirteen flew north over Hareshawmuir on 22nd May. At this station return is noted on 13th

September and the species is noted at intervals thereafter, while three were seen at Corsemalzie on 29th December.

PINK-FOOTED GOOSE, *Anser brachyrhynchus*.—At Fair Isle one is noted on 8th February, about 2000 flying east at Duns on 12th March, and a skein going north over North Berwick on 22nd April. Had returned to North Fife by 21st September; about a hundred were seen near Hule Moss on 2nd October, and about 600 there on 21st October.

BARNACLE-GOOSE, *Branta leucopsis*.—On 10th January ten were noted at Hyskeir, at least 3000 on the estuary of the Nith on 13th April, and at Vallay (O.H.) to 21st May. First seen in autumn at Vallay on 9th October, and one or two at Hyskeir on 27th and 31st October.

BRENT GOOSE, *Branta bernicla bernicla*.—Twenty arrived at Vallay on 16th September.

SHELD-DUCK, *Tadorna tadorna*.—By 4th March a pair had returned to an inland loch in Forfarshire, on 13th April "many, mostly in pairs," were seen in the estuary of the Nith, on 29th April two were on the Isle of May, and the full numbers were back at Invergowrie. On 5th August the adults were last seen at the Forfarshire loch mentioned above, but the young did not leave till between 20th and 30th August. Adults were last seen at Kingoodie on 5th August and young birds on 23rd September.

MALLARD, *Anas platyrhynchos platyrhynchos*.—The Forfarshire lochs were "colonised" by 10th March. On 24th March large flocks were still in the Tay Estuary and off the Red Head, these had dwindled to a quarter their winter size by 8th April, and the last was seen in the Tay Estuary on 6th May. A flock of seven is noted off Tentsmuir Point on 30th June. By 16th September arrivals are noted, these increasing during October, and a few are recorded at Fair Isle till 5th November.

GADWALL, *Anas strepera*.—A pair is reported from Tentsmuir on 19th May.

TEAL, *Anas crecca crecca*.—Two were at Fair Isle on 10th and 12th May and four there on 30th August. From 10th September to mid-October arrivals are recorded, and two Teal at Fair Isle on 25th October.

WIGEON, *Anas penelope*.—Northward movement is noted during March and April, and a pair on Loch Etive on 3rd May. An immature drake was shot at Hareshawmuir on 25th August, and a male in eclipse seen on Thriepley Loch on 30th August. Arrivals

took place from 16th September to 29th October, and one or two were seen on Fair Isle on 8th and 24th November.

PINTAIL, *Anas acuta acuta*.—Two pairs were seen in Invergowrie Bay on 8th April, and nine pairs off Kingoodie on 18th April. Two in Tayport Bay on 6th October, and six at Langbank on 22nd October.

SHOVELER, *Spatula clypeata*.—The full numbers had returned to Forfarshire nesting quarters by 14th April. A drake was seen on Duns Castle Loch next day, and a pair at Possil Marsh on 27th May.

On 18th August a Shoveler visited Fair Isle. The species decreased at its Forfarshire nesting quarters during September; there were two in Tayport Bay on 6th October, and numbers at Lochwinnoch on 15th October.

POCHARD, *Nyroca ferina ferina*.—Numbers are recorded on Loch Elrig (Wigtownshire) on 1st November, and the White Loch of Myrtown on 7th November (1. 1923, 172).

TUFTED DUCK, *Nyroca fuligula*.—Last seen, Tay Estuary on 25th February, and twenty arrived at Moncrieffe next day. The Forfarshire lochs were occupied in early March and the Tufted Duck left them again during September, while numbers were on Lochwinnoch on 15th October.

SCAUP, *Nyroca marila marila*.—A pair was on Possil Marsh on 8th April; last seen, Tay Estuary on 15th April, but a male was in Tayport Bay on 16th June. Two were shot at Summerston, Dumbartonshire, on 27th October.

GOLDENEYE, *Bucephala clangula clangula*.—Northward movement is recorded from 19th March to the end of April; last seen, near Dundee on 6th May, Possil Marsh on 13th May, and on the Tweed at Melrose on 15th to 17th June. Immature birds were seen at Monikie Reservoir on 3rd July, and Thriepley on 20th July. On 16th and 17th September a Goldeneye was at Hyskeir, and a good many arrivals are noted between 24th October and 19th November.

LONG-TAILED DUCK, *Clangula hyemalis*.—During March and April a good many are recorded; last seen off Buddon on 5th May, off Dundee next day, and at Fair Isle on 15th May. From 4th July on, one was seen off Fair Isle, about fifty at Vallay on 17th November, and flocks of drakes were constantly passing south at Balcomie (E. Fife) on 4th December.

EIDER, *Somateria mollissima mollissima*.—Great flocks are

noted in Largo Bay on 20th April, off St Andrews on 19th May, "about a thousand, mostly adult males," and on the Tay Estuary on 10th November.

COMMON SCOTER, *Oidemia nigra nigra*.—Large flocks off St Andrews on 19th May, and flocks passing constantly to the east in Largo Bay on 27th May.

GOOSANDER, *Mergus merganser merganser*.—Last seen, Buddon Ness on 13th April, and one at Lintrathen on 29th September.

RED-BREASTED MERGANSER, *Mergus serrator*.—Many were on Loch Ryan on 24th March, two at Fair Isle on 13th April, common in the Tay Estuary up to 6th May, and "parties in Tayport Bay" on 27th May and 30th June. On 13th August arrivals are noted at Buddon Ness, and in Largo Bay on 1st September.

GANNET, *Sula bassana*.—Some arrived at Ailsa Craig on 29th January, and they were "getting numerous" there on 12th February. On 4th December several adults were seen off Balcomie (E. Fife).

MANX SHEARWATER, *Puffinus puffinus puffinus*.—Came to the Hyskeir lantern on 5th, 8th, 12th, and 13th April in large numbers, 10 P.M. to mid-night on 12th (1. 1923, 134), while single birds were seen off the Isle of May on 27th April and 1st May, and seven off Tentsmuir Point on 5th August.

GREAT SHEARWATER, *Puffinus gravis*.—See p. 108.

SOOTY SHEARWATER, *Puffinus griseus*.—See p. 108.

FULMAR, *Fulmarus glacialis glacialis*.—Had returned to the cliffs at the Red Head by 10th March, on 26th April and 27th August one was seen at the Bass Rock, and left the cliffs at Fair Isle on 15th September.

GREAT CRESTED GREBE, *Podiceps cristatus cristatus*.—Is reported on salt water till 22nd April, at this date there was one on Possil Marsh and a pair arrived at Thripley (Forfarshire) next day. On 15th September one was off Buddon Ness, and one on Monikie Reservoir on 21st September.

GREAT NORTHERN DIVER, *Colymbus immer*.—There are a good many notes of this species from 29th March to 5th May; last seen, Fair Isle on 15th May, Connel and Largo Bay on 20th May. Had returned to Fair Isle by 23rd October.

BLACK-THROATED DIVER, *Colymbus arcticus arcticus*.—Is recorded from various stations to end of April, Buddon on 5th May, and Largo Bay on 6th June. On 20th September two were seen off Inchkeith.

RED-THROATED DIVER, *Colymbus stellatus*.—Seen off Buddon to 5th May, and one in full winter plumage on Loch Etive on 6th May.

WOOD-PIGEON, *Columba palumbus palumbus*.—On 13th October arrivals are noted at Reston, Berwickshire, large flocks passing the Isle of May on 20th October, and a big influx from 20th November to 20th December from east coast stations, and at Hareshawmuir.

TURTLE-DOVE, *Streptopelia turtur turtur*.—Single birds are reported at Garsheugh, Luce Bay, on 3rd May, near Cullen on 31st May (I. 1923, 132), Fair Isle on 23rd September, and Vallay on 6th October.

PRATINCOLE, *Glareola pratincola pratincola*.—See p. 108.

OYSTERCATCHER, *Hæmatopus ostralegus ostralegus*.—Returns to breeding-places are noted between 16th February and 25th March, and this species was passing north at Largo on 11th April. A flock of three hundred was seen at Tentsmuir Point on 19th May, and large flocks are noted from this date to end of June. Returns to the shore from inland nesting sites took place during July.

DOTTEREL, *Charadrius morinellus*.—Four are recorded from Buddon Ness on 25th August.

RINGED PLOVER, *Charadrius hiaticula hiaticula*.—A large flock was seen at the Edenmouth on 6th May, "parties" in Tayport Bay on 19th May, and a flock of one hundred and fifty there on 26th May. On 15th September two appeared on Fair Isle, and flocks were seen between Carnoustie and Elliot.

GOLDEN PLOVER, *Charadrius apricarius*.—Returns of our breeding *Ch. a. apricarius* to their nesting-places are recorded during March, and from 5th April to 6th May much movement is noted; probably many of these notes refer to the northward passage of *Ch. a. altifrons*. From 3rd August to 26th November steady records come of movement of Golden Plover, the earlier may refer chiefly to returns to the shore of our home-bred birds, the later appear to be mainly arrivals from overseas. A weather movement is noted from 19th to 29th December.

GREY PLOVER, *Squatarola squatarola squatarola*.—Small numbers are reported from Tentsmuir Point on 3rd March, and Buddon Ness on 31st March. Arrivals took place between 30th September and 11th October at Kingoodie, Buddon Ness, Tayport Bay, Aberlady, and Fair Isle, and one was seen at St Andrews on 22nd November.

LAPWING, *Vanellus vanellus*.—Returns to nesting grounds, and much movement at our southern stations are recorded during

February and the first half of March; also a little movement at Fair Isle. On 22nd March several were at this station, at the Bell Rock (L.) on 30th March, and Bass Rock next day, two at Hyskeir on 15th April, and one there on 17th April. By 30th June flocking had begun, and a little movement is noted during July and August. Throughout September and October notes come of huge flocks and much migration chiefly to S.W. and W.; no doubt many of these were arrivals from overseas. A weather movement took place between 22nd and 29th December.

TURNSTONE, *Arenaria interpres interpres*.—Northward migration is noted throughout May; last seen, Largo Bay on 6th June, Tentsmuir shore on 16th June, and Hyskeir on 23rd June. Autumn arrivals are recorded at Hyskeir from 29th July onwards, and Tayport Bay on 11th August.

RUFF, *Philomachus pugnax*.—Three were observed near Lochmaddy (O.H.) on 1st September (1. 1923, 152), and a female shot at Summerston, Dumbartonshire, on 22nd September.

SANDERLING, *Crocethia alba*.—About twenty were at Vallay on 2nd January. Northward passage is noted from east coast stations from 7th April to 16th June, and thirty were seen west of Port-William on 3rd May. Autumn passage is recorded on the east coast from 14th July to 24th August, a few were at Vallay on 27th August and 19th September, and single birds in Largo Bay on 7th November, and at St Andrews on 22nd November.

KNOT, *Calidris canutus canutus*.—Arrivals are recorded from Buddon Ness on 1st August and Balcomie on 6th August; after this we have many notes of Knots.

DUNLIN, *Calidris alpina* subsp.?—From 22nd April to 26th May a good deal of movement is noted, and large flocks at east coast stations, probably passage migrants. Two Dunlin were at Loch Arklet, Stirlingshire, on 15th June. Return movement is recorded from 18th August to 29th October.

CURLEW-SANDPIPER, *Calidris testacea*.—Two were at Invergowrie on 7th October.

LITTLE STINT, *Calidris minuta*.—Single birds were on Fair Isle on 17th, 22nd, and 23rd September.

PURPLE SANDPIPER, *Calidris maritima maritima*.—This species is recorded at Vallay till 18th May, Fair Isle to 23rd, Bell Rock to 24th May, and Hyskeir on 22nd June. Had returned to Hyskeir by 28th July and increased steadily thereafter.

COMMON SANDPIPER, *Tringa hypoleucos*.—Arrivals are reported

at Summerston on River Kelvin on 8th April, Eaglesham on 13th, Bardowie Loch on 15th, and Contin (Ross-shire) on 16th April. Thereafter a steady influx is noted till 18th May. Autumn movement had begun by 19th July and continued throughout August; last seen, Fair Isle on 9th September, Elliot (Forfarshire) on 15th, and River Leven (Fife) on 20th September.

GREEN SANDPIPER, *Tringa ochropus*.—See p. 108.

REDSHANK, *Tringa totanus totanus*.—Returns to inland breeding-places are recorded between 4th March and 22nd April, and single birds at the Hyskeir lantern on 5th and 24th April. From 4th July to 23rd October movements of small numbers are noted from Fair Isle, Hyskeir, Ailsa Craig, and the Bass Rock; some of these *may* have been the Iceland Redshank, *T. t. robusta*.

SPOTTED REDSHANK, *Tringa erythropus*.—See p. 108.

GREENSHANK, *Tringa nebularia*.—One went north over Largo on 15th April. Much movement is noted in autumn from 14th July to 26th September from Fair Isle, Vallay, Hyskeir, Buddon Ness, Tayport Bay, and Morton Loch (N. Fife).

RED-NECKED PHALAROPE, *Phalaropus lobatus*.—Arrived at a breeding site on 27th May.

BAR-TAILED GODWIT, *Limosa lapponica lapponica*.—Seen at Tentsmuir Point up to 30th June, and about a hundred and twenty were there on 14th July. From 11th August to 23rd September many arrivals are recorded; a flock of about fifty at Vallay (O.H.) on 6th November, and great flocks near St Andrews on 22nd November.

CURLEW, *Numenius arquata arquata*.—Returns to inland breeding haunts are noted from mid-February throughout March; on 11/12th and 12/13th April Curlew are reported from the lanterns of Hyskeir, Ailsa Craig, and the Bell Rock. By 25th June returns to shore are recorded and continued throughout July.

WHIMBREL, *Numenius phaeopus phaeopus*.—First recorded from Hyskeir on 2nd May, Port-William next day, Isle of May, Dalmeny, Buddon Ness on 5th May. After this many are recorded to the end of the month, and one at Hyskeir on 22nd June. Passing Hyskeir throughout July and to 17th September, East Fife 6th to 18th August, Saltcoats (Ayrshire) on 31st August, and the Isle of May on 24th September.

GREAT SNIPE, *Capella media*.—See p. 108.

COMMON SNIPE, *Capella gallinago gallinago*.—Returns to nesting-places are noted in March, passage at Fair Isle and Hyskeir between

22nd March and 19th April, and a Snipe on the Isle of May on 8th May. One or two visited Hyskeir during July and August, and much movement is noted during September and October from this station, Fair Isle, and the Isle of May. One at the Bass Rock on 2nd November, a few at Fair Isle on 5th and 24th November, and thirteen on Hyskeir on 28th November.

FAROE SNIPE, *Capella gallinago færvænsis*.—See p. 108.

JACK SNIPE, *Lymnocyptes minimus*.—Movement is recorded from Hyskeir on 5th and 12th April and Fair Isle on 19th; last seen near Castle Douglas on 22nd April. First seen in autumn on Fair Isle on 15th September, Vallay on 19th, and Isle of May on 25th September, arrivals being noted up to 24th November. A weather movement, in frost, is recorded from Fair Isle on 26th December and East Fife on 29th December.

WOODCOCK, *Scolopax rusticola rusticola*.—One was on Ailsa Craig on 21st February, unusual numbers at Moncrieffe on 27th February and several at Fair Isle on 14th, 21st, and 25th April. In autumn a few visited this station on 8th, 13th, 23rd, 27th, and 28th October; and from 2nd to 10th November a large influx is recorded. A Woodcock was on Fair Isle on 24th November.

SANDWICH TERN, *Sterna sandvicensis sandvicensis*.—Arrivals are reported from Largo Bay on 20th April, Tentsmuir Point two days later, and Port-William on 23rd May. Last seen, Buddon Ness on 1st October and in the Firth of Forth on 6th October.

COMMON TERN, *Sterna hirundo hirundo*.—Is recorded at Buddon Ness on 10th April, a very early date, and the main arrival took place during May. Huge flocks are noted on the east coast during the second half of August and September; last seen, Buddon Ness and Isle of May on 4th October.

ARCTIC TERN, *Sterna macrura*.—Arrived at Vallay on 17th May and Outskerries on 25th May, but did not settle down and begin to nest at this latter station till 29th June. Last seen, Outskerries on 1st September and Arbroath on 10th September.

LITTLE TERN, *Sterna albifrons albifrons*.—First noted at Tentsmuir Point on 5th May and Vallay (O.H.) on 13th May; last seen, Buddon Ness on 20th August.

LITTLE GULL, *Larus minutus*.—See p. 108.

SCANDINAVIAN LESSER BLACK-BACKED GULL, *Larus fuscus fuscus*.—Small numbers passing at the Isle of May on several dates from 1st to 13th May (i. 1923, 134).

BRITISH LESSER BLACK-BACKED GULL, *Larus fuscus affinis*.—

Arrivals are noted on 14th March at Queen's Dock, Glasgow, Erskine Ferry (Clyde) next day, Balcomie on 29th, and Buddon Ness on 30th March. Last seen at Buddon Ness on 11th October.

GLAUCOUS GULL, *Larus hyperboreus*.—Two are recorded from Fair Isle on 8th February, one at the Bass Rock on 3rd March, an immature bird in Largo Bay on 10th March, an adult at the Isle of May on 29th September, and two at Fair Isle on 17th November.

ICELAND GULL, *Larus glaucoides*.—One was at Hyskeir on 21st November.

KITTIWAKE, *Rissa tridactyla tridactyla*.—From 26th May "off and on for about a fortnight," about a dozen Kittiwakes frequented Morton Loch, North Fife.

ARCTIC SKUA, *Stercorarius parasiticus*.—Single birds are noted at Vallay on 2nd and 13th June and two at Tentsmuir Point on 30th June. From 6th August to 7th October we have many records of Arctic Skuas all along our east coast.

BLACK GUILLEMOT, *Uria grylle grylle*.—Two were off the Isle of May on 29th April and 1st May.

LITTLE AUK, *Alle alle*.—One is recorded from Outskerries on 25th January, a few at Fair Isle on 9th March, and one on the White Loch of Myrtoun on 7th November (1. 1923, 172).

SOUTHERN PUFFIN, *Fratercula arctica grabæ*.—About forty were off Auchmithie on 23rd March, and Puffins arrived on Ailsa Craig and Outskerries on 28th April. Almost all had left the cliffs on the Bass Rock by 9th August.

CORNCRAKE, *Crex crex*.—Very early arrivals are reported from Eskdalemuir on 29th March and 2nd April, and Abbey St Bathans on 30th March. The next notes are from Kinglassie on 22nd April, Craigends (Johnstone) on 30th April, Darvel, Kilmacolm, and Hareshawmuir on 2nd May. Thereafter records of arrivals come up to 19th May. Late autumn birds are noted at Vallay on 24th October and in Ayrshire on 20th November.

WATER RAIL, *Rallus aquaticus aquaticus*.—Single birds are noted on 26th February at Corsemalzie, 29th October and 3rd November at Fair Isle.

CAPERCAILLIE, *Tetrao urogallus urogallus*.—A female was seen at Teasses (Fife) from 12th November onwards.

BRITISH RED GROUSE, *Lagopus scoticus scoticus*.—In Argyllshire small packs of Grouse were moving N.E. in early November, and on 22nd November a greater proportion than usual of cocks was noted, the hens having left (1. 1924, 10).

Nesting of the Wigeon on Bute.—For the last three years Wigeon have brought their young to Quien Loch, on Bute. I have statements to this effect from two of the gamekeepers on the island, one of whom lives in view of the loch. Young birds have been shot in the early autumn. As long ago as 29th May 1916, I saw two pairs of Wigeon on one of the little ponds in the hills, about half a mile from Quien. On 4th June 1924, I raised a drake Wigeon from the shore of Quien Loch. I was away from the island myself at the time when the chicks would have been visible. Still, in the case of so familiar a species, I think that the evidence indicating breeding is sufficient to justify publication. I have tramped over a good deal of the ground in this neighbourhood, but I cannot find where the Wigeon nest. The keepers believe that it is at some distance from the loch. There is only one previous record of this bird nesting in the Clyde area, and none from the Firth of Clyde.—J. M. M'WILLIAM, Craigmore.

Late Nesting of Coot in Midlothian.—On 31st August I saw a single young Coot (*Fulica atra atra*) being fed by one of its parents off the reeds in Duddingston Loch. A short distance away I found the nest, which contained several newly-hatched young, which I assume formed the remainder of the brood. The other adult bird was standing over the young on the nest and, on my approach, gave the alarm call, left the nest and swam about excitedly in the water, calling to the young. All of these succeeded in scrambling out of the nest with the exception of one, which was probably the youngest bird. It can, I think, safely be assumed that the eggs had just hatched as the young appeared rather helpless, and the red warty growths on the back were prominent.—CHARLES G. CONNELL, Edinburgh.

Return of Curlews to same Breeding Area.—I am confidently informed that the white Curlews, first seen at the head of Shinnel Water and in Eskdalemuir respectively, in the spring of 1904 and 1919, both turned up again in 1924 as usual.—H. S. GLADSTONE.

Hoopoe in Shipyard near Glasgow.—When recently visiting the Fairfield Shipyard on Clydebank, I was told that in August 1923, a Hoopoe had frequented the premises for three or four weeks. This is certainly a very strange place to be patronised by so rare a visitor to Scotland, and it is very pleasing to know that so far from attempting to kill or capture the bird the workmen all took the keenest interest in its welfare.—H. S. GLADSTONE.

NOTES ON SOME THYSANOPTERA FROM
THE ABERDEEN AREA.

By GUY D. MORISON, B.Sc. (Lond.), North of Scotland
College of Agriculture.

BETWEEN the 23rd October 1923 and the 27th January 1924 I have been able to collect the following Thysanoptera Terebrantia from the Aberdeen area:—

Aptinothrips rufa, Gmelin. Nine females taken by beating grass at three different localities (near Bridge of Dee Fishery Station, Craibstone Experimental Farm) and each time associated with *A. rufa* var. *connaticornis*, Uzel. As a rule this species and its variety do not occur together.

Aptinothrips rufa var. *connaticornis*, Uzel, is common on many species of grass as larvæ, pupæ, and imagines, and some of the females had ova ready for depositing. In spite of the fact that the grass was usually coated with ice, the insects were only a little less active than I have known them to be in summer in England, and many of them, especially the first and second stage larvæ, had been feeding just before capture. Males are exceedingly rare in this species and variety. Uzel states that out of many thousands taken in Bohemia he did not find a male; Bagnall and Williams in England and Hinds in America also record the rarity or absence of males. Williams draws attention to the fact that males appear chiefly during the winter, and out of hundreds of females taken by me in England during the last year I obtained only one male which was in winter. At Aberdeen I have been able to catch 200 females, 10 males, 35 larvæ, 4 pupæ, which shows an exceptionally large proportion of males. Later I hope to publish the results of some breeding experiments on this species.

Platythrips tunicatus, Haliday. One female beaten from grass at Craibstone Experimental Farm 16/12/23, and twenty-two females beaten from a clump of grass about 300 yards from the first place on 20/1/24. The male is unknown.¹ The female is widely distributed but scarce.

¹ I have since found the male and hope to describe it soon.

Thrips tabaci, Lind., the Onion Thrips. One ovigerous female taken on 23/1/24 from Composite flowers in the Union Room of Marischal College. This is a widely distributed and destructive species which I have taken in fair numbers in the flowers of cultivated Composites in England, but in spite of search I have not found more than the single specimen here.

Physothrips (Euthrips) pallipennis, Uzel. One female found in the garden of a house in Aberdeen in a dying hollyhock flower which was covered with frost 2/11/23. One female beaten from Gorse (*Ulex europæus*) at Craibstone Experimental Farm 20/1/24. This species may be recognised by the comparative length of the antennal joints.

Physothrips (Euthrips) atrata, Hal. One female taken on 27/1/24 by beating grass at Craibstone Experimental Farm, was very active.

Iceland Gull in Midlothian.—While cycling past a field near Duddingston on the morning of 16th September this year I observed a strange gull just over the fence. It was on a manure heap, feeding in company with several Herring Gulls, and was about the size of these birds. I turned back and repassed the place several times and saw that it was an Iceland Gull. I then dismounted and looked over the fence, at which the Herring Gulls went off, but the Iceland Gull seemed quite indifferent to my presence and went on feeding. I watched it for almost five minutes, and as it was only a few yards away I could see the long wings projecting well beyond the tail. The legs were very light coloured, and the plumage, other than the mantle, was intensely white. It was evidently almost an adult bird. It was the general whiteness that attracted my attention at first. Considering the few records for the east side of Scotland I thought this would be of interest.—DAVID HAMILTON, Edinburgh.

Breeding of Black-Headed Gull on Little Cumbraes.—On 17th May 1924, I found two nests of the Black-headed Gull on the Little Cumbraes, in the Clyde area. There were two eggs in each nest.—JOHN P. RITCHIE, Johnstone.

Breeding of Eider in the Clyde Area.—On 18th June 1924, I went with Dr J. N. Marshall to the Little Sgat Island, near the entrance to Loch Fyne. When I had been on the island for about half an hour I saw an Eider a few yards from the shore. It showed anxiety, and I had no doubt that it had just stolen away from its nest. I searched for the nest without result.

Dr Landsborough of Tighnabruaich, who was with us on the island, arranged to go back with me a week later, and on 27th June, on approaching the island from the land, I at once saw the Eider swimming quite close to the shore, accompanied by two young birds that must have been hatched very recently. We watched them through a fairly powerful telescope for a considerable time, at a distance of about a hundred and fifty yards, in good light. I saw another female Eider, which kept quite near the shore while we remained on the island, and probably had a nest. Dr Landsborough told me that he saw a third.

The Eider has been reported on very few occasions as nesting in the Clyde area. In 1921 Mr W. Stewart saw a female with three young birds near the head of Loch Fyne. They have also been reported as nesting near the south end of Kintyre, just inside the Clyde area. Mr Harvie-Brown stated that as long ago as 1908 he knew of this species nesting on Loch Fyne, though no details have been given of this occurrence. It would seem that the Eider has passed as a breeding species into the Clyde area at two points, by rounding the Mull of Kintyre, and probably by crossing the very narrow land-boundary between Loch Fyne and West Loch Tarbert.

The Eider has also, of recent years, established itself as a breeding species in Co. Donegal, and has extended its breeding range northwards on the west coast of Scotland. It is an interesting subject for speculation whether such extensions of breeding range are due to some change in the natural conditions, which often seems unlikely, or to some increase in the vitality of the species, or a lessening of the conservative instinct.—J. M. M'WILLIAM, Craigmore.

Occurrences of Loggerhead Turtle in Scotland.—In addition to the records mentioned in my paper on this subject, there should also be noted the appearance of a small specimen, washed up on the shore at Vallay, North Uist, on 26th November 1898. To this record by Mr C. V. A. Peel (*Wild Sport in the Outer Hebrides* and *Ann. Scot. Nat. Hist.*, 1899, p. 113) my attention has kindly been drawn by Mr G. Brooksbank.—

JAMES RITCHIE.

Turtle Barnacles in Scottish Waters.—In the last number of this magazine (p. 100) I mentioned that the large Loggerhead Turtle, found on the coast of Skye in December 1923, bore on its carapace several clumps of barnacles. These belong to three distinct species, and all have been found in other parts of the world attached to Turtles. One, indeed, is remarkable in that it is distinctively a Turtle-Barnacle, an interesting case of a species exhibiting a very definite habit or preference in an unlooked-for direction.

The species are as follows:—

1. *Chelonobia caretta* (Spengler).—The Turtle Acorn Barnacle. Some fifty-seven individuals of this species were grouped about the upper and under surfaces of the carapace, particularly along the margin. The base of the largest specimen measured 58 mm. × 49 mm. ($2\frac{5}{8}$ × 2 inches), and was deeply embedded in the carapace, so that the layers of tortoise-shell abutted against its walls—exactly as described by Charles Darwin in his *Monograph of the Cirripedia*, (1854, p. 391). It is a tropical species, found in the Pacific as well as the Atlantic Ocean, but only attached to Turtles.
2. *Lepas hilli* (Leach).—A number of individuals of this stalked Goose-Barnacle hung suspended by their straw-coloured stalks from the underside of the carapace. It closely resembles the common *Lepas anatifera*, but the surface of the valves is smoother, there are no umbonal teeth within the scuta, and the stalk lacks any dark colour. It occurs in all the oceans, attached to floating timber, the hulls of ships, and such like. Sir John Murray and Dr Hjort found their only specimen attached to a Turtle captured near the Azores, during the cruise of the *Michael Sars* in 1910 (*Depths of the Ocean*, 1912, p. 582).
3. *Conchoderma virgata* (Spengler).—One example of this brownish-striped species was attached to the basal plate of a specimen of *L. hilli*. It is common in all the oceans.

These barnacles, being on the whole warm rather than temperate forms, can be looked upon only as chance wanderers to the shores of Scotland. *Conchoderma virgata* has been found on floating timber in the Firth of Forth (Leslie and Herdman, 1881), but I doubt if the other two species have previously been recorded from Scottish waters.—JAMES RITCHIE.

Thorny or Rock Lobster in Sound of Sleat.—On the afternoon of 26th July, while fishing for cod with a paternoster line, I caught a fine example of the Thorny Lobster, *Palinurus vulgaris* (Latr.). It was caught in the Sound of Sleat, near Kyle Ree, in about ten fathoms of water. It seems to be rare here, as old fishermen say they only once, years ago, saw a specimen.—SYMINGTON GRIEVE, Edinburgh.

[The specimen is a male, 15 inches long from front of carapace to tip of tail. The presence of growths of polyzoa on the swimmerets indicated that it had not moulted for some time. Although records are few, the species would seem to be distributed sparsely along all the western coast of Scotland, but in the northern parts it is scarcer than in the southern, and only two records are known from north Scotland.—EDS.]

BOOK NOTICES.

THE BIRD AS A DIVER: A CONTRIBUTION TO THE NATURAL HISTORY OF BIRDS. By John M. Dewar, M.D. London: H. F. & G. Witherby, 1924. Pp. xii + 173. Price 10s. 6d. net.

There are few naturalists but have on one occasion or another timed the disappearance of a bird under water and its reappearance. The results, as published, showed an amazing lack of uniformity, for while recent observers have seldom recorded a dive exceeding two minutes in duration, some of the older recorders maintained that dives of ten minutes (Great Northern Diver), fifteen minutes (Little Grebe), and half an hour (Storm Petrel) had been observed. Dr Dewar, who made most of his observations in the Firth of Forth, off Gullane and Aberdour, and in the lochs in the King's Park, has brought order into the chaos of observations. His own records have been made with the most scrupulous accuracy as regards time and the depth of water in which each dive was made, so that for the birds observed (and they include twenty-three species belonging to six different families) they must be taken as the last word. In several respects they require a revision of earlier ideas on the subject. For example, in close on six thousand dives timed, none was observed to exceed seventy seconds, or to take place in water more than 6 fathoms deep, and the author places the limits of ascertained time and depth at two minutes and 10 fathoms. But the most striking discovery is that the duration of the dive, whether the bird be a Diving Duck, a Grebe, Cormorant, Diver, or Auk, is definitely related to the depth of the dive, roughly twenty seconds for the first fathom and ten seconds for each subsequent fathom. The

space between dives has also a regularity associated with the depth. This constant time-depth relation Dr Dewar regards as due to the influence of similar conditions acting upon similar organisms. Many other interesting facts are brought out in this treatise, which is a fine example of the solving of an obscure problem in natural history by persistent and accurate observation.

BUTTERFLY LORE. By H. Eltringham, M.A. (Cantab.), M.A., D.Sc. (Oxon), F.E.S., F.Z.S. Oxford: At the Clarendon Press, 1923. 180 pp., 52 figs., and coloured frontispiece. Price 4s. 6d. net.

This is one of the most charming books on Butterflies that we have read for many years. Not only is the style quite original and out of the ordinary, but the subject is treated in a manner entirely different from the usual entomological text-book. The ten chapters which the volume contains give the reader a fascinating view of the life-history and structure of these beautiful creatures, their remarkable senses and sense-organs, their scent-producing apparatus, their relations to ants and other insects, and lastly, the wonderful phenomena of protective coloration, mimicry and polymorphism by which their enemies are deceived and their fragile selves preserved. In all sections of the work an insight is given into the remarkable discoveries of modern times such as is seldom found in a work of so small a compass. Few can read this delightful book without considerable pleasure and profit.

LITTLE NURSERIES IN THE FIELDS. By M. H. Crawford. London: The Religious Tract Society, N.D. Pp. 270. Price 7s. 6d. net.

Here is a miscellany of observations, made by the author, on the young and the ways in which the young of many animals are shielded during their childhood. The collection appeals to many interests, for it ranges from the oak-apples of a gall-fly, the tunnels of beetles, the egg-cocoons of spiders, the eggs of slugs and snails, to the nests of birds and the cosy dormitories of field-voles, harvest mice, rabbits, moles, and the like. The simple text, the clear type, and the abundance of excellent and instructive photographs (over 100 in number) by the author, ought to open new fields to children, in whom the love of nature is innate and for whom the book is intended.

BRITISH MOSSES AND HOW TO IDENTIFY THEM. By J. H. Crabtree, F.R.P.S. London: The Epworth Press, 1924. Pp. 64. Price 1s. 6d. net.

A nodding acquaintance with British mosses could hardly be more easily attained than by the field use of the photographic illustrations of some sixty species in this book, and the succinct descriptions which accompany them. It is a wonderful production at the price.

The Scottish Naturalist

No. 150.]

1924 [NOVEMBER-DECEMBER

THE SPORTSMAN AND WILD LIFE.

THERE are sportsmen who are sportsmen pure and simple, whose only incentive is the exhilaration of the chase and its successful termination, but there is a vast number, perhaps a majority, of sportsmen who are naturalists at heart, and who enjoy the presence of wild life as well as its pursuit. To these, nature knowledge owes much. Our own columns contain many of their observations, and he has little interest in the lore of animals who is not familiar with some at least of the classic works of sportsmen-naturalists, which have given a distinctive flavour to natural history publication in this country.

From the sportsman-naturalist wild life has little to fear, but sport pursued wantonly and thoughtlessly is a danger to be reckoned with. Its results are clearly to be seen in the United States of America, and they are typical of what has happened and may happen elsewhere. There, while game shooting was unrestricted, sportsmen flocked from the cities into the nearest game country, so that in many States large game was driven farther and farther back until it had almost or altogether disappeared. Drastic laws, often entailing an entire cessation of shooting in the case of particular species, had to be enforced, and even yet the annual legislation of Congress shows in many areas a gradual tightening of the law against the sportsman.

Yet it is to the interest of every sportsman to keep an eye on the future as well as on the quarry of the moment. The long view has been vindicated by the many generations who have preserved the Red Deer, whilst its relatives, once likewise natives of Scotland, have disappeared; yet I doubt if it is sufficiently remembered on those estates which are overstocked with deer far beyond their grazing capacity, at the risk of a gradual decline and degeneracy in the native stock. In America, it would seem, the lesson has been well learned.

I have before me a summary of the Game Refuge Bill, which, as I write, is approaching its test in the United States Congress when the December session opens. It has the enthusiastic support of the American Game Protective Association and of sportsmen generally, and its avowed non-partisan appeal has gained it the adherence of leading politicians on both sides of the House. The gist of the measure may be stated in the words of the Hon. John W. Davis:—"Hunting is fast losing its character as one of the most democratic of sports. The really good shooting grounds are rapidly being taken up by clubs too expensive to be patronised by the average sportsman. Drainage of great marsh and swamp areas, the natural breeding and feeding grounds of wild fowl, has threatened these with extinction. We must establish shooting grounds so that the man of average means may enjoy the ancient, healthful, and democratic pastime of shooting, and *we must have the refuges if we are to continue to have the wild fowl.*"

These are wise words. They foreshadow a time when, in this country also, sportsmen and naturalists will combine in an effort to set aside and guard efficiently reserve areas, where wild life may flourish with the least possible interference from man. The sanctuary is the best solution of the problem of the preservation of the native fauna.

* * * *

As we foreshadowed in the first number of the year, we are able, owing to the success which has attended the sale of the SCOTTISH NATURALIST in recent years, to make a reduction in the price of the magazine for the coming year.

The reduction is a modest one, from an annual subscription of 15s. to 12s. 6d. post free, and from the 3s. charged for a separate part two years ago to 2s. 3d. We trust that this reduction may be the precursor of others, but this depends largely upon the activities of readers themselves, and we would again ask readers and contributors to continue their own practical interest in the welfare of the SCOTTISH NATURALIST, and to induce others interested in wild life to become subscribers. Were each subscriber to bring another to the fold, we should be in a position to publish articles which at present have to be rejected owing to lack of space, to illustrate articles in a way which we dare not venture upon at present, and further to reduce the price of the journal.

* * * *

With a view of stabilising the financial position of the magazine, a reserve fund has been started, the principal of which will remain untouched, and the interest of which will be devoted to the production of the magazine, and particularly to the reproduction of suitable illustrations. At the present moment this reserve fund, owing to the generosity of a few donors, to the modest claims of the publishers, and to unclaimed editorial fees, amounts to just over £60. This is a good beginning; we should welcome donations earmarked for the "reserve fund," which we propose to place in the hands of trustees on behalf of the magazine.

* * * *

While the financial position of the SCOTTISH NATURALIST has improved very considerably during the last few years, the same good fortune has not attended all its contemporaries, and we read with profound regret the announcement that the December number will be the last issue of *The Irish Naturalist*, a journal which for many years has done excellent work for natural history in the sister isle.

* * * *

Mr E. Leonard Gill, Assistant in the Natural History Department of The Royal Scottish Museum, has been appointed Director of the South African Museum in Cape Town. The excellent work accomplished by Mr Gill during

his two years at The Royal Scottish Museum and his published researches show how great an accession he was to the ranks of the Scottish naturalists and zoologists, and in offering him our hearty congratulations, we cannot but regret the loss entailed by his departure.

* * * *

Dr James Ritchie has been elected President of The Royal Physical Society of Edinburgh, in succession to Professor D'Arcy W. Thompson, and contributors to this magazine—Dr T. V. Campbell, Mr Kirke Nash, Surgeon Rear-Admiral J. H. Stenhouse, Professor D'Arcy Thompson, and Professor J. H. Ashworth—have been elected respectively Treasurer, Librarian, and Members of Council.

* * * *

In closing these notes for another year we regretfully record the death during this period of a distinguished Scottish zoologist, Professor Sir William A. Herdman, F.R.S., whose studies, commenced and inspired in Edinburgh, did much to further knowledge of marine zoology and oceanography. He was a stimulating leader, endowed with a boundless store of energy and enthusiasm for investigation.

Late Appearance of House Martin.—On 9th November at 9 A.M. I observed a House Martin (*Delichon urbica*) hawking for insects round the houses at the east end of Portobello. Though stragglers of this species have frequently been observed in the British Isles in November, it may be of interest to place on record the occurrence of this bird so far to the north. Of perhaps even more interest than its occurrence at this late date was the inhospitable treatment which it received from a Sparrow. As the Martin flew up Morton Street, the sparrow dashed from a roof and made a half-hearted attack on it. On the Martin's return down the street, however, the sparrow again attacked the stranger, this time with greater vigour and determination, and finally drove it away to the eastward where I lost sight of it. There appears to be something in the flight of the swallow tribe which arouses distrust among small passerines unaccustomed to their presence. At Fair Isle, on 24th September last year, a Swallow made its appearance and proved a great attraction to small parties of Twites which mobbed it as if it were a bird of prey.—J. H. STENHOUSE.

THE GREAT BUSTARD IN SCOTLAND.

By HUGH S. GLADSTONE, M.A., F.R.S.E.

THE following is an attempt to collect together all that is known as regards the former existence of the Great Bustard in Scotland.

In 1526, Hector Boethius, or Boece (who it may be pointed out is the first British author who gives any account of the Great Bustard) wrote:—

“Præter hæc aves in Merchia nascuntur Gustardes vernaculo sermone dictæ, colore plumæ ac carne perdicibus non dissimiles, sed quæ holores corporis mole exuperant. Rara est ea avis atque humanum aspectum plurimum obhorrens; nuda humo ova ponit; quæ si ab homine contrectata, aut ejus anhelitu et afflatu vel leviter imbuta senserit (quod facile naturæ beneficio dignoscit) extemplo veluti inidonea ad pullos procreandos relinquens, alio ad ova parienda se confert.”¹

About 1536, John Bellenden's translation of Boece's work appeared and the above passage is rendered as follows:—

“Beside thir thre [viz. Capercaillie, Red Grouse and Blackgame] uncouth kynd of fowlis, is ane uthir kynd of fowlis in the Mers mair uncouth, namit gustardis, als mekle as ane swan, bot in the colour of thair fedderis and gust of thair flesche thay ar litil different fra ane pertrik, thir last fowlis ar not frequent bot in few noumer. And sa far haytis the cumpany of man, that gif thay find thair eggis ayndit or twichit be men, thay leif thaym, and layis eggis in ane othir place. Thay lay thair eggis in the bair erd.”²

It is necessary here to give some definition of the district referred to as “Merchia” or “the Merse.” In the first

¹ Hector Boethius, *Scotorum Historiæ a prima gentis origine*, 1526 folio xii. (*Scotorum Regni descriptio*) lines 58/64.

² John Bellenden, *Heir beginnis the hystory . . . of Scotland* [circa 1536/1542], p. cii. (Copy in British Museum Library: S.C. 12. b. 3). Reprinted as *The History and Chronicles of Scotland: written in Latin by Hector Boece . . . and translated by John Bellenden . . .* vol i. 1821, p. xlii.: this reprint appears to follow the original sufficiently closely as not to call for repetition here.

printed map of Scotland (1570) this is shown as "Merchia"¹ and Joan Blaeu in his *Atlas* gives a description of "Marcia or Merche" with a map of "The Merce or Shirrefdome of Berwick," drawn by Timothy Pont.² The limitations of the district are thus defined in 1682:—"Marcia, the countrey of the Mers or March, commonly called the Sherifffdom of Berwick. It hath to the east, the Scots Sea [Firth of Forth]; to the south, the river of Tweed, which divideth it from England. To the west, Tweed and Lidder [Leader Water] which march it from Teviotdale and Lauderdale: and Lamormoor [the Lammermuir Hills] divideth it, together with the Den-burn [Dean Burn]³ that water[eth] Dunglass,⁴ from Lothian, to the north."⁵ George Muirhead, in 1895, writes:—"Although it is probable that during the time of the Britons and Saxons Berwickshire was a well-wooded district, yet it appears that a few centuries later, in the reign of William the Lion, its woods, which formerly had been widely spread over the surface of the country, were confined to the sheltered valleys and ravines,⁶ the general

¹ Abraham Ortelius, *Theatrum orbis terrarum*, Amsterdam, 1570. It is perhaps worthy of note that in the early Latin editions of Ptolemy's geography a district on the east coast between Tyne and Forth is assigned to the *Otalini*: but that in the edition of 1525, and subsequent editions, the name appears as *Otadeni*. This name, although similar to *otides*, can hardly be regarded as of any significance as to the presence of Bustards [*otides*] in the district. The *Otalini* (who have been identified with the Gododin and Godden of the Welsh bards) appear to have been a sept or subject tribe of the great race of *Brigantes*, and although it is possible, of course, that the Bustard may have been their badge or totem it is far more probable that *Otalini*, *Otadeni* or *Ottodeni* were phonetic attempts by Roman travellers and soldiers to express the Celtic (Brythonic) name of the tribe.

² Joan Blaeu, *Nieuwe Atlas*, Amsterdam, 1654, pp. 47/8.

³ The Dean Burn forms the boundary between Berwickshire and Haddingtonshire.

⁴ Dunglass House, formerly a notable castle of the Lords Home, was from the seventeenth century the seat of the Hall family (baronets), and in 1919 was bought by Mr Frank Usher. The house is in Oldhamstocks parish near Cockburnspath.

⁵ Christopher Irvine, *Historiæ Scoticæ Nomenclatura Latino-Vernacula*, 1682, p. 145.

⁶ Alexander Allan Carr, *A History of Coldingham Priory*, 1836, pp. 24/25.

face of the country being comparatively bare of trees. The wide plain which lies between the Tweed on the south and the Lammermuir Hills on the north, extending to upwards of one hundred thousand acres,¹ and now known as the Merse, would then be a vast waste of heather mingled with pasture, and interspersed with impenetrable bogs and morasses."²

Returning to the chronological sequence of evidence as to the presence of the Great Bustard in Scotland we must observe that Conrad Gesner, in 1555, simply quotes Hector Boethius word for word as regards the "Gustard" in Scotland, but that he adds:—

"Ego è Scotia avis cujusdam palmipedis iconem accepi, tanquam gustardæ: quam posui supra post anseres feros, quoniam à gustarda sive tarda qua de hic scribimus, planè diversa est, et in nomine fortassis ab eo qui adscripsit, erratum est. Vera quidem tarda, gustarda dicta videtur à Britannis: quoniam GUSS anserem significat, ac si tardum anserem dicas, palmipes tamen non est, et præter magnitudinem nihil cum anserem commune habet."³

Gesner gives a very good woodcut of a female Great Bustard,⁴ and it is not surprising that he should have been confused by the picture of the "Gustard" which was sent to

¹ Francis Groome, *Ordnance Gazetteer of Scotland*, 1884, vol. i., p. 152.

² George Muirhead, *The Birds of Berwickshire*, 1895, vol. ii., p. 208.

³ Conrad Gesner, *Historiæ Animalium, Lib. III. qui est de Avium Natura*, 1555, p. 471. (Translation: I have received from Scotland a picture of a web-footed bird purporting to be a Gustard which I have placed above after the wild Geese, since it is plainly different from a Gustard or *Tarda* which we are here describing, and perhaps he who sent it me has erred as regards its name. The true *tarda*, indeed, seems to be called Gustard by the British: since GUSS means Goose, and though you may call it slow goose, it is not however web-footed, and moreover it has nothing in common with the goose except size). It may be noted that the name Bistard or Bustard has, by some authorities been accepted as a corruption of the words *Avis tarda*, indicative of the bird's slowness in taking flight.

⁴ *Tom. cit.*, p. 468. This is one of the earliest pictures of the Bustard, but it may be pointed out that this bird is one of those portrayed in the Neolithic drawings at the Tajo Segura in the province of Cadiz; these drawings are assigned an antiquity of six to eight thousand years and are in all probability the oldest pictures of birds in the world.—*Country Life*, 25th July 1914, pp. 115/117.

him from Scotland, and which, in reproducing the picture, he cautiously describes as follows :—

“DE GUSTARDA AVE SCOTICA. . . . Hanc etiam avis aquaticæ, ut apparet, et anserum ferorum generis iconem è Scotia accepi, absque alia descriptione, nam quæ gustardæ avis in Historia Scotica Hectoris Boethii nobis demonstrata est, non ad avem quæ hîc pingitur, sed ad otidem pertinet, (ut in historia ejus recitabimus), quæ tarda et starda hodie in multis Europæ regionibus vulgò vocatur, nostris trappa, itaque cum in nomine hujus ad nos missæ iconis erratum suspicer, nihil aliud addam donec rem certius cognovero.”¹

In 1560, Gesner again reproduces the same picture, and he then writes :—

“Gustarda avis vulgò apud Scotos dicta, ni fallor, à tarda vel bistarda, id est otide, longè diversa.”²

by which it would seem that Gesner had been so far influenced by its picture as to decide that the “Gustard” was not the same as the Great Bustard, and it must therefore be observed that he in no way substantiates Boethius’ statement as to the presence of the Great Bustard in the Merse. As regards this picture it was one of five of which Gesner writes :—

“Has figuras avium³ . . . doctissimus Jo. Ferrerius Pede-

¹ Conrad Gesner, *Historiæ Animalium, Lib. III. que est de Avium Natura*, 1555, p. 159. (Translation: OF THE GUSTARD A SCOTTISH BIRD. . . . From Scotland I have received this picture, without any description, of what appears to be an aquatic bird of the wild goose kind yet the bird which Hector Boethius has shown us in his *History of Scotland* as a Gustard is not the bird here portrayed but belongs to [the class] Bustard (as I set forth in the description [of that species]) which to-day is commonly called tarda and starda in many parts of Europe and by us [in Switzerland] trappa: therefore while I suspect a mistake in the title of this picture which has been sent to me I shall add nothing more until I have been more certainly informed in the matter.)

² Conrad Gesner, *Icones Avium Omnium*, 1560, p. 83. (Translation: Gustard, a bird, commonly so called by the Scots, which if I mistake not is very different to the tarda or bistarda that is the Bustard.)

³ Conrad Gesner, *Historiæ Animalium, Lib. III. qui est de Avium Natura*, 1555. Clakis (reproduced on p. 109), *Anser Bassanus*, *Gustarda*, *Capricerca* [Capercaillie] (reproduced on p. 159), and *Gallus Palustris* [? Grouse] (reproduced on p. 225).

montanus ad nos misit, præstantissimi apud Scotos viri Henrici à S. Claro liberalitate." ¹

and it has been conjectured that these pictures may have been sent to Gesner by Henry Sinclair, Bishop of Ross, *b.* 1508, *d.* 1565.²

In 1577, there appeared W[illiam] H[arrison]'s *Description of Scotland*, but it will be observed that his notice of the "Gustard" is nothing more than a rough translation of Hector Boethius:—

"Beside these, we have moreover another foule in Mers more strange and uncouth than all these afore mentioned, called a Gustard, fully so great as a Swanne, but in colour of feathers and taste of fleshe, little differing from a Partriche, howbeit these byrdes are not very common, neyther to be seene in all places, suche also is their qualitie, that if they perceive their egges to have bene touched in theyr absence by man's hand (whiche lie commonly on the bare earth) they forsake those nestes and lay in other places."³

In 1578, Bishop Leslie mentions the Gustard, but in such a way as to be but a paraphrase of Hector Boece's original:—

"In una Marchia, ut hoc obiter dicam, avis est humanum aspectum summopere refugiens, Gustarda vulgus vocat: ova nuda humi ponit, quæ si senserit ab homine atrectata, eiusùe afflatu violata, illa ut pullis procreandis non idonea planè deferit: colore, saporeque pernici haud dissimilis est, verum magnitudine olorem exuperat."⁴

¹ *Tom. cit.* p. 109. (Translation: Jo. Ferrerius the very learned man of Piedmont sent me these pictures of birds through the kindness of that pre-eminent Scotsman Henry S. Clarus.)

² J. H. Gurney, *The Gannet*, 1913, p. 30. (Citing Prof. Alfred Newton.)

³ Raphaell Holinshed: *The History of Scotland*, 1577, *The Description of Scotland*, p. 10.

⁴ John Leslie (Bishop of Ross), *De origine, moribus, et rebus gestis Scotorum*, 1578, p. 25. (Translation: I may say here that there is [found] only in the Merse a bird which with the greatest diligence avoids the human gaze: it is commonly called Gustard: it lays its eggs on the bare ground and if it finds that they have been touched or breathed on by Man it leaves them and betakes itself to some other suitable place for the purpose of rearing its young: in colour and flavour it is not unlike the partridge, but in size it is indeed larger than a swan.) See also *The Historie of Scotland . . . by . . . Jhone Leslie . . . translated in Scottish by Father James Dalrymple . . .* 1596: ed. by Rev. Father E. G. Cody, vol. i. 1888, pp. 39/40.

About 1595, for that is the period ascribed to the writings of Thomas Muffet (*d.* 1604) whose statement follows, it is said:—

“*Bistards* or *Bustards* (so called for their slow pace and heavy flying), or as the Scots term them, *Gusestards*, that is to say, *Slow Geese*.”¹

In 1684, Sir Robert Sibbald wrote:—

“*Otis tarda* Avis Aldrov. Eadem videtur, quæ ab Historicis nostris *Gustarda* dicitur. Gallopavoni magnitudine nequaquam cedit. Dicitur Merciam frequentasse, & nuper mihi relatum est, unam non ita pridem in Lothianâ Orientali visam fuisse. Hector Boethius dicit *Gustardam* (uti vocat) colore plumæ & carnibus perdicibus non dissimilem, sed quæ Olores mole corporis exuperet.”²

It may be noticed that, although Sibbald, in 1684, records the recent occurrence of a Bustard in East Lothian, he uses the past (*frequentasse* = *frequentavisse*) and not the present tense (*frequentare*) when writing of the existence of the species in the Merse.

It is remarkable that the Great Bustard is absent from the lists of birds sent in by all the parish ministers to Sir John Sinclair when compiling his *Statistical Account of Scotland*, 1791/9.

The following experience of Robert Mudie is given here in full since it has not often been quoted:—

“[In 1793] I saw two birds in the parish of Carmyllie, in Forfarshire, (a place famous, by the way, for migratory birds, in their passage to Strathmore and the Grampians), which I have no doubt in my mind were bustards, although, from the little knowledge I then had of the names even of these local birds, which were

¹ Thomas Muffet, *Healths Improvement*, corrected and enlarged by Christopher Bennet, 1655, p. 91.

² Sir Robert Sibbald, *Scotia Illustrata . . . de Animalibus Scotiæ*, 1684, pp. 16/17. (Translation: The Gustard which is so called by our writers seems to be the bird *Otis tarda* of Aldrovandus. It is quite as large as a Turkey. It is said to have frequented the Merse, and I was recently told that one had been seen in East Lothian not so long ago. Hector Boece says that the Gustard (as he calls it) is not unlike the Partridge in the colour of its plumage and in the flesh, but in size of body it exceeds the Swan.

absolutely teasing me to study their habits every day, and the length of time that elapsed before I saw even a tolerable representation or description of a bustard, I cannot venture to record my belief as an authentic instance. The place consisted of a wide extent of very bleak and bare surface, half moor, half marsh, but so constituted both ways, that neither could claim it wholly. It was surrounded by "outfields" of barley, which was choked in the shoot-blade, or oats, which seldom got white till helped by the frost; but at one place a dell, with a succession of pools, formed a sort of drainage, and there the sward was a little more kindly. I was on the one side of these pools, and near the other was the termination of the cropped land, fringing the summit in a way, but not coming over it. The wind had been keen and hollow from the east for some days, (an east wind in such a place often makes May cut up April and March); but it had veered round, rain had fallen, and all was beginning to be green. It might be the end of May, or the beginning of June, and an hour or two after sunrise. I saw two brown birds, of great size, by the edge of the cover, and very distinctly made out against the sky. They might have been about a quarter of a mile distant, so that I could not see the markings or minute parts; but they certainly were larger in size than any of the common birds, more especially than any that appear in the summer. The pools formed a perfect barrier, and I am not sure whether then I should have approached to take a nearer view, even if there had been no impediment in the way. After a little while they stalked off out of sight, by descending the other side among the corn, and I did not see them either alight or take wing, so as to observe the wings suspended half closed for a time, which is one of the characters of the bustard when alighting or rising undisturbed; neither did I again see them, or any birds like them."¹

There is no suggestion here that these birds, even if they were Bustards, were anything more than wanderers, and this remark applies to all the subsequent records which will be given below.

George Montagu, in 1802, stated:—

These birds were formerly found in the wolds of Yorkshire, and even as far north as Scotland."²

¹ Robert Mudie, *The Feathered Tribes of the British Isles*, 1834, vol. i., pp. 53/54.

² George Montagu, *Ornithological Dictionary*, 1802, vol. i.

It is recorded by John Fleming that :—

“One was shot in 1803 in Murrayshire by William Young, Esq., of Boroughhead.”¹

The Bustard is not mentioned in any of “The Acts of the Parliaments of Scotland” which is certainly remarkable, when it is remembered how zealously all Game was protected, and the fact that it is included for the first time as a game-bird in 1828 in the “Night Poaching Act”² proves nothing, since this Act—passed after the Union—applied to both Scotland and England, in which latter country the Bustard still existed at that date in a few favoured localities. In the “Game Act”³ of 1831 (An Act to amend the laws in England relative to Game) the Bustard is specifically mentioned but it is omitted, and perhaps significantly, in the “Game (Scotland) Act”⁴ passed in the following year.⁵

In an account of Maybole (Ayrshire), written in 1837, *Otis tarda* is included, on the authority of Dr M'Tyer⁶ of Redbrae, in a list of the rarer animals of the parish.”⁷

In 1844, the Rev. G. Gordon, in a paper entitled *A Fauna of Moray* enlarged the record given above under 1803 and wrote :—

“Great Bustard, *Otis tarda*. A very rare straggler. One was shot near Oakenhead, in 1803, by the late Wm. Young, Esq., of Burghead. Another was taken a few years ago at Inchbroom by Chas. Barclay, Esq.”⁸

¹ John Fleming, *A History of British Animals*, 1828, p. 115.

² 9 Geo. IV., c. 69.

³ 1 and 2 Will. IV., c. 32.

⁴ 2 and 3 Will. IV., c. 68.

⁵ In this connection it is humorous to note that the Great Bustard, long since lost to Great Britain as indigenous, is still revived as a British Game bird in the prosaic *Police and Constabulary Almanac* (1924), where we read under the notes for 1st September, “Bustard shooting begins,” and 1st March, “Bustard shooting ends.”

⁶ William M'Tyer, Redbrae, Maybole, Ayrshire; M.D. of Glasgow University, 1826; M.R.C.S., England, 1827; Fellow Fac. Phys. Surg., Glasgow, 1829; *d.* [? 1878].

⁷ *New Statistical Account of Scotland*, 1845, vol. v., Ayr and Bute, p. 353.

⁸ *The Zoologist*, 1844, p. 512.

It has been stated that :—

“A Bustard was seen in Strath Skinsdale, Sutherlandshire, in August 1861.”¹

but this record is not mentioned by J. A. Harvie-Brown and T. E. Buckley in 1887.²

In 1867, William P. Turnbull states :—

“There is a beautiful specimen of the bird, supposed to be Scotch, in the Hunterian Museum, Glasgow.”³

I have examined a mounted skin of a male Great Bustard in the Hunterian Museum but, beyond appearing to be very old, nothing definite is known of its origin except that it was presented by one Thomas Dixon.⁴ Captain John Laskey, in 1813, includes a specimen of the Great Bustard in his *General Account of the Hunterian Museum*,⁵ but he gives no information as to how, when, or where it was obtained, and it is impossible to say whether this is the actual bird now in the Museum. It may be noted that Laskey wrote in 1813 of the species :—

“In England they are sometimes met with in troops of 50 or more on the open downs of Dorsetshire, the wolds of Yorkshire, and on Salisbury Plain in Wiltshire.”⁶

and the fact that he makes no mention of Scotland as a habitat for the Great Bustard in 1813 may perhaps be taken as significant.

[In the first week of January 1871 a Great Bustard was shot at Fenham Marshes, near Berwick-on-Tweed, and another was seen ten days later.⁷ I have included these records here in “square brackets” since they cannot

¹ J. E. Harting, *A Handbook of British Birds*, 1901, pp. 160/161.

² J. A. Harvie-Brown and T. E. Buckley, *A Vertebrate Fauna of Sutherland, Caithness and West Cromarty* [1887].

³ William P. Turnbull, *The Birds of East Lothian*, 1867, p. 47.

⁴ James Chumley (Natural History Department, University of Glasgow) *in litt.* 10. VIII. 23, 23. VIII. 23, 13. IX. 23, and 17. IX. 23.

⁵ Capt. John Laskey, *A General Account of the Hunterian Museum, Glasgow*, 1813, p. 8.

⁶ *Loc. cit.*

⁷ Robert Gray, *The Birds of the West of Scotland*, 1871, p. 248.

be regarded as Scottish, as the locality named is in Northumberland. The bird which was shot was stuffed and eventually purchased for Berwick Museum where it now is.¹]

On 29th March 1876 a mature female Bustard was shot by Mr W. Stephenson [? Stevenson or Steavenson] of New Holland, Stronsay (Orkneys),² and doubtless this is the bird referred to as shot at the same place but in 1886.³

On 8th February 1892, a female was shot by Mr D. H. Learmonth at Honsebay, Stronsay (Orkneys), and is now exhibited in the Royal Scottish Museum. It is curious that the bird killed in 1876 should have been shot on the adjoining farm.⁴

On 20th June 1895, a female Bustard was washed up on the Ayrshire coast at Irvine. The bird was considerably decomposed when found, and had evidently been in the water for some days.⁵

On 4th January 1924, an immature female Bustard was captured on Newark farm, Sanday (Orkneys); it was kept alive till 20th February 1924 when it died.⁶ This specimen has since been presented to the Royal Scottish Museum, Edinburgh, by Mr Scott who caught it.

¹ George Bolam, *Birds of Northumberland and the Eastern Borders*, 1912, p. 504:—Since Northumberland has been mentioned it may be noted that "Bustardes" are mentioned in *The Regulations and Establishment of the household of . . . the fifth Earl of Northumberland . . . 1512* (London printed, 1770, pp. 107 and 192) as articles "for my Lords owne Meas at Princippall Feists Ande noon outhier tyme except my Lord's commaundement be otherwise": and though this statement shows that Bustards were used in 1512 as articles of diet on rare occasions in the Northumberland household it does not prove that these birds bred locally. Mr Bolam states (*op. cit.*, p. 503) that the tradition as to Bustards having formerly bred in the neighbourhood of Chillingham cannot be confirmed by any evidence with which critical readers would be likely to be satisfied.

² *The Zoologist*, 1876, p. 4927; *The Field*, 8th and 15th April 1876.

³ J. A. Harvie-Brown and Thomas E. Buckley, *A Vertebrate Fauna of the Orkney Islands*, 1891, p. 201.

⁴ *Annals of Scottish Natural History*, 1892, p. 138; *The Field*, 12th March 1892.

⁵ *Annals of Scottish Natural History*, 1895, p. 253.

⁶ *Scottish Naturalist*, 1924, p. 89.

The above are all the records of which I am aware as to the occurrence of the Great Bustard in Scotland, and it is certainly remarkable that there are no instances of its bones having been found. It will be noticed that Boethius alone refers to its nesting in our country, for it may be shrewdly suspected that subsequent writers simply quoted him on this point, and their quotations can hardly be regarded as endorsing—and certainly not as furthering—his statement. In any case there is nothing definite to go upon as regards its breeding in Scotland since the time at which Boethius wrote.

I cannot conclude this paper without expressing my indebtedness to Sir Herbert Maxwell and Mr James Chumley, for the assistance which they have rendered me in its compilation. Perhaps I may be allowed to add that the value of this paper is considerably enhanced by the fact that I have checked all the records with the originals quoted, some of which are extremely scarce.

Cinnamon-coloured Sparrow.—For several years, at the Hametoon, Isle of Foula, Shetland, there has existed an unusually coloured Sparrow, which is known as “the yellow Sparrow.” This bird is still at liberty, but I am sending to the Royal Scottish Museum a young Sparrow, not much over three weeks old, and perhaps the progeny of the older abnormal bird. The young bird is of a pale cinnamon colour, the legs, feet, and beak are all pale yellowish and the contrast of shading, so conspicuous in the newly-assumed coat of a Sparrow, is absent.—WM. HARRY GREENAWAY, Foula.

Pheasants and Lilies.—A friend who has given much attention to the cultivation of lilies sends me the following note of an incident in his garden in Berkshire. He was puzzled to account for the disappearance of the bulbils which the Tiger-lily (*Lilium tigrinum*) bears in such profusion in the axils of the leaves. When dressing early one morning in September, he happened to notice a cock Pheasant busily picking the beans off a row of scarlet runners. Thence the bird went to a clump of *Lilium Sargentiae*, another Asiatic species which bears stem bulbils. One of these it picked off, but it was not to its liking, and it marched away.

Suspecting the Pheasant to be the purloiner of the bulbils of the tiger-lily, my friend cut a stem of that lily and on the evening of that day stuck it in the ground near the runner beans. Next morning the Pheasant was at work again upon the beans; but so soon as it came upon the tiger-lily stem it proceeded to gobble the bulbils, jumping up to reach the higher ones and finally pulling the stem down to finish off the lot. It was the poor fellow's last meal. Whether he was shot in the interest of science, or merely to put a stop to his depredation, the present deponent sayeth not. He died, and the *post-mortem* revealed forty-one tiger-lily bulbils in his crop.

The incident might not be worth recording, but for the evidence it affords that this Pheasant showed discrimination in devouring the bulbils of *Lilium tigrinum*, an edible species, the roots being regularly grown for food in China and Japan, and rejecting the bulbils of *Lilium Sargentiae* which are considered inedible.—HERBERT MAXWELL, Monreith.

Black Redstart in Inner Hebrides.—On the morning of 28th October 1924, I caught, in an exhausted condition, at the lighthouse of Skerryvore, about twenty-eight miles west of Mull, a migrant which has been identified at the Royal Scottish Museum as a female Black Redstart, *Phœnicurus ochrurus gibraltariensis*. I am told that it is a rare autumn passage-migrant on the west coast of Scotland. The wind had been fresh from the south-east and the atmosphere was hazy.—ROBERT LESLIE, Skerryvore Lighthouse.

Swimming of Redshanks.—In the *Report on Scottish Ornithology* (p. 137), mention is made of the swimming of a Redshank. This, of course, is a record of a well-known phenomenon, for I and others have seen them do it hundreds of times, not only when washed off, but also swimming about and feeding on the surface. I have seen up to sixteen all swimming at once.—H. W. ROBINSON, Lancaster.

Iceland Gulls in East Lothian.—Regarding Mr Hamilton's note on an Iceland Gull in Midlothian (p. 164), of which he states that there are few records for the east side of Scotland, it may be of interest to state that Mr F. W. Smalley and myself saw a pair in Aberlady Bay, East Lothian, on 15th October 1902, and every day up to the 21st. On the 16th we found the remains of a third which had been dead some time. On the 30th and 31st I saw another, possibly one of the pair already mentioned. All the specimens were adult birds.—H. W. ROBINSON, Lancaster.

THE OCCURRENCE IN THE FORTH OF THE SEA-ANEMONE *SAGARTIA PALLIDA* (HOLDSW.); WITH REMARKS ON ITS ANATOMY, REPRODUCTION, AND AFFINITIES.

By W. EDGAR EVANS, B.Sc., F.R.S.E., Royal Botanic Garden,
Edinburgh.

WHILST collecting on the shore at Boglehill below Longniddry, East Lothian, on the 18th of May 1916, I observed three examples of a small, reddish Sea-anemone attached to the under surface of a stone. These were, at the time taken to be very immature specimens of *Metridium dianthus* (Ellis), and consequently, though two were placed in my aquarium and their capture recorded, they were not thought to be of special interest and were subsequently lost.

In April 1923, undoubted *Sagartia pallida* (Holdsw.) was obtained at Torquay, one of the localities cited by P. H. Gosse for the species,¹ these being all of the colour-form called by him var. *cana*; while in April of this year (1924) several of his var. *rufa*² were included in a consignment of Anemones sent me for identification from Valencia Island, Co. Kerry, by Miss M. Delap. So strongly did the latter recall the creatures I had obtained in 1916 at Boglehill, that I decided to take an early opportunity of re-visiting that locality in the hope of adding the present species to the list of those known to occur in the Firth of Forth.

Accordingly, the tides being then suitable, a careful examination of the shore below Longniddry was made on the 20th of May, when about a dozen undoubted examples of *Sagartia pallida* (Holdsw.), var. *rufa* (Gosse) were seen, four of which were taken alive for further observation. The species appeared to be confined to a short stretch of the beach, only about 50 yards in length, at Boglehill, and was far from common. The specimens were invariably found

¹ *Actinologia Britannica*, Appendix (1860), p. 355.

² *Ibid.* (1858-1860), p. 79.

adhering to the under surfaces of loose stones, generally two or three individuals together, near the low-water level of spring tides. In every case the characteristic purple-black curved lines embracing the bases of the tentacles, which are apparently very constant and perhaps the best means of identification in the field, were present; in most of the specimens these markings were rather slender and sharply defined, but in one, which was larger and deeper in colour than the others, they were much diffused, giving the general effect of a dark, circular band occupying that portion of the disc which bore the tentacles. With a single exception, the animals were of somewhat smaller size than seems to be usual, the column being, in the majority of cases, only some 3 or 4 mm. in diameter and about twice as much in height when fully expanded.

The recorded localities for *Sagartia pallida* (Holdsw.) are few, and, so far as I am aware, it has previously been known to occur in Scotland only at Banff, whence Gosse received numerous specimens about the year 1860.¹ It is of no little interest, therefore, that it should have been again met with on the Scottish coast, this time as an addition to the known fauna of the Forth littoral.

The Anemone thrives in captivity and the continued observation of numerous individuals suggests that certain peculiarities, seemingly overlooked by previous observers, may prove of value in determining its true relationships, for it should be pointed out that such authorities as Milne-Edwards and Andres² have doubted the propriety of including the creature in *Sagartia*, even if that genus be taken in the very wide sense in which it was used by Gosse himself. It may, therefore, be well to refer shortly here to two of these peculiarities.

As was previously known, the upper margin of the column, or more correctly of the scapus, forms, in the present species, a slight but distinct collar.³ It does not appear

¹ *Actinologia Britannica*, Appendix, p. 355.

² *Fauna und Flora des Golfes von Neapel, etc.*, vol. ix. (1884); *Le Attinie* (Monografia), p. 167.

³ Termed by Gosse the "parapet."

to have been observed till now, however, that in full expansion, for example after feeding, the disc and tentacles are normally raised considerably above the level of this collar upon what may be described as a smooth, pillar-like capitulum which forms a conspicuous feature in so small an animal, being frequently one or two mm. in length and only slightly narrower than the scapus itself. On the other hand, in *Sagartia sphyrodeta* (Gosse), with which that author closely associated the present form,¹ and indeed in all species now placed with certainty in that genus, the outermost tentacles are marginal, and it would hardly seem possible to include within the same genus animals showing so marked a difference in structure as this.

The second characteristic which it is desired to mention here lies in the asexual method of increasing its numbers, which would appear to be the main means of reproduction in the present case. This consists in the spontaneous separation from the limbus or margin of the pedal disc of small fragments which quickly become more or less regular in outline, and, usually in the course of from ten days to a fortnight, produce their first tentacles and are able to feed, thus indicating that their internal as well as their external anatomy has not only taken shape but has become functional. These fragments from which new individuals are thus produced are separated from well-fed and healthy Anemones at fairly frequent intervals, especially during early summer, when as many as three have been seen to be detached from a single specimen within twenty-four hours. Discharge through the mouth of formed young resulting from the fertilisation and development of ova within the body-cavity has not been observed, and I am of the opinion that those mentioned by Holdsworth² "immediately surrounding" one of his examples, and thought by him to indicate its sexual maturity, were, in all probability, produced asexually as described above.

These two features, in conjunction with its admittedly great resemblance in other respects to small individuals of *Metridium dianthus* (Ellis), lead me to suggest that the

¹ *Actinologia Britannica*, p. 122.

² *Ibid.*, p. 80.

form now under discussion may be found to belong also to that genus rather than to *Sagartia* (Gosse), *Aiptasia* (Gosse), or *Paractis* (M.-Edw.), the only alternatives previously put forward, the two latter respectively by Andres and Milne-Edwards. In an endeavour to settle the matter Miss E. M. Stephenson is working out the anatomy from sections prepared from two of my specimens, and the detailed results will be published later. Unfortunately, the lack of gonads in that which was cut transversely makes it impossible to give a final opinion until further sexually mature individuals have been secured. Meantime it can be stated, however, that the general impression given by the examination of the sections already made is that there are present only six pairs of perfect mesenteries, not about twice that number as should be the case if the Anemone belonged to the family *Sagartiidæ* as now understood, and that the animal is provided with a mesogloæal sphincter. Should these expectations be substantiated, the opinion arrived at from the observation of the species in life will be verified and the creature will, in that case, take the name of *Metridium pallidum* (Holdsw.). The division of the column into scapus and capitulum precludes its inclusion in *Aiptasia*, while the presence of acontia and cinclides clearly rule out *Paractis*, in which both are wanting.

The above observations, admittedly tentative, are now recorded, partly at least, in the hope that they may indicate how much still remains to be done before a thorough knowledge of our British Sea-anemones has been reached. This is only one of many cases in which interesting results merely await the re-discovery of little known species, and in conclusion I would therefore direct the attention of readers of the SCOTTISH NATURALIST to the appeal for help in this respect which appeared in the Editorial Notes in the issue for July-August 1924.

ERRATUM

Late Nesting of Coot in Midlothian—In Mr C. G. Connell's note (p. 162), the word "back" in the last line is a misprint for "head."—[EDS.]

Albino Example of Shag or Scart.—I am presenting to the Royal Scottish Museum a white Scart shot by me on the west coast of Isle of Barra on the 16th September 1924.—JOHN BEATON, Barra.

[The specimen of *Phalacrocorax graculus*, a beautiful milk-white individual, shows almost all the characters of perfect albinism, for apart from the plumage, the bill, legs and feet, are all of a pale yellow colour, very different from the dark tints of normal birds. It is the more remarkable, therefore, to have to record that the eye, as examined on the arrival of the carcass at the Royal Scottish Museum, was not of the full albino pink; the irides were of a pinkish hue, but the pupils were of a grey-black colour.—EDS.]

Fertility of the Common Whelk or Buckie.—The spongy masses of Whelk egg-capsules, cast ashore after the spawning season in autumn, indicate a fertility which even among mollusca, noted for their fertility, is remarkable. Fischer (*Manuel de Conchyliologie*, p. 91) mentions an estimation by Cailliaud of the content of a Whelk egg-capsule cluster which comprised 540 capsules, each containing 18 to 25 embryonic shells. Taking the average at 21 per capsule, we get a total of 11,445 young individuals in a single bunch. This number must often have been exceeded. Recently Mr George Cochran, North Cairn, Kircolm, presented a cluster of Whelk's capsules to the Royal Scottish Museum. It was found at Corsewall Point, Wigtownshire, on 15th March 1924, and is roughly oval in shape, its greatest length being $9\frac{1}{2}$ inches, its greatest breadth 5 inches. Counts of the number of capsules per square inch in different parts of the bunch gave a calculated average of rather over 47 capsules per cubic inch. At a conservative estimate the capacity of the whole cluster may be put at 78 cubic inches; the total number of capsules is therefore about 3666. At 500 eggs per capsule the total number of eggs laid would exceed 1,800,000; and at an average of 21 survivors per capsule (Cailliaud found 18 to 25), almost 77,000 young Whelks must have been cast homeless upon the world. Of course it may be said that the capsule-mass described is the joint product of several individuals, and cannot be taken as representing the fertility of one. The specimen shows no indication that this is so: the mass looks as if it were composed of a twisted coil, but the coil seems to be continuous, and there is no sign of loose or haphazard aggregations. It is likely that this mass, many times greater than the shell of the creature which produced it, belonged, with its enormous con-

tribution to the live stock of the seashore, to one individual.—
JAMES RITCHIE.

Additions to the Scottish and Clyde Faunal Area Lists of Coleoptera—(1) *Harpalus attenuatus* (Steph).—One specimen taken under a stone near the shore at Glenluce, Wigtownshire, at the beginning of June last. This species appears to be more frequently met with near the coast than inland. It has been recorded from the Liverpool district and other localities, chiefly in the south, but so far as I am aware it has not been recorded from Scotland.

(2) *Cercyon nigriceps* (Marsh).—One taken in stable refuse, 11th October 1924, near Milngavie. A very small species, similar to *C. pygmæus* (Ill.), a commoner insect, from which it may be separated by the fact that the inner striæ of the elytra are distinct at the base, whereas in *C. pygmæus* they are obsolete near the scutellum. Its occurrence has not been previously noted from "Clyde."

(3) *Trogophlæus pusillus* (Grav.).—One in stable refuse, 11th October 1924, near Milngavie. This Rove Beetle, which is very common in some districts in hotbeds, etc., has been recorded from the Solway, Tweed, Forth, and Dee districts, but not from the Clyde.

(4) *Carpophilus dimidiatus* (Fab.) var. *mutilatus* (Er.)—A cosmopolitan Clavicorn, which appears to be generally imported with dried fruits, cereals, etc., and is not considered to be indigenous. I took one specimen on a tablecloth on the 9th of September last. It is possible that it may have been among some flowers which I received that day from Dalkeith, but it is difficult to account for the presence of an insect which may have been introduced in many different ways. Its occurrence has not been previously recorded from Scotland.

(5) *Anoplus roboris* (Suffr.).—Four specimens of this Weevil were taken by beating near Houston, Renfrewshire, on the 4th June 1923. This species greatly resembles *A. plantaris* (Næz.), from which it may be distinguished, apart from its larger size, by the sculpture of the elytra. It has not been previously recorded from the Clyde area.

I have to thank Commander J. J. Walker for his kindness in identifying or verifying all the above specimens.

T. H. M. GORDON, Glasgow.

NOTES FROM THE SCOTTISH ZOOLOGICAL PARK

THE KING PENGUINS.

BREEDING.

(Continued from p. 64.)

THE dates in 1923 followed very closely those of the preceding year, the first egg being laid on 18th June, the second on 2nd July, and a third on 30th July, only three, apparently, being laid that year.

It will be noticed from this record of dates that the season of the breeding impulse in these captive Penguins has moved fairly steadily forward from the period of the year at which it first, somewhat hesitatingly, appeared, till it seems to have definitely settled into the middle of the northern summer. It will also be noticed that in this it followed the corresponding advancement of the moulting period. There is this striking difference, however, that whereas the moulting season was at first deferred to a period some six to eight months later than the Penguins' normal moulting time, and has in successive years retraced two-thirds of the way back to the normal, the breeding of the birds, on the other hand, tended at first to remain about the normal months, and by degrees settled into a period six months or so removed from it. And this is the general rule with birds imported to this country from the southern hemisphere.

In order to make the story of the Penguins' domestic affairs intelligible, it is necessary to be able to refer to them individually. It is rather curious that birds possessing so much personality have never attracted to themselves familiar or "pet" names; most captive animals quickly become "Jack" or "Billy," "Sally" or "Fenny" to their keepers, but the Penguins in the Park have remained innominate. They have, accordingly, in any writings concerning them, been designated by the letters of the alphabet. A, B, and C are the three which arrived in the Park in 1914, the first being the bird which was in adult plumage when it arrived, while the other two were still in their nestling plumage and were therefore probably less than a year old. D and E are the surviving two of the consignment which reached the Park in 1917; they had then moulted for the first time and so were probably a little over a year old. It is important to determine, so far as may be, the ages of these young birds on their arrival, since they afford, as will be

noted later, fairly convincing evidence as to the age at which the King Penguin attains sexual maturity.

It has already been mentioned that signs of mating between two of the Penguins were observed in the autumn of 1915. These two were A and C. It was not difficult at that time to distinguish the three birds, because A was slightly larger than the other two, and B had a greenish patch on top of the head. The fact that A was larger, and also the behaviour of the birds, led to the assumption that A was a male and C a female, and as the three were always very friendly and A showed considerable interest in B as well as in C, who was regarded by their human friends and also apparently by A itself as its mate, B was also assumed to be a female. How far these assumptions were well founded will appear later. A and C continued their association with its somewhat intermittent courtship for the next year or two, but no egg was seen, and it is improbable that any was laid until 1918, when in July the first egg was known to be laid. The egg appeared to belong to the pair A and C, and it is to be noted that if the age of the bird was correctly guessed, C was then probably about five years old. This egg, it has been already stated, was broken at an early stage of incubation. No other egg was seen till the following July, and the egg, which was seen then for an hour and afterwards disappeared, was at the time believed to have been laid by B. The question which laid it will always remain unanswered, but, as will also appear later in this narrative, it cannot have been B.

INCUBATION HABITS.

Although, up to this point, no breeding results in any real sense had been achieved, much interesting behaviour on the part of the birds had been observed. The King Penguin (and its cousin the Emperor Penguin) differ very markedly in their breeding habits from all other members of their family and probably from all other birds, for the single egg which is laid is not placed in any nest, or on the ground, but is held upon the feet of the parent bird and covered by a kind of flap or pouch of the skin and feathers of the abdomen. The flap is furnished with a constricting muscle by means of which the egg can be held securely even though the bird be walking or rather shuffling about, or, as it very often is, engaged in a fight with its neighbours. In the case of the Emperor Penguin, whose breeding ground is the polar ice and whose breeding season is the depth of the Antarctic winter, when the temperature may be a hundred degrees below freezing-point, the usefulness and necessity of such a device is obvious, since contact with the ice or even



[Photo. J. C. McKechnie.

KING PENGUIN TUCKING EGG UNDER BROOD POUCH.

exposure in such intense cold would rapidly destroy the egg or young chick. The King Penguin does not live so far south (its breeding grounds are in the South Shetlands, South Georgia, Macquarie Island, and Kerguelen), and the bird may be merely manifesting an ancestral habit in its manner of treating its egg, or perhaps the water, mud, and filth which abound in the rookeries may be second only to intense cold in harmfulness to the egg or young, so that the "nesting" habits of the King Penguin may still have survival value. In addition to the perils of "winter and rough weather" the eggs and young are exposed to great danger from the very strong instinct to brood which these birds possess and which leads every unmated Penguin and every bird which has lost egg or young to compete with the legitimate parents for possession of the latter's property. It was estimated by Dr Wilson, not as a guess but as the result of careful and prolonged observation and the counting of the chicks dead and alive, that between seventy and eighty per cent. of Emperor Penguin chicks hatched die before they reach maturity, and that more than half of this heavy infantile mortality is due to this perverted kind of philoprogenitiveness. When an egg or a living or dead chick cannot be appropriated, the desire for it may be satisfied by the adoption of a stone or lump of ice as a substitute. This instinct in the King Penguin has been clearly shown by the birds in the Park. When the first egg was laid there was a considerable amount of excitement among the birds, C, which had it, being surrounded by a circle of four interested and perhaps covetous companions. C had the egg for the first few days and was very unwilling to let even its own mate approach too near or have a share in the incubation of the egg. On the fifth day the writer observed the egg being transferred from C to A. The behaviour of the birds at the time was most interesting. A came up and asked, as plainly as movement and sign could ask (A was then regarded as the male), if it might have the egg. C was by no means willing, and looked the other up and down very doubtfully at first but afterwards relented (less perhaps from regard for A than from inclination to change a cramping position for more freedom of movement) and, allowing A to come close up, shuffled the egg off its feet to its neighbour's, A tucking it in upon its feet with an appearance of great content. Even then C returned once or twice to make sure that the egg was safe. In a day or two it was seen to be again in the possession of C, and A was consoling itself with a stone which, however, it did not long retain, having perhaps found it somewhat hard and uncomfortable. While the spouses showed a certain amount of jealousy of each other in regard to the egg,

they were of one mind in repelling the too near approach of any of the other three Penguins. Of the other three, B showed most interest in the affair, C and D, the two younger birds, keeping more to themselves. It was doubtless during one of the frequent scuffles caused by the near approach of one of the other birds that the egg was broken.

The association between A and C continued unchanged, and when, on 1st September 1919, there appeared the egg which was to develop into the historic "baby," it was in the possession of C with A standing in close attendance, the indications again being that C had laid the egg. In order to reduce the danger of damage to the egg from the attempts of the other birds to purloin it, B, D and E were at once removed from the enclosure and A and C left in a possession which it was hoped would be undisturbed. For two days all went smoothly, and A was seen taking over the egg each evening while C took it back in the morning. On the third day it was apparent that something had gone wrong; A, instead of standing beside C, as it had done during the greater part of the two preceding days, was wandering restlessly about the enclosure and obviously very much perturbed. It was not long before the cause of the disturbance became apparent; it was B trumpeting from the distant enclosure, to which it had been removed, to A which answered, and which in the excitement caused by its inability to reach B, seemed to have forgotten all about mate or egg. When A was not walking up and down the boundary fence looking for a way of escape, it spent its time in the pool, seemingly having made up its mind that its share in incubation was ended. This went on for some days when, as the restlessness of A seemed to be communicating itself to C, which looked as if it were on the point of abandoning the egg, the experiment was tried of bringing back the third of this triangle to the enclosure. The result was completely satisfactory; A again took up its share in the burden of incubation and the three seemed to settle down quite amicably together. The egg was exchanged between A and C at irregular intervals which varied from about twelve hours to ten days. When C had it it stood very steadily in or about one spot, but when A had it, it moved about the enclosure a good deal, to the anxiety of his human observers and also, it seemed at times, of C. A offended in this way particularly at feeding time and would persist in shuffling over the rocks to meet the keeper coming with the fish-box, so exposing the egg to very great risk; indeed a breakage was only narrowly averted more than once.

T. H. G.

(To be continued.)

INDEX

NOTE.—No attempt is made to index in detail the species mentioned throughout articles.

A

- Aberdeen Area, Thysanoptera in, 163
 Aberdeenshire, Greenshank breeding in, 126
Actinia, see under Sea-anemone
Aeschna, see Dragonfly
Agriolimax, see under Mollusca
 Annandale, Dr Nelson, death of, 68
 Argyll, Iceland Gull in summer, 8
 migration of Grouse, 10
 Ayrshire, Bittern in, 44

B

- BADGER, Dr C. W., Buff-coloured Common Hare, 68
 Barnacles, Turtle-, in Scottish waters, 166
 BARTHOLOMEW, JAMES, Colours of Grey Lag-Geese, 8; Colour-variety of Rook, 127
 Bavelaw Wood, a naturalist's notes on, 11
 BAXTER, EVELYN V., and RINTOUL, LEONORA JEFFREY, Spread and Distribution of Woodcock as breeding bird in Scotland since beginning of nineteenth century, 13, 47; Northern Golden Plover in Scotland, 35; Wood-lark in E. Fife, 75; Report on Scottish Ornithology in 1923, 105, 137; A third record for Britain of the Subalpine Warbler, 126
 BEATON, JOHN, Albino example of Shag or Scart, 189
 BEDFORD, DUCHESS OF, Alpine Swifts in Wigtownshire, 84
 Beetles, see Coleoptera
 BELL, J. P. F., The Bittern in Berwickshire and E. Lothian, 43; Little Owl in Berwickshire, 76
 BERRY, J., Combat between Heron and Black Water-Vole, 4
 Berwickshire, Bittern in, 43
 Little Owl in, 76
 alleged Green Woodpecker record, 89
 BEVERIDGE, GEORGE, White-fronted Geese in North Uist, 28

- Birds, egg-laying vagaries, 65
 extension of breeding range (1923), 108
 habits, etc. (1923), 119
 in winter of 1923, 114
 increase and decrease of breeding birds (1923), 109
 migration in 1923, 138
 migration rush at Holy Island, 89
 movements in Scotland (1923), 141
Nesocichla eremita gordonii, nov., 94
 nesting notes (1923), 110
 new to faunal areas (1923), 107
 plumage, abnormal (1923), 117
 rare Tristan d'Acunha, 93
 recovery of ringed (1923), 115
 Scottish Ornithology in 1923, 105, 137
 species movements (1923), 141
 uncommon visitors (1923), 107
 Bittern, may recolonise Scotland, 33
 in Ayrshire, 44
 in Berwickshire and E. Lothian, 43
 in Kirkcudbright, 44
 Bitterns, slaughtered in Solway, 136
 BLAIR, Dr M. S., Iceland Gull on Argyll coast in summer, 8
 BOLAM, G., on *Sirex gigas*, 34
Bombus, see Humble-Bee
 BOOK NOTICES: Guide to the Birds of Europe and N. Africa, R. G. Wardlaw Ramsay, 29; Our Butterflies and Moths, and how to know them, E. Fitch Daglish, 29; Pets for Boys and Girls, A. J. Macself, 30; Farm Live Stock of Great Britain, R. Wallace, 30; Plant and Flower Forms, E. J. G. Kirkwood, 30; Notes on the Birds of Dumfriesshire, Hugh S. Gladstone, 61; A Biology of the British Hemiptera - Heteroptera, Ed. A. Butler, 61; Flowers: a Garden Note-Book, Sir Herbert Maxwell, 62; The Peaks, Lochs, and Coasts of the Western Highlands, Arthur Gardner, 62; The Deer and Deer-Forests of Scotland, A. Inkson McConnochie, 91; Deer Stalking in Scotland, A. Inkson McConnochie, 91; The Birds of Portugal, William C.

Tait, 91; A Monograph of British Desmidaceæ, the late W. West and the late G. S. West, 92; Our Birds' Nests and Eggs and how to know them, F. Fitch Daglish, 92; The Biology of Birds, Prof. J. Arthur Thomson, 103; A Practical Handbook of British Birds, edited by H. F. Witherby, 104; Vivarium and Aquarium Keeping for Amateurs, A. E. Hodge, 104; Charlie Macintosh: Post-runner, Naturalist, and Musician, Henry Coates, 128; The Bird as a Diver: A Contribution to the Natural History of Birds, Dr J. M. Dewar, 167; Butterfly Lore, H. Eltringham, 168; Little Nurseries in the Fields, M. H. Crawford, 168; British Mosses and how to Identify Them, J. H. Crabtree, 168

British Hedge-Sparrows, 45

Buccinum, see Whelk

Bustard, Great, in Orkney, 89
in Scotland, 173

Bute, Humble-Bees of, 53
roosting habits of Rooks, 5
Wigeon nesting, 162

Buteshire, Black-headed Gull breeding, 164

Great Black-backed Gull in, 126
local scarcity of *Bombus lapidarius*, 128

C

CAMPBELL, BRUCE, Nesting of Great Spotted Woodpecker in Linlithgowshire and Inverness-shire, 10; Goldfinches in Perthshire, 28

Campbell, Dr T. V., 172

Carpophilus dimidiatus, new to Scotland, 190

CARTER, A. E. J., Robber-fly, *Pamponerus germanicus*, in Forfarshire, 28

Cat, the Wild, 97

CLARKE, Dr W. EAGLE, 3; Lesser Snow-Goose in Outer Hebrides, 9

CLARKE, Dr W. E., and STENHOUSE, Surg. Rear-Admiral J. H., Coues' Redpoll and Eastern Lesser White-throat at Fair Isle, 4

Clyde Area, Coleoptera new to, 190

Eider breeding in, 165

Great Black-backed Gull in, 126

Hoopoe in, 162

Sandwich Tern breeding in, 136

Coleoptera, new records for Clyde Area, 190

new records for Scotland, 190

Larch Longicorn, 60

Wireworms and cultivation, 34

CONNELL, C. G., Late Nesting of Coot in Midlothian, 162, 188

Coot, late nesting, 162, 188

Cultivation and soil-insects, 34

Cumbræ, Little, Black-headed Gull breeding, 164

Curlews, albino, 162

return to same breeding area, 162

D

Diptera, *Hypoderma bovis* and *lineatum* in Scotland, 85

Ox Warble flies in Scotland, 85

Pamponerus germanicus in Forfarshire, 28

Distribution of Ox Warble flies in Scotland, 85

Dolphin, White-beaked in Firth of Forth, 75

Dragonfly in Leith Docks, 128

Duck, Eider breeding in Clyde Area, 165

Smew in Kirkcudbright, 44

Smew in Renfrewshire, 52

Wigeon nesting on Bute, 162

Dundee Naturalists' Society, 35

E

Eggs, abnormal, of Ptarmigan, 127

ELMHIRST, R., local scarcity of Stone Humble-Bee, 128

Entomological papers mentioned, 28

EVANS, WM., A Naturalist's Notes on the old Redford or Bavelaw Wood, 11

EVANS, W. EDGAR, On the identity of the Sea-anemone *Actinia elegans*, Dalyell, 121; the Occurrence in the Forth of the Sea-anemone *Sagartia pallida*: with remarks on its anatomy, reproduction, and affinities, 185

F

Fair Isle, Coues' Redpoll and Eastern Lesser Whitethroat at, 4

Fertility of Whelk, 189

Fife, Bean Geese in, 35

Black Water-Vole in, 4

Wood-lark in, 75

Flies, see Diptera

Forfarshire, *Pamponerus germanicus* in, 28

Forth, Firth of, Hag-fish in, 89
 Pilot Whale in, 37
 White-beaked Dolphin in, 75
Sagartia pallida in, 185
 Foxes, large litter, 68

G

Gill, E. Leonard, 171
 GILLESPIE, T. H., King Penguins in
 Scottish Zoological Park, 13, 63,
 191
 GLADSTONE, H. S., 3; Bittern and
 Smew in Kirkcudbright, 44; Great
 Bustard in the Orkney Islands,
 89; Slaughter of Bitterns in Solway
 Area, 136; Hoopoe in shipyard
 near Glasgow, 162; return of
 Curlews to the same breeding area,
 162; the Great Bustard in Scot-
 land, 173
 GLADSTONE, Sir JOHN R., Unusual
 litter of Foxes, 68
Globicephala, see Whale, Pilot
 Goldfinches in Perthshire, 28
 Goose, Bean, in S. Fife, 35
 Grey Lag-, colours of, 8
 Lesser Snow-, in Outer Hebrides, 9
 White-fronted in North Uist, 28
 GORDON, SETON, late migration of
 Swifts, 126; Greenshank breeding
 in Aberdeenshire, 126; abnormally
 shaped Ptarmigan's eggs, 127
 GORDON, T. H. M., Additions to the
 Scottish and Clyde Faunal Area
 lists of Coleoptera, 190
 Gray, Mrs Robert, death of, 35
 GREENAWAY, W. H., Cinnamon-
 coloured Sparrow, 183
 Greenshank breeding in Aberdeenshire,
 126
 GRIEVE, SYMINGTON, Thorny or Rock
 Lobster in Sound of Sleat, 167
 GRIMSHAW, P. H., 3; Dragonfly,
Aeschna juncea, in Leith Docks,
 128
 Grouse, migration of, 10
 Gull, Black-headed, on Little Cumbraes,
 164
 Common, age of, 96
 Glaucous in East Lothian, 36
 Great Black-backed, in Buteshire, 126
 Great Black-backed, in Clyde Area,
 126
 Iceland, in Argyll in summer, 8
 Iceland, in East Lothian, 184
 Iceland, in Midlothian, 164

H

Haddingtonshire, see Lothian, East
 Hag-fish in Firth of Forth, 89

Halibut, curious capture by, 60
 HAMILTON, DAVID, Rooks removing
 nests, 135; Iceland Gull in Mid-
 lothian, 164
 Hare, Common, buff-coloured, 68
Harpalus attenuatus, new to Scotland,
 190
 Hatching of *Agriolimax*, 131
 Hawfinch in Renfrewshire, 52
 Hebrides, Inner, Black Redstart in,
 184
 Inner, Hemiptera of Southern, 21
 Outer, Lesser Snow-Goose in, 9
 Outer, White-fronted Geese in, 28
 Hedge-Sparrows of British Isles, 45
 Hemiptera of South Ebudes, 21
 Herdman, Sir W. A., death of, 172
 Heron and Black Water-Vole, combat
 between, 4
 Hoopoe in Glasgow shipyard, 162
 Humble-Bee, local scarcity, 128
 Humble-Bees of Bute, 53
 HUTCHINSON, G. EVELYN, Hemiptera
 of South Ebudes, 21
 Hymenoptera, see Humble-Bees, *Sirex*
Hypoderma, see under Diptera

I

INGLES, W. M., Hag-fish in Firth of
 Forth, 89
 Insect Fauna of South Ebudes, Hemip-
 tera, 21
 Insects and cultivation, 34
 see also Coleoptera, Diptera, Hymen-
 optera, Thysanoptera
 Inverness-shire, Great Spotted Wood-
 pecker in, 10

J

JAMIESON, H., Breeding of Sandwich
 Tern in Shetland, 52

K

Kirkcudbright, Bittern in, 44
 Smew in, 44

L

LAIDLAW, T. G., Alleged Scottish
 record of Green Woodpecker, 89
 LAING, D., Curious capture by Halibut,
 60
 Lanarkshire, Rooks' roosting habits, 69
 LESLIE, R., Black Redstart in Inner
 Hebrides, 184
 LINDSAY, LORD, Bean Geese in South
 Fife, 35

Linlithgowshire, Great Spotted Woodpecker in, 10
 Lobster, Rock, in Sound of Sleat, 167
 Loggerhead Turtle in Scotland, 99, 165
 Lothian, East, Bittern in, 43
 Glaucous Gull in, 36
 Iceland Gull in, 184

M

MACDOUGALL, Dr R. S., On the distribution of the Ox Warble flies (*Hypoderma bovis* and *H. lineatum*) in Scotland, 85

MACKETH, T. THORNTON, Weasel killed by Barn Owl; and Note on the hatching of young Barn Owls, 36; the Hawfinch in Renfrewshire, 52

M'WILLIAM, Rev. J. M., Roosting habits of Rooks in Bute, 5; Great Black-backed Gull breeding in Buteshire, 126; Great Black-backed Gull nesting in Clyde Area, 126; nesting of the Wigeon on Bute, 162; breeding of Eider in Clyde Area, 165

MALLOCH, T., Smew in Renfrewshire, 52

Martin, House, late appearance, 172

MAXWELL, Sir HERBERT, Pheasants and lilies, 183

May, Isle of, Northern Golden Plover at, 35

 Subalpine Warbler at, 126

MEIKLE, KATE W., Bittern in Ayrshire, 44

MEINERTZHAGEN, Col. R., A Note on the Hedge-sparrows (*Accentor modularis*) of the British Isles, 45; A Note on the Scottish Wrens (*Troglodytes*), with characteristics of a newly defined Hebridean race, 135

Midlothian, Black Redstart in, 76

 Coot, late nesting, 162

 Iceland Gull in, 164

Migration of birds in 1923, 138

 of birds at Holy Island, 89

 late, of Swift, 126

MILES, HERBERT W., Observations on the Hatching of the Field Slug, *Agriolimax agrestis*, 131

Mollusca, hatching of *Agriolimax agrestis*, 131

Morayshire, Pratincole in, 8

MORISON, GUY D., Notes on Some Thysanoptera from the Aberdeen Area, 163

Myxine, see Hag-fish

N

Names, tyranny of, 129

NASH, J. KIRKE, 172; Observations on the Swift, 77

Naturalist's Notes on Bavelaw Wood, 11
Nesocichla eremita gordonii, subsp. nov., 94

Nests removed by Rooks, 135

NICOLSON, Sir A. J., Great Snipe in Shetland, 10

O

Orkney, Great Bustard in, 89

Owl, Barn, hatching of young, 36
 Weasel killed by, 36

 Little, in Berwickshire, 76

P

Palinurus, see Lobster, Rock

Penguins, King, in Scottish Zoological Park, 31, 63, 191

 King, breeding and incubation, 191

Perthshire, Goldfinches in, 28

 Willow-Wren building in tree, 127

Pest-destruction by aeroplanes, 34

Phalacrocorax graculus, see Shag

Pheasants and lilies, 183

Pigeon, Wood-, extensive immigration, 36

Plover, Northern Golden, in Scotland, 35

Pratincole in Morayshire, 8

Partridge, abnormal eggs, 127

R

Redpoll, Coues', at Fair Isle, 4

Redshank, swimming of, 184

Redstart, Black, in Inner Hebrides, 184

 Black, in Midlothian, 76

Renfrewshire, Hawfinch in, 52

 Smew in, 52

Report on Scottish Ornithology in 1923, 105, 137

RINTOUL, LEONORA JEFFREY, and BAXTER, EVELYN V., see under BAXTER, E. V.

RITCHIE, Dr JAMES, 3, 172; Observations on a Pilot Whale stranded in the Firth of Forth, 37; White-beaked Dolphin in Firth of Forth, 75; Swallow's Nest on branch of tree, 83; the Loggerhead Turtle in Scotland, 99, 165; Turtle Barnacles in Scottish Waters, 166; Fertility of the Common Whelk or Buckie, 189

RITCHIE, JOHN, Willow-Wren building in tree in Perthshire, 127

- RITCHIE, JOHN P., Sandwich Tern breeding on the Clyde, 136; Breeding of Black-headed Gull on Little Cumbræ, 164
- ROBINSON, H. W., Swimming of Red-shanks, 184; Iceland Gulls in East Lothian, 184
- ROEBUCK, A., on Soil Insects, 34
- Rook, colour-variety, 127
removing nests, 135
roosting habits in Bute, 5
roosting habits in Lanarkshire, 69
- Roosting habits of Rooks, 5, 69
- Royal Physical Society, 172
- RUSSELL, Major W. M., Bittern in Kirkcudbright, 44

S

- Sagartia pallida*, see Sea-anemone
- Scart, see Shag
- Scotland, Coleoptera new to, 190
Great Bustard in, 173
Loggerhead Turtle in, 99, 165
Ornithology in 1923, 105, 137
spread and distribution of Woodcock in, 13, 47
Wrens in, 135
- SCOTTISH NATURALIST, I, 170
- Sea-Anemones, 98
identity of *Actinia elegans*, 121
Sagartia pallida, occurrence, anatomy, reproduction, etc., 185
- Shag, albino example of, 189
- Shetland, Great Snipe in, 10
Sandwich Tern nesting, 52
- Sirex gigas* at high altitude, 34
- Skye, Loggerhead Turtle on, 99
- Slug, hatching of Field-, 131
- Smew, see under Duck
- Snipe, Great, in Shetland, 10
- Solway Area, Bitterns slaughtered, 136
- Sparrow, cinnamon-coloured, 183
- Speedy, Tom, death of, 35
- Sportsman and Wild Life, 169
- STABLES, Major ALEX., Pratincole in Morayshire, 8; extensive immigration of Wood-pigeons, 36
- STENHOUSE, Surg. Rear-Admiral J. H., 3; notes on rare land birds from Tristan d'Acunha in the Royal Scottish Museum, 93; late appearance of House Martin, 172
- STENHOUSE, J. H., and CLARKE, W. E. EAGLE, see under CLARKE, W. E.
- STEWART, WALTER, roosting habits of Lanarkshire Rooks, 69
- Swallow, nest on branch, 83
- Swift, Alpine, in Wigtownshire, 84
Common, late migration, 126
Common, observations on, 77

T

- Tern, Sandwich, breeding on Clyde, 136
in Shetland, 52
- Thysanoptera in Aberdeen Area, 163
- Tristan d'Acunha, rare land birds in Royal Scottish Museum, 93
- Troglodytes*, see Wrens
- Troglodytes t. hebridensis*, subsp. nov., 135
- Turtle, Loggerhead, in Scotland, 99, 165
- Turtle-barnacles in Scottish Waters, 166

V

- Vole, Black Water-, combat with Heron, 4

W

- Warble Flies in Scotland, 85
- Warbler, Subalpine, at Isle of May, 126
- WATSON, W. G., Record of a migrant rush at Holy Island, Northumberland, between 8th and 11th Nov. 1923, 89
- WAUCHOPE, Lt.-Col. D. A., Black Redstart in Midlothian, 76
- Whale, Pilot, observations on, 37
- Whelk, fertility of, 189
- WHITE, ADAM, Recovery of ringed Woodcock, 36
- Whitethroat, Eastern Lesser, at Fair Isle, 4
- Wigeon, see under Duck
- Wigtownshire, Alpine Swifts in, 84
- WILD, Dr O. H., Glaucous Gull in East Lothian, 36; Observations on the Humble-Bees of Bute, 53
- Wild Life and the Sportsman, 169
- Willow-Wren building in tree, 127
- Woodcock, recovery of ringed, 36
spread and distribution in Scotland, 13, 47
- Wood-lark in East Fife, 75
- Woodpecker, Great Spotted, in Inverness-shire, 10
in Linlithgowshire, 10
Green, alleged Scottish record, 89
- Wood-wasps, see *Sirex*
- Wrens, Scottish, 135

Z

- Zoological Park, Notes from Scottish: The King Penguins, 31, 63, 191

The Scottish Naturalist

A Magazine devoted to Zoology

With which is incorporated
"The Annals of Scottish Natural History"

EDITED BY

JAMES RITCHIE, M.A., D.Sc., F.R.S.E.,
Keeper, Natural History Department, Royal Scottish Museum

AND

PERCY H. GRIMSHAW, F.R.S.E., F.E.S.
Assistant Keeper, Natural History Department, Royal Scottish Museum

ASSISTED BY

EVELYN V. BAXTER, F.Z.S., H.M.B.O.U.	W. EAGLE CLARKE, I.S.O., LL.D.
LEONORA J. RINTOUL, F.Z.S., H.M.B.O.U.	ANDERSON FERGUSSON, F.E.S.
H. S. GLADSTONE, M.A., F.R.S.E., F.Z.S.	

1925



EDINBURGH: OLIVER & BOYD, TWEEDDALE COURT
LONDON: GURNEY & JACKSON, 33 PATERNOSTER ROW

1925

(Authors are responsible for nomenclature used.)

The Scottish Naturalist

No. 151.]

1925

[JANUARY-FEBRUARY

THE EARLY SPRING.

EAGLE ECCENTRICITIES.

TWO years ago we drew attention to the marked influence which the open winter of 1922-23 had upon the routine of animal life, in inducing one set of creatures to continue the activities of autumn, as if winter had never come, and another set to commence the activities of spring, as if winter had already passed. The present spring would appear almost to have stolen a march on that other, for again the spring blossoms are appearing out of season, and birds are courting and nesting before their time. On Tweedside sprigs of furze were in bloom before the old year closed, on the south shore of the Forth crocuses were opening before the new year was many days old, and in Fife, aconite, snowdrops, and roses were flowering in company.

More remarkable are the signs of early nesting. Miss Rintoul writes that at Largo a young Stockdove, just fledged, was accidentally killed by a dog on 12th January, and that on the previous day, she watched baby Starlings, just out of the nest, being fed by their parents on the stable roof.

But the open winter may have effects of a more general kind, which may carry their traces far into the year. Absence of severe weather offers insects the most favour-

able opportunity of surviving till milder days set the wheels of procreation and multiplication in motion; it may even permit of an increase in numbers when, in ordinary times, the dormant insect is safely hibernating. Were these events to take place later in the year, they would be of little significance. The open winter and early spring are the danger periods for insect multiplication from man's point of view, and for this reason.

From late spring till autumn the country is peopled by hosts of insectivorous birds, which feed their young, and themselves survive, by the destruction of myriads of insects. The autumn sees the departure of the majority of the wholly insectivorous birds to warmer climes, and the influx of insect-eaters from northern and central Europe in nowise compensates for the numbers temporarily lost by emigration. During winter and early spring, therefore, the land, largely deprived of its insectivorous body-guard, lies, more than at any other season, at the mercy of the insect world. In ordinary years this means little, for in severe weather the majority of insects are safely under the sod, waiting for the great vernal reawakening. But in such seasons as the present, insect life, free from the threat of the insectivorous bird, seizes the opportunity of an early start, a handicap which may weigh heavily against the farmer and the gardener in the course of the year's race.

* * * *

A paragraph in the daily newspapers of 3rd February tells of a repeated attack made by a Golden Eagle upon a pup dog, which accompanied a youth driving a cart at Turriff in Aberdeenshire. The bird was eventually killed, but not before it had seized and endeavoured to make off with the dog. Such attacks are unusual, but not unrecorded. Gray (*Birds of the West of Scotland*) mentions the case of an Eagle stooping at a dog at Kirriemuir in Forfarshire, and describes a prolonged combat between an Eagle and a Fox at Strathmore in Caithness.

The Eagle may display extraordinary capacity for carrying a heavy burden over a long distance. Mr D. Lamont

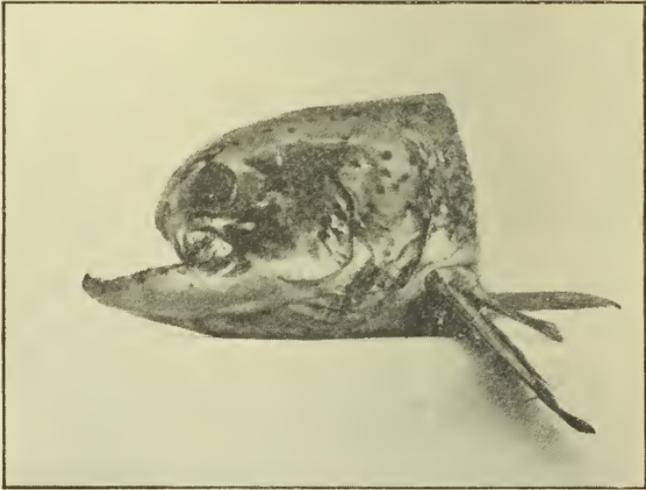
informed Gray that he had seen the old eagles of Mount Hecla in South Uist coming almost daily from Skye with a young lamb each to their eaglets—a distance of twenty-five miles; and every schoolboy is familiar with the tale, first recounted, in 1664, by Mathew Mackaile, apothecary in Aberdeen, of a White-tailed Eagle of Orkney which carried a child, a month old, from Houton Head to its eyrie on Hoy.

An account of a somewhat similar case of child-snatching has been brought to our notice through the inquiries of Dr Burn Murdoch and Rev. R. M'Lean of Morven. We repeat the story as it is told in a letter, dated 11th October 1924, from a lineal descendant of the victim, Mr John Campbell of Waternish, Skye. Mr Campbell writes: "The child that was taken from Waternish to Uig was not my father but my great-grandfather, and the event must have happened about 170 years ago. The child of fifteen months old wandered away from the house while his mother was busy inside. The neighbours saw the Eagle take the child, and noted that it went across the loch to Uig with it. A boat was sent immediately in the same direction.

"A shepherd in Uig, herding lambs, saw the Eagle. It was flying very low, as the child was heavy, and alighted on a hill a little bit away from where he was. Of course the shepherd thought it had taken one of his lambs, and off he went at once, getting quite near without the Eagle noticing him. He succeeded in getting the child, and took it home. The child was restored to his parents the same day; he was taken back to Geary in the boat. It would be about the end of July or beginning of August that the lambs would be taken from their mothers."

Mr M'Lean explains that the east coast of Waternish is high above the sea, bordered by towering cliffs, and that on that account the Eagle could have planed, in some degree, from the spot where the child was seized, across the Bay of Uig from Geary to Uig.

Malformed Salmon.—When netting Loch Stack, in Sutherland, in January 1925, for the purpose of marking salmon and sea trout, Mr Menzies, the Assistant Inspector of Salmon Fisheries, caught a Salmon of peculiar appearance owing to a malformation of the head. The mouth had no upper jaw, the anterior portion of the cranium ending in an abrupt rounded boss an inch and a quarter short of the end of the mandible. The nostrils had thus their openings facing forwards in the abrupt end of the head. This anterior end curved back into the centre of the mouth and was armed with teeth, while two abortive maxillary bones, that on the left side being a mere nodule, were situated below the eyes. The operculum on the right side was also imperfect. The fish had



Malformed Head of Salmon from Loch Stack.

grown to adult condition, was $30\frac{1}{4}$ inches long, measured to the end of the lower jaw, and had recently spawned.

The scales showed that it had been a three-year-old smolt, and had ascended from the sea as a summer fish after two winters in the sea. This malformation is occasionally seen amongst recently-hatched fry and even in the pau or smolt stage. The present fish had survived five years, and had grown normally.—W. L. CALDERWOOD.

Pine Marten in Argyllshire.—In August 1924, a Pine Marten was observed at Acharacle, close to the River Shiel. It was shot in the act of robbing a hen-roost in broad daylight, and the skin was subsequently sent by me to the British Museum (Natural History), London.—EDWARD VALPY, Stornoway.

THE STARLING (*STURNUS VULGARIS*)
IN THE FORTH AREA.

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

To my mind, the Starling is one of our birds which presents several features of the highest interest. Now ubiquitous, it is difficult for us to realise that not so very many years ago it was clearly a rare breeding bird in the area. Definite information on the point is distinctly meagre. That at least a few pairs bred in the neighbourhood of Edinburgh quite a hundred years ago may be gathered from Patrick Syme's little book, *A Treatise on British Song-Birds*, published in 1823. "Stirlin" and "Stare" were familiar names for it with the bird fraternity of that time; but these names may have had their origin in the west, where we know the bird was common in the eighteenth century. I am inclined to think, too, that it was at one time common in the Border counties, and this seems to be borne out by a statement made in his *Journal* by Sir Walter Scott;¹ and that for some reason a downward wave set in, and having reached its lowest ebb, has been succeeded by another of those marvellous increases, which we now see at about its maximum—for it is difficult to see where nesting sites can be provided for many more birds.

When I was a bird-nesting boy about 1860 there were always a fair number of Starlings' nests in the neighbourhood of East Linton, and it was not their rarity but the difficulty of getting at them that prevented us adding their eggs more frequently to our collections. There were

¹ "When I was four or five years old [this would be about 1776] I was staying at Lessuddun House [St Boswells] an old mansion, the abode of this Raeburn. A large pigeon house was almost destroyed with Starlings, then a common bird, though now seldom seen. They were seized in their nests and put in a bag, and I think drowned, or threshed to death, or put to some such end. The servants gave one to me which I in some degree tamed." (Cf. *The Journal of Sir Walter Scott*, vol. ii., p. 325, under date 23rd May 1830.)

always a few, however, in the open sheds connected with the farm buildings, which could be reached. At Buckstone, immediately to the south of Edinburgh, there was a very old ash tree in a hole in which a pair of Starlings annually reared their young, and several sites were known to me at Comiston, Oxfangs, and other spots nearby. At Oxfangs Farm the first pair nested in 1846, when one was shot (and considered a rarity) by the late Mr John Reid, who told me the facts in 1902. They were common there by the sixties of last century. But before that, namely in the spring of 1842, my father shot an adult male Starling in beautiful glossy plumage and with pale yellow bill (its skin is still in my possession) at Hopetoun in West Lothian; while from information supplied to me by the late Mr Campbell, factor at Dalmeny, it would appear that Starlings nested at Barnbogle Castle in the same county, and also at Colinsburgh in Fife, not later than 1850, and this was looked upon as exceptional. It was considered a rare bird at Dysart, in the latter county, about 1840 (S. Martin). Going back to the time when Macgillivray was collecting the information for his classic *History of British Birds*, in which he was ably assisted by Durham Weir in West Lothian and Archibald Hepburn in East Lothian, we gain the impression that while the bird was present in certain localities it was far from common.

Regarding its early status in East Lothian, the following letter written to me by Hepburn in 1895 is of the greatest value:—

ALDRIDGE, NEAR WALSALL,
4th Jany. '95.

MY DEAR SIR,—In reply to your favour of the 28th Novr. last which is referred to for its terms,—I beg to say, that if you have ever examined the ruins of the beautiful old parish church and its famous tower “the Lamp of the Lothian” at Haddington, and the fortified “Grange” and adjacent rocky precipice “the Kae Heughs” in the same parish, I think you will agree with me that no more suitable localities could be found for the nests and haunts of the Starling. And yet I never met with it during my schoolboy rambles.

In August 1838 I shot my first specimen in the parish of Whittingham. Towards the middle of the "Forties," three or four nesting pairs were exterminated by the gamekeeper for being accused of eating the eggs of dove-cote pigeons. Subsequently four or five pairs bred regularly in some ancient Ashes which crowned a steep bank of the Whittingham Water, to the westward of the conservatory attached to Whittingham House; and again about the same date my friend the late Mr Robert Gray of Dunbar frequently found Starlings in summer and autumn feasting on the larvæ of insects and crustaceans breeding in the heaps of decayed sea-weeds by the seashore.

Broadly speaking the Starling was not a common bird up to 1854, when I left the county.

From 1846 to the above-mentioned date, I frequently attended meetings of the Berwickshire Naturalist Club in the eastern parishes of that county, and I have several times ridden through its western parishes, without seeing any Starlings.—Ever yours truly,
A. HEPBURN.

The above dates, extracted from my notebooks, differ very little from those cited for Forth by Harvie Brown in his paper "The Starling in Scotland, its Increase and Distribution" (*Ann. Scot. Nat. Hist.*, 1895); from which it would seem to be proved that the Starling began to nest in the area, roughly speaking, about the "forties" of last century.

The "grotesque" figure of a chattering Starling on a chimney-can is familiar to every one; and after the breeding season is over he again takes up his stand, and throughout the autumn and winter gives joyous expression to his love of life on every sunny day. In his glossy gold-spangled plumage with its iridescent sheen of green and purple, he is indeed a handsome bird. When the young have to be provided for, the activity of the parents in extracting "leather-jackets" and other insect larvæ from the lawn is a picture of energy; and when the young leave the nest they are duly instructed in the art.

By the beginning of June these family parties have betaken themselves to the fields and hill-pastures, where, joining up with many similar groups, they form large flocks. For a time they may roost in the vicinity of their feeding grounds, but by mid-summer they will be seen joining the

flocks of non-breeding birds which have continued to resort each night to the great roost of the district. I recall one such roost in an ivy-clad wall at Tynninghame in 1869, where the babel of the birds as they squabbled and fought for their perches made a lasting impression on my mind. Many years later (in 1890), observing the continuous flocks passing over Edinburgh in the afternoons, flying towards the west, I determined to discover if possible where their roost was. By successive stages of observation I traced them to a young spruce plantation near Winchburgh. On the afternoon of 25th January I was early on the scene, and witnessed a spectacle not easy to describe. The day was stormy, with a boisterous wind, and it was marvellous to watch the arrival of flock after flock from every point of the compass. They settled in an old pasture close by, where they kept up an incessant noise. All of a sudden, with one impulse, the whole concourse rose into the air—one would have said they were at least ten thousand strong—and dividing into battalions, crossed and recrossed each other's path, manœuvring with the precision of an army. This performance was repeated more than once; till, finally, the entire assemblage flew over the plantation and descended *en masse* into it. Allowing them ample time to settle, and darkness to set in, I climbed the wall and proceeded stealthily for some distance into the wood. The noise was deafening, a medley of indescribable sounds, in which loud discordant notes mingled with the general murmur. The stormy nature of the night had caused them to seek the lower branches, and I found that I could run my fingers over the toes of the birds on the bottom tiers—a proceeding to which they paid little attention, no doubt supposing it to be one of their closely packed neighbours seeking a more comfortable perch. I have an impression that in stormy weather the sleepless murmuring continues throughout the greater part of the night. With the first streak of dawn the birds emerge from the wood, and in their separate companies, speed away to their respective feeding grounds. A similar, and perhaps even larger, roost existed on Cramond Island from about 1896 to 1901. The wood occupied was in the course of that

time practically killed out by the excessive quantity of the birds' droppings. I walked over to the island at low water one afternoon in November 1901, to watch their arrival, and was amply rewarded. They came streaming in by thousands over the water, and by careful estimate (on this and other occasions) I came to the conclusion that there could not be less than 12,000 birds, perhaps even a thousand or two more. By other observers they were put down at "millions," but that was a manifest exaggeration. These large winter roosts—I have notes of many others in the Lothians—are usually deserted every five or six years for a new site, the old woods becoming unsuitable.

Anyone who has watched the operations of a flock of Starlings on a field of clover or young grass in the spring must realise their enormous economic value to the farmer. An analysis of the contents of the stomach and intestines reveals the remains of great numbers of weevils (*Sitones*) and click-beetles, besides other noxious insects. A case in point was recorded by me in a note on *Cryptohypnus riparius* published in the SCOTTISH NATURALIST for 1921.

Another interesting habit of the Starling is the way it has of perching on the backs of cattle and sheep, the popular supposition being that it is searching for ticks and other parasites with which the animals are infested. This view has been supported by many of the older naturalists, among whom may be mentioned Macgillivray (*History of British Birds*, vol. i., 1837, pp. 600, 612, and 615); Yarrell (*History of British Birds*, 4th Edition, vol. ii., 1876-82, p. 230); Muirhead (*Birds of Berwickshire*, vol. i., p. 194); Dresser (*Birds of Europe*, vol. iv., p. 410). Naturally, these authorities have been followed by other writers. This explanation of the Starling's very individual and noticeable habit of sitting on the backs of animals has, however, been called in question of recent years. I have watched them again and again alighting on sheep, and have never been able to satisfy myself that the birds were actually searching for insects among the wool. It seemed to me that when they were feeding in a grass field and were disturbed in any way, or when their hunger was satisfied, they flew up and perched

on the animals' backs just as they might fly up and perch on a fence or bush.

The Starling has been recently introduced into America, and no more interesting account of it can be found than that given in the pamphlet issued by the American Bureau of Entomology, where its habits, food, etc., are thoroughly discussed.

I have seen eggs as early as March, but the usual time of laying in the area under review is about the middle of April. The number of eggs varies from four to six or even seven, five being the most usual figure. The period of incubation is remarkably short for a bird of its size—only about eleven days. If the first clutch is lost, a second will be laid; but in ordinary circumstances, two broods in a season are, I consider, extremely rare.

Migratory Starlings make their appearance every year at the Isle of May and other lighthouse stations, and it is possible that some of these go to swell our winter roosts. An instance of a Starling ringed on the May being afterwards captured near the North Cape shows that they are no stay-at-home birds, as also does the case of a specimen caught at Biel in East Lothian with a ring on its leg indicating that it had been marked at Viborg in Denmark.

Recently, young Starlings from Shetland have been described as more dusky than young birds from the mainland of Britain; but it has been pointed out in the SCOTTISH NATURALIST (1922) that specimens obtained in Edinburgh are quite as dark. This coincides with the opinion I have formed after close examination of nestlings bred in a hole in a tenement behind my house.

Bull-headed Sea-Trout in Don.—On 31st January, while netting the tidal water seawards of the Brig o' Balgownie, on the Don, Aberdeenshire, we captured a Sea-Trout with a head malformed, very much after the fashion of the Salmon described on p. 4 by Mr Calderwood. The Sea-Trout was a small individual, of 3 or 4 lbs. weight, and after it had been marked, so as to render subsequent identification possible, it was returned alive to the river.—W. J. M. MENZIES, Edinburgh.

WILSON'S SNIPE IN SOUTH UIST : A
NEW BRITISH BIRD.

AT the meeting of the British Ornithologists' Club held in London on 13th February this year, Colonel R. Meinertzhagen recorded the occurrence of an example of Wilson's Snipe (*Gallinago gallinago delicata*) in South Uist on 26th October 1920. When shot, it was regarded as probably belonging to the European race of Snipe, and it was only recently that a correct identification was made.

This Snipe breeds in North America, and is found in winter not only in the United States, but also widely throughout S. America. It was reported by Harting as having occurred on 1st August 1863 at Taplow, Buckinghamshire, but this record has not been accepted; and this South Uist bird must be looked on as being the first of its race which is known to have occurred in the British Isles.

As Wilson's Snipe very closely resembles our Common Snipe (*G. g. gallinago*), and as its recognition is not at all easy, the characters which are relied on for identification are here given in detail. Colonel Meinertzhagen, after quoting the opinions of various authorities, sums up the points on which a differential diagnosis may be made, and states that these are six in number, as shown in the accompanying table. All these six characters are only indicative, but it may be safely assumed that, if a Snipe with sixteen tail feathers, well-barred axillaries and black bars broader than white, transverse breast markings, a comparatively short bill, and outer tail feathers narrowly barred and not exceeding 8 to 9 mm. in breadth, be found in the British Isles, it belongs to the American race.

Another feature which is given by Hartert as being characteristic of the American race, viz., more abundant white spots on the upper wing coverts, was not dealt with by Colonel Meinertzhagen. This character is well seen in the few specimens of American Snipe in the Royal Scottish Museum, but as the spotting is sometimes as abundant in

European birds, it must be regarded also as only an indication.

	American Snipe.	European Snipe.
1. Number of tail feathers.	Always 16.	Usually 14, but examples are met with, with 12, 16, and even 18 tail feathers.
2. Barring of outer tail feathers.	Barring narrow, and number of bars may be as many as 7.	Barring wide, number of bars often 3, but occasionally birds are found with more, even as many as 7.
3. Barring on axillaries.	Barring heavy, dark and clean cut; the breadth of the black bars being usually greater than that of the white.	Barring usually not so distinct; the white bars usually exceeding the black in breadth, but many western European examples have the barring very well marked.
4. Markings on breast.	Markings usually transverse, but a certain proportion (about 8 per cent.) have longitudinal striping.	Markings nearly always longitudinal.
5. Length of bill.	Averages less—in the male 59 to 68 mm. measured from the feathers to the tip.	Averages more—in the male 58 to 74 mm.
6. Breadth of outer tail feathers.	Narrower, breadth at 20 mm. from the tip 4 to 9 mm.	Broader, breadth at 20 mm. from the tip rarely less than 10, ranging from 8 to 12.5 mm.

Naturalists and sportsmen in Scotland are invited to pay attention in future to any Snipe they may come across with sixteen tail feathers: an opinion on any such will gladly be given if they are forwarded to the Keeper of the Natural History Department, Royal Scottish Museum, Edinburgh.

J. H. S.

Cat Swimming a River.—On 10th November 1924, when walking along a road by the side of a river I met a cat. I spoke to it and, as it seemed friendly, picked it up and commenced to stroke it, but it did not relish my attention and suddenly jumped from my arms. It then ran across the road and, crossing about three feet of sloping bank, waded into the river till it got out of its depth, when it swam without the slightest hesitancy to the other side. The river is about forty feet wide at this point and was in fair flood at the time. The cat had some difficulty in effecting a landing and on doing so crawled beneath some bushes. I have never before heard of a cat taking to water voluntarily, and for this reason think that this note may be of sufficient interest for publication.—HUGH S. GLADSTONE.

THE SEA-SLATER, *LIGIA OCEANICA*: A STUDY
IN ADAPTATIONS TO HABITAT.

By Professor JOHN TAIT, M.D., D.Sc., F.R.S.E., Department of
Physiology, M'Gill University, Montreal.

MANY a person, overturning a large slab of stone by the seabeach, has been startled to discover the space underneath tenanted by a crowd of gigantic Slaters, which, hurrying helter-skelter in every direction from their disturbed retreat, scuttle with astonishing celerity into crevices between stones, or, in the absence of such convenient lairs, race headlong over the surrounding rocks to halt in some slight depression, where they lie rigid and motionless, but alert and ready at an instant's notice to dash off again. The size and agility of these lusty animals and the air of resolute determination with which each pursues his independent career, have over and over again communicated a shock of alarm to the unwary stranger. For all their apparent ferocity these giants of their clan are as innocent of mischief or possibility of doing harm as the most timid little Slater that creeps under the mortar of a wall or hides itself in a flower-pot, and should you succeed in catching a few, no easy task for a novice, you will find not only that they can be handled with impunity, but that they actually make charming and entertaining pets.

There is one unfailing method of becoming intimately acquainted with an animal, and that is to maintain it in captivity under conditions as nearly natural as possible. Almost all the facts here set down with regard to *Ligia* are the result of a study by the author of specimens kept, as a rule, miles from the sea and watched at odd hours of the day and of the night. But first of all let me tell you where to search for *Ligia* and, once you have secured your captives, how to keep them in full health, so that they will freely and unconcernedly exhibit their hundred-and-one odd traits of fascinating Slater behaviour.

NATURAL HABITAT OF THE SEA-SLATER.

Ligia lives on the seashore just above high-water mark and always on rough, rocky territory; it is not found on sand

or mud, and is even rare among the rounded boulders that are steeply piled in bays open to the full force of the waves. One never fails to find the animal, hiding singly or in small groups, in deep, fissured, rocky crevices near the upper tidal fringe, from which difficult retreats it can on occasion be dislodged by gentle titillation with a piece of wire bent at the point. Under loose, flat slabs of coarse sand-stone, should you luckily know of a locality heaped with such, they congregate in crowds. All they demand in the way of a den is that a certain degree of natural dampness should be conserved; free ventilation by dry wind they cannot endure. By day they lie in hiding, and at dusk they begin to emerge from their retreats, running silently but actively about the rocks in search of food, and taking exercise. In the south of England I have seen an occasional specimen wandering openly on piers and rocks by day; in the north of Scotland they are almost wholly nocturnal. Perhaps the greater number and the greater vigilance of the shore-birds in these last localities have led to the production of a more wary type, for as a dainty titbit their plump bodies are relished by fowl of all descriptions.

CONDITIONS IN CAPTIVITY.

For ease of observation an attempt was first made to keep them in a confectioner's bottle. On a smooth glass surface they tend to huddle in a mass, swarming over each other's backs, and, as they thus hang together in clusters, it is easy at any time to lift out a handful. When the bottle, a tall one, was laid on its side, some of the animals thus unceremoniously overturned would begin to move towards the mouth of the vessel. On the polished glass they made but sorry progress; the leaders in the race would be overhauled by others in the rear, which, crawling over their predecessors' backs, would thus impede their advance. Arrived at the inclined neck of the bottle, upward progress of the foremost was extremely difficult owing to the clawing mass adherent behind. The struggling behaviour of the crowd was ludicrously suggestive of a crush of jostling, elbowing human beings, yet it would be quite fallacious to

suppose that the *Ligiæ* were animated by any wild impulse of rivalry or of escape.

The animal needs a rough surface for foothold. Glass and glassy surfaces scarcely fall within its range of domestic experience, and on such a disconcerting pavement it clings to and walks over its fellows merely because they afford a better grasp for its feet. Each of its seven pairs of legs is armed at the extremity with two little hooks, arranged not side by side like the prongs of a fork but one nearer the body and the other at the extreme tip. Young animals have sharp hooklets on their feet, and, when put to the trial, can with difficulty just climb a vertical sheet of unglazed writing-paper. In a larger animal the hooks are blunt, and the owner may have trouble in scaling an upright sheet even of rough wrapping-paper. Our simple experiment teaches us that we should furnish an adequate foothold for our captives—and indeed when so provided they show no particular tendency to cling one to another; it also throws light on a circumstance that might otherwise cause wonder, namely, that in their natural habitat on the shore the full-grown grey-beards of the species are more fastidious and discriminating in regard to the quarters they inhabit than are the youngsters. *Ligia* wanders only where it can move with confidence and security; consequently the seniors are strictly confined to rough territory, whereas the feet of the small fry can safely take them to regions, such as the smooth water-worn pebbles of the beach, where their parents no longer dare venture.

Slaters of all kinds, whether they live by the seashore or far inland, are unable to withstand prolonged exposure to dry air, and any receptacle in which *Ligia* is to be confined should have a well-adjusted cover. Ultimately a large biscuit tin with tightly fitting lid was chosen as the most convenient house for them. To provide moisture and at the same time to act as a suitable foothold, a piece of rag wrung out of a mixture of half tap- and half sea-water was spread over the bottom of the tin. With occasional ventilation, such as occurs at the odd times of observation, the air supply is quite adequate, and the occupants instead of resenting the darkness seem actually to prefer it.

FEEDING HABITS.

When a colony of captive animals is thus kept together the individuals are apt to eat each other, the victims being those recently moulted, which in their soft-bodied state are specially vulnerable. An endeavour was made to discover a suitable food for them—not altogether a simple task owing to the fact that they feed only by night or at least under cover of darkness. The writer has never seen a *Ligia*, however hungry it might be, in the act of consuming food, while observers who have sought to study the feeding habits of ordinary land Slaters have commented upon the same difficulty. As *Ligia* is frequently found occupying common quarters with Shorehoppers (*Orchestia*) and with a bluish-grey land Slater known as *Porcellio*, specimens of both these animals, living and dead, were tentatively provided as food. The Shorehoppers were eaten, the specimens of *Porcellio* left untouched. Pieces of cooked bacon and cooked chicken were likewise neglected. Then different varieties of vegetable food were provided. Land plants were wholly disregarded; seaweeds of the Bladderwrack or *Fucus* type were in cases of dire extremity gingerly consumed, but blades of Oar-weed or *Laminaria* were voraciously eaten; when these are provided *Ligia* relinquishes its cannibal habits and its proclivity to kill and eat *Orchestia*.

The homes they select for themselves on the beach are remarkably clean; one never finds them, for example, underneath the soft, glutinous, decomposing wrack cast up by the sea and left stranded along high-water mark; whence one would infer that they are, like pigs when left free to themselves, somewhat particular and nice in their habits. In captivity their quarters are apt to become soiled, and the simplest way to keep them clean is to have a spare house for them and to change their quarters from time to time. The spare domicile, let us say, stands dry and empty. Into this they are transferred by hand from the box previously in occupation, and here they are repeatedly flooded with seawater so as to wash their skins, the polluted water being on each occasion drained away until it is seen to escape clear. The cloth which provides dampness is at the same

time well washed and replaced in the new tin. When in this way they have a bath and a change of quarters every two or three days they thrive amazingly and appear to be as happy and contented as in their natural haunts on the shore.

AFFINITIES OF THE SEA-SLATER.

Having settled the problem of keeping our charge in a healthy condition in captivity, let us now consider the animal more closely. It is a member of the extensive group of animals known as isopods, the great majority of which are wholly marine, many being first-class swimmers. The only terrestrial isopods are the Woodlice or Slaters. Now *Ligia*, unlike the other slaters, is never found far from the sea. Though its chosen line of habitation is at a slightly higher level than the water-washed beach, it never strays out of reach of the surf, being most abundant where the rocks are frequently drenched with spray. Since the belief prevails that all our land animals have sprung from aquatic ancestors, is it possible that *Ligia* is in the stage of undergoing slow and imperceptible change from a sea to a land life?

If we drop the animal into a bucket of water, it slowly sinks to the bottom, meantime making clumsy and utterly ineffectual efforts to swim by alternately bending and straightening its body. A Shorehopper (*Orchestia*) or a Sandhopper (*Talitrus*) similarly let fall, behaves in exactly the same way. The evidence is strong that the Hoppers at least have sprung from aquatic ancestors, yet all three animals are strangely unable to make any forward movement in the free aqueous element. One might well suppose that certain of the long succession of marine ancestors had, while still inhabitants of the sea, relinquished their swimming habits in favour of a crawling mode of existence, and that these special reptant accomplishments had in turn enabled or enticed each family group to emerge on the land. This supposition, which, be it said, has possible bearings on the much disputed origin of land vertebrates, is rendered no less likely when we find in salt pools on the upper beach another interesting and beautiful little isopod, *Jæra*, which, though entirely aquatic, yet progresses wholly by crawling.

RESPIRATORY ADAPTATIONS.

The aquatic affinities of *Ligia* are indicated best of all by its organs of respiration. Like all the water-inhabiting isopods, it breathes by means of gills, which consist of thin plates, underneath the hinder or tail part of the body, arranged in succession from before backwards like the leaves of a book. Gills differ from lungs in that they freely project from the surface of an animal, whereas lungs, the common instrument of ærial respiration, are contained in pocket-like recesses of the body. The reason why lungs are thus concealed within the body is that the lining membrane of every type of breathing organ, whether lung or gill, has to remain moist to permit passage of the gases of respiration. Should the delicate membrane be effectually touched by drought, an accident that is prone to happen in the case of a freely projecting gill, the owner must inevitably die of asphyxiation, which in turn explains why *Ligia* is under the imperious necessity of shunning localities that are arid. In its adjustment to the exigencies of air surroundings *Porcellio* has advanced a stage further than *Ligia*, for examination has shown that some of its gill plates contain a system of hollow branching tubes into which dry air can diffuse with less risk of doing damage.

While the configuration of the breathing apparatus in itself indicates insufficient adaptation to land conditions, the behaviour of these gills during immersion is no less suggestive of an aquatic history. In orderly succession they beat the water with a beautifully regular and wavelike rhythm, by which action fresh supplies of fluid are constantly drawn over the respiratory surface. This active movement of the gills themselves, so characteristic of every aquatic isopod and so rare in other crustacean forms, is imperceptible so long as *Ligia* is surrounded by air. As the mechanism of the movement is highly intricate and involves the harmonious action of an elaborate system of nerves and muscles, it is incomparably simpler to suppose that *Ligia* has retained a pre-existing endowment than to believe that it has independently developed such an accomplishment merely to meet the contingency of occasional immersion.

(*To be concluded.*)

THE FUTURE OF THE STUDY OF FLIES.

IN a Presidential Address to the Yorkshire Naturalists' Union, delivered at Sheffield on the 6th December last, Mr Percy H. Grimshaw discussed the above subject, and his Address, since it suggests many lines of investigation suitable for the field naturalist, is here summarised. The author sets forth his conception of the nature of the work which can be undertaken by the members of local societies, something beyond the mere capture of specimens and formation of bare local lists. The paucity of dipterists is accounted for, in the first place, by the absence of any general text-book in the English language, and in order to overcome this difficulty it is suggested that each collector should pay special attention to one particular family and acquire the necessary literature (British, French, or German, as the case necessitates), at the same time amassing material in all groups. By specialising in this way he would soon become an expert in his own group and be able to name not only his own material, but that of his colleagues. They, on the other hand, would deal with different groups in the same way, "and thus by a kind of labour exchange each dipterist would get together a collection fully representative of his own district, and would be able to add much of value to our knowledge of the fauna" in general. But the mere compiling of a local list is not sufficient, and an *intensive* method of collecting to show the fullest variations in distribution should be undertaken, and the results either plotted on large-scale maps or kept under a system of card-indexing. In this connection C. G. Lamb's paper on "Insect Oases," which appeared in the *Proceedings of the Cambridge Philosophical Society*, is discussed and quoted as illustrating the problems which present themselves when special attention is given to a limited area. The presence of certain species in definite oases or local areas is regarded by Lamb as a forecast of approaching extinction. Whether his conclusion

is correct or not, the case is worthy of consideration and may serve as an example of the interesting results which may arise from the intensive method advocated.

Other points for investigation suggested in the Address are (1) the range of flight of individual Flies; (2) the systematic recording of the altitudinal range of the various species; (3) the range landwards of those species which occur on or near the coast—all subjects connected with the study of geographical distribution. The investigation of *insect communities* is next dealt with, and it is pointed out that there is here a fine opportunity for entomologists of all kinds to work together. The study of life-histories is a necessary adjunct to this line of work, for the "real index of an insect's habitat is where it breeds" (Cameron).

The habits of Flies are discussed in some detail, and attention is drawn to the unsolved problem regarding the winter condition of the common House-Fly (*Musca domestica*). Fly-swarms, such as are found in the case of Midges (*Chironomidæ*), the Winter-Gnat (*Trichocera*), and others, are regarded as worthy of detailed observation, and it is suggested that the actual number of each sex in a swarm should be ascertained, and that information should be gathered regarding the influence of the weather, the time of day, and the time of year when the swarms are prevalent. Variation in diptera is another subject that would well repay investigation, especially in the case of hairy Syrphidæ and the brilliant metallic Flies of the genera *Lucilia*, *Pyrellia* and others, while the study of chætotaxy (bristle-arrangement), in certain families is instanced as a fruitful subject. Feeding habits, parasitism, and the relation of Flies to the human race form the concluding paragraphs of the Address, which appeared in full in the January number of *The Naturalist*, and appeals to a wider circle than the members of the Association for whom it was prepared.

NOTES

Red-crested Pochard (*Netta rufina*, Pallas), a Rare Scottish Immigrant, in Midlothian.—On 21st December 1924, I identified a Red-crested Pochard on Duddingston Loch. When observed first the bird—a drake not in very bright plumage—was in company with some Common Pochard, of which species there was a large number at the east end of the loch. Tufted Ducks and Coots were also in the vicinity, but it was noticed that the Red-crested Pochard kept somewhat apart from the other birds and pursued its own course in seeking food.

On 28th December I again observed the bird, and on the 29th the identification was confirmed by Mr Kirke Nash. On these occasions the bird was frequenting a different part of the loch. It was again seen in company with Pochards, but on the 28th it delivered a slight attack on one of these birds.

The descriptions and pictures of the bird in full plumage point to easy identification, but in the poor light of late afternoon, it can easily be taken for a Common Pochard. Its form is, however, distinctive, the body being larger, the neck longer and more curved, rather after the style of the Divers. The head has not the heavy appearance of the common species, the neck and head being carried more gracefully. The crest feathers are but slightly lengthened and stand out to give the bird's head a "fuzzy" appearance. There is no suggestion of the elongated "crest" of the Tufted Duck. The lighter yellow (golden bay in text-books) on the head crest is plainly visible in a good light. The most noticeable feature for field identification is the white on the shoulders which is, however, a variable quantity and was much more conspicuous on the first than on the subsequent occasions when the bird was seen. It can even be seen clearly when the bird is facing the observer, when it appears as a continuous band interrupted by the neck. The dull white on the flanks contrasts with the brownish back, and the black tail and the practically black neck and breast are noticeable on the water. The bill is red and a very distinctive feature, forming a marked contrast to the dark blue banded bill of the common species. One other point may be mentioned, that the chestnut of the head stops short on the back of the neck much higher up than in the case of the Common Pochard.

In diving, the bird is active and takes a more headlong plunge than the common species. It was observed to feed both on the surface and under water, whence it brought up weeds, which it proceeded to "dibble" in the water in its search for food clinging

to them. Its dives were all in shallow water, of short duration and at infrequent intervals. It has always been observed feeding within a short distance of the banks or reeds of the loch.

Perhaps the most complete information in regard to this Pochard is in Millais' *British Diving Ducks*, Vol. i. The bird breeds in South Germany, South France, and Spain as well as Asia, and normally proceeds southwards in winter, being abundant then in Sardinia and the north of Africa. It has occurred on a number of occasions in England. In Scotland it occurred in 1862 in Argyllshire, and Millais further records for the first time that an Oban taxidermist had mounted two which had been taken in the winter of 1898 in that district.

At the time the specimen under note arrived, taking that date to be the date on which it was first observed, the weather, according to the *Times*' reports was mild, and the winds south to south-west, in parts being strong to gale force.—CHARLES G. CONNELL, Edinburgh.

Late Occurrence of the Lesser Tern in Forfarshire.—

On 20th October 1924, I observed three Lesser Terns (*Sterna minuta*) passing to and fro on the seashore between Arbroath and Elliot. One of the birds was apparently in immature plumage. This would appear to be an exceptionally late date for the species to be visiting this coast on migration.—DOUGLAS G. HUNTER, Arbroath.

Rare Gulls in West Lothian (a) Iceland Gull.—During the winter of 1872 Iceland Gulls frequented the Forth in considerable numbers, but since then the species appears to have been seldom observed. The occurrence of the nearly adult bird, recently recorded by Mr Hamilton, has, however, been shortly followed by that of an immature specimen which we observed on 10th January last near Dalmeny. Our attention was first drawn to the bird by its light ash-brown, mottled plumage, as it rested on a sandy stretch of the beach among a group of immature, darker plumaged Herring Gulls. The long pale primaries also came under our notice. So marked was the contrast that on revisiting the locality on the 24th we could quite easily pick out the bird from an immense flock of Gulls standing on the shore at the beginning of ebb-tide.

(b) *Sabine's Gull.*—On the occasion that we first observed the Iceland Gull we noticed a bird in the late afternoon which we strongly suspected to be a young Sabine's Gull, but in the fast failing light we could not definitely determine this. During our next visit, on the 24th January, we were not a little surprised to find the bird still frequenting the spot, and then we had no difficulty in recognising the species. In addition to the dark legs, the crown,

mantle, and wings were of a decidedly dusky hue and the wings projected clearly beyond the forked tail with its dark terminal band. On either side of the breast was a dark patch, whilst the forehead and throat were distinctly white. A Black-headed Gull showing traces of the summer hood afforded an excellent opportunity for comparison as it stood beside the stranger. The latter presented a much more graceful appearance, an effect largely due to the fine sweep of the long wings.—DAVID HAMILTON and J. KIRKE NASH.

The Little Gull in Forfarshire.—During the autumns of 1922, 1923 and 1924, Little Gulls (*Larus minutus*) regularly visited the foreshore at Elliot, about one mile to the south of Arbroath. In 1922 single birds were observed a dozen or more times between 5th August and 14th October, while on 4th October two were seen. In the following year single birds were again frequently observed between 29th August and 24th January 1924, and on 10th October a pair of old Gulls accompanied by a young bird were noticed hawking flies over a marshy area adjoining the sea. In 1924 one was regularly seen between 17th September and 27th October, while three individuals were observed on 15th October and two on 22nd October. All these Gulls were in winter plumage. This species of Gull appears to subsist largely on insects. When visiting Elliot, they frequent for feeding purposes marshy ground more than the sea, and it is only when at rest that they are found about the foreshore. When settled there they almost invariably sit a little apart from a flock of Black-headed Gulls (*Larus ridibundus*), their nearest allies among our native British Laridæ.—DOUGLAS G. HUNTER, Arbroath.

Flocks of Tree Sparrows in Edinburgh District.—Although breeding at several places in the Edinburgh district, this species is by no means numerous, and we had much pleasure in encountering two fairly large flocks in the hedgerows bordering the western boundary of the city on 6th December last. We counted twenty-four birds in one flock and over forty in the other. It would have been interesting to know whether they were immigrants or merely a congregation of local birds.—DAVID HAMILTON and J. KIRKE NASH.

“Roosting Habits of Lanarkshire Rooks.”—*Corrections.* The following corrections have reference to the paper on “Roosting Habits of Lanarkshire Rooks,” SCOT. NAT., 1924, pp. 69-74.

On page 73, the winter roost (4) “New Liston, Kirkliston, Linlithgowshire,” should be replaced by (4) Avontoun, Linlithgow, West Lothian. Macgillivray, in *British Birds*, vol. i., p. 545,

quoting Mr Weir of Boghead House, Bathgate, writes of the Rooks from Kirkliston flying every morning to their feeding grounds in the vicinity of Shotts, Lanarkshire; and we, finding that one rookery in an eastern corner of that parish undoubtedly belonged to an eastern tribe of Rooks, their line of flight actually passing within sight of Boghead House, naturally did not question the correctness of this observation thereby inadvertently perpetuating the error.

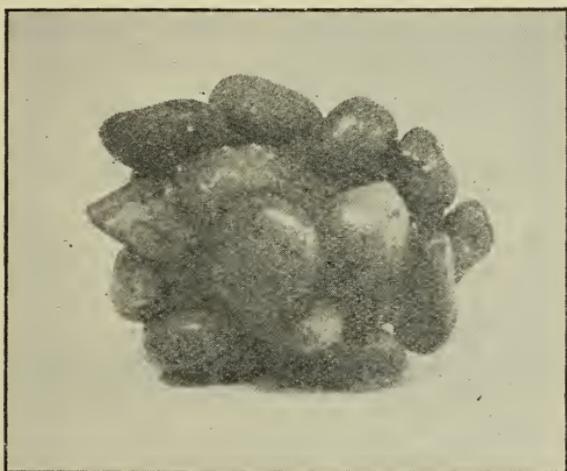
Some few miles east of this place there passes northward a broad and exceedingly well-defined rook flightway which leads from the rookeries in the Mid and West Lothian parishes of West Calder and Whitburn, gradually links up the branch flightways in Bathgate and Torphichen, and, skirting the hills of these two latter parishes, ends in the low ground of Linlithgow at the winter roost of Avontoun. Along this flightway also pass small flocks of Carrion Crows, their destination being a winter roost on higher ground some $2\frac{1}{2}$ miles further south than that of the Rooks. This roost of the Carrion Crows is no doubt identical with that described by the late Capt. S. E. Brock (SCOT. NAT., 1913, p. 188). (It is a remarkable fact that Carrion Crows usually have their winter roosts in the same neighbourhood as the Rooks, but invariably on higher ground, and only in a highly situated coniferous rook winter roost do they deign to occupy a section of it.) Avontoun is situated in a finely-wooded park, and is the residence of Sheriff Maconachie. Although records do not go further back than fifty years (previous to this for a long period it was virtually closed, being occupied by a hermit or recluse), there is little reason to doubt its antiquity as a winter roost. It is entirely deciduous and contains a decreasing rookery, numbers being reduced in the interests of agriculture.

Southrigg School rookery is actually $7\frac{3}{4}$ miles distant from the winter roost at Avontoun, but the actual distance flown, first east to join the main flightway then north to the roost, is $10\frac{3}{4}$ miles.

Also on page 73—(7) Ogg's Castle, Liberton, should be deleted as a winter roost. During the winter of 1923-24, some roosting did actually take place, probably by both home and foreign Rooks. Later on, however, we learned that the proprietor of Mossfennan had been prevailed upon by the neighbouring game-preservers to sanction an intensive shooting of the Rooks at the winter roost there, this, no doubt, contributing to the erratic roosting of that winter. In late November 1924, we visited the Newbigging and Ogg's Castle district, but found an entire absence of Rook roosting. On every occasion the birds departed for Mossfennan in the early afternoon. Immense flocks of Starlings were congregating nightly at Ogg's Castle woods from all points.—WALTER STEWART, Airdrie.

Cinnamon Variety of Redwing.—On 8th November 1924, a pale-coloured variety of Redwing was found by me on Fair Isle, where it had been seen for more than a week previously. The colour is of a cinnamon tint, varying in its depth according to the ordinary markings of the species. The specimen was forwarded to The Royal Scottish Museum.—JEROME WILSON, Fair Isle.

Remarkable Cocoon of the Puss-Moth (*Cerura vinula*, L).
—A curious instance of the versatility of architectural instinct in the Puss-Moth caterpillar has come under my notice recently, and is perhaps worthy of permanent record. In September last three nearly full-fed larvæ were brought in alive to the Royal Scottish



Remarkable Cocoon of Puss Moth.

Museum by Mr A. Currie of Leith, who had found them on the 2nd of that month in the Meggat valley near St Mary's Loch, at an elevation of about 1000 feet above sea-level. They were placed in a dry tank in the aquarium and left to themselves. Some little time afterwards the attendant in charge of the aquarium had occasion to clean out and prepare for occupation the particular tank referred to, in which the larvæ had remained undisturbed and apparently forgotten. The floor of the tank was covered with ordinary pea gravel, such as is used for garden walks, and it was in the course of cleaning and redistributing this gravel that the attendant noticed in one corner of the floor a strange agglomeration of pebbles, which upon examination proved to contain a cocoon spun by one of the larvæ. The ability to make use of abnormal material for the strengthening of its cocoon by this species of

caterpillar is well known, and Barrett records cocoons built on the mortar of a wall or on a potato tuber. But the use of pebbles of the size shown in the accompanying Fig. (which is very slightly over natural size) appears to me to be extraordinary. The whole structure measures in its greatest length 38 mm. ($1\frac{1}{2}$ in.) and in its greatest breadth 27 mm. ($1\frac{1}{8}$ in.). Its weight is no less than 13.5 grms., which is only about 12 grs. short of half an oz. The two largest pebbles used are each nine-sixteenths of an inch in length!—PERCY H. GRIMSHAW, Royal Scottish Museum, Edinburgh.

Humble-Bees' Unusual Nesting Sites. — During the exceptionally wet summer of 1924, in a garden at Broughty Ferry, Forfarshire, I met with two examples of rather unusual sites chosen by Humble-bees for their nests.

The cup-like nest of a pair of Blue Tits, which I had been watching, appeared to be completed about the 7th May 1924, but on the 10th May, instead of finding eggs, I discovered both birds flying to and fro in a state of great excitement, and the nest itself apparently disturbed. Further examination dislodged a large specimen of the Stone Humble-bee (*Bombus lapidarius*) which had evidently annexed the nesting-box and nest for its own purposes. The Bee was driven off, but I did not see the Tits near the nest again.

I should have thought that a Blue Tit would have been a match for any Humble-bee, but possibly the insect may have managed to dig itself in during the absence of the birds, after which its buzzing would probably be sufficient to frighten away the rightful owners.

In the middle of June I found, in ivy on a wall, a Hedge Sparrow's nest tenanted by a small garden Humble-bee (*Bombus hortorum*). The bee's nest was well established and contained a number of workers. The presence of a couple of Hedge Sparrow's eggs unincubated in the nest suggests that the advent of the Bee had resulted in the departure of the birds.—J. N. DOUGLAS SMITH, London.

BOOK NOTICES

THE BIOLOGICAL FOUNDATIONS OF SOCIETY. By Arthur Dendy, D.Sc., F.R.S. London: Constable & Co., Ltd., 1924. Pp. x+197. Price 7s. 6d. net.

Professor Dendy in his endeavour to unearth the foundation-stones upon which the structure of human society has been reared, digs deeply into the activities of the animal kingdom; for it is his thesis that the complex institutions of humanity are founded upon the essential processes of living matter. Thus he discusses growth and cell division in the simplest organisms, the workings of inheritance of characters, the influence of environment, and the natural selection which of necessity follows upon excessive multiplication and the struggle for existence. He regards human society as more or less a complex organism largely controlled by the laws of organic evolution, subject to the factors that play a leading part in the evolution of the lower organisms—"the response to stimuli, the accumulation of capital, co-operation, differentiation and division of labour, and upon the integrative action of a well-organised system of control or government." The mental outlook has, however, come to transcend the purely physical environment, so that "progress [for mankind] must now consist in the formulation of high ideals and in adaptation to these." While much of the discussion seems to be very remote from society in its finished manifestations, the author concludes with a suggestive chapter in which he forecasts the problems which must be solved "if our present civilisation is to escape the fate of its predecessors and enjoy any lengthened period of further development."

BIRDS AND THEIR RELATION TO MAN. By Clarence M. Weed and Ned Dearborn. London: J. B. Lippincott Company, 1924. Pp. viii+414. Price 15s. net.

The relationship of birds to man, whether as pests or benefactors, has given rise to much controversy, and has resulted in most civilised countries in a very considerable body of legislation. Yet the controversy continues, and we doubt whether it will ever be satisfied to the liking of all parties to the dispute. The present work, a new and enlarged edition of a book which appeared in 1903, with its reasonable outlook and readable summaries of the habits of the various species of American birds, ought to do much to spread a wise knowledge of their activities. It discusses the methods of studying the food of birds, summarises their chief plant and animal diets, indicates how the depredations of birds may be avoided, enumerates, family by family

and species by species, their feeding habits, and makes a strong appeal for the conservation of birds "either for the good they do or for love of them." Although a relatively small number of the American birds here dealt with, are to be found in Britain, the statements in general hold good for their relatives in this country, the ornithological literature of which still lacks a readable and comprehensive work upon this important aspect of bird-life. Of the 113 illustrations in the book the majority afford excellent characters for the identification of the species.

IMPRESSIONS OF GREAT NATURALISTS. By Henry Fairfield Osborn. London and New York: Charles Scribner's Sons. Pp. xxix + 216. Price 12s. 6d. net.

Professor Osborn, who is well known as one of the most distinguished of living American scientists, is the author of many biographical memoirs and has delivered not a few biographical addresses. He has drawn freely on these for the present work, which to him must have been a labour of love. In it are his reminiscences of twelve great naturalists, of whom six are American, five British, and one French. We were surprised to find the name of the late Viscount Bryce on the list, but the author fully explains his reasons for this in the "Foreword." Professor Osborn is at his best in his personal touches, and he had personally met all these eminent scientists with the exception of Alfred Russel Wallace. The book is excellent reading.

INSECTS: THEIR STRUCTURE AND LIFE.--A Primer of Entomology. By George H. Carpenter, D.Sc. London and Toronto: J. M. Dent & Sons, Ltd., 1924. Second Edition, Revised. Pp. 335. Price 10s. 6d. net.

We welcome the appearance of a second edition of this excellent manual. In addition to a careful revision of the text, bringing the subject up-to-date, we notice considerable improvement in the typography, and by the use of a smoother paper a more effective use of the many excellent illustrations, while a slight enlargement of the size of the page has added much to the general appearance of the volume. An attractive new feature will be found in the four coloured plates illustrating protective resemblance in the certain Geometrid Caterpillars, Mendelian Inheritance in British Moths, two forms of Saturniid Silk-moths, and the mimetic female forms of the African Swallow-tail Butterfly (*Papilio dardanus*). In its new form this work, which is much more than a primer, can be recommended as one of the best introductions to the study of entomology as yet published. It is a wonderful production at the price, and the name of the author is sufficient guarantee for the soundness of the information contained within its pages,

NOTES FROM THE SCOTTISH ZOOLOGICAL PARK

THE KING PENGUINS.

(Continued from 1924, p. 195.)

HATCHING OF FIRST CHICK.

It was not known with certainty what the period of incubation was in the case of the King Penguin, and as the weeks passed till the eighth had begun without any result, doubts began to increase as to whether the egg would hatch. On the 22nd of October it was found to be chipped and the chick inside was heard calling. Two days later—seven weeks and four days after the egg was laid—the chick had left the shell. Although C had latterly done most of the incubation, the honour of actually hatching the chick went to A who had the egg at the time. As soon as the chick appeared trouble began with B, who either wanted the chick or else desired the company of A without encumbrance. The “baby” passed the first three or four hours of its life outside the shell in the midst of squabbling and bickering on the part of its elders which all but finished it; twice it was found half buried in sand and forgotten by its parents and a third time it dropped into a crevice of the rock, and, but that a visitor in the Park chanced to see the accident, the chick would probably have disappeared, leaving no trace. The offending B was again removed from the enclosure, and this time was taken to a distant part of the grounds beyond sight and hearing of A, and C, getting possession of the chick, never let A have it again, though during the first week or two A tried frequently to get it.

The chick at first was quite naked, looking like nothing so much as a rather dirty, battered and badly deflated rubber-ball, but on its head could be seen traces of fine white filaments, the vestige of an ancestral coat of primitive nestling feathers now all but lost. It was held just as the egg was, on the old bird’s feet and covered by the brood-flap or pouch.

FEEDING OF CHICK.

The chick having been hatched the next anxious question was, “Will the old birds feed it?” All doubt on that score was satis-

factorily settled on the second day, when the chick was seen feeding from C's throat. It was noticed that when it wished to feed the chick stretched its neck out and uttered a whistling call of a clear, flute-like note, whereupon the old bird, after a few contorted movements of its body, opened its beak and allowed the chick to take from its throat the almost digested fish which it disgorged. It had been noticed that C had fed very sparingly for a day or two before the chick hatched, and it seemed as if this might be designed to ensure that a supply of almost completely digested fish should be in readiness for the needs of the young chick. If that assumption be correct, it suggests an extremely sensitive adjustment of the complex of instincts involved. At first the occasions of feeding were fairly frequent and were performed in a leisurely manner; when the chick had intimated that it was ready and the old bird had disgorged a quantity of almost liquid fish, the young one took it a little bit at a time, pausing after each mouthful and signifying its willingness to have another by its little flute-like cry on a double note which, some people thought, sounded very like the word "ready." On one occasion (at three days old) it was noted that the "baby" took its breakfast in nineteen distinct beakfuls. The chick's likeness in size and texture to a rubber-ball did not long persist; very soon it began to show an increase in size and, at the same time, the growth of the brown nestling feathers began to show.

PARENTAL JEALOUSIES.

During the first ten days of the chick's existence A, the supposed father, showed a strong desire to get possession of it and explained its views to C with a wealth of gesture so expressive that neither penguin nor human could fail to understand. C however made the other side of the question clear in a manner equally emphatic and kept the untrusted partner at a safe distance. On one occasion, at this time, the writer noticed a pathetic attempt on the part of A to share in the joy of the nursery by feeding the "baby"; it disgorged a part of its own dinner and laid it at the feet of C who, however, was not to be won over even by that, so after a decent interval A proceeded to pick up the biggest pieces and swallowed them again himself. This not only showed some practical commonsense, but also afforded the only instance observed during the eleven years the King Penguins have lived in the Park, of one of these birds eating anything off the ground.



KING PENGUIN AND YOUNG IN DOWN, SCOTTISH ZOOLOGICAL PARK.

RAPID GROWTH OF CHICK.

The growth of the chick was so rapid that by the end of its second week it was becoming too large for the old bird to cover it properly; its head was still tucked in on her feet beneath the brood-flap but the greater part of its body lay exposed on the sand. By this time the chick was well covered with the soft brown nestling plumage and had begun to stand upon his feet and even to take some interest in its own person, for it was seen trying to preen and dress its feathers.

When about three weeks old the "baby" made another important advance, for it left the shelter of its parent's body and, taking a few steps forward, turned and regarded her with an amusing appearance of contemplative interest. The first few hesitating steps were soon followed by journeys of greater length and daring, in which an adventurous "baby" was closely followed by an anxious and harassed "mother," as one may, at this stage of the story, term C. This quickly led to some unpleasantness, for the "baby," thinking apparently that all adult penguins were much the same thing, or being unable to distinguish any very important difference between them, went up to A instead of to C. The latter, having been denied the privilege of caring for the chick when he wanted it, was no longer in a nursing mood and greeted it with a savage pecking. The powers controlling the destiny of these particular penguins, being inexperienced in the matter of penguin chicks and knowing not the infinite number of pecks which they will receive with indifference, immediately decreed the banishment of A, and for some time after, C and the chick had the enclosure to themselves.

The baby's brown coat was now growing long and thick and drew from a visitor the criticism—"That's no a bir-r-r-d, it's a beast; it's got fur." He had grown so large, too, that even his head could scarcely be covered or protected by his "mother," and her attempts to cover him were almost as pathetic as they were ludicrous. Once she almost solved the problem by lying down on top of him! About this time—when some three weeks old—the "baby" began to develop another accomplishment; he would utter a soft and rather sweet warbling sound, rather like the early efforts of a young thrush, and quite distinct from the clear, flute-like call for food.

T. H. GILLESPIE.

(To be continued.)

The Scottish Naturalist

No. 152.]

1925

[MARCH-APRIL

SUNSPOTS AND ANIMAL PLAGUES.

How far man still is from comprehending the delicacy of life's adjustments! There is a subtlety about the relationships of living things to inanimate nature that evades our rude inspection, so that only here and there do we gain a glimpse of ultimate cause and effect. But every glimpse adds to the wonder of life. The pulsing of the Gulf Stream affects fisheries in the North Sea; the amount of summer sunlight influences the catch of mackerel; the last quarter of the moon in October and November determines the egg-laying of the Palolo-worm of the Pacific Ocean; the ups and downs of the herring fisheries are said to have coincided for a century and a half with the maximum and minimum declination of the moon.

Now Mr C. S. Elton, in an instructive paper,¹ suggests that animal plagues are no sporadic occurrences, springing somehow or anyhow for the confounding of man, but that they are determined by deep-seated and remote physical causes.

We are all aware that the number of animals in a particular district varies from year to year, and we ascribe the variation to change in the abundance of the local supply of food, perhaps to more favourable weather conditions. When,

¹ "Periodic Fluctuations in the Numbers of Animals: their Causes and Effects," *British Journ. Experimental Biology*, vol. ii., 1924, p. 119.

however, we look beyond the parish boundary, we may find that at the very time our numbers have reached their flood, other far-distant countries suffered a similar condition. Surely it is a matter for thought that when southern Scotland had its field-vole or "mouse" plague in 1875, there were also mouse plagues in the Athabaska-Mackenzie region of North America, in Norway, in Galicia, and Hungary. The southern upland vole-plague of 1891-93 in Scotland had its counterpart in opposed corners of Europe, in Norway and in Thessaly. Are these contemporaneous plagues mere coincidences, or is it not more likely that some influence, wider than local conditions of food or weather, is making itself felt over a great part of the globe? Mr Elton favours the latter conclusion.

A minute examination of the recurrence of animal plagues suggests a further step in the argument. Take again the vole plagues. It is found that these do not burst out at haphazard intervals, but that over a long period, from 1810 onwards, they "have occurred about every eleven years or multiple of eleven years." So with the Canadian Rabbit or Varying Hare (*Lepus americanus*), a species also subject to violent fluctuations in numbers. Here also a collection of the available data suggests that about every ten or eleven years the number of rabbits increases to a maximum over a wide area. The Arctic Fox exhibits a well-marked maximum increase of numbers every 3.6 years, with a less distinct ten- or eleven-year period underlying the shorter recurrence. And since the Arctic Fox feeds largely upon Lemmings, it is not surprising to find that there is a Lemming periodicity of 3.6 years.

Even amongst birds the same kind of repetition holds, for the fluctuations in the number of Sand-grouse in the deserts of Central Asia seem to revolve round an eleven-year period.

How can we account for wide-spread fluctuations of animal numbers which take place with remarkable regularity every eleven years, or multiple of eleven years? The suggestion is that the solution must be looked for in some climatic factor, holding sway over a great part of the earth

and recurring with a periodic swing. Evidence of such influence has been confirmed by an examination of the rates of growth of certain trees. In the rings of their great trunks, which carry a record of growth back for three or four thousand years, the giant red-wood or Sequoia trees

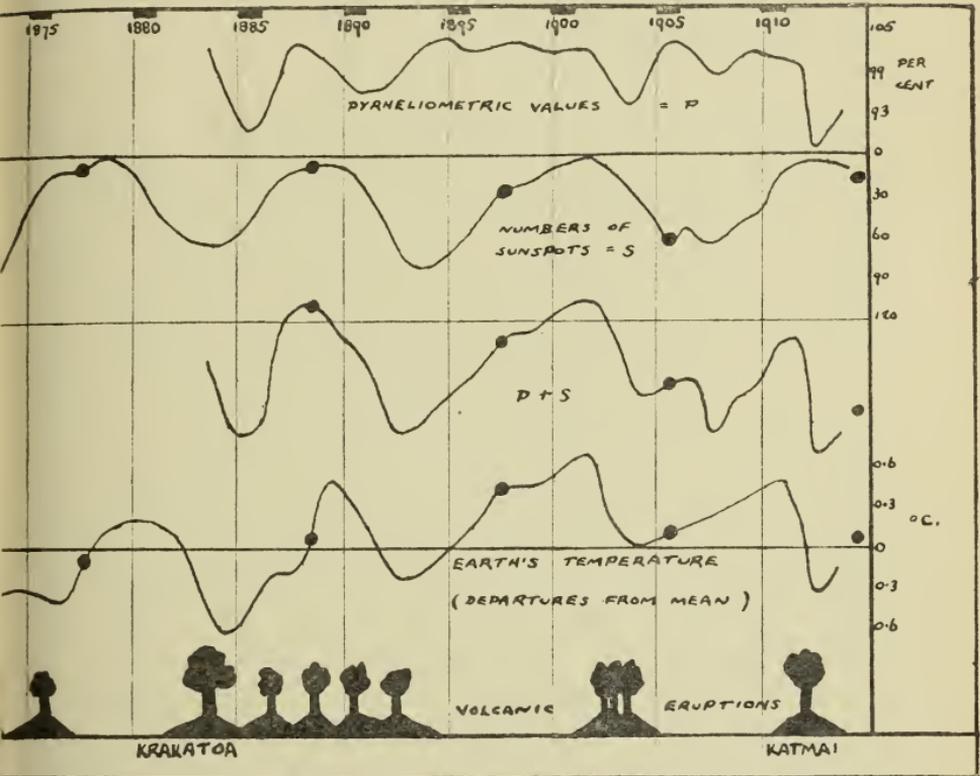


FIG. 1.—RELATIONS BETWEEN SUNSPOTS, EARTH'S AVERAGE TEMPERATURE, FLUCTUATIONS OF CANADIAN RABBIT, AND VOLCANIC ERUPTIONS.

The top curve shows the amount of sunlight cut off by volcanic dust; the second, the numbers of sunspots (inverted); the third combines these two; the fourth shows the earth's temperature; and volcanic eruptions are indicated below. The years of maximum numbers of the Canadian rabbit are indicated by dots on the curves. (Block from Mr Elton's paper in *British Journal of Experimental Biology*, Oct. 1924, p. 123, by courtesy of author and publishers.)

of America show a well-marked eleven-year succession of favourable seasons.

Can it be a coincidence that the periodicity of sunspots falls in an eleven-year cycle? After all the sun is the source of most of the earth's energy, and it is not surprising to find that there is a traceable connection between the

average annual temperature of the earth, the pressures and rainfall of various parts of the earth, and sunspot fluctuations. Carry the argument a step further, as Mr Elton has done, and we arrive at the very plausible suggestion that the great fluctuations in animal numbers, which reveal an eleven-year cycle, are intimately connected with the periodic disturbances in the solar sphere.

* * * *

The newly formed Scottish Branch of the Royal Society for the Protection of Birds has taken up the questions in which it is interested with a vigour which bodes well for the success of its projects. The report of its first annual general meeting states that, through its representations, Glasgow Corporation has been granted by the Secretary for Scotland an Order for the absolute protection of all birds and birds' eggs within the city boundaries; that nesting boxes, bird-feeding tables and drinking dishes are to be provided in all the public parks of the city, which are to be regarded as bird sanctuaries; and that many Scottish counties have been induced to obtain Orders absolutely protecting the Lapwing and its eggs. These are moves in the right direction. We shall be interested, however, to see what will happen should any common and pugnacious species of bird so increase in the sanctuaries as to oust rarer and more interesting species. Even the Corporation cannot interfere to adjust the balance, by so much as destroying a Sparrow's egg, without breaking the law. Indiscriminate protection is not so simple as it looks.

* * * *

We regret to record the death, on 24th January, of a distinguished Edinburgh zoologist, Professor W. A. Haswell, long professor of zoology in the University of Sydney. His name is familiar, apart from his researches, on account of its association with Parker and Haswell's excellent Text-Book of Zoology.

BOLD BIRDS AND SHY ONES.

By the Rt. Hon. Sir HERBERT MAXWELL, Bart., F.R.S.

No one can have given much attention to the habits of wild birds without having noticed how differently they behave in their avoidance of man. That this difference is innate, and not the result of greater or less persecution by gunners or trappers, is apparent in the varying degree of shyness exhibited by different species of water-fowl, all of which have equal reason to keep out of gunshot. I speak only of the behaviour of such birds in their normal relation to mankind, that is—of those that have not been induced, as such surface-feeding ducks as Mallard and Wigeon may be induced, to suspend their suspicion of human beings by the provision of tempting food.

There is good opportunity for observing this on a lake in the park at Monreith, about seventy acres in extent, which has been kept as a sanctuary for wildfowl for at least as many years; consequently the birds have no experience of human molestation on that particular sheet of water, and Mallard bred in the woods around behave with far more confidence than those which visit the lake in winter. Thus it is quite easy to distinguish between the home-bred flight and the immigrants. Teal, however, manifest no such difference between home-bred and visitant. They seldom show on the open water, hiding mostly in the reedy margins of the lake, whence they take precipitate flight at the first inkling of man's presence. I have never known teal to be allured by food provided for swans, mallard and wigeon.

By far the most nervous bird that comes there is the Golden-eye (*Clangula glaucion*). Let it but catch sight of a human being two or three hundred yards off, and away goes "rattle-wings" with his mates. This is the more remarkable because the nearly related Tufted Duck (*Fuligula cristata*) shows less suspicion than any other species frequenting this lake. True, a good many tufted ducks breed hereabouts; but their broods are largely

reinforced by immigrants in winter, and all seem equally confident. The Pochard (*Fuligula ferina*) also nests in the district, but never acquires the fearlessness of the tufted duck.

These three species are diving ducks; the Pochards and Tufted Ducks habitually flocking together; the Golden-eyes keeping themselves to themselves. None has more reason to dread the gunner than the others; for the fact that the Pochard is about the most excellent British duck on the table and the other two are highly unpalatable, does not seem to be considered by the ordinary run of sportsmen. Whence, then, the greater shyness of one species than another?

Similar variation among the *Limicolæ* is equally difficult to account for. Curlews and Golden Plover take no risks, well knowing the range of a shot-gun; but the inhospitable reception which is too often given to the Lapwing—the farmer's diligent ally—has never taught it effective vigilance. Salmon-anglers may have noticed that Oyster-catchers (*Hæmatopus ostralegus*) consider the breadth of a moderate river enough to ensure them security; but one shall not find a Curlew of the same opinion.

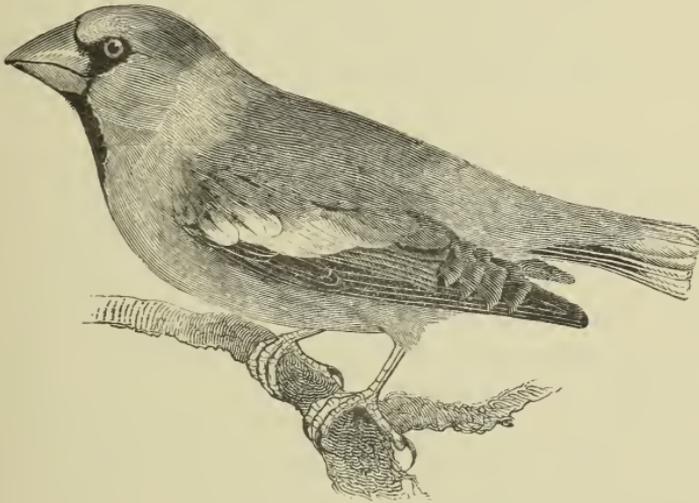
Among the birds of our gardens, the Robin is the sturdiest of beggars, perching on the very spade of one digging a border; while the Thrush and the Blackbird (why have the good old names Mavis and Merle fallen into disuse?) though quite as eager as the robin for a diet of worms, hold shrewdly aloof; and the Wren, equally carnivorous, though it appreciates the sheltered neighbourhood of a dwelling-house, will brook no intercourse with those who live therein. Tits and Chaffinches respond readily to the proffer of delicacies; but who has ever overcome the aloofness of Goldfinches?

The list of contrasts might be indefinitely prolonged; it may be thought, indeed, that the subject is too familiar to deserve comment. Nevertheless there is a certain attraction in unexplained phenomena, among which must be reckoned the different degree of dread inspired by man among various species of birds.

THE HAWFINCH IN SCOTLAND.

By J. KIRKE NASH, L.D.S.

THE Hawfinch (*Coccothraustes coccothraustes*), which is the largest of our Finches, is said to derive its trivial name from the belief that the fruit of the hawthorn forms its staple food, though it is really somewhat catholic in its diet so far as fruits are concerned. It is found throughout Europe, but was referred to by Montagu, at the beginning of the nineteenth century, as only an occasional visitor to England.

THE HAWFINCH.¹

The first printed records we have of it as a breeding species seem to be those of Sir William Jardine (1843), who mentions that it had lately been known to breed in the south of England, his own collection containing birds, nest and eggs which had been procured for him in Epping Forest by Mr Henry Doubleday. From that time onward it gradually became generally distributed throughout England and Wales, though rarest in the north and west.

The bird was known in Scotland prior to its record as a breeding species in England, as Macgillivray, writing in

¹ From Saunders' *Manual of British Birds*, by courtesy of the publishers, Messrs Gurney and Jackson.

1837, describes it as an irregular winter visitor and he specially mentions that it had been observed at Rosslyn, Midlothian. He also states that several dead specimens had come under his notice. A considerable interval intervenes before the next authentic occurrence, in December 1861, when an adult female was obtained by Professor W. C. M'Intosh in Annat Lodge Garden, Perth. This, the first preserved Scottish specimen, is now on exhibition in the Perthshire Natural History Museum, and I am indebted to Mr John Ritchie, the curator, for full details of the record.

Some years later Mr Robert Service recorded the presence of the Hawfinch at Dumfries in the years 1868-69 and 1874, but at that time no nests were obtained, and Mr Robert Gray was unable to record it from the west of Scotland when he published his *Birds of the West of Scotland* in 1871.

Turning to more recent records: In 1894, a young male was found near Arniston Castle, Midlothian, by Sir Robert Dundas. It had become entangled in a strawberry net and was killed by his terrier dog. In a contribution to THE SCOTTISH NATURALIST at the time, Dr Eagle Clarke commented on the probability of its having been reared in the neighbourhood, and if this surmise was correct it would constitute our first knowledge of the Hawfinch as a breeding species in Scotland. Four years later, in the early spring of 1898, a dead bird—an adult female—was picked up near the same place. The next available record occurs in August 1903, when Sheriff Berry recorded that, at Newport, Fife, he was shown a nest containing a broken egg, placed on the bole of an elm tree, about five feet from the ground. During April of the same year an adult male was found dead on the hills near Kinnelhead, Dumfriesshire, and in the following year (1904) there is a record of a starved female bird which was got in February at Tynninghame, East Lothian.

Two records occur in 1907: the first by Dr J. H. Harvie Brown, who mentions that, on the 18th March, Mr Simpson, gamekeeper at Touch, shot a Hawfinch which was presented to the Smith Institute, Stirling; the second by Sir Archibald Buchan-Hepburn, who reports the finding

of a dead male bird in April, at the foot of a spruce tree at Smeaton Hepburn, East Lothian.

In 1908, on 1st August, the Rev Dr M'Conachie observed an old and a young bird in the manse garden at Lauder, Berwickshire. He communicated with Mr William Evans, who visited the spot on the 15th and was fortunate in seeing one of the birds. Dr M'Conachie noted that they visited the garden in the early morning and in the evening between five and seven, and apparently they helped themselves liberally to his vegetable peas. Three other widespread occurrences of the Hawfinch took place this year. In April a female bird was trapped at the Grove Gardens, Newton Stewart, Galloway, as recorded by Mr Robert Service, who incidentally mentions that six years previous a Hawfinch was seen at Kirkconnell. A young male, forming the third record from this locality, was got in July at Arniston and presented to the Royal Scottish Museum by Dr O. H. Wild, and an adult male bird, also in the same museum, was got in Shetland. The Galloway and Shetland records show the bird at the extreme northern and southern limits of the country in the same year.

On the 9th May of the following year (1909), in a wood in East Lothian, Mr Evans was shown a nest in a holly-bush, placed about ten feet from the ground. It was made of twigs of honeysuckle, lined neatly inside with fine rootlets, and contained five eggs. Two of the eggs had holes in them, which he imagined had been the work of a squirrel, and in the course of a few days the entire nest was destroyed. By the 23rd May another nest was built in a holly-bush near by, but it also came to grief. In the same county an immature male was obtained at Tyneholm, Pencaitland, on 3rd July. It had evidently been killed through dashing against the wire of a hen coop (Rev. H. N. Bonar). Sheriff Berry also observed a Hawfinch on 21st April near his house, Newport, Fife.

During the summer of 1911 a pair paid frequent visits to a garden at Duns, Berwickshire, but no nest was found; and in the same year at Dalmeny, West Lothian, the headkeeper found a young bird alive, but at the time no nest was dis-

covered owing to the dense growth of the vegetation. In the following December, however, an old nest was got in a hawthorn near the spot.

On 21st June 1912 a young male, not more than ten days old, was found alive in Dalmeny Park (Mr Bruce Campbell), and on 7th July a young bird, in a dying state, was caught at the lantern of Fidora Lighthouse, Firth of Forth.

In the following year (1913) the Rev. H. N. Bonar found a dead bird, badly gnawed by mice, in the churchyard, Pencaitland, and we also have a record from Brora, Sutherlandshire, where a male bird was captured on 8th May and put into a cage in which it was said to be quite at home. So far this constitutes the farthest north record on the mainland.

Another interval elapses, until in the summer of 1915 Mr Evans saw two nests with young birds, and he comments on the beautiful colour within their mouths—a bright lake-red merging into yellow at the sides. These nests were both in East Lothian.

The year 1916 yields the first record for Peeblesshire, a wounded male bird, unable to fly, being caught at Castle-craig on 1st January. It was followed by a record from Linlithgow, where a dead adult male was found on 12th May 1917, and Mr Crossley Sykes also records that during this year a pair was seen on several occasions at Musselburgh, Midlothian.

Two birds were seen in 1919. On 5th May Col. R. C. Mackenzie mentions that a male bird of the year was caught in a fruit net at Camis Eskan, Dumbartonshire, and Mr H. S. Gladstone gives an account of a young but full-fledged bird having been picked up dead near the Crichton Royal Institute, Dumfries. In 1920 the breeding range of the Hawfinch was carried as far north as Aberdeenshire. In the garden of the U.F. Manse, Methlick, Mr Douglas G. Hunter found an old nest of this species in an arbor vitæ bush on 16th July, and he submitted it to Messrs Eagle Clarke and Evans, who corroborated his identification.

Although the records enumerated form a fairly complete

list, it is by no means a formidable one considering that it goes back to 1837.

The somewhat peculiar appearance of the Hawfinch, due to its huge head and bill and short tail, suggests that it is well calculated to command attention, but, although it may be present in many places, it is seldom seen. The bird is a shy, secretive creature, avoiding man—though not his dwellings and gardens, especially if ripe fruit and peas are there, the first indication of its presence often being empty pods and split fruit stones. The powerful bill is strengthened internally by horny pads which make it easy for the bird to split open the stones to get at the kernel. A characteristic habit of the bird, when perched, is the constant turning of the huge head from side to side. The flight is rapid and direct and the white patch on the wing is conspicuous; but the most attractive feature of the bird is undoubtedly the huge lead-blue or steel-blue beak. Close examination reveals a remarkable bill-hook termination on some of the inner wing feathers.

All the descriptions I have seen of the position of the nest give the impression that in nearly all cases it is placed in bushes and occasionally in taller trees at no great height from the ground, anything from 5 to 15 feet. Since very few naturalists in Scotland have had the good fortune to find the nest, I add a short account of my own observations. In company with my friend, Mr David Hamilton, I first saw the Hawfinch on the banks of the River Esk, near Musselburgh, on 10th May 1921, and here we had a distinct view of a bird which settled on the footpath. As this was during the breeding season we surmised that it was probably nesting in the private grounds of Dalkeith House. Next year, on 4th May, I received a male bird which was picked up dead at Carlhall, a small hamlet in the same locality.

This experience suggested the idea of making an effort to find the Hawfinch nesting, and during the same month we made a strenuous search of some woods in East Lothian. Working from the usual descriptions we scanned many bushes, especially holly, without the slightest success, but on 27th May, in a dense wood of tall forest trees

with a good deal of undergrowth, we noted what looked like a nest on a thick branch close to the bole of a sycamore tree, about 35 feet from the ground. While we debated whether it would be worth while climbing up, a bird suddenly darted across a small open space into the tree. A momentary glimpse of the white on the tail made us instinctively sure it was the bird we were looking for, and my friend at once scaled the tree. It was an awkward tree to climb and the effort caused a good deal of disturbance, yet there was not the slightest indication of a sitting-bird until the nest was reached, when, with surprising suddenness, the Hawfinch dropped like a plummet to the base of the tree before flying off at right angles into the undergrowth. We were much impressed by this peculiar action and wondered if it were a habit of this species. The nest contained three eggs.

It was revisited on the 31st and we were greatly disappointed to find it deserted. We therefore decided to remove both the eggs and the nest, which for such a large bird was a very flimsy structure, composed of fine twigs and fibrous material. The eggs of this species usually number from four to six and are almost bunting-like in their bold irregular streaks and blotches.

Having now more definite knowledge we decided to make a further search, and on 3rd June we noted what appeared to be another nest in a scrubby growth on the branch of an elm tree, about 30 feet from the ground. The rest of the branch was dead wood. There seemed to be no way of approaching the nest, so we threw up a stone which struck quite close to it, but without result. Fortunately we thought of trying again, and this time the stone shot right over it when the sitting-bird, as on the previous occasion, suddenly dropped to the ground before darting into the undergrowth. This is apparently a characteristic habit of the Hawfinch, though I have never seen any reference to it.

The only way of seeing into the nest was by climbing high up the bole of the tree so as to view it from above. It contained five eggs.

If the Hawfinch makes a practice of nesting in such

situations its rapid increase in Scotland is almost assured. High up in the topmost branches we saw both birds viewing the situation, and exhibiting their characteristic habit of constantly turning their huge heads from side to side—the blue bill showing conspicuously in the bright sunshine. Later on in the season we revisited the wood but saw no sign of either old or young birds.

Following these personal experiences there are two more occurrences of the Hawfinch to record. In a letter to the *Scotsman*, on 22nd May 1923, Mr Thomas Hanton gave an interesting account of a Hawfinch's nest with four eggs at Fordeldean, Ford, Midlothian, and Mr R. O. Blyth recorded the first occurrence of this bird in Renfrewshire on 16th February of the present year. It was observed in a garden at Kilmacolm. Further, Dr James Ritchie informs me that the collections in the Royal Scottish Museum contain several birds and eggs which add to our knowledge of the appearance and spread of the Hawfinch in Scotland. He sends me a note in chronological order of such as have not been referred to in the above account, as follows:—The first known Scottish egg of the Hawfinch, from Scotsraig, Fife, August 1903, presented by Miss Marjorie Maitland Dougall; a young male bird, killed at the lantern of Skerryvore lighthouse on 28th April 1904, from Mr James Tomison; a male from Fair Isle, 8th May 1909, from Mr Stewart Stout; eggs from East Lothian, 24th May 1915, presented by Rev. H. N. Bonar; a young male from Dalmeny, on 30th June 1918, from Mr Charles Campbell; a young individual from Greenlaw, 21st June 1919, and a juvenile male from Duns, 4th July 1920, both in Berwickshire and presented by Mr T. G. Laidlaw; a male found dead on Luffness Grounds, Aberlady, 20th November 1923, presented by Mr A. M. Jamieson; and a female from Fair Isle obtained on 2nd June 1924.

Golden Eagle and Fox.—While out stalking on Gordonbush, Brora, Sutherland, a few years ago, I passed near a trap or rather traps which we had set for foxes in a peat-hag. We usually set the traps in pairs so that a fox in its struggles in one trap gets on to the other also. I found a dead fox, quite fresh, with its inside torn out. The ground all round showed signs of a big fight and there were some eagle's feathers. On looking for the second trap I found it gone, the peg having been pulled out. The next day was a Sunday so I was at home. We spied an eagle flying over the Lodge towards Dunrobin Forest, and hanging to its leg was a trap. The eagle was shortly after found in Dunrobin Forest dead, with the trap on its leg. There is no doubt, I think, that the eagle, finding the fox in difficulties, had attacked it and got into the second trap. I could find no signs of the extracted entrails of the fox.—FRANCIS G. GUNNIS, Eridge Green.

Crested Tit in Lanarkshire.—For several winters we have fed the Tits by suspending a piece of fat meat from one of the clothes poles on the green, but until the 9th February last only the two commoner species, Great and Blue, have been observed. On the morning of that date I was informed that "a strange Tit with black and white markings round the head, and white underparts" had been seen feeding. This bird, which proved to be a Crested Tit, returned in the early afternoon, and was seen daily, always about the same time, down to and including Sunday 15th; of course it may also have fed in the mornings unobserved.

When feeding it was extremely shy and ill at ease, the slightest movement of a face too near the window would send it precipitately to the topmost twigs of a chestnut tree near by; but even at a distance of at least 25 yards it could be distinguished from the Blue Tits.

This is the first occasion I have been able to identify satisfactorily the Crested Tit in Lanarkshire, although once in the Blantyre district many years ago I felt certain of having seen one, only the time of observation was much too short to warrant positive assertion. Previous to that (in January 1897), I had the good fortune to see several of these birds in the Aboyne district of Dee.—WALTER STEWART, Airdrie.

INCREASE OF THE MOUNTAIN HARE IN THE SCOTTISH LOWLANDS.

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

THE Mountain Hare was, in the far-off days succeeding the Ice Age, probably a common animal throughout the mainland of Scotland, but, like several other species, it gradually receded northwards, leaving the Lowlands entirely untenanted. The present stock of Mountain Hares in southern Scotland is due to the transplanting of new colonies by man in the not far distant past. In Manor Parish in Peeblesshire, Alpine Hares were first set free in 1834, and further colonies were planted in the same county in 1846 and 1847; in the Pentlands they were set free in 1867 or 1868, and in 1861 or 1862 on Cairntable on the borders of Ayrshire and Lanarkshire. So successful has the colonisation been that from a few centres the hares have spread themselves over almost all the high ground of the Lowlands, even to the neighbourhood of Kirkgunzeon and Criffel Moors, hard by the Solway Firth.

Although the opportunity of conquering fresh fields in southern Scotland is now somewhat limited, the vitality of the Mountain Hare in this area is shown by the steady growth of its numbers in at least one locality. In my "Influence of Man on Animal Life in Scotland," from which the above statements have been repeated, it is stated that as many as 300 hares have been killed in a single season on the Misty Law Hills in Renfrew. An examination of the Game Book of Col. J. Craig of Ayr, kindly shown me by the owner, shows that, while this number has not yet been attained on his shooting, on The Mair in Kirkcudbrightshire near the Ayrshire border, the increase in numbers of the species there is very striking. The extent of the area in question is about 5575 acres, ranging from about 1000 feet to 2260 feet in altitude. The numbers of Mountain Hares

shot each season are entered in the Game Book as follows:—

1901 · 37	1908 · 49	1915 · 83
1902 · 45	1909 · 73	1916 · 178
1903 · 40	1910 · 81	1917 · 95
1904 · 8	1911 · 77	1918 · 110
1905 · 39	1912 · 158	1919 · 122
1906 · 28	1913 · 121	1920 · 162
1907 · 32	1914 · 76	1921 · 230

These numbers do not show a steady annual increase, but this is not to be expected, owing to the many variations which affect the stock as well as the results of a shooting season. A steady and remarkable increase, however, is shown if the irregularity of individual seasons is eliminated by grouping the results in 5-yearly periods. We then have 1901 to 1905, 169 hares; 1906 to 1910, 263; 1911 to 1915, 515; 1916 to 1920, 667; and for 1921 alone, 230.

The numbers suggest that in Lowland Scotland the Mountain Hare has not yet reached the limit of multiplication, which will be touched only when shortage of food supplies puts a check upon further increase. The same inference may be drawn from a short series of observations made at Allershaw in Lanarkshire on the borders of Dumfriesshire, and supplied to me by Mr Hugh S. Gladstone. "The keeper reports that there are no Hares on the low ground, but that they are plentiful on Daer-head heights and Queensberry." According to him they have increased during the last six years, and this notion is confirmed by the only figures he can supply, showing the numbers killed in the last four years as follows:—1921, 304; 1922, 332; 1923, 425; 1924, 415.

I should be glad to receive similar records, covering a long series of years, extracted from other Game Books, in order to compare the results in different regions, and to discover whether throughout the Lowlands there is a general increase in the numbers of this importation.

THE SEA-SLATER, *LIGIA OCEANICA*: A STUDY
IN ADAPTATIONS TO HABITAT.

By Professor JOHN TAIT, M.D., D.Sc., F.R.S.E., Department of
Physiology, M'Gill University, Montreal.

(Concluded from p. 18.)

LIGIA OF MARINE ANCESTRY.

Suppose we immerse the animal in rain- or tap-water which by some special contrivance is kept well aerated. After some hours, while still active, it shows signs of swelling of the body; later its gill movements become irregular, and finally cease; its heart, which lies in the hinder part of the body and is visible through the skin of the back, may yet continue to beat for a time, but eventually, after a period varying from a few to forty-six hours, the animal succumbs. By applying a simple chemical test (silver nitrate) to the surrounding water the presence of abundant salt can be demonstrated; this must have leaked through the skin or gills of the animal, its eventual death being due to the loss of this salt.

Let us now vary the experiment by making the water a little salt. So soon as we mix sea-water with the rain-water, even to the extent of one-quarter dilution, the period of survival is considerably extended, and in proportion as we bring the salinity of the water up to that of the sea the animals live longer and longer. With complete immersion in aerated sea-water a well selected example may live without food for as long as three whole months. So close is the correspondence between the salinity of the sea and the bodily arrangements of *Ligia*, that, when one of the specimens plunged under fresh-water shows marked signs of distress—swelling of the body for example—on transference to sea-water the tumidity subsides and in a few hours the animal is none the worse for its unpleasant experience.

The remarkable result of these experiments proves at least that *Ligia* is a thoroughly amphibious animal; in point of fact it constantly enters the sea of its own free

will, which statement applies with particular validity to the young and tender forms. A further presumption is that, unlike other members of the group of Woodlice, which succumb more quickly under sea- than under fresh-water, *Ligia* is in the direct line of descent from truly marine ancestors. We may recall that the food it eats is salty, and that it consistently refuses land-grown food; its blood too, which can be readily expressed from the antennæ, is very salt to the taste. In its bodily functions, therefore, as well as in its structure, it continues to bear indubitable marks of the primal ocean, and the specific name *oceanica*, chosen by Linnæus in 1767 for the common species of Northern Europe, thus proves to be singularly appropriate.

ADAPTATION AND DISTRIBUTION.

The length of time that the animal can endure complete immersion in salt-water may well provide the explanation of one fact that long puzzled the writer. Given adequate territory for habitation, it is found at every available spot round the length and breadth of our coasts. As it cannot directly cross a long stretch of intervening sand, the problem was to account for its never-failing presence wherever rocks and rocky crevices occur. The probability is that the creature, by clinging to floating wreckage or other wind-drifted material, is transported by sea; thus no recently bared, suitable locality could long remain devoid of a *Ligian* population. In these accidental migrations some must succumb by being carried bodily to sea, running imminent risk of death from ever watchful and predacious enemies (as bait for fishes *Ligia* is regularly used by the Japanese), but the chances are that occasional survivors will effect a successful landing, to carry on in virgin countries the traditions of their race. In adventurous voyages of such uncertain duration the high capacity of the animal for enduring famine, a characteristic it shares with many Crustacea, must be taken into account.

Any animal emerging from the sea and seeking to establish itself on land is confronted with a host of novel and exacting conditions. Apart from the all-important

evaporation question, there is the danger of occasional soaking with rain. As free contact with this element is apt to extract essential salts, *Ligia* is obliged to seek out dwellings with an impervious roof; should it be flooded out in a thunderstorm its one sure refuge is the sea. Only by gradual stages can its bodily economy become so modified that it can afford to wander out of reach of its primordial sanctuary, and we may feel sure that much water will yet run under the bridges ere it or its descendants enjoy the same free range over the land as is the privilege of its more familiar cousins, *Porcellio* and the rest of them.

ADAPTATIONS FOR CLINGING.

We have already had occasion to note the persistency with which *Ligia* seeks out and clings to objects that afford suitable foothold. In studying its behaviour it was considered expedient to use sheets of sand-paper as a portable playground or race-course, and one of the first objects of inquiry was to see how the sea-slater behaves in a gale. A sheet of coarse sand-paper was pinned to the table and with the aid of an electric fan its surface was swept with a strong blast of air. When the hurricane was at its height a *Ligia* was let down upon the sand-paper and given a moment to adjust itself. Squatting flat, with its fourteen feet hooked on every *point d'appui*, the animal doggedly held its own and was not to be dislodged even with contributory pressure from the finger. When its feet on the weather side were tickled with a pencil, a somewhat unfair proceeding which corresponds to nothing that could well happen under similar circumstances in nature, it let go and was swept across the table, to drop lightly upon the floor below. A new device had now been brought into play; by bending its body the animal had rounded itself into a ball, and had it not escaped the draught it was prepared to continue its course by rolling.

When one bears in mind that some of the common marine isopods, for example *Idotea*, can on occasion flex their body into a sharp hook or loop, it is the less surprising to discover that *Ligia* can round itself into a fairly respectable ball. Among the isopods it has been reserved for certain

special members of the terrestrial group, the so-called "pill-bugs," to carry this art to its highest perfection, the common *Armadillidium vulgare*, on very slight provocation or hint of danger, curling itself into a perfect sphere, from which no single portion of body appendage projects. In *Ligia* this reaction is less common and the sphericity less complete, nor can the animal conceal its stout antennæ within the ball. Experiment showed that the posture is not assumed as a defensive reaction, but rather when the animal, either in full racing career or when jerked upwards on a stiff sheet of paper, temporarily loses its footing. On more than one occasion while hunting *Ligia* on slanting rocks, the author has seen the animals roll for a considerable distance and bounce from slope to slope. The pose is maintained just so long as the external agitation is continued, and the creature promptly uncurls itself when it comes to rest.

If we examine the under surface of the body we see that the seven pairs of legs are beautifully fitted for clinging. Transferring to *Ligia* the terms we use in speaking of our own anatomy, we may say that the "thighs" are set wide apart and that all the "knees" point towards the middle line of the body; the jointed leg below the knee then splays outwards to end in the immovable double claw. The front legs, which are short and reach forwards, have a backwardly directed "elbow" rather than a knee; the long hinder legs, which project backwards, have a forward pointing "knee." The consequence is that the terminal claws are arranged along the curved border of the animal from head to tail like so many boat-hooks held out from the side of a boat, and should the creature choose to hold fast it has the necessary tackle ready.

It seems strange that in such a fleet and active animal the hooks or claws on the posterior limbs should dig into the ground so as to resist not a backward thrust but a forward pull on the part of the leg. Suppose that we select from our tin a well-rested *Ligia* and place it on a sheet of sand-paper held horizontally in the hand, the head of the animal being directed to a distant edge of the sheet. So soon as we let it go it races off in a straight line, never

slackening speed for one instant as it approaches the dangerous precipice. It plunges over. We involuntarily look down, for we could have sworn that it fell. Yet it is not on the floor. When we examine the sand-paper we find our acrobat suspended side downwards from the edge, calmly engaged in making its further way at right angles to its previous course. The hind claws of *Ligia* are used in perilous descents over rocks, and when in full course it becomes necessary to draw up suddenly, this braking gear can be instantaneously thrown into action. At the same time it is worthy of note that, for all its provision of momentum-checking mechanism, nothing can induce *Ligia* to reverse its gait and walk backwards, which implies that the central nervous connections for this purpose are undeveloped.

SENSORY ADAPTATIONS.

It has been said that the content of a dog's mind largely centres around olfactory sensations. Such consciousness as *Ligia* possesses of the external world must chiefly depend on impressions received from the ventral part of its body with its cluster of limbs. While the whole dorsal surface is dull and insensitive, each single limb is exquisitely endowed with sensation, the animal reacting by some special movement to the slightest touch on any ventral appendage. In full flight across a slab of rock *Ligia* will stop dead at any chance crack or depression, and squat. Without something to cling to, as in free water, the animal is deprived of its main source of sensory communication with the external world. In a three-dimensional universe it knows only two dimensions. Its power of orientation is related not so much to gravity as to a surface of some kind, and it is as much at home on the under surface or on the vertical face of a rock as on its upper surface. Just as a child from its inferior stature is more engrossed with objects at its feet than is a grown man, so in infinitely greater degree is *Ligia's* range of sensory experience limited to the surface with which it is for the moment in contact.

As an aid in exploration, its well-developed antennæ

are of notable service. Held outwards in front of the head, with the terminal portion drooping downwards, these are used in progression to probe the path exactly as a blind man uses a stick. It is true the animal has eyes, but it soon becomes evident that the eyes are useless for focussing or for judging distance. Suppose the cloth in the bottom of their house is arranged in the form of a peaked hill. The animals, wandering about the floor, climb to the top of this elevation and stand there probing the air with their feelers. Should the peak of the eminence be so near the side of the tin that the antennæ can bridge the gap, the *Ligiæ* immediately make efforts to clamber on to the side of the box. If the gap is adjusted to be ever so little greater, just enough to preclude contact by the antennæ, the animals remain utterly unaware of their proximity to the wall. Their eyes have therefore no clear vision like our eyes; at the same time they are eminently responsive to sudden variation in the size or position of shadows, as when one makes a movement.

COLOUR CHANGE.

Unlike other terrestrial isopods, *Ligia* resembles some of the marine forms in being able to change its shade of colour in response to its surroundings. Specimens taken during the daytime from under stones on the beach vary somewhat in colour. The females are mottled, having laterally situated lighter patches on an otherwise uniformly dark ground, this mottling being still more conspicuous when the animals are viewed under water. Exposed to light in a black-painted dish the creatures retain their dark appearance. Exposed in a white dish they gradually grow lighter in colour and more transparent, so that eventually the heart can be seen beating through the integument over the back. The effect is equally pronounced when the experiment is carried out in the faint red light of a photographic darkroom, the specimens on a light background becoming light in shade, those on a dark becoming dark. When a *Ligia* is temporarily blinded by having its eyes

covered with black paint, it does not undergo the usual change of colour on transference to a white background, which shows that the reaction depends on the mode of illumination of the eyes. This power of colour change, long recognised as occurring in *Idotea*, and noted by the author in *Ligia*, in *Sphæroma* and presumably in *Glyptonotus*, is generally assumed to be a device for better concealment, though it is hard to admit this explanation of its purpose in *Ligia*.

One might go on recounting detail after detail with regard to this inadequately studied yet delightfully interesting animal; in particular its breeding habits, its moulting habits, its blood and its nervous organisation have afforded very pleasant holiday occupation to the writer. But already the account is unwarrantably long. Perhaps two outstanding points of interest concerning the animal may be emphasised: its beautiful adaptation to its own particular habitat, and the quite peculiar position it occupies as a presumptive transitional form between marine and terrestrial isopods.

The following communications contain further information and bibliographic references in regard to *Ligia*:—

- ¹ Hewitt, C. G., "*Ligia*," *L.M.B.C. Memoirs*, xiv., London, 1907, p. 37.
- ² Tait, J., "Colour Change in the Isopod, *Ligia oceanica*," *Journ. of Physiol.*, 1910, xl.; *Proc. Physiol. Soc.*, pp. 40-41.
- ³ Tait, J., "Crustacean Blood Coagulation as Studied in the Arthropoda," *Quart. Journ. Exper. Physiol.*, 1910, iii., pp. 1-20.
- ⁴ Tait, J., "Types of Crustacean Blood Coagulation," *Journ. Marine Biol. Assoc.*, 1911, ix., pp. 191-198.
- ⁵ Tait, J., "Capillary Phenomena observed in Blood Cells; Thigmocytes, Phagocytosis, Amœboid Movement, Differential Adhesiveness of Corpuscles, Emigration of Leucocytes," *Quart. Journ. Exper. Physiol.*, 1918, xii., pp. 1-33.
- ⁶ Tait, J., "Immersion Experiments on *Ligia*," *Proc. Roy. Soc. Edin.*, 1917, xxxvii., pp. 50-58.
- ⁷ Tait, J., "Mouling of Isopods," *Proc. Roy. Soc. Edin.*, 1917, xxxvii., pp. 59-68.
- ⁸ Tait, J., "Limb-Flexures and Limb-Taxis in the Peracarida," *Proc. Roy. Soc. Edin.*, 1917, xxxvii., pp. 69-94.
- ⁹ Tait, J., "Some Structural Features pertaining to *Glyptonotus*," *Proc. Roy. Soc. Edin.*, 1917, xxxvii., pp. 246-303.

NOTES

Generic Habit exhibited by "Domesticated" Mandarin Duck.—On the 5th of November this year I unwittingly shot a duck which turned out to be a female Mandarin Duck (*Aex galericulata*). There was nothing about the appearance of the duck to suggest to me that it was anything out of the ordinary; and in itself the occurrence is of no ornithological interest, for the bird, though showing no signs of captivity or domestication, can only be an "escape" from some private collection. Its choice of a habitat, however, appears to me to possess some interesting features.

The Duck was sitting by itself in a broad, shallow and somewhat winding stream which runs between a large rushy marsh and an old pine wood, and had selected a spot where for about a hundred yards some old birches and alders throw their branches completely across the stream. I first came into its sight at a distance of about forty yards, and on seeing me it at once jumped on to the bank, and then rose immediately and flew off along the stream. A truly wild and unwounded duck would have risen from the water, without jumping on to the bank; and I accordingly assumed it to be a bird which had chosen this retreat for its convalescence from some slight wound or injury.

The point which appears to me to be of interest is that the spot selected by the bird was very much the kind of spot that would be chosen by the closely allied species, the American Wood Duck (*Aex sponsa*). In a book on *North American Wild Fowl Shooting* by Mr J. Bruce Leffingwell, the writer says that these ducks frequent "running creeks where alders and maples, willows and birch, bend fraternally towards each other across some babbling brook, their topmost limbs intertwining affectionately" above the water. That passage almost accurately describes the spot where this Duck had taken up its abode, and is about the only spot in this district where these conditions prevail. So far as my experience goes, nothing but a frozen-out Mallard would have sat for a moment in such a place; and at the time, as it happened, some small lochs at a distance of less than a quarter of a mile were covered all over with ducks of some four or five different species.

My friend, Mr R. A. Currie, M.B.O.U., of the C.M. Customs, Shanghai, who has spent most of his life in China, happened to be here a short time previously, and I reported the occurrence to him. He writes me: "The Mandarin Ducks used to be fairly common in a wild state at Nanking, and I have shot them occasionally at

Chinking and Wuhu, on the little narrow creeks through the reed beds. I never remember seeing them sitting with the other ducks on the open river or ponds. The reeds are from 10 to 12 feet or more high, so the Mandarin Ducks seem to follow the habits of the American Wood or Summer Ducks, mentioned by Mr Leffingwell and yourself." The point is that the habitats of the birds of this genus appear to be identical in both continents, and that this "escape" had inherited the generic idiosyncrasies.—WILLIAM BERRY, Newport.

Albino Shags in Orkney and Shetland.—Apropos of the albino Shag or Green Cormorant mentioned in Nov.-Dec. issue (1924, p. 189), perhaps the following additions may be of interest. Towards the end of December 1904 one was shot near Stromness, Orkney. It was a true albino, being creamy white, even to the bill, with pink eyes, and light flesh-coloured, almost white, legs and feet. I recorded this bird in *The Field*, 4th March 1905. On the afternoon of 19th December 1906, another nearly pure white specimen was seen in Stromness Harbour, the bird being quite white except the tail, which appeared to be brown. As I left for the mainland that day, I was unable to make a closer examination, but I heard later that it was there for over a fortnight, and fortunately was not shot. I recorded this in *The Field*, 29th December 1906. On 27th February 1884, an albino was shot at Mid Yell, Shetland, and was sent for preservation to Mr George Sim of Aberdeen, who recorded it in *The Zoologist* for that year.—H. W. ROBINSON, Lancaster.

Smew in Forfarshire.—On Friday, 6th March 1925, a male Smew, in very fine plumage, was killed at the west end of Montrose Basin. It was brought to my notice by an old gunner, who has shot Montrose Basin for sixty years, as a bird he had never seen before. He states it was wounded and had been caught by his dog. Fortunately I managed to procure the specimen, and it is now to be set up for Montrose Museum. On this coast it is evidently fairly rare, as Harvie Brown in the "Fauna of Tay and Strathmore" mentions the one in Montrose Museum dated 1837, and very few other occurrences for the area.—R. N. THOMAS EWART, M.B., Montrose.

Land Rail in Orkney in Winter.—Though numerous instances are on record of the occurrence of Land Rails in the British Isles in winter, yet the condition is sufficiently rare to merit reporting.

In the present instance the specimen in question was shot in the

parish of Sandwich, Orkney, by William M'Ewan, Kirbuster, on 24th February 1925. It was sent to Mr William Towers, Secretary of the Orkney Natural History Society, who in turn passed it on to Dr G. C. Low, Honorary Secretary, British Ornithologists' Club, in London. The bird was skinned and found to be in good condition, with no sign of any old injury about it; it proved to be a male. Dr Low, to whom I am indebted for the particulars given above—and who has asked me to contribute this note—informs me that he has a similar record for the South of England. His spaniel flushed a Land Rail from a bush on the bank of the River Coln, on Horton Farm, Horton, Buckinghamshire, on 11th January 1919, and he shot it. Here again the bird was in excellent condition, flew quite well and showed no signs of any old injury.—JOAN M. CHATTERTON, London.

Faroese Snipe at Fair Isle.—A specimen of this Snipe, *Gallinago gallinago farøensis*, was shot at Fair Isle by Mr Jerome Wilson on 24th December 1923, being the second recorded occurrence of this race on that island. The skin, which is now in the Royal Scottish Museum, is that of a female, and has a wing measurement of 135 mm.; the bill measures 68 mm.—J. H. STENHOUSE.

Grouse, Weasel and Sparrow-Hawk.—Some years ago I was crawling up a burn in Sutherland to get a shot at a stag, when I put up a hen Grouse with a Weasel hanging to it. The Weasel dropped off when the Grouse was about 25 feet up, and ran away. About two hours afterwards I saw a Sparrow-Hawk pounce on something about 500 yards off. I walked to the spot and the hawk flew away and left a half-eaten Weasel: the hawk had done its good turn. Of course it was not the first Weasel, as I had walked three miles or so. The hindquarters of the Weasel were left.—FRANCIS G. GUNNIS, Eridge Green.

Bean Geese in North Uist.—On 28th February Mr Hitchcock of the Lochmaddy Hotel shot two geese, which were strange to him, out of a small lot of eight. He asked me to come and see them, and I had no doubt of their being Bean Geese when I saw them. He sent them to Mr P. D. Malloch of Perth to be set up and Mr Malloch replied that they were certainly Bean Geese. On an earlier occasion I recorded what I thought might be examples of this species in North Uist (SCOT. NAT., 1924, p. 28).—GEORGE BEVERIDGE, Lochmaddy.

Whales stranded in Scotland in 1923 and 1924.—In his latest "Report on Cetacea stranded on the British Coasts," Sir Sidney Harmer records seven strandings of whales on the Scottish coast during 1923 and 1924. The species included the gigantic Blue Whale, Caithness, October 1923; the Common Rorqual, Lewis, August 1923; the Pilot Whale, North Berwick, February 1924; the White-sided Dolphin, Scalloway, July 1924; and the White-beaked Dolphin, Alloa, February 1923, Kirkcaldy, April 1924, and South Uist, December 1924. The last "seems to be establishing the claim to be regarded, next to the Common Porpoise, as the commonest British Cetacean."

The Food of the Herring's Food.—Several species of fishes, and notably the Herring, feed largely upon a minute marine crustacean, *Calanus*; and since the abundance and quality of herring depend to a great extent upon the abundance of the food supply, it is of some importance to discover the sources upon which that food supply depends. Miss Sheina Marshall, in the course of an examination of the food content of over 3000 examples of *Calanus finmarchicus* taken in the Firth of Clyde, has shown that the staple food consists of diatoms, but that when diatoms are scarce, particularly in winter and mid-summer, the crustacean supplements its staple diet with other organisms, such as radiolarians, other lesser crustaceans, and flagellates. *Calanus* exhibits some curious feeding habits: in spring and summer it was found to feed mainly during the hours of daylight, but in winter at night, when even bright moonlight seemed to have the effect of restraining its appetite (*Journ. Mar. Biol. Assn.*, 1924, p. 473).

The Proceedings of the South London Entomological and Natural History Society for 1923-24, indicate that the Society is in full vigour. Several papers of general interest make their appearance, including a very suggestive Presidential Address by Capt. N. D. Riley, in which he tests the "Age and Area" theory of Willis in the light of the present distribution of Australian Butterflies, especially those of the Eastern coast region. Among the other papers may be mentioned: (1) "A short but very readable Account of Two Visits to St Kilda," by Dr James Waterston; (2) "Some Ancient Naturalists and their Work," by Robert Adkin; (3) "A valuable Summary of our Knowledge of the Small Heath Butterfly" (*Cænonympha pamphilus*), by Henry J. Turner; and (4) "An Account of the History and Varieties of the 'Buff Ermine' and 'White Ermine' Moths" (*Diacrisia lubricipeda* and *D. lutea*), by Robert Adkin.

OPHIODESMUS ALBONANUS (LATZ.), AN ADDITION TO THE SCOTTISH DIPLOPOD FAUNA.

By RICHARD S. BAGNALL, F.R.S.E., F.L.S.

WHEN I brought this little white Polydesmid forward as British,¹ it was regarded as a rare European species, a few examples being known from Hamburg, near Paris, and Pau. My original example was found near Bath in November 1917, but I have since found it in several localities, as far apart as Westmorland, North Northumberland, and Yorkshire in the north of England, and Kent and Dorsetshire in the south. Only on two occasions, however, at Swanage and Meathop, near Grange-over-Sands, have I found it in numbers.

I also add further records of another species only recently recognised as British.

Ophiodesmus albonanus (Latzel).—A small white species with twenty body-segments, somewhat resembling a longish and stout *Macrosternodesmus* in the field, with the dorso-lateral keels entire as in *Orthomorpha*.

SCOTLAND.—Forth Area, 1 ♂ in a glen near Juniper Green, 12th September 1922.

Monacobates tenuis (Bigler).—Before I recorded this little *Protoiulid* from numerous British localities (including Edinburgh, where both the late Mr Evans and I had taken it),² it was only known from the Vosges, having been described by Bigler in 1913.

SCOTLAND.—Edinburgh (W. Evans and R. S. B.), Juniper Green, 12th September 1922, and Dalmeny, 17th September 1922.

¹ Records of some new British Diplopods and Pauropods, with a preliminary check list of the British "Myriapoda" (*Journ. Zool. Res.*, iii., pp. 87-93, October 1918).

² *Ibid.*

BOOK NOTICES

OUR ZOO AND ITS BABIES. By W. Percival Westall, F.L.S. With Thirty-two Photographs by W. S. Berridge, F.L.S. London: G. T. Foulis & Co., Ltd. 1925. Price 5s.

This attractive volume, designed for the amusement and instruction of children, consists of an admirable series of photographs of young animals born at the London Zoological Garden. The illustrations



PUMA CUB, three weeks old, showing spotted coat, which in the adult is replaced by one of uniform colour. (From *Our Zoo and its Babies*.)

suggest many lessons for older students. The Grevy's Zebra foal and its parent illustrate the truth that "like begets like"; the hybrid Chapman's Zebra foal shows the blending influence of heredity; the young Tapir, Red Deer, Altai Deer, and Puma cub (here reproduced) show how diverse the markings of the young may be from those of their parents; and various modes of carrying the young are illustrated by the Sacred Baboon, the Langur, the Lemur, the Opossum, and the Kangaroo. A short descriptive text, adapted for youthful readers, accompanies each photograph.

BRIAN AND THE WOOD-FOLK. By Maribel Edwin. London: J. M. Dent & Sons, Ltd. 1924. Pp. 179. Price 5s. net.

This series of stories for children, written by the daughter of Professor J. Arthur Thomson, forms an easy and attractive introduction to the habits of the more familiar creatures of the country-side. It avoids the pitfalls, on the one hand, of telling too much, and on the other of obscuring truth by too great play of imagination. Yet there is little that escapes the vigilant eye of Brian, and as a simple test has shown, many a child will share with him the pleasure of his adventures and discoveries amongst the wild things of the woods and fields. The chapters are accurate and well-written, and the stories gain in vividness by the personifying of the creatures whose histories they recount.

THE LITERATURE OF THE CHARADRIFORMES FROM 1894 TO 1924. By George C. Low, M.A., M.D., etc. With a Classification of the Order and Lists of Genera and Species. London: H. F. & G. Witherby. Price 12s. 6d.

The object of this useful compilation is to bring up-to-date all the references which have appeared since the publication of the late Dr Bowdler Sharpe's great work on the Order, which formed volume xxiv. of the *Catalogue of Birds in the British Museum*. Dr Low's book will prove of great service to all who are interested in this attractive group of birds, which includes Plovers, Snipes, Bustards, Coursers, etc. The voluminous references on which it is based are arranged chronologically under families, genera, and species, and give the name of the author, and the precise nature of each contribution. Many of the scientific names which have hitherto dominated the literature of the Order have, alas, been changed, and many now adopted, such as that of the Curlew Sandpiper, will doubtless prove to be more or less ephemeral.

SUPPLEMENTARY NOTES ON THE BIRDS OF THE ISLE OF MAN.
By P. G. Ralfe, M.B.O.U.

In 1893 Mr Ralfe published a complete account of the members of the Manx avifauna which proved to be a valuable contribution to British ornithology; and from time to time he has given us additional matter. In this last contribution he informs us that since 1905 the Blackcap, Yellow Wagtail, Tree Pipit, Hen Harrier, Honey Buzzard, and Pink-footed Goose, have been added to the fauna; that the records for the Lesser Whitethroat, Carrion Crow, previously regarded as somewhat doubtful, have been verified; and that the breeding of the Woodcock, Common Tern, Sandpiper, Great Black-backed Gull, and the Short-eared Owl may be looked upon as established. In addition there is much other information of an interesting nature on many other species.

ROSS AND CROMARTY (Cambridge County Geographies). By Prof. W. J. Watson, University of Edinburgh. Cambridge: At the University Press. 1924. Pp. xi + 140.

The series to which this volume belongs has frequently been commended in these pages, and the present work furnishes a wonderfully concise and comprehensive account of the county—its physical features, natural history, archæology, history, manufactures and fisheries, architecture, etc. The traveller could have no more useful guide to the area. Amongst the birds recorded in the chapter on natural history, the White-tailed Eagle, the Kite and the Hen-Harrier must now, we fear, be regarded as extinct there; and it is scarcely accurate to say that the bite of the adder has "often been fatal," the very few fatal cases in Britain have generally involved young children.

THE BIOLOGY OF FLOWERING PLANTS. By Macgregor Skene, D.Sc., University of Aberdeen. London: Sidgwick & Jackson, Ltd.. 1924. Pp. xi + 523. Price 16s. net.

Since there is much that is fundamentally common between the life of plants and the life of animals, Dr Skene's fine volume carries many a message for the naturalist. His work, like all recent work in both branches of biology, owes much to the later experimental researches which have shed so much light on the processes of living, and Dr Skene, who has given much attention to the functional or physiological side of his science, brings together from many sources a wonderful array of fresh material. His object has been to interpret the life of the flowering plant, particularly in relation to its environment, and we know no book which gives so thorough an account of this aspect of plant life. The chapters deal with the absorption of water and salts, assimilation and transpiration, special modes of nutrition, mechanical problems, protection, reproduction and dispersal, and development.

CATALOGUE OF THE TYPE SPECIMENS OF LEPIDOPTERA RHOPALOCERA, PART I., SATYRIDÆ, at present in the Collections at South Kensington. Trustees of the British Museum. Price 4s. 6d.

In this, the first, section of a great and useful undertaking, no fewer than 3,900 type specimens are listed, alphabetically, under their original specific names. The whole work is arranged in columns, showing respectively the British Museum type number, the specific name, the genus under which the species was originally described, the full reference to the author and place of publication, the date, and lastly the sex of the specimen and whether a cotype or seasonal form. This publication will be of considerable service to the specialist, and will no doubt assist greatly in the careful preservation of these priceless and irreplaceable Butterflies, which are now housed in this great national collection.

A HUNDRED YEARS IN THE HIGHLANDS. By Osgood Hanbury Mackenzie of Inverewe. Popular Edition. London: Edward Arnold & Co., 1924. Pp. xv + 272. Price 7s. 6d. net.

On the 16th April 1922, Osgood H. Mackenzie died at Inverewe at the ripe age of eighty years; but only a few months before his death he saw the publication of a series of family memories of the Highlands, which give a vivid glimpse of a century's progress on a remote part of the west coast of Scotland. The publishers have done well to reprint a cheap edition of that work, for many readers are certain to avail themselves of the opportunity of studying so entertaining a series of personal impressions.

In addition to his own recollections, Osgood Mackenzie had the good fortune to fall heir to ten manuscript volumes of Highland memories, written by his uncle Dr John Mackenzie, and these, carrying the history back to 1803, help to cover a period of vital importance in the development of the Highlands. Even in the author's own time the changes were very great: one of his earliest memories was the great potato famine of 1846 to 1848, when the west of Scotland suffered, with Ireland, a three years' period on the borderline of starvation. But the famine helped to make Gairloch accessible to the world, for a great road-making scheme was devised and carried out for the benefit of the workless people. He saw the change in his own district from the intensive but labour-wasting system of the runrig, with its cultivation by the prehistoric Norwegian hand-plough and home-made hoe, to the crofting system; and an early sporting recollection centres about the use of a flint-lock gun, which missed fire whenever a rare bird was shot at!

Observation of wild life played a great part in Mackenzie's life, and he has many interesting things to recount. The fork-tailed Kite swarmed in his youth, and Pinemartens and Polecats were so common that his mother had every year forty or fifty skins of Martens, from the keepers, for robe-making. These creatures, we know, have gone, but it is surprising to learn that the author considered that "many, if not most kinds (of birds) are far less numerous now on the west coast of Ross-shire than they were fifty or sixty years ago." He sites Black Grouse, Partridges, Grey Lag-Geese, Wild Duck, Snipe, Golden and Green Plover, Greenshank, Dunlin or Whimbrel as being on the verge of extinction in that area; and regrets the disappearance of such as the Wheatear, House Martin, Storm Petrel, and many other commoner birds. "Can anyone explain what has caused so many of our birds to disappear," he asks; and we can only say that many of them, fortunately, are still common in other parts of Scotland.

It is a pity that so interesting a book should go without an index.

(Authors are responsible for nomenclature used.)

The Scottish Naturalist

No. 153.]

1925

[MAY-JUNE

WANTED—A “NATURE MONUMENTS COMMISSION.”

THE need for more thorough protection of the rarer creatures of this country has been constantly advocated in these pages, and facts constantly brought to our notice show that the protection must be no niggardly measure, but a broad enactment gathering a wide range of creatures within its shelter. Birds have had their share of protective legislation, though the promotion of a new Wild Birds Bill by the present Government shows that they require still more. But why should the rare mammals be allowed to disappear without a single finger being raised by the law to moderate their destruction? Rare plants are constantly being banished from their native haunts, and the extermination of some rare butterflies by the collector is notorious. It may be said of some of the rare mammals that they are harmful to certain interests, but such an excuse for destruction cannot be brought forward in the case of butterflies, upon the plight of which a contemporary has recently focussed attention.

The increasing scarcity or the actual disappearance of certain of our British butterflies is seriously disturbing the minds of students of Lepidoptera in this country, and it is

an important and urgent question whether anything can be done to further the preservation of those species which are in danger of extinction. In an article which appeared in the May number of *The Entomologist*, W. G. Sheldon gives a careful summary of the facts he has ascertained regarding the diminution in numbers or the actual extinction of several species which formerly occurred in plenty in certain favoured localities, and from a perusal of his paper it seems clear that in many instances the scarcity or actual dying-out of the species may be attributed to excessive zeal or greed on the part of unscrupulous collectors or dealers. In a few cases the cause of the decrease in numbers is a mystery, and may be more or less due to natural causes. Here, perhaps, little or nothing can be done to check the process, but where over-collecting is the undoubted cause (as is so often the case) it is high time that some effective means of controlling such depredations should be devised and enforced, as has been so happily and successfully done in the case of many birds.

It is, perhaps, hardly possible to procure actual legislation in this matter, say on the lines of the Wild Birds Protection Acts, although such a course would appeal strongly to many naturalists. Failing such a method, the establishment of reservation areas on an extensive scale, including some of the classic haunts of the rarer species, would go far towards the preservation of such forms. The probability of success of such an undertaking is well illustrated in the case of the "Purple Emperor" cited by Mr Sheldon. He says: "That *iris* will return to a familiar old habitat is proved by the fact that after it had not been seen for many years in a famous haunt, so long as this remained open to collectors, within a short time after it was closed owing to a change of ownership, and resultant protection, the butterfly returned, and I am informed it is now permanently established there." This is an encouraging example, and we trust that further discussion of this urgent subject in the pages of our scientific serials may lead to some definite action in the near future. Mr Sheldon's article and also the notes by John E. Eastwood, P. P. Milman, and F. W. Frohawk in the June

number of *The Entomologist* (pp. 144-147) should be read by all who are interested in the subject.

Our suggestion for a first step towards a solution of this and other problems of protection which are constantly arising, is a simple one. Protection must not be a spasmodic affair, it must be carried out consistently, carefully, and only where it is deemed necessary; above all it must be comprehensive in its dealings. Not only birds and butterflies but other creatures as well as plants, nay even the natural monuments of the country, its waterfalls and beauty-sites, are constantly in danger, and protection fails, since it is the interest of no one in particular to clamour for protection. It was thus with the monuments of man's handiwork in this country till the Ancient Monuments Commission was created, and well has that Commission justified its birth. What is now required is a *Nature Monuments Commission*, to guard the threatened works of nature, to list such creatures, plants, and natural objects as require protection, and to suggest to Government such steps as should be taken for their safety. And one of the first steps to be recommended, we do not doubt, would be the creation of nature reserves or sanctuaries.

*

*

*

*

An account of the Mammals of the Lammermoors formed Rev. Dr M'Conachie's address to the Berwickshire Field Club in the autumn of 1924, and appears in the Club's *History*, vol. xxv., pp. 163-184. It brings up to date our knowledge of the distribution of the mammalia in this area, recording some marked increases in numbers, as in the case of the Mountain Hare, and some serious fallings off, as in the case of the Red Squirrel. The number of species which have disappeared entirely in historic times is remarkably large in relation to the total mammalian fauna. Dr M'Conachie records many interesting notes on habits which have come under his observation.

Albino Brown Rats in Kirkcudbrightshire.—On 30th May I forwarded to the Royal Scottish Museum an albino rat, which was killed in the garden at Argrennan, Castle Douglas, by the gardener, who has been there for nearly thirty years and has never seen an albino before. We kill a large number of rats every year both about the house, garden, and farms, and generally over the whole area (about 1000 acres), and my game-keeper, who is an excellent observer, assures me that this is the first time in all his experience he has come across an albino. We have difficulty in knowing where this particular specimen came from as we are usually able to trace the entrance of any rat killed in the garden, which does not average one per annum, owing to the careful trapping round about, and we assume that he came in through an open door. I showed the rat to a few local people, but none of them had ever seen such a variety before.—J. AIKMAN SMITH, Edinburgh.

[The rat in question is a pure albino Brown Rat, *Mus (Epimys) norvegicus*, with pink eyes and a rich cream-coloured coat. On 31st October 1921 a similar specimen from Kirkcudbright, now exhibited in the Royal Scottish Museum, was received from Mr T. Munro, and the particulars given above by Mr Aikman Smith were his response to our query as to whether there was any indication of the presence of a widely diffused local albino strain in his district.—EDS.]

The Ruddy Sheld-Duck at Duddingston Loch.—As no previous account has been given, we think it as well to put on record that a Ruddy Sheld-Duck (*Tadorna (Casarca) casarca*) frequented Duddingston Loch, within the boundary of Edinburgh, during the winter 1923-24. It was first seen in October and our last view of it was on 29th March when we heard it several times give utterance to its peculiar call-note. The bird apparently did not remain constantly on the loch, and on 8th March, when the loch was frozen, we saw it flying high over the breast of Arthur Seat in a westerly direction. From its strong flight and its wary attitude in always making for the centre of the loch whenever we attempted a near approach, we are convinced it was a wild bird. It was presumably a female, as during all the time of its sojourn there was no indication of the black neck band worn by the male of this species.—DAVID HAMILTON and J. KIRKE NASH.

THE FOOD OF THE PTARMIGAN.

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

IT has hitherto been supposed that the food of the Ptarmigan (*Lagopus mutus*) consists entirely of vegetable substances, but through the kindness of Mr D. Wotherspoon I was given the opportunity of examining the crop contents of two birds shot by Mr D. N. Reid, of Tullich, Lochcarron, Ross-shire, for whom the birds were mounted as specimens by Mr Wotherspoon. The results of this examination show that the adult Ptarmigan is not exclusively a vegetable feeder, in spite of the statements in the standard ornithological manuals. From information supplied by Mr Reid we learn that the specimens were shot on an isolated hill which rises from the sea at Lochcarron, Ross-shire, to a height of 2300 ft., and that the birds were secured at about 2200 ft., or very nearly at the summit. Mr Reid makes the suggestion that possibly the diet varies with age. Both birds were shot from the same covey. The hill is fairly rocky and precipitous on the north side, with a fair amount of the usual mountain vegetation.

The following quotations, taken at random from various works in the Royal Scottish Museum library, will serve to show the orthodox ideas regarding the food of the Ptarmigan.

Yarrell (*Hist. British Birds*, vol. ii., p. 323): "The food of these birds is the various sorts of alpine berries, seeds, and the tender shoots of alpine plants."

Macgillivray (*Hist. British Birds*, vol. i., p. 205): "Their food consists of various plants, chiefly of a shrubby nature. Thus, in the crops of the individuals first described above, was contained a large quantity of fresh green twigs of *Calluna vulgaris*, *Vaccinium Myrtillus*, and *Empetrum nigrum*, the largest fragments not exceeding five-twelfths of an inch in length. Leaves and twigs of *Vaccinium Vitis-idaea*, *Salix herbacea*, seeds of various Junceæ and Cyperaceæ, and other plants, with berries in autumn, also form part of their food; which is thus, in fact, for the most part the same as that of the Brown Ptarmigan (Red Grouse)."

Seebohm (*Hist. British Birds*, vol. ii., p. 426): "The food

of the Ptarmigan is almost exclusively composed of vegetable substances, such as the seeds, buds, and tender shoots of mountain-plants, especially the heath and ling. This fare is varied in autumn with berries of various kinds and ground-fruit."

Selby (*Illustr. of Brit. Ornithology*, vol. i., p. 431): "Alpine berries, such as those of the *crawcrook*, cranberry, and cloudberry or *knoop* (*Rubus chamæmorus*), with the seeds and tender shoots of alpine plants, form their food."

Witherby (*Pract. Handbook of Brit. Birds*, vol. ii., p. 868): "FOOD.—Shoots and leaves of *Vaccinium myrtillus*, also less frequently *V. vitis-idaea*, *Calluna vulgaris*, *Empetrum nigrum*, *Salix*, and seeds of various Junceæ and Cyperaceæ. In autumn also berries of *Empetrum nigrum*, etc."

In all these statements there is not a hint of an insect. A contrast is presented by the crop contents of the birds shot by Mr Reid:

Crop 1 contained the remains of no fewer than 362 specimens of a Crane-fly of the genus *Tipula*, with mottled wings, which might be *T. marmorata* Mg., but owing to the mutilated state of the specimens it is impossible to be certain of the species. These "Daddies" filled practically the whole of the crop, but there were also present a few tips of shoots of the Heath Bedstraw (*Galium saxatile*).

Crop 2 contained the remains of 326 specimens of what I believe is the same species of *Tipula*, but in a more macerated condition than those of crop 1. There was also present a single larva of a Saw-fly (not determinable), while vegetable remains were represented by several fruits of *Juncus*, some tips of shoots of *Galium saxatile* and *Empetrum nigrum*, also a seed-vessel (containing seeds) which I was not successful in identifying.

From the evidence supplied by these two crops it is clear that the Ptarmigan occasionally resorts to an insect diet. Unfortunately I have no information as to the exact age of the birds in question, though they were undoubtedly adults, but it would be interesting to know if the chick of the Ptarmigan, like that of its near relative the Red Grouse, is habitually insectivorous for the first two or three weeks of its life.

OBSERVATIONS ON SEA-BIRDS AND OIL.

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

THE following notes are compiled from observations made at Aberlady, East Lothian, during the period 1917 to 1924.

Prior to the war I occasionally found sea-birds, namely Guillemots and Razor-bills, with plumage soiled by grease. It was rumoured that the oil had its origin from the grease of ship slip-ways, being used as a lubricant in the launching of ships. I often found at high-water mark pieces of grease, sometimes as large as 6 inches in diameter, of a consistency like that of hard butter. These could easily be flattened under foot. I do not go so far as to say that the grease I found there was responsible for the fouling of the plumage of the birds, but as such grease masses are still to be found (Dec. 1924), this matter seems worthy of mention. The grease is not liquid enough to form a surface film on the water, though there is a possibility that the action of the sea-water may have altered it in some way.

In 1917 to 1918 along the high-water mark at Aberlady Bay, East Lothian, I repeatedly came across the corpses of Guillemots, Razor-bills, and sometimes young Puffins. Some of the birds were smothered in grease, but most of them had their heads, necks, and backs unsoiled. In others the soiling was confined to the belly, especially an area between the legs and vent. When a bird is greased the tail is nearly always involved. All the dead birds are in an extremely emaciated condition, though live ones, perhaps only recently soiled, often appear well nourished. A few live birds were seen swimming near the shore in shallow water or resting on land near the tide margin. If an attempt is made to place these birds in deep water they may swim seawards for 100 yards or so, but invariably they swim ashore again in a few minutes. If a bird is chased in shallow water it will make abortive attempts at diving. If thrown into the air some can fly feebly a few yards and gain sufficient momentum to stop a perpendicular fall to earth. Several birds were seen to flap their wings

repeatedly both in water and on land. I am inclined to think Guillemots and Razor-bills attempt to clean their plumage when grease-fouled by wallowing and flapping their wings in sand. Hollows excavated by the efforts of the birds were noticed on several occasions.

On a stretch of sandy shore measuring roughly $1\frac{1}{2}$ mile, I have seen grease-fouled corpses of Guillemots and Razor-bills up to 100 in one day. Puffins are scarce and their numbers are made up entirely of young birds.

The species involved are as follows: Guillemot, hundreds every year; Razor-bill, very common every year; Velvet Scoter, 12 one day in 1920; Common Scoter, a few at Aberlady.

The Velvet Scoters are birds rarely shot by fowlers, though there are always flocks in the Forth in winter, chiefly off Leith and especially Portobello. Most specimens of this species were only slightly soiled, a patch of grease extending from between the legs to the tail being usually found. I have four skins of this species picked up at Aberlady on one day, and others from Ross-shire. They needed little cleaning to free them entirely from grease.

Description of the Grease.—On handling the matted plumage a stickiness is noticed almost resinous in tenacity. The fouled patches are yellowish in colour. The substance is readily soluble in petrol, and the petrol and grease can be easily removed by absorption with plaster of Paris. Grease left on a skin in a collection does not seem to spread over a larger area, as does the grease from the natural fat of a bird.

Numbers of birds in the hampered condition I have described, met their death by the attacks of the larger Gulls.

Since the war, if anything, there has been an increase in the number of birds involved. At Aberlady I always expect to get a number of birds greased after an easterly gale. Birds are found at all periods of the year, but my visits were more frequent during the winter months—August to February.

REPORT ON SCOTTISH ORNITHOLOGY IN 1924.

By EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL.

INTRODUCTION.

We, once more, thank our recorders for the excellent series of notes sent from many parts of Scotland. We are most grateful for all the trouble taken to gather the notes together. Some parts of the country are insufficiently represented in the returns and we would warmly welcome new recorders from these, or indeed from any part of Scotland. Schedules for notes will be supplied if a request for them be sent to either of us. Our warm thanks are due in the Northern division to Jerome Wilson, Fair Isle; Sir Arthur Nicolson, Fetlar; and H. Greenaway, Foula. In the Eastern division to Col. A. F. Mackenzie, Ord; Major A. Stables, Pitgavenny; W. Ogg, Elgin; Dr Mahood, Elgin; A. Macdonald, Aberdeen; Seton Gordon, Aviemore; Lt.-Commander E. J. Ferguson, Pitlochry; F. Nisbet, Pitlochry; John Ritchie, Perth; Miss Campbell Swinton, Doune; Captain A. H. R. Wilson, Moncrieffe; Professor M'Intosh, Nevey; H. J. Colman, Broughty Ferry; H. Boase, Dundee; William Berry, Tayfield; John Berry, Tayfield; C. H. Guild, St Andrews; J. H. Gaskell, Colinsburgh; The Right Hon. The Earl of Lindsay, Kilconquhar; Rev. D. Macmichael, Largo; D. J. Balfour Kirke, Burntisland; N. M. Johnston, Dunfermline; Frank Magee, Kirkcaldy; M. Sutherland, Isle of May; J. Muir and C. MacEachern, Bass Rock; G. Graham, Barnsness; C. Tunnard, Tynninghame; Charles Connel and J. Kirke Nash, Edinburgh. In the West to Col. W. Anstruther Gray, Lochmaddy; George Beveridge, Vallay; John Bain, Hyskeir; R. M'Morran, Mull; James Bartholomew, Glenorchard; T. Hill, John Robertson, T. Robertson, W. Jamieson, H. T. Cumming, R. Wilson, D. Macdonald, Mrs. K. V. Graham, P. Goodfellow, W. Rennie, and Nicol Hopkins, all of Glasgow; T. Thornton Mackeith, Kilmacolm; T. Malloch, Johnstone; S. Hopkins, Darvel; E. Richmond Paton, Hareshawmuir; Lt.-Commander G. Hughes-Onslow, Barr; Sim Baigrie, Ailsa Craig. In the South to Dr W. M'Conachie,

Lauder; A. Falconer, Duns; G. Davidson, Melrose; T. G. Laidlaw, West Linton; A. J. Rintoul, Ancrum; J. R. Simpson, Selkirk; Rt. Hon. The Earl of Home, The Hirsell; H. S. Gladstone, Capenoch; J. G. Gordon, Corsemalzie, and J. Hewat Craw, Berwick-on-Tweed.

No outstanding event characterised 1924, no new bird was added to the Scottish list, nor was there any great rush of migrants. The course of migration was steady and normal, but there was a certain number of uncommon visitors. A pleasing feature was the increase of various species as breeding birds in Scotland; this desirable result is no doubt largely due to the protection now afforded to birds at the nesting season, and in this connection we are glad to note that a branch of the Royal Society for the Protection of Birds has been formed in Scotland in the year under review; we wish it all success in the good work which it has so well begun.

During 1924 interesting papers dealing with the habits, etc., of birds in Scotland have appeared in the SCOTTISH NATURALIST, to cite a few, on The Roosting Habits of the Rooks of Bute and of Lanarkshire, on the Hedge Sparrows of the British Islands and the Wren of the Outer Hebrides, on the Nesting Habits of the Swift and on the Great Bustard in Scotland; and in *British Birds* on the Courting Display of the Fulmar, and of the Goldeneye on Salt Water, while the papers in this Magazine on the results of ringing birds are always of value and should be consulted by all ornithologists.

The following abbreviations are used in this Report:—

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

BIRDS NEW TO FAUNAL AREAS AND UNCOMMON VISITORS.

This section was not very large in 1924, but it contained some interesting occurrences. A Hawfinch was recorded

from Kilmacolm on 16th February (I. 1924, 52), this being the first record for Renfrewshire and the second for the Clyde area; and a female of this species appeared on Fair Isle on 2nd June. On 9th and 12th September a Scarlet Grosbeak was recorded from Fair Isle; on 16th May an Ortolan from the same station; and a Wood-lark at Balcomie, East Fife, on 7th April, constitutes the first record for the Tay area and the Scottish mainland (I. 1924, 75). Three Shore Larks were reported on Tayport shore, N. Fife, on 7th January and one at Fair Isle on 5th May, while the latter station was visited on 21st May by one Blue-headed Wagtail, and by two on 6th and 7th October. Two Waxwings were noted at Lauder on 14th and 15th January, and single birds of this species at Newtonairds station, Dumfriesshire, on 19th January, Blackhouse, Bunkle parish, Berwickshire, next day, Kingoodie, Perthshire, on 10th February, near the Townhead of Jedburgh on 2nd March, and Pitlochry on 27th November. The third British record of the Sub-Alpine Warbler came from the Isle of May on 30th May (I. 1924, 126), this being also the first record for Forth. A pair of Black Redstarts visited the Royal Botanic Gardens, Edinburgh, on 1st May (I. 1924, 76), a male was singing on the Isle of May on 22nd May, and a female was caught at Skerryvore on 28th October (I. 1924, 184). On 4th April a Little Owl was caught on Lamberton Moor, Berwickshire (I. 1924, 76), the second record for Tweed and first for the county, and a White-breasted Barn Owl on Fair Isle early in January furnishes the first record of this sub-species for Shetland. An Osprey visited Taymount about 26th April. Quite a number of Bitterns were recorded in January; on 9th a weak and emaciated bird was noted near Girvan, and another was believed to have been seen about the same time half a mile away (I. 1924, 44). On 15th January one was seen on the golf course at Ayton and found dead next day (I. 1924, 43). Another, "undoubtedly a piner," was caught on the 23rd near Innerwick, East Lothian (I. 1924, 43), and one was killed by a motor lorry near Crossmichael, Kirkcudbrightshire, on 25th January (I. 1924, 44). On page 136 of the SCOTTISH NATURALIST we find

single birds reported in "winter and early spring," 1924, from Lochmaben (Dumfriesshire), Newcastleton (Roxburghshire), Castle Douglas (Kirkcudbright), and in January near the Barony, Kirkmichael (Dumfriesshire).

A Snow Goose (sp?) was watched with Pink-footed Geese on Tayport shore, N. Fife, on 11th January, and a Ruddy Sheld-Duck frequented Duddingston Loch from October 1923 to March 1924. A male Red-crested Pochard visited this loch on 21st, 28th, and 29th December (I. 1925, 21), this being the first record for Forth. Smews are noted as follows: an adult male at the end of January at Greenlaw, Castle Douglas (Kirkcudbrightshire) (I. 1924, 44); a pair on Castle Semple Loch (Renfrewshire), on 21st February (I. 1924, 52) and 1st March; and an adult female at Spittal Haugh (Peeblesshire), on 4th November. On 28th December a Red-necked Grebe was reported from the Lake of Menteith; Little Stints at Vallay (O.H.) on 3rd and 25th June, and at Tentsmuir Point, N. Fife, on 30th August. A Black-tailed Godwit visited Buddon Ness on 15th September; two Roseate Terns were seen at an east coast ternery on 17th May, and another at a different east coast locality on 19th May. Elliot, Forfarshire, was visited by a Little Gull on 24th January; one was seen there constantly from 17th September to 27th October, three on 15th and two on 22nd October (I. 1925, 23), and a single bird at Arbroath on 22nd September. Lastly, a Great Bustard was captured on Sanday, Orkney, on 4th January and lived there till 20th February (I. 1924, 89).

EXTENSION OF BREEDING RANGE.

Great Spotted Woodpeckers are still spreading in Scotland: we have records of nesting from Birkhill, North Fife, from Pluscardine and Altyre, Morayshire, and from East Inverness. The latter show a return to old breeding places. We have also a note of Great Spotted Woodpeckers "among the firs at Birkwood, Banchory-Ternan, all spring and early summer. They have thus reached a point eighteen miles from Aberdeen, spreading from Braemar, where they were noted in the last decade of the nineteenth century."

Gadwall and downy young were seen on Biel pond on 7th July, the first record of this duck nesting in East Lothian; while Rev. Mr M'William (I. 1924, 162) records Wigeon nesting at Loch Quien, Bute, where he says they have bred for the last three years, although no record has hitherto been published. A female Pintail with young was seen at Kingoodie, Perth, on 14th June. Red-throated Divers now nest in Mull, as we are informed by Mr M'Morran, and Greenshanks bred in Aberdeenshire in 1924, the first record in Dee (I. 1924, 126). In *The Field* of 11th September 1924 we find that Whimbrel nested this season near the Spey at Newtonmore; a young bird was found and the old birds carefully identified. On 17th May two nests of the Black-headed Gull were found on the Little Cumbraes (I. 1924, 164); Greater Black-backed Gulls bred at Inchmarnock, where they had three nests in 1923, the first record for Bute; and on Little Sgat Islands, Loch Fyne, the same species was found nesting on 18th June (I. 1924, 126).

INCREASE AND DECREASE OF SCOTTISH BREEDING BIRDS.

Although there is no record of the Raven increasing in numbers, yet it is satisfactory to know that it is holding its own in Dumfries and Galloway. The Jay is becoming more plentiful in several parts of the country, more being seen in Kirkcudbright, Dumfriesshire, Mid Lothian, near Dunkeld, and in North Fife. Goldfinches are increasing in parts of the Borders. Lesser Redpolls and Goldcrests were very plentiful at Pitgavenny, Elgin, in early summer. Yellowhammers are increasing at Murthly and Glen Clova, and Reed Buntings at Corsemalzie, Wigtonshire. At the latter place Meadow-Pipits were very plentiful, as were White-throats at Broughty Ferry. Sedge-warblers were exceptionally common in Mid Lothian, while at Nevay Park more Wheatears were observed than in 1923, and Redstarts were more numerous at Murthly. Stonechats and Goldcrests continue to increase at Corsemalzie; House-martins were more numerous in the Broughty Ferry district, and Cuckoos

in East Perthshire. Satisfactory reports of more nesting Great Spotted Woodpeckers came from Dumfries, Kirkcudbright, Peebles, and the Pitlochry district of Perthshire. Tawny Owls were more numerous in the Broughty Ferry district; Mallard and Teal have increased as breeding species in Upper Nithsdale, and Eider in North Fife. Oystercatchers and Redshanks were more numerous as inland nesters near Corsemalzie, and Mr Gordon added that he noticed no diminution in the number of Lapwings nesting there. Arctic and Little Terns were reported in increased numbers at an east coast breeding ground, and four nests of the Sandwich Tern were found in the Clyde Estuary where last year there was but one.

We have records of a decrease in the number of Rooks breeding in the Kenmure Rookery (Clyde), in the neighbourhood of Dundee, and in parts of East Perthshire. Linnets, Grey and Pied Wagtails were also scarcer near Dundee, and a notable decrease in the number of Yellow Wagtails is observed in Ayrshire, only one nest being found at Hareshawmuir (2. xviii. 55, and "Birds of Hareshawmuir," p. 27). No Crossbills nor Long-tailed Tits bred at Pitgavenny this year, nor was the latter species seen in Forfarshire, nor (in April) near Dunkeld. Mr Boase suggests that the Tits may have suffered from a disaster such as overtook them in 1917, and that this may be so is shown by Mr Balfour Kirke's interesting notes from East Ross. He writes, of Contin: "Bird life in this district had a severe toll taken of it by a great storm of high wind, snow, and severe frost which occurred on the 1st and 2nd March. A gamekeeper tells me that after the storm the woods on his beat (and they are extensive and sheltered) were full of dead birds of all kinds. At this time last year I knew over a dozen nests each of Long-tailed, Cole, and Blue Tits. . . . This year there are no Long-tailed Tits in the district, very few Cole Tits have been seen, and Creepers also are very scarce." Professor M'Intosh too reports scarcity of Tits at Nevey; Swallows did not nest there this year; Swallows and Cuckoos were below their usual numbers at Tynninghame; Swallows, Wheatears, Willow-warblers, and Spotted Flycatchers were

all scarce at Corsemalzie, and House-martins and Swifts at Burntisland. All kinds of nesting duck were remarkably scarce on the Mochrum Lochs this year, and Golden Plover were not nearly as plentiful as usual there or at Nevay Park. The decrease in the number of Lapwings in many parts of Scotland is a serious matter; at Nevay Park and in the North of Mull they are becoming fewer, and as their eggs are never taken in either place the reason for this decrease is not apparent. There was also a serious falling off in the number of Lapwings in East Ross and East Inverness. Common Gulls were fewer at their nesting colony near Durriss (Dee). Blackgame are seldom seen at Nevay now, and this species and Grouse are scarce in Mull; Mr M'Morran says, "they seem to have migrated." Corncrakes too are scarce in various parts of Scotland.

SUMMER AND NESTING.

The cold inclement weather in spring affected the breeding birds and several of our recorders say that nesting, in their districts, was later than usual and not very successful.

Bullfinches were noted near Elie, Fife, this summer, and bred at Kemback, North Fife, while "a lot" of Tree Sparrows appeared in May and stayed to nest by the River Tyne, East Lothian. A Pied Wagtail's nest with seven eggs was found at Hareshawmuir; and Pied Flycatchers nested in a good many places in Roxburgh and Berwick. A Willow-warbler's nest, 4 feet up in a spruce tree in a fir plantation, was found near Perth (I, 1924, 127), and at Pitlochry Wood-warblers and Garden-warblers bred in fair numbers. A Redwing was seen at Burntisland in June and two pairs of Herons nested, for the first time, in a clump of trees at Gattonside, Tweed, and brought off their young safely. The Gadwall bred again in South Fife this year, which looks as if this duck were going to establish itself there. Pochard, Pintail, and Tufted Ducks were reported as nesting on a hill loch in East Ross, and the Goosander too is nesting in that county. At least two Pochard spent the summer at Duddingston Loch, although actual nesting has not yet been proved. Eider (i. 1924, 165) were seen, with

young, at Little Sgat Island in June; they have nested in Loch Fyne for a good many years now. Off St Andrews a large flock of Eider was in the sea on 3rd June. Two hill lochs, on the borders of Perth and Forfarshire, are occupied each year by one and sometimes two pairs of Great Crested Grebes; these lochs are 700 feet above sea-level (2. xviii. 213). Storm Petrels were in their usual numbers at their breeding sites in Argyllshire this year and Fulmars are spreading down the Forfarshire cliffs. About seventy-five Oystercatchers spent the summer in Tayport Bay, these being probably non-breeding birds. Our correspondent at Fair Isle tells us he is almost sure that two pairs of Golden Plover bred there this summer; "they were on the hill all summer and acted as if they had nests." Dunlin bred on Hedderwick Hill golf links, East Lothian, and Redshanks and Curlew, as usual, on the Sidlaws. Roseate Terns were seen at a ternery on the east coast but they "were not located as nesting." A Corncrake built in a bed of nettles at Tweedmill, Selkirk, the nettles were cut down but the birds did not desert and hatched out at least seven eggs. A Pheasant nested in a rock garden in St Andrews, and in Mid Lothian a nest was found with seven Partridges' and four Pheasants' eggs in it.

The only February nesting records were of Rooks and Woodpigeons, but with March came more of interest, and we have reports of a Raven in Ayrshire with five eggs on the 12th, and Starlings, Blackbirds, Dippers, and Lapwings all nesting. In spite of the cold weather in April many species had eggs early in the month. By 1st April the nests in the rookery at Alticig contained young, on the 6th a Long-eared Owl had two eggs at Darvel, and a Stockdove, at the same place, had young about ten days old. Coots and Moorhens at Possil had begun to nest, and Stockdoves had hatched at Moncrieffe, Perthshire. From 7th April onwards we have notes of all our earlier nesting birds having eggs or young. On the 16th a Raven had hatched four young, which left the nest in mid-May ("Birds of Hareshawmuir," p. 9); a Shoveler in the Tay area was laying on the 19th, a Woodcock in Perthshire hatched on the 20th, and Common Sandpipers at Contin, East Ross, which arrived

on 21st April, built a nest three days later. By the 25th Great Spotted Woodpeckers were nesting at Moncrieffe, and next day young Blackbirds flew at Edinburgh. A Grey Wagtail had a nest with two eggs at Selkirk on the 27th, and by the end of the month Carrion Crows and Black-headed Gulls were reported with eggs. On 1st May a Chaffinch's nest was found at Lahill, Fife, and a Dabchick was building near Dundee; on the 4th, Dunlin, Redshanks, and Ringed Plover had full clutches at Aberlady, where the last mentioned species was very abundant. On 9th May a Mallard had nine eggs in rank grass at the edge of a ditch a few yards above tide-mark near Corsewall, Wigtownshire, and several Snipe there were nesting within 100 yards of high tide-mark. Next day a Shoveler had eleven eggs, "hard sat, on the edge of a swamp at Clayshant, Wigtownshire, and a Curlew there had three eggs in marram grass on the side of a big steep sand-hill." On the 15th a Thrush, four miles from Perth, had a nest and nine eggs (2. xviii. 219), and the same day the first Razorbills' and Guillemots' eggs were seen on the Isle of May, where many Herring Gulls and Eider had nests and eggs. On 17th May a Tufted Duck's nest with five eggs was found at Hareshawmuir, 800 feet above sea-level (2. xviii. 82). On the 20th, Goldfinches were nesting in Wigtownshire. Common and Sandwich Terns' nests with eggs were found in an east coast ternery, and a Curlew's nest with six eggs was reported from Selkirk. On the 29th, a Shag was sitting on a nest on the Isle of May, and many Kittiwakes had eggs. On the 31st, a Great Black-backed Gull was found nesting on a heathery, rocky hillock, out on a big, bare flat at Darsnag Flow, Corsemalzie, the nest was of white grass well hollowed and contained three fresh eggs. This is the first time the species has nested at Corsemalzie, which is several miles from the nearest breeding place.

June brings records of nesting warblers, while duck and waders were hatching. By 1st June a Dunlin had young at a nesting place 700 to 800 feet above sea-level at Hareshawmuir (2. xviii. 82). A Stonechat with young is reported from Darvel on the 3rd, the first time our correspondent has

found the species nesting there; and on the 6th, seven nests of Pintail and two of Gadwall were found near Loch Leven. A Dunlin brooding six nestlings was recorded from the Solway Marshes on 12th June (2. xviii. 83), and a Snipe at Corsemalzie had four fresh eggs next day. Eider, hundreds of Common Terns' and Black-headed Gulls', and a few Sandwich and Lesser Terns' nests were recorded from an east coast nesting place; no young were seen except those of Black-headed Gulls. On 14th June, Teal, Shoveler, and Tufted Duck had young, and young Pintail about three weeks old were seen near Kingoodie by Mr Boase. A Wren's nest in a manure heap at Selkirk had young nearly full-fledged on the 22nd, and on 30th young Swallows left the nest at Lahill. By July the nesting season was practically over, but we still have reports of family parties being seen; thus on the 7th a party of old and young Long-tailed Tits were seen at Biel, East Lothian, where were also Mallard and some flappers, a Shoveler Duck and downy young, and Moorhens and Coots both with young ones. On 12th July a Sandmartin had young in a nest built in a hole in a wall near Prestonkirk. Goldfinches were nesting in Forfarshire, and Tree Pipits in Glen Clova, in the middle of the month, when two very thin and elongated Ptarmigan's eggs were found at Braeriach in the Cairngorms, 3925 feet above the sea; eggs of the same shape were found there last year (1. 1924, 127). House-martins in Largo were fledged by 20th July, and a Ring Ouzel and two young were reported from near Aberfeldy on the 26th. August notes were scanty: on 16th the young Kittiwakes at Fowlsheugh were almost full-fledged: there were some Fulmars "gliding about the great rock face, but the earlier nesting birds, Herring Gulls, Razorbills, Guillemots, and Puffins, were nowhere to be seen." On the 18th two young Woodcock, unable to fly, were found at Capenoch, Dumfriesshire, and a brood of four, just hatched, near Methven on the 30th (2. xviii. 142). At Duddingston on the 31st a Coot had a nest with young quite newly hatched (1. 1924, 162). Several very late records came in September: on the 4th, two pairs of Little Grebes at Ballinluig, each with three young, all being fed by their

parents, by 16th, the older family had lost all signs of head stripes but were still being fed by the adults. On the 14th, Swallows were in the nest at Glenorchard, and three young of this species, almost fledged, are reported from Perth on the 20th (2. xviii. 244). House-martins with young still in the nest were seen at Oakwood, Selkirk, on 16th, and at St Andrews on 27th September.

WINTER.

The winter of 1923-24 was not distinguished by any long spell of frost. There were many notes of winter visitors all over Scotland, and several Waxwings were recorded. Redwings were less abundant about Aberdeen than in the previous winter, and they were not common about Selkirk, where Fieldfares and Siskins were not seen. There were a good many records of Whooper Swans, and geese and wintering duck were present in some numbers, while a very unusual number of Bitterns were noted. A good many Gannets spent the winter on the Bass Rock, and Stockdoves were noted as staying all winter in parts of Fife to which before they have been only summer visitors. Woodpigeons were unusually plentiful at Moncrieffe, and Snipe in the west of Scotland and in the Isles.

The very mild weather which characterised the winter of 1924-25 affected the bird-life of the country. As there was no long spell of frost to close up the centre of Scotland and drive birds to the shores and estuaries, they tended to be scattered over the country, and we do not find records of any great number of winter visitors in any part. Tits of all species were rare at Moncrieffe, where they are generally numerous in winter. Redwings, Fieldfares, and Bramblings were recorded from many parts and seem to have been present in fair numbers. Grey Lag-Geese were more numerous than usual in North Fife; Goldeneye were scarce this winter; the large flocks of Duck generally seen in the sea off Cambo, East Fife, were only represented by a party of Mallard, and wintering duck were scarce in some other places round our coast. Enormous numbers of Lapwings were recorded from Moncrieffe, Perth, a flock extending for

1½ miles and estimated at 5400 birds was seen on 19th December, and after that date Captain Wilson says, "I have noticed many flocks of about 500 to 700." Many Snipe and few Woodcock were reported from East Fife.

RINGING.

Space does not permit of particulars of all the records of ringed birds being given, we must therefore be content with a brief summary. A Guillemot ringed on Ailsa Craig on 17th July 1923 and reported from Fuenterrabia, Guipuzcoa, North Spain, on 17th January 1924 (2. xvii. 242), is one of several reports of birds ringed in Scotland being recovered abroad. We have, also, the usual evidence of Scottish birds wintering in Ireland: a Cormorant ringed at Castle Loch, Mochrum, as a young bird on 14th June 1919 was recovered at Ferry Carrig, Co. Wexford, 11th January 1924 (2. xvii. 240). A Lapwing ringed at Torrance, Stirlingshire, as a young bird, on 9th June 1923, was recovered at Barefield, Co. Clare, on 25th February 1924; while another Lapwing ringed as a nestling at Kintore, Aberdeenshire, on 21st May 1912, was recovered at Ballymore, Co. Galway, in the last week of January 1924 (2. xviii. 190 and 60)—the last an interesting record, as it shows that Lapwings live to a good old age. A Curlew ringed at Torrance on 2nd July 1923 as a young bird, was recovered at Dundalk, Co. Louth, on 26th February 1924 (2. xviii. 190), and a Common Gull ringed at Ardnamurchan, Argyllshire, on 1st July 1924, as a young bird, was recovered at Tralee, Co. Kerry, on 28th August 1924 (2. xviii. 190). There were many reports of birds being recovered at or near the place where they were ringed, some quite a short time after ringing, others after a period of years. A Starling ringed at Broughty Ferry on 22nd August 1921 as a young bird was recovered at Leven, Fife, in January 1924 (2. xvii. 236); a Blackbird ringed as a nestling at Torrance on 4th May 1914 was recovered there in May 1924 (2. xviii. 187); a Swallow ringed at the same place on 24th July 1923 was recovered near by on 3rd July 1924 (2. xviii. 189). Of four young Woodcock marked at Grange Wood, Reston, Berwickshire, on 20th June 1922,

two were shot in the same wood on 2nd January 1924 (I. 1924, 36).

Since the above was written another very interesting instalment of ringing returns has appeared (2. xix. 13-19), in which the following records relating to Scotland are of special interest. A Willow-warbler ringed at Torrance, Stirlingshire, 17th June 1921, was reported in Portugal on 23rd October 1924. Two Mallard ringed as adults at Stranraer, Wigtownshire, on 5th March 1924, were recovered—one in Holland on 25th October, and the other at Drumoak, Aberdeenshire, in the same month. Five Gannets ringed on Ailsa Craig in July 1924 were recovered in the same year—one at Portarogie, Co. Down, 8th September, another near Lamlash, Arran, 2nd October, another near Santona, Spain, 18th October, another near Helensburgh, Dumbartonshire, early in October, and another at Bangor, Co. Down, on 27th September. Two Lapwings ringed at Torrance in June 1923 were reported from Co. Mayo, Ireland, in December 1924; and a Curlew ringed at Kingoldrum, Forfarshire, on 18th June 1924, was also recovered in Co. Mayo on 27th October 1924; while one ringed at Callender on 4th July 1924 was reported at Co. Kerry on 9th October 1924. Finally, a Guillemot ringed on Ailsa Craig in July 1924 was recovered in Co. Wexford on 23rd October of the same year.

PLUMAGE.

A Rook of a warm, blackish-brown colour on cheeks, wings, and tail was reported from Glenorchard, Stirlingshire, on 19th July (I. 1924, 127). For several years a Sparrow, called the "yellow Sparrow," has been noticed on Foula, Shetland; this year a cinnamon-coloured young bird was sent to the Royal Scottish Museum by Mr Greenaway, possibly the progeny of this yellow bird (I. 1924, 183). A perfect albino Reed-bunting was hatched in a nest found near Aberdeen; the bird was seen several times after it left the nest. On 20th April a Song Thrush at Invergowrie was "markedly dull in appearance, the upper plumage dark grey-brown, under-tail coverts and flanks dusky greyish (not

yellowish as in the normal), spots on breast large, very black and numerous"; while a cream-coloured Redwing was on Fair Isle from 29th October to 8th November. A Blackbird with a yellow head was seen at Moncrieffe on 5th April; another at Kirkcaldy on 3rd November had head, neck, back, shoulders, breast, and wings speckled with white. Four pied Blackbirds, showing more or less white, frequented Langdon West Lodge, near Duns, in the winter of 1923-24; of these, two at least returned in the winter of 1924-25, and Mr Falconer tells us he has seen a pied Blackbird in that neighbourhood at various times during the last ten or twelve years. A beautiful milk-white Shag was sent to the Royal Scottish Museum from Barra on 16th September (1. 1924, 189) and a Gannet with black eyes was again seen on the Bass Rock. On 5th March a Lapwing with white head and speckled white mantle was reported from Darvel, Ayrshire, and the white Curlews "turned up as usual" on Shinnel Water and Eskdalemuir, Dumfriesshire, these birds having appeared there every summer since 1904 and 1919 respectively (1. 1924, 162). On 1st September a young Woodcock, very red, with the dark markings very faint, was shot at Halmyre, Peeblesshire.

HABITS, ETC.

On stormy nights in winter it is not uncommon to have Greenfinches tapping at the windows at Corsemalzie, Wigtownshire; when allowed to enter, they roost quietly on a plant or picture frame till morning. A Goldfinch has once been known to tap on the window there, while at Montrose a cock Chaffinch came to a window on the morning of 26th January and tapped on the glass. Chaffinches and Thrushes are reported to have imitated the mating song of the Greenshank (2. xviii. 88). On 1st March a Tree-creeper was seen at Selkirk feeding on the ground among beech-nuts. A Thrush built its nest in the bottom of a hollow tree stump, about a foot below ground level, at Monifieth, while a bird of the same species at Dunkeld built in a stone wall, and a Blackbird had a nest on the handle of a watering can in a shed at Selkirk. One bright afternoon in December

about 2.45 a Barn Owl was hunting a plantation about half a mile from East Saltoun, East Lothian. In Ardnamurchan a Peregrine was seen to swoop to the ground and seize on its prey. It soared in the air, but presently gave a scream and fell to earth. The observer, going to the place, found a weasel which scurried off none the worse of its flight into the air, but the Peregrine was quite dead "with its breast ripped open."

In July a Sparrowhawk was seen chasing Swallows at Johnstone, and a flock of wild Geese circled round Doune, in fog, from 6.30 to 11 p.m. on 4th January, "no doubt attracted by lights. They included Deanston, a mile off, in their circle." A Woodcock was killed, on 28th April, by striking the wires in South Street, St Andrews, and Great Black-backed Gulls at Hyskeir in November ate a lot of Redwings which had been injured by striking the lantern. For five or six years Grouse have not come to the stooks at Nevay Park as they used to do. At Kingoldrum, Forfarshire, a cock Capercaillie was seen to fly through the wires of a fence which, on being measured, proved to be but nine inches apart (2. xviii. 174).

MIGRATION—SUMMARY OF MOVEMENTS.

January.

In January the wind was variable and, during the second week, weather movements caused by a snow-storm were recorded. There were several records of the appearance of Bitterns, and in the latter half of the month Waxwings were reported. Returns of partial migrants to their breeding grounds took place at the end of the month.

February.

The wind was between N.W. and S.W. for the first week, then easterly to the 13th, and thereafter westerly or northerly till the end of the month. Redwings were moving throughout this period and partial migrants were returning to their breeding haunts; this movement strengthened as the month progressed. The usual movements of sea-fowl were noted.

March.

March opened with a spell of frost and N. and N.W. winds; after the 7th it was milder, with variable winds, till the 19th; from that time to the end of the month the wind was chiefly N.E. to E., and light. More returns of partial migrants took place, especially in the first fortnight, when arrivals of Lesser Black-backed Gulls were also noted. After the middle of the month notes were received of the departure of duck and other winter visitors, and in the last week there were arrivals of Wheatears.

April.

The first week of April showed winds chiefly from N.E. to N.W., then easterly till the 13th, thereafter variable and chiefly light. The principal movement during the first fortnight was the marked departure of our winter visitors, which became less noticeable after the middle of the month. Summer visitors were coming in throughout April and a very marked arrival took place from the 17th onwards. In the first week there were a few notes of the return of partial migrants and there was a small stream of passage migration throughout the month.

May.

The wind in May was chiefly N.E. and E. and light, and a big arrival of summer visitors took place in the first half of the month, this naturally lessening during the last fortnight. A few late winter visitors were departing; a small stream of passage migrants was recorded throughout the month, along with one or two uncommon visitors.

June.

June was characterised by variable winds, chiefly light. Flocking of duck, waders, etc., after nesting, was recorded, as well as the arrival of some belated summer visitors. A few passage migrants were still on the move.

(*To be continued.*)

ON THE SUPPOSED OCCURRENCE IN SCOTLAND OF THE SEA-ANEMONE *HORMATHIA CORONATA* (GOSSE), WITH NOTES ON ITS REPRODUCTION, ETC.

By W. EDGAR EVANS, B.Sc., F.R.S.E., Royal Botanic Garden,
Edinburgh.

THE Sea-anemone which forms the subject of this paper was discovered by that ardent student of marine life, P. H. Gosse, while dredging in twenty fathoms of water off Berry Head, on the south coast of Devon. This was in August 1858, and his description of the creature, under the name *Bunodes coronata*, appeared shortly afterwards.¹ The possession of true acontia, however, as well as other peculiarities, precludes the inclusion of the species in *Bunodes*. This was first pointed out by Fischer in 1875; but the genus *Chitonactis* which he then erected for its reception,² has been considered by M'Murrich³ and others to be based upon characters hardly definite enough to allow of its separation from the older genus *Hormathia*, Gosse,⁴ in which, therefore, the present form has now been placed.

In his account of the finding of the anemone,⁵ Gosse mentions certain facts, which may well be quoted here, since they throw light on what appears to have taken place in the case of one at least of the Scottish records of the species. "Three or four specimens," he states, "came up in about the same number of hauls. In every case the animal was adherent to the shell of the living *Turritella terebra*, a mollusc which is so abundant there that the dredge comes up half-filled with it. . . . Before I had seen it expand, I suspected it to be *S. [Calliactis] parasitica*, especially when

¹ *Ann. Mag. Nat. Hist.*, 3rd Series, vol. ii. (1858), p. 194.

² *Recherches sur les Actinies des Côtes océaniques de France*, in *Nouv. Arch. Mus. Paris*, x. (dated 1874), p. 226.

³ Report on the Actiniæ collected by the U.S. Fish Commission Steamer *Albatross*, etc., Appendix, in *Proc. U.S. Nat. Mus.*, vol. xvi. (1893), p. 209.

⁴ *Ann. Mag. Nat. Hist.*, 3rd Series, vol. iii. (1859), p. 47.

⁵ *Actinologia Britannica* (1858-60), p. 203.

in the act of unfolding. It has much resemblance to that species, as well as to *S. coccinea*,¹ with which it was associated; for a number of this little species occurred in the same dredge-hauls; these also adherent to the shells of the *Turritellæ*. The whole aspect of the Diadem Pimplet, including its colouring, is that of a *Sagartia*, though the preponderance of its characters determine it to *Bunodes*."

Hormathia coronata (Gosse) has only twice been recorded from the Scottish coast; once from Forth and once from Clyde. The first of these records is contained in a paper by F. G. Pearcey, entitled "Notes on the Marine Deposits of the Firth of Forth and their Relation to its Animal Life," read before the Natural History Society of Glasgow in August 1901, and later published in the *Transactions* of that Society.² It is there stated that the species is abundant, attached usually to the shells of *Turritellæ*, over a considerable area of the sea-bottom lying approximately to the east of Inchkeith Island, the frequency of its occurrence and its general appearance being indicated in the following passage. "The dredge brought up fully one hundredweight of the deposit, which showed three distinct layers. The surface layer, some two inches in thickness, composed of soft, thin, dark-brown mud, amongst which were great numbers of *Turritella terebra*. Quite 98 per cent. of these were dead shells. Many had attached to them a small bright pink-coloured actinia (*Bunodes coronata*), and some an ascidian (*Styelopsis grossularia*)." ³ That some dubiety must have existed with regard to the identification of the anemone is suggested, however, by the fact that, in a detailed list of the animals taken in the above haul, given subsequently,⁴ it is referred to as *Urticina crassicornis*? O.F.M.; while Pennant is cited as the authority for the name *Bunodes coronata*, when that is used, instead of Gosse.

¹ This species, supposed by Gosse to be identical with Müller's *Actinia coccinea*, is clearly that named by Dalyell *A. lacerata*. It should consequently bear the name *Sagartia lacerata* (Dal.).

² *Trans. Nat. Hist. Soc. Glasgow*, New Series, vol. vi. (1899-1902), p. 217.

³ *Loc. cit.*, p. 225.

⁴ *Loc. cit.*, p. 228.

Taking all the facts into consideration, it seemed not unlikely that the similarity of *Sagartia lacerata* (Dalyell) to *Hormathia coronata* (Gosse), already mentioned, might have led to these species being confused in the present instance, the description, meagre though it be, tallying better with the former than with the latter. Accordingly, through the courtesy of Dr Alexander Bowman, Scientific Superintendent of the Fishery Board for Scotland, I obtained a live specimen of the form in question from the exact locality investigated by Pearcey. The creature was brought to me on 12th December 1924, adhering to the shell of a living *Turritella terebra*, and it proved to be, as I had anticipated, a typical example of *Sagartia lacerata*. There can be no doubt whatever that this was actually the species found by Pearcey, and Mr A. C. Stephen, B.Sc., who took the specimen seen by me, tells me that it is still abundant to the east of Inchkeith, where he has dredged it on several occasions.

The second Scottish record, that from Clyde, appears in a list of *Cœlenterata* contained in the *Handbook on the Natural History of Glasgow and the West of Scotland*.¹ In this list are included twenty-eight species, and in every case but one details are given indicating on whose authority and from what localities each is recorded. The solitary exception is, unfortunately, the present form, of which the bare name *Bunodes coronata*, is inserted. It should be remembered that in August 1901, when Pearcey's paper, already referred to, was read before the Natural History Society of Glasgow, the Clyde *Handbook* was nearing completion for publication under the auspices of the British Association early in September of the same year. One is tempted to wonder whether Pearcey's Forth record may not have been inadvertently supposed to refer to Clyde, or may have suggested to the compiler some anemone met with in that area, thus leading to the insertion of the name *Bunodes coronata* in this list at the last moment. Some colour is indeed given to this

¹ Also entitled the *Fauna, Flora, and Geology of the Clyde Area*. Published by the Local Committee for the Meeting of the British Association for the Advancement of Science, Glasgow, September 1901. The list of *Cœlenterata* appears at p. 367.

view by the fact that no authority for the name is quoted, while Pearcey, in his paper, wrongly attributes it to Pennant, a somewhat curious coincidence. In any case, this supposed record from the Clyde cannot be regarded otherwise than with the greatest doubt, the more so since there has been no subsequent corroboration of it.

There would thus appear to be, at present, no proof that *Hormathia coronata* (Gosse) occurs in Scottish waters; it is, in fact, somewhat doubtful whether it should be expected to do so, all the thoroughly authentic British records being from the extreme south-west of England and Ireland.¹ Bearing in mind, however, that the species was found by Gosse along with *Sagartia lacerata* (Dal.), which is not infrequent around the Scottish coast, it should be carefully searched for in that association, especially off the western seaboard. The following statement of those external characters which normally distinguish the two forms may therefore be given here as an aid to correct identification in future.

In making use of the characters indicated below, it should be remembered that all of them are more or less liable to variation. The warts on the column of *H. coronata* (Gosse) are frequently inconspicuous and, in young examples, may be difficult to observe; while the dark spots which occur on the upper part of the column in mature specimens of *S. lacerata* (Dal.) may, especially in certain states of contraction, be mistaken for warts. Again, in contraction, the latter species may show longitudinal foldings in the upper portion of its column, but these are less regular than in the capitulum of *H. coronata*, the ridges of which are usually very pronounced in semi-contraction and definitely 12 in number. The markings of the tentacles are also subject to much inconstancy and are frequently very indistinct in young individuals of *S. lacerata*, but the general tendency

¹ The specimens recorded in the *Irish Naturalist*, xxi. (1912), p. 221, from the entrance to Dublin Bay, appear to have been wrongly identified. Several features possessed by them, especially the discharge of acontia through apertures in the column as well as through the mouth, suggest that they were small *Sagartias*, possibly once again *S. lacerata* (Dal.) which is known to occur in that area.

in the majority of cases is towards the condition described. In the disc the colour-pattern is too variable to admit of a short, concrete description, but it seems to be fundamentally different in the two forms though, in mature examples, this tends to become obscured. When clearly developed in the case of *H. coronata*, it bears a remarkable resemblance to that described by Haddon in his *Paraphellia expansa*.¹

HORMATHIA CORONATA.

1. Column not very flat when contracted; destitute of cinclides; beset throughout its greater part with small but distinct warts.

2. Uppermost part of column forming a distinct capitulum without warts and divided into 12 usually darker-coloured areas by an equal number of paler, sinuous, longitudinal ridges.

3. Lower margin of column (limbus) regular in outline, propagation not taking place from it by partition.

4. Tentacles frequently bearing on their oral aspect, towards the base, two parallel, longitudinal, dark lines, broken midway by a pale band, giving the appearance of two pairs of dark markings, one pair above the other. Outermost tentacles not strictly marginal.

5. "Viviparous" production of young, as in *Actinia*, apparently usual.

SAGARTIA LACERATA.

Column very much flattened when contracted; cinclides few but well developed; warts altogether wanting.

Uppermost part of column not differentiated.

Limbus usually irregular in outline or lacerated, owing to propagation taking place from it by partition.

Tentacles frequently bearing on their oral aspect a single, median, longitudinal, dark line, broken by one or more pale bands. Outermost tentacles marginal.

Young apparently never produced "viviparously."

So far as I am aware, the propagation of its kind, either sexually or asexually, has never been observed in *Hormathia coronata* (Gosse); the following facts may therefore be recorded. On the 15th of March of this year (1925) a large specimen, received some weeks previously from the Eddy-stone Grounds attached to a valve of *Pecten opercularis*,² was

¹ "A Revision of the British Actiniæ, Pt. 1," in *Sci. Trans. Roy. Dublin Soc.*, New Series, iv. Pt. v. (1889), 322 and Plate XXXII.

² For this and other rarities I have to thank the Staff of the Marine Biological Association's Laboratory at Plymouth.

found to have produced, since the previous day, nine well-formed young. These were scattered about the aquarium, where they had been carried by the aeration currents, one being adherent to the upper part of the column of the parent. This, as well as their sudden appearance and quite regular shape, clearly showed that these young were the result of the development of fertilised ova within the body of the parent and their subsequent discharge through the mouth, exactly as in the well-known case of *Actinia*. In size the little creatures, when expanded, varied from 2 to 4 mm. in height and from 2.5 to 4 mm. in expanse of tentacles. The primary and secondary cycles of tentacles (6+6) were in all cases fully developed and quite symmetrical, the third cycle being, however, still incomplete and containing only from 5 to 10 tentacles. In most of the brood the tint was throughout of a transparent flesh-colour, unmarked except for a faint indication of the darker patches on the distinctly ridged capitulum. In two only, the opaque white pigment of the disc was appearing in radial lines and the lower pair of dark marks was clearly defined upon the primary and secondary tentacles. Though the anemones were carefully examined by the aid of a Zeiss binocular dissecting microscope no trace of warts could be discerned on the column.

Since the above was written, on the 7th of May, a single, much larger, young anemone was produced. This was first seen attached to the parent near the upper margin of the body and was much more distinctly coloured than were those born previously. The third cycle of 12 tentacles was also completed and 6 of the fourth had made their appearance. Two further young, also comparatively large, were discharged on the 10th of June, and it would therefore seem that the "viviparous" production of young is characteristic in *Hormathia coronata* (Gosse).

NOTES

Polygamy amongst Sparrow-Hawks.—It may be of interest to record what appears to be an undoubted case of polygamy amongst Sparrow-Hawks. Nearly every year a pair try to nest in a wood on the estate of Alton Albany, Barr, Ayrshire, and although never allowed to bring off a brood they appear in the same locality spring after spring. This year was no exception and on the 23rd May I went with the keeper to try to locate the nest. We soon found it in a larch tree, and were astonished to see two birds (both looking like hens) fly off the nest when I rapped the boll of the tree with my stick. Near the nest is a wooden footbridge over a small glen, and it was obvious that this was where the cock was bringing his kills to feed his mate or mates. Traps were set here and within a few hours one was found sprung containing the corpse of a small bird, plucked, but no hawk. However, on the morning of the 25th a hen Sparrow-Hawk was killed in the same trap. As it seemed unlikely that we should succeed in trapping the cock (for I presumed that it was he who had first sprung the trap and that he would be wary), I decided to shoot the other hen off the nest, which I did, and then to wait for the cock coming in. A wait of three hours failed to bring him, though we saw him once, and although the keeper tried for the two following days he got no more than one more sight of him.

The nest contained eight eggs which the keeper's son, who climbed to it, found arranged in two rows of four. They were slightly incubated, and I think there is no doubt that both hens were brooding, for they both showed the bare breast patch generally noticeable on sitting birds. Four to six eggs is a normal clutch.

Apart from the interest attaching to such a departure from the normal habit of the species, it seems remarkable that there should have been a surplus hen available at pairing time, for the cock is so much the most difficult to kill of the two that he must often escape on occasions when the hen is destroyed. I should add that to avoid any possibility of mistake both birds killed were dissected, to verify their sex.—J. HUGHES-ONSLow, Barr.

Increase of Eider Ducks in Firth of Clyde.—The Common Eider is now firmly established as a breeding species on the Clyde. Along with several friends I visited Sgat Mhor, the larger of the two islands near the entrance to Loch Fyne, on 2nd June 1925.

Several Eiders rose as we came near the island. We searched for nests, and one nest was found with the remains of an Eider and several sucked eggs. In other places also we saw the shells of eggs that had been sucked. Before we left the island the Eiders returned and swam fairly close to the island in one flock, consisting of seven males, four females, and four young. It is clear that the Eiders in this place are rapidly increasing, and it is equally clear that they have had an unfortunate season this year. Numbers of the larger gulls were nesting on the island, and no doubt the eggs were destroyed by them. We did not land on the Little Sgat Island where I saw Eiders last year. The Eiders appear to be as common now on this part of the Clyde as they would be on a corresponding part of the Forth. As we came home I saw in rather bad light within half a mile of Bute a bird which I believed to be a female Eider.—J. M. M'WILLIAM, Craigmore.

Pugnacity of the Redbreast.—The pugnacity of Robins is well known and to-day (16. v. 25) my chauffeur was witness of a remarkable affray. He came upon two Robins fighting at a water trough and, after watching the contest for a few minutes, he noticed that one Robin had disappeared and that the other kept plunging into the water. On coming up to the trough he found the one Robin nearly drowned, but after drying it and keeping it in his pocket for a little while it recovered sufficiently to fly away.—H. S. GLADSTONE.

Spread of the "German" Cockroach to Aberdeenshire.—This little cockroach, *Blattella germanica*, described in Lucas's *Monograph of the British Orthoptera* (1920), p. 87, 3 figs., has been found abundantly at Turriff, in Aberdeenshire. It has been previously reported from Edinburgh, Glasgow and Paisley. The distinguishing features of the species are well marked in this female specimen: the general colour is tawny; the pronotum shows two distinct longitudinal dark brown streaks with lateral margins almost pellucid; the length from the tip of the head to the tip of the elytra, which project beyond the abdomen, is 14 mm.; the elytra are lanceolate, pale yellow in colour; the legs are pale with the tips of tibiae and of tarsi darker; and the ootheca, which is protruding from the body, is nearly rectangular and has the suture directed to one side.—L. M. ISOBEL DEAN, Natural History Department, University of Aberdeen.

(Authors are responsible for nomenclature used.)

The Scottish Naturalist

No. 154.]

1925

[JULY-AUGUST

NEW FACTS ABOUT THE HIVE-BEE.

IF there is any insect whose life-history and activities have been probed to the uttermost, surely it is the hive-bee. Generations of bee-keepers, anxious to know their stock, have added fact after fact, scientists have contributed their close analysis, philosophers have reasoned and speculated; yet, in spite of all the bee-journals, the scientific magazines, and the literary works, there is more to be learned.

We know that bees, like human beings, dislike wet weather and stormy weather, but to what extent does inclemency affect them and at what stage of inclemency do their activities begin to flag? We know that they prefer warm temperatures, but what outside temperature is most favourable, and how far does variation from the most favourable influence the constant journeyings from the hive? A few marked bees have been watched to discover the length of time each spent in gathering its load of honey or pollen, but what about the crass average time spent abroad in different conditions? How many excursions a day does a bee make; how long on an average is the working life of a bee; how many bees, in a hive of known population, die in the hive each day, and how many issue from the hive never to return?

Answers to these and other questions have been made possible by a clever piece of apparatus invented by Mr A. E. Lundie, formerly field assistant in the bee culture laboratory of the United States Department of Agriculture's bureau of entomology. The essence of the apparatus is that it compels the bees of a hive to depart and return by different openings, and as each passes, the weight of the bee is used to make an electric contact, which automatically records the numbers of the comings and goings.

Mr Lundie has recently published some of the results obtained by his apparatus (in Department Bulletin No. 1328, United States Department of Agriculture, May 1925), and though he found that the apparatus itself did not cause any discernible abnormality in the activities of the bees, he has made every allowance for possible error. Let us glance at a few brief summaries of some of these interesting discoveries.

Under equal conditions of weather, he finds that a main determining factor in deciding the number of bee journeys to the outer world, is the amount of honey available, the "honey flow." Three or four times as many exits are made during the honey flow as at any other time in the investigation. Thus a hive from which 10,000 to 20,000 exits were being made in late April showed, in the third week of May when the honey flow was at its height, daily exits numbering 60,000 to 70,000.

But weather is all-important, and a combination of adverse climatic conditions may reduce the departures to a fraction of 1 per cent. of the possible. A threatening storm, of but an hour's duration, reduced the possible flight on one day in the honey flow by 7.41 to 9.67 per cent. A wind, having a velocity of 16 to 21 miles per hour, from 9 A.M. to 6 P.M., reduced the possible maximum flight by 28.53 per cent. Bees are sticklers for a proper temperature at which to work: during the honey flow they did not begin to leave the hive till the air temperature was 14° to 16° C., and the main flight began only at 16° to 18° C., reaching its maximum somewhere between 9 and 11 A.M.

But the last returns in the evening were regulated rather by failing light than by falling temperature.

The average length of time occupied by a trip varied very greatly. During the honey flow trips were naturally of much shorter duration than during a time of dearth, and in any day morning and evening trips were shorter than those between times, the daily range being as great as from 15 minutes to 1 hour 43 minutes. It would appear, however, that the bees spend more time in the hive than they do on their outdoor journeys.

Mr Lundie's experimental hive was placed on a balance, so that the alteration in weight due to the addition of honey could be measured accurately each day. This, associated with the number of return visits of bees to the hive, enabled him to calculate the average load of nectar carried by each bee. In the midst of the honey flow on 22nd May, each individual of 44,597 bees carried a load averaging 25.3 mgrms., or almost nine-tenths of an ounce.

Finally, during the eighty-nine days the experiments were in progress, it was found that of the 2,434,666 bees that left the hive 3.16 per cent. did not return. This means that on an average a bee makes 31.65 trips before death overtakes it. But there is also death within the hive, and of the total of 65,178 bees lost from all causes 1.63 per cent. died in the hive.

These short notes give some idea of the value and interest of the results to be obtained by Mr Lundie's ingenious method of investigation.

* * * *

The ranks of Scottish entomologists, sadly thinned of recent years, have again been depleted by the death, in mid-July, of Mr James E. Black, F.L.S., F.E.S., of Nethercroft, Peebles. An enthusiastic coleopterist, Mr Black contributed many notes of his Scottish captures to the pages of our entomological contemporaries, and amassed a collection of British and exotic Beetles of considerable value.

It is with much regret that we record also the death of Mr A. E. J. Carter, F.E.S., of Hillgarth, Currie, which occurred in Edinburgh on the 18th May. Mr Carter was an ardent student of insects and contributed several articles and notes to the various journals dealing with his favourite subject. After devoting many years to the study of the Aculeate Hymenoptera, he turned his attention to the more neglected group of Diptera, and by his zeal and patience soon acquired a good working knowledge of the group in general. He was the means of adding several species to the British List, and his published records considerably extended our knowledge of the distribution of Two-winged Flies in Scotland. The greater part of his life was spent in the service of the Bank of Scotland, and it is sad to think that of the retirement to which he had eagerly looked forward as likely to afford opportunity for further study, he enjoyed only very few weeks, before passing away in an Edinburgh Nursing Home at the age of 62.

*

*

*

*

Mr A. C. Stephen, B.Sc., for close on five years junior naturalist on the scientific staff of the Fishery Board for Scotland, has been appointed by the Civil Service Commissioners assistant in the Natural History Department of the Royal Scottish Museum.

Golden Oriole in Kirkcudbrightshire.—An example of a female Golden Oriole, in fine plumage, was found by me dead outside the door of my house at Gatehouse, Kirkcudbrightshire, on the morning of 6th May. The specimen was forwarded to the Royal Scottish Museum, and I am indebted to Dr Ritchie for his identification of the bird, and for the further information that its body was poorly nourished, that there were only minute traces of vegetation in its stomach, and that having arrived here on the northward migration journey it had probably died of starvation owing to deficiency of insect food during the cold and unseasonable weather of early May.—ROBERT L. TAIT, Gatehouse.

MIXED PLUMAGES IN A BROOD OF HYBRID CROWS.

By Surgeon Rear-Admiral J. H. STENHOUSE.

IN Scotland two species of Crows breed: the Hooded Crow (*Corvus cornix*) in the north and west; the Carrion Crow (*Corvus corone*) in the south and east. The demarcation of the ranges of these two species can be roughly taken as following a line drawn from northern Forfarshire to mid Argyll; though Carrion Crows occur in Moray to the north and Hooded Crows in the Clyde and Solway areas in the south-west.

Throughout Europe and Asia, wherever the ranges of these two species overlap, interbreeding occurs, and in one district in Siberia all stages of intermediate forms are met with, the hybrids being fertile.

In our country this interbreeding is probably more common than is usually supposed or recorded. Hybrid Crows are far from rare; but I am unable to trace any publication of a description of the plumages of a complete brood of these hybrids.

In May 1923, Mr T. Leslie Smith found at Kingoldrum, in the north-west of Forfarshire, a Crow's nest with four eggs. The nest was in a Scots fir, and had been occupied in 1922 by a pair of Kestrels. A month later there were four young, which he took and successfully reared. Observation showed that of the parent birds, one was a Carrion Crow and the other a Hooded Crow.

On 10th February 1924 one of the young Crows died, having been killed by the others; and nine days later a second died. Mr Smith at that time suspected that all four birds were males; in this, however, he was mistaken; one was a female, and sexual jealousy was in all likelihood the cause of the domestic quarrels which resulted in the death of these two birds. The bodies were sent to the Royal Scottish Museum and skins prepared. The feathers of the wings and tails were badly broken as a result of their con-

finement, and they were unsuitable for mounting as specimens. In November 1924 the two remaining Crows died and were also sent to the Royal Scottish Museum; being in perfect plumage, these have been mounted. Dissection showed that both the birds which died in February were males; the two others were a pair. Their measurements (in millimetres) are as follows:

		Wing.	Tail.	Tarsus.	Bill from feathers.	Bill from nostrils.
1.	♂	326	196	61	54	37·5
2.*	♂	broken	broken	60·5	49	35
3.†	♂	broken	broken	59·5	48	35
4.	♀	300	185	61	50	35·5

* Died 19.2.24.

† Died 10.2.24.

These measurements agree well with those of either Hooded or Carrion Crows.

No two of these four birds are alike in plumage, and it is considered that a description of each will be of interest. Before describing them, it may not be out of place to state that in the Carrion Crow the entire plumage is glossy black with metallic reflections, and in the Hooded Crow the back and sides of the lower neck, the mantle, scapulars, back, rump, breast, abdomen, under tail coverts and axillaries are light grey; the remainder of the plumage being like that of the Carrion Crow.

1. In this bird the "Hooded" characters are well developed. The sides of the lower neck are grey, joining with the grey of the back on the one hand and with that of the breast and abdomen on the other. Many of the feathers of the mantle have dark centres and some of the scapulars are grey on the inner and black on the outer web. The rump feathers are black with grey edges. The lower breast, flanks and abdomen are lighter grey than the back, and there are many fine black shaft streaks visible. The under tail coverts near the vent are chiefly grey, further down they have black centres and grey edges. The axillaries are grey; a few of the anterior feathers show a little black at their bases.

2. This bird has much less of the "Hooded" character than No. 1. The lower part of the sides of the neck shows a greyish tinge due to some grey edgings to the feathers; this grey tinge prevails over the back and is there also due to more or less grey tips to the feathers. Underneath, the lower breast, flanks and

abdomen are smoky grey; there are many well-marked shaft streaks broadest towards the breast. The under tail coverts near the vent are chiefly grey with small black centres; lower down they are black with grey edges. The axillaries are chiefly grey, some of the shorter anterior feathers are black.

3. The only trace of "Hooded" plumage to be found in this bird is on the flanks and lower part of the abdomen which are dark



FIG. 1.—The extreme types of the Hybrid Brood. (Nos. 4 and 1 of text.)

grey; where the grey joins the black on the abdomen there are a few indistinct shaft streaks. The under tail coverts near the vent have black centres and grey edges, lower down they are completely black. The axillaries are almost entirely black.

4. The female bird shows no trace whatever of its "Hooded" ancestry. Its plumage is that of an ordinary Carrion Crow and nothing can be found to suggest that it is in any way a hybrid. The under tail coverts and axillaries are entirely black.

Regarding the parent birds, there is no information as to which of the pair was "Hooded" and which was "Carrion."

Judging from the position of the nest in a tree, the presumption is that the hen was a Carrion Crow; if this was so, there is no evidence that male characters are shown most clearly in female descendants in this cross, for here we have the only female in the brood indistinguishable from an ordinary Carrion Crow. The pair returned to the nesting tree in 1924, but were unable to rear a brood, a charge of shot into the nest from a keeper's gun being the deciding factor; but the old birds escaped, and it is hoped that this year we may learn more about this interesting pair.

By some ornithologists the Hooded and Carrion Crows are regarded as subspecific forms of one species. This interbreeding where the ranges overlap certainly lends support to that theory. We have no information, however, as to what extent hybrids are fertile *inter se*. It is known that hybrids are fertile, but it must be remembered that these may continually be receiving fresh blood from pure stock. It is quite possible that if hybrids bred only with hybrids, the stock would die out in a few generations. This is an interesting field of study which some one with sufficiently large aviaries might with advantage take up.

It has already been mentioned that in one district in Siberia all stages of intermediate forms between these two Crows are met with. The examination of this brood shows that even from one nest birds showing various degrees of intermediate plumage may be obtained, and from parents which in the field appear to be of pure stock. The fact that one of this brood, though of hybrid blood, was still indistinguishable from a Carrion Crow, shows how difficult it is to be sure that birds apparently of pure stock are really so. The writer's only experience of an attempt at breeding by Crows of these two species was in Forfarshire in 1892. The nest was on a steep bank on the coast, and the apparently ordinary Hoodie which left the nest was regarded as the hen; the other, considered to be the cock bird, appeared to be an ordinary Carrion Crow. There were five eggs in the nest, of average Hoodie size (41×29 mm.); all were addled and infertile. It is just possible that we were mistaken in considering the birds to be of pure stock; we

may have come across an instance of hybrids attempting to breed and with unsuccessful results.

I beg here to acknowledge my indebtedness to Mr Leslie Smith¹ for information, both verbal and written,

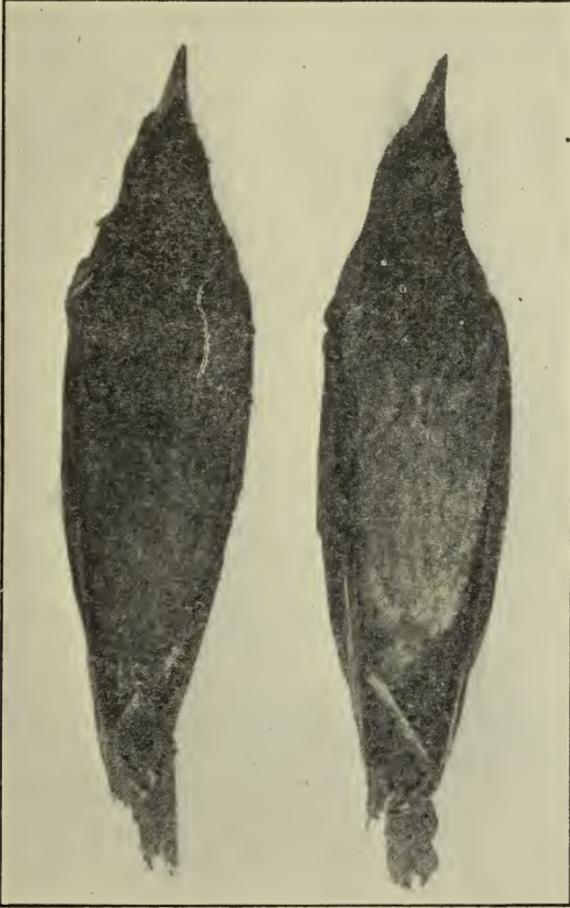


FIG. 2.—The intermediate types of the Hybrid Brood.
(Nos. 3 and 2 of text.)

regarding these birds, and to express my thanks to him and to the authorities of the Royal Scottish Museum for this opportunity of examining such an interesting brood of Hybrid Crows.

¹ A preliminary note on this brood, by Mr Smith, appeared in *British Birds*, vol. xviii., 1924, p. 53.

TWO NEW SCOTTISH SYMPHYLES.

By RICHARD S. BAGNALL, F.R.S.E., F.L.S.

SINCE publishing my account of the Scottish *Symphyla* in 1913, many thousands of specimens have passed through my hands, and I have thus been able to extend our knowledge of the rarer species, such as *Symphylella jacksoni* (Bagn.), *S. dunelmensis* (Bagn.), *S. isabellæ* (Grassi), *S. horrida* (Bagn.) and *S. minutissima* (Bagn.). I have secured examples of the two first-named in the Forth Area, and take this opportunity of putting them on record. Students should refer to a paper on classification,¹ which simplifies the study of what is regarded as a somewhat difficult Order.

Symphylella dunelmensis (Bagn.), 1911.—For sometime known only from the county of Durham, where it occurred plentifully at Gibside, but now known from several English localities.

SCOTLAND. — Forth Area, Juniper Green, 12th September 1922.

Symphylella jacksoni (Bagn.), 1912. — Until recently known only from the Estuary of the Dee, where Dr Randall Jackson took it in numbers. Now known from several localities, usually near the sea, such as Swansea, Torquay, Hastings district (where Mr Ruskin Butterfield finds it in profusion), and Warkworth.

SCOTLAND.—Forth Area, Belhaven Bay, near Dunbar, 7th August 1920, during a short ramble with my friends Professors T. Hudson Beare and J. H. Ashworth, F.R.S.

¹ R. S. Bagnall, "On the Classification of the Order *Symphyla*," *Journ. Linn. Soc., Zool.*, xxxii., pp. 195-199.

Black-headed Wagtail—First Recorded Appearance in Scotland.—On the 14th June 1925, in Upper Nithsdale, at a spot a short distance up the Spango Water, my attention was arrested by bird notes which somewhat resembled those of the Yellow Wagtail. Directing my son, who had the binoculars, to examine the bird, which was perched in a birch tree at the water-side, I was somewhat amazed to hear him pronounce it “a Yellow Wagtail with a jet-black head.” This description I found to be absolutely correct; in fact I have seldom seen two colours show up in such marked contrast—the jet-black head and the brilliant yellow of the breast. It now flew down and for some time continued to thread its way Pipit-like, about the steep grassy bank, where I had ample opportunity to examine it minutely.

That it was the rare Black-headed Wagtail, *Motacilla feldeggi*, I am positive, everything in fact favouring correct identification—perfect light; short distance, aided by powerful $\times 25$ binoculars, which provided an almost arm's-length view of the bird.—WALTER STEWART, Airdrie.

Greenshank nesting in Scottish Lowlands.—From a reliable source we have learned that the Greenshank nested this year, and probably last year also, on high ground in the Lowlands. In 1925 the nest was unfortunately deserted owing to interference by sheep or shepherds, but we have had an opportunity of seeing one of the eggs, typically that of a Greenshank, of the very beautiful variety in which the dark colour is aggregated in a zone round the broad end. This is the first record of the nesting of the Greenshank in Scotland, south of the Perthshire Highlands, though rumours of breeding in different areas of the Lowlands have been current for several years. We hope it may be the precursor of a further extension of range, and regret that the persecution which this species has suffered in northern Scotland at the hands of egg-collectors, makes it necessary to refrain from exact specification of the new nesting locality.—Editors, SCOTTISH NATURALIST.

Red Grouse Eggs of Unusual Colour.—On 28th May a friend who was traversing a moor, at 400 feet above sea-level, on the estate of Davo, Fordoun, flushed a Red Grouse which was sitting on a clutch of six eggs. All the eggs were creamy white in colour, with extremely faint pale reddish brown markings. They resembled Grouse eggs which had been long exposed to the weather, but they were quite fresh and hatched a week later.—A. C. STEPHEN, Edinburgh.

Stock Dove's Nest under a Bridge.—During May I paid several visits to the nest of a Stock Dove built beneath a foot-bridge over Yarrow Water at Bowhill. The nest was placed upon a ledge at the top of one of the stone piers of the bridge, directly underneath the wooden foot-way of the bridge. The dark tunnel-like entrance to the nest and the cavity between the pier and planks suggest the sort of place mostly favoured by a Stock Dove for its nest; but it is surprising that, in spite of the traffic immediately overhead, the bird should have chosen this place, and have clung to it till the full clutch of two eggs was laid. Unfortunately, the nest came to be too well known, and the interference of the curious with the planks, so that the nest might be the better seen, caused the birds to desert. I removed the eggs on the evening of 27th May, and sent them to The Royal Scottish Museum, for confirmation of my identification.—J. R. SIMPSON, Selkirk.

Birds at High Altitudes on Cairngorms.—During July several interesting occurrences of birds at high altitudes on the Cairngorms have come under my notice. On 15th July I observed a Rook crossing Wells of Dee, at 4000 feet altitude, and on the same day a Blackbird on summit of Brae Riach, 4100 feet. On 19th July a breeding Golden Plover had four eggs at 2900 feet on Brae Riach.

This year there are not half the number of Swifts on our house at Aviemore as there were last year, and they seem to be few all round here. On the hills there are very few young Ptarmigan broods.—SETON GORDON, Aviemore.

Oystercatcher eating Tern's Eggs.—On the 18th of May 1922, our nesting Terns arrived at the Skerries Lighthouse; they appeared a bit half hearted about nesting at first, then all seemed to make a start and there were quite a lot of nests and eggs on the rock. There were also seven Oystercatchers' nests on the rock and they hatched out rather earlier than the Tern. Then we were surprised to see a great destruction of Terns' eggs, commencing in the vicinity of the Oystercatchers' nests. I began to have my doubts, and watching Mrs Oystercatcher from the kitchen window, saw her feed her two precious chicks with one limpet and two half-hatched Tern's eggs for their supper, then cuddle them close below her wings. I don't know if this has ever been recorded before; shortage of food was no excuse as they could always get plenty of limpets.—HENRY JAMIESON, Skerries Lighthouse, Shetland.

REPORT ON SCOTTISH ORNITHOLOGY IN 1924.

By EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL.

MIGRATION AND SUMMARY OF MOVEMENTS.

*(Continued from p. 88.)**July.*

In July the wind was almost entirely from the west and light. There were indications in the first half of the month of movements through the country on the part of our summer visitors, and of returns of our breeding waders to the shore. In the second half of the month these movements were intensified, and the beginning of the arrival of overseas waders was recorded and departures of Swifts noted.

August.

The type of weather in August was much the same as in July, the wind being almost entirely westerly and light. Much movement of waders took place, including arrivals from overseas; also departures of breeding birds and movements of partial migrants. Some of our summer visitors were leaving; a little passage migration was recorded, and one or two winter visitors arrived.

September.

Up to the 8th the wind was east and north-east; for the rest of the month it was almost entirely from some westerly quarter. The movements during September were perfectly normal: there were considerable departures of summer visitors, distinct passage migration was noted throughout the month, but no rush, and there were arrivals of winter visitors especially in the second fortnight.

October.

From the 5th to the 7th, and again from 19th to 21st and from 27th to 29th, there were easterly spells of wind;

the rest of the month the wind was westerly, mainly S.W. and light. Considerable movements of *Turdidæ* and arrivals of other winter visitors coincided with the periods of easterly wind, otherwise the movements were small but steady. Some belated summer migrants were recorded up to the end of the month, and there was a certain amount of passage migration.

November.

Up to the 6th there was a continuance of the westerly type; from that date till the 17th the wind was easterly, thereafter to the end of the month chiefly westerly. Arrivals of winter visitors continued, and one or two very late summer visitors were recorded, otherwise there was little of interest.

December.

The weather in December was of a westerly type throughout, with a marked absence of frost and snow. The movements were very small and confined almost entirely to winter visitors, although a few uncommon visitors were noted.

MOVEMENTS OF BIRDS IN SCOTLAND IN 1924,
ARRANGED UNDER SPECIES.

RAVEN, *Corvus corax corax*.—On 27th February two Ravens were noted at Moncrieffe, one at Hyskeir on 2nd April, one at Halmyre, Peeblesshire, on 12th September, and two on Ailsa Craig on 7th October.

HOODED-CROW, *Corvus cornix cornix*.—Movement was recorded in March and April; last seen, Hyskeir on 1st May and Glenorchard on 3rd May. Returns were reported from Tayport on 8th November, and to the end of that month from other stations.

CARRION-CROW, *Corvus corone corone*.—A flock of twenty, "evidently travelling," was seen at Ancrum, Roxburghshire, on 6th February.

ROOK, *Corvus frugilegus frugilegus*.—On 20th March and 28th April a few Rooks visited Fair Isle, and one was at Hyskeir on 25th April. Small numbers were again recorded from Fair Isle on 28th October and 27th November.

JACKDAW, *Colæus monedula spermologus*.—A big flock went N.W. over Lahill on 7th January, and a Jackdaw was on Hyskeir on 2nd December.

BRITISH JAY, *Garrulus glandarius rufitergum*.—Several were seen about Gilston (Fife) and two in Berwickshire in January; a pair frequented Tentsmuir in February, and one was at Livingstone, Kirkcudbrightshire, on 22nd April.

STARLING, *Sturnus vulgaris vulgaris*.—Constant movements were reported from Ailsa Craig and Hyskeir from the beginning of the year up to 23rd February. A flock of a thousand was at a roost near Dundee on 10th April, and on 20th May arrivals, no doubt of passage migrants, were noted on the Isle of May. On 22nd May flocks were seen at Hareshawmuir (Ayrshire); movement was recorded at Hyskeir in July, and at the end of August many left the local roosts in Forfarshire. In November movements took place frequently at Ailsa Craig and Hyskeir.

HAWFINCH, *Coccothraustes coccothraustes coccothraustes*.—See p. 74.

GREENFINCH, *Chloris chloris chloris*.—A Greenfinch was on Ailsa Craig on 18th January, and two on Fair Isle on 29th October.

BRITISH GOLDFINCH, *Carduelis carduelis britannica*.—Flocks were noted in Wigtownshire in January, February, and October; two pairs were seen near Duns in March, and a pair in Renfrewshire in April.

SISKIN, *Carduelis spinus*.—A male was at Lahill on 16th and 18th February, and a flock at Derrie (Mochrum) on 2nd October.

TWITE, *Carduelis flavirostris flavirostris*.—Some Twites were on Ailsa Craig on 18th January and a few on Hyskeir on 10th and 11th February, while movement was again recorded from these two stations from 14th September to the end of the year.

MEALY REDPOLL, *Carduelis linaria linaria*.—Several were reported from Kingoodie, Perthshire, on 1st January, single birds at Fair Isle and Buddon on 3rd May, and two at Fair Isle on 23rd May.

LESSER REDPOLL, *Carduelis linaria cabaret*.—On 6th January a number were seen at Sunderland Farm, Selkirkshire, and a flock of forty at Corsemalzie on 1st February, while two were at Buddon Ness on 17th August.

LINNET, *Carduelis cannabina cannabina*.—One was on Fair Isle on 19th April, one on the Isle of May on 15th May, and four there on 20th May. Numbers were reported near Largo on 22nd September, and a flock of 250 at Whithorn, Wigtownshire, on 23rd October.

SCARLET GROSBEEK, *Carpodacus erythrinus erythrinus*.—See p. 75.

CHAFFINCH, *Fringilla cœlebs cœlebs*.—Some Chaffinches visited Ailsa Craig on 18th January and 27th March. From 6th October to 7th November a large movement was recorded at Fair Isle, Hyskeir, Ailsa Craig, and mainland stations, while on 30th December two Chaffinches visited Ailsa Craig.

BRAMBLING, *Fringilla montifringilla*.—Last seen, Invergowrie on 23rd March and Fair Isle on 8th May. Immigration was noted at Fair Isle during October, and a good many Bramblings were at Lahill on 23rd November.

HOUSE-SPARROW, *Passer domesticus domesticus*.—One on Ailsa Craig on 30th December.

TREE-SPARROW, *Passer montanus montanus*.—Recorded near Selkirk in January, from Milnfield (Tay) on 27th April, in August and October. On 4th May a number arrived near Tynninghame and stayed to breed, while on 6th December two fairly large flocks were seen near Edinburgh (i. 1925, 23).

CORN-BUNTING, *Emberiza calandra calandra*.—Single birds were noted at Fair Isle on 7th April and Isle of May on 28th May.

YELLOW-BUNTING, *Emberiza citrinella citrinella*.—Two were on Ailsa Craig on 20th January; an increase was noted about Dundee on 16th March; a few Yellow-Buntings were on Fair Isle on 2nd and 21st April, and single birds on Ailsa Craig on 22nd May and Isle of May on 24th May.

ORTOLAN, *Emberiza hortulana*.—See p. 75.

REED-BUNTING, *Emberiza schœniclus schœniclus*.—Returned to their breeding area near Dundee on 2nd March. One was on Fair Isle on 12th April and one at Vallay (O.H.) on 7th June. Reed-Buntings left breeding grounds in Forfarshire early in August, one was on Fair Isle on 9th September and a few there on 28th October, while one was seen near Invergowrie on 2nd November.

SNOW-BUNTING, *Plectrophenax nivalis*.—Last seen on Lismore on 1st April. In autumn, early records came from Fair Isle on 12th September and Isle of May on 23rd September, while many were on Fair Isle on 24th September. From 29th October to 14th December there were a good many notes of Snow-Buntings from Vallay, Hyskeir, and mainland stations.

WOOD-LARK, *Lullula arborea arborea*.—See p. 75.

SKYLARK, *Alauda arvensis arvensis*.—A lot of movement was reported chiefly from Ailsa Craig and Hyskeir up to 26th February, probably returns of partial migrants. On 31st March a big flock was seen at Halmyre, Peeblesshire, "migrating," while throughout April there were notes of movement, probably relating chiefly to passage migration, which continued at Hyskeir to 11th May and at the Isle of May to 25th May. From 14th September to 13th October much movement, chiefly to the south and west, was reported, though at Dundee eastward passage was noted during October. A few Skylarks were on Ailsa Craig on 5th November and one on Hyskeir on 3rd December.

SHORE LARK, *Eremophila alpestris flava*.—See p. 75.

TREE-PIBIT, *Anthus trivialis trivialis*.—First reported from Halmyre, Peeblesshire, on 17th April, Contin (Ross) on 28th and Loch Goil on 29th April, thereafter arrivals up to 11th May. Passage migrants were recorded from Fair Isle from 9th to 23rd May, and at the Isle of May on 21st May. Autumn movement began as early as 20th July. Last seen, Balgay, Forfarshire, on 24th August, Dunkeld on 3rd September, and Isle of May on 24th September.

MEADOW-PIBIT, *Anthus pratensis*.—Arrivals at Possil were noted in the first week of February, at Corsemalzie on 20th February, and Ailsa Craig and Balcomie (E. Fife) on 8th March. From 2nd April to 13th May much movement was recorded at Hyskeir, and arrivals at inland breeding places up to the end of April. Autumn movement was noted from 22nd July onwards to 6th October; inland breeding places were pretty well deserted by 3rd September, and a good many of the later Meadow-Pipits recorded from our inland stations were probably passage migrants.

BLUE-HEADED WAGTAIL, *Motacilla flava flava*.—See p. 75.

YELLOW WAGTAIL, *Motacilla flava rayi*.—First noted in Mid-Lothian on 26th April, Possil Marsh and Hareshawmuir next day. Last seen, Hareshawmuir on 1st September.

GREY WAGTAIL, *Motacilla cinerea cinerea*.—Returned to Invergowrie on 2nd March and Kilmacollm on 31st March, while on 8th May one was seen on Fair Isle. By 18th July movement was apparent in Glen Clova, and near Broughty Ferry on 21st July. Last noted in Invergowrie on 14th September. A Grey Wagtail was seen at the top of Corrie Ba, Blackmount, on 5th October, one on Fair Isle next day, and five on Hyskeir on 13th October. During October and November there were many notes of this species at east coast stations.

WHITE WAGTAIL, *Motacilla alba alba*.—Noted at Moncrieffe on 19th March and Bardowie on 6th April. Passage along the west coast was reported from 15th April steadily to 13th May, and one bird at Hyskeir on 12th June. The east coast records fall between 3rd and 23rd May, and those from Fair Isle from 27th April to 2nd June. By 7th August return movement had begun at Hyskeir; it was reported frequently from Fair Isle between 15th August and 6th October, from east coast stations in the latter half of September, and Inveroran (Argyllshire) on 30th September.

PIED WAGTAIL, *Motacilla alba yarrellii*.—Returns to breeding places were reported during March and up to 7th April; a few were noted at Fair Isle on 15th, 17th, and 26th April, and 3rd May. By 11th August autumn movement was apparent about Broughty Ferry, and from 23rd August to 28th September was recorded from many stations, though up to the end of November many Pied Wagtails were present about Dundee.

BRITISH WILLOW TITMOUSE, *Parus atricapillus kleinschmidti*.—Three were seen at Corsemalzie on 6th March.

GOLDCREST, *Regulus regulus*.—Goldcrests (subsp.?) were reported from Ailsa Craig on 5th and 6th April, one British Goldcrest was on the Isle of May on 26th September and two of this sub-species at the lantern there on 26/27th September.

RED-BACKED SHRIKE, *Lanius collurio collurio*.—A male was on the Isle of May from 19th to 21st May, and one on Fair Isle on 20th May.

WAXWING, *Bombicilla garrulus*.—See p. 75.

SPOTTED FLYCATCHER, *Muscicapa striata striata*.—An early arrival was recorded from Melrose on 30th April, but the main influx took place between 11th and 30th May. By 20th July movement through the country had again begun, and departures took place in August and the first half of September. Last seen,

Possil Marsh on 19th September, Isle of May on 24th, and Corsemalzie on 25th September.

PIED FLYCATCHER, *Muscicapa hypoleuca hypoleuca*.—Reported from Duns on 3rd May, Tynninghame next day, Fair Isle on 7th, 8th, and 12th May, Pitgavenny (Elgin) on 9th May, and the Isle of May on 26th September.

CHIFFCHAFF, *Phylloscopus collybita collybita*.—First noted at Halmyre, Peeblesshire, on 6th April, Corsemalzie 15th, and Rouken Glen on 27th April. Last reported at Bowhill, Selkirkshire, on 18th September.

SCANDINAVIAN CHIFFCHAFF, *Phylloscopus collybita abietinus*.—Two were on the Isle of May on 23rd September, and a Chiffchaff on Fair Isle on 6th and 7th October was probably of this race.

WILLOW-WARBLER, *Phylloscopus trochilus trochilus*.—First noted at Loch Goil and Corsemalzie on 16th April and Hareshawmuir on 19th; after this a big arrival took place, and arrivals at breeding places were reported up to 15th May. Passage migration was in evidence at Fair Isle from 7th to 22nd May, and on the Isle of May to 29th May. By 11th July the beginning of the autumn movement through the country was noted, and departures took place during August and the first half of September. Last seen, Possil Marsh and near Arbroath on 19th September, Balgay on 21st, and Isle of May on 24th September, while on 7th October there were a few Willow-Warblers (subsp.?) on Fair Isle.

WOOD - WARBLER, *Phylloscopus sibilatrix sibilatrix*.—Arrivals were recorded at Loch Goil on 4th May, Carmyle on 6th, and Corsemalzie on 8th May; after this there were a good many notes of immigration up to 18th May.

SEDGE - WARBLER, *Acrocephalus schænobænus*.—First noted at Possil Marsh on 4th May and Mochrum Loch on 7th May. From the 11th to 18th May a rapid spread was noted, and this species was seen on the Isle of May up to 29th May. Last seen, Loch Elrig, Wigtownshire, on 8th September, and the Isle of May on 26th September.

GARDEN WARBLER, *Sylvia borin*.—Reported on 11th May at Darvel, on 15th May from Barochan (Renfrewshire), Melrose, and the Isle of May; further arrivals were recorded to 25th May. Passage migrants were noted at Fair Isle on 17th, 23rd, and 25th August, 9th and 12th September, and Garden Warblers visited the Isle of May on 11th, 12th, 20th, and 24th September.

BLACKCAP, *Sylvia atricapilla atricapilla*.—On 10th May a male Blackcap was seen near Duddingston. From 8th September to 28th October there were frequent records of small numbers at Fair Isle, and a male at the Isle of May on 11th and 24th September.

WHITETHROAT, *Sylvia communis communis*.—First noted on 26th April at Corsemalzie, St Boswells on 28th April, and Ailsa Craig on 1st May. After this many arrivals were recorded from all over Scotland till 20th May, when the bulk of our breeding birds had arrived. Passage migrants were reported at Fair Isle from 3rd to 31st May, and Whitethroats at the Isle of May from 17th May to the end of the month were probably also on passage. Southward drift became apparent in the latter half of July, and much departure was recorded in August and September. Last seen, Isle of May on 26th September, and near Largo on 1st October.

LESSER WHITETHROAT, *Sylvia curruca curruca*.—Single birds appeared on the Isle of May on 19th May and Fair Isle on 31st May. In autumn this species was noted on Fair Isle on 25th August, 4th and 8th September, and the Isle of May on 26th September.

SUB-ALPINE WARBLER, *Sylvia cantillans cantillans*.—See p. 75.

FIELDFARE, *Turdus pilaris*.—Strong northward movement was recorded from many stations from 8th April to 11th May. Last seen, Hareshawmuir, 14th May, and the Isle of May next day. Returns were reported from Fair Isle on 24th September and 7th October, and Alticig, Wigtownshire, on 8th October, but the main arrival took place between 23rd October and 10th November. Two visited Hyskeir on 4th December, and one was at that lantern at 3 A.M. on 16th December.

CONTINENTAL SONG-THRUSH, *Turdus philomelus philomelus*.—This subspecies was noted in weather movements in East Fife in January, and two at Invergowrie on 3rd February. From 15th to 28th April emigrants were reported at Fair Isle, and at the Isle of May from 17th to 21st May. Thrushes on Ailsa Craig on 12th May were probably this form. Autumn arrivals were reported from island stations from 5th to 28th October, and this subspecies visited Hyskeir on 3rd and 4th December.

BRITISH SONG-THRUSH, *Turdus philomelus clarki*.—Some were in the January weather movements on the shores of East Fife. Returns to breeding places were reported as early as 23rd January and continued throughout February. Movements of the British Song-Thrush were recorded from Balgay, Forfarshire, on 16th July

and Largo on 11th August, and a good deal from the Isle of May between 14th and 27th September.

REDWING, *Turdus musicus*.—A good deal of movement was noted in January, chiefly weather movements. Up to 3rd March a great deal of coming and going took place, chiefly noted in East Fife but also in Peeblesshire; then from 21st March definite northward movement was reported up to the end of April. Last seen in Selkirkshire on 3rd May, Hyskeir on 10th May, and one was seen in June at Greenmount, Burntisland. In autumn the first record came from Fair Isle on 20th September: the main arrival took place between 4th October and 12th November, with a smaller influx between 27th November and 4th December.

RING-OUZEL, *Turdus torquatus torquatus*.—Several Ring-Ouzels were on Fair Isle on 15th and 17th April. Arrivals were noted at Loch Goil, Contin (Ross) and Hareshawmuir (Ayrshire) on 19th April, Dunkeld on 27th, and the Greenock Hills on 29th April, while one was on the Isle of May on 19th and 21st May. A few were seen in Glenorchy, Perthshire, on 2nd and 3rd October, and at Fair Isle on 4th and 7th October, and one at Fetlar, Shetland, on 21st October.

BLACKBIRD, *Turdus merula merula*.—A few Blackbirds were on Ailsa Craig from 9th to 13th January and the Bass Rock on 10th January, and they participated in the weather movements in East Fife this month. "A decided movement" was reported from Melrose at the end of July and beginning of August, and a large arrival was noted, chiefly from Fair Isle, from 4th to 28th October. From 24th October to 8th November records came from Ailsa Craig, probably of emigrants, and on 10th and 11th November and 28th November to 4th December decided movement occurred at Hyskeir.

WHEATEAR, *Enanthe ananthe ananthe*.—Arrived on Ailsa Craig on 22nd March, Darvel and Black Loch (Clyde) and Tentsmuir (N. Fife) on 29th, and Craignarget (Wigtownshire) on 30th March. After this much movement was recorded up to the beginning of May, but chiefly from 10th to 19th April. Wheatears at Ailsa Craig, Hyskeir, and the Isle of May from 1st to 17th May were probably passage migrants. By 13th July movement after breeding had begun, and this strengthened during August and up to mid September. Last seen, Invergowrie on 21st September, Isle of May on 26th September, Derrie, Wigtownshire, on 2nd October, Hyskeir, 5th, and Buddon, Forfarshire, on 6th October.

GREENLAND WHEATEAR, *Enanthe enanthe leucorrhoea*.—One was reported from near Selkirk on 17th April, and one at Hyskeir on 30th April. Steady passage was noted from 9th to 30th May, from Corsewall (Wigtownshire), Hyskeir, Tentsmuir (N. Fife), and the Isle of May. Autumn passage was recorded from 12th September to 5th October from Hyskeir, the Isle of May, and Balcomie, E. Fife.

WHINCHAT, *Saxicola rubetra rubetra*.—First noted at Blackford Hill (Mid-Lothian), Fairlie (Ayr) and Bardowie on 27th April, Kilmacollm, Loch Goil, and Glen Ling (Wigtownshire) on 29th April. After this the spread was rapid, till by mid May our breeding birds seem to have been in. Passage migrants were reported at Fair Isle on 8th and 12th May, and Whinchats on the Isle of May from 15th to 25th May were doubtless also on passage. By 20th July autumn movement was showing itself, and departures took place in August and beginning of September. Last seen, Ochterhouse on 10th September and Isle of May on 16th September. Passage migrants were on Fair Isle on 9th September, 4th and 7th October, and a belated straggler was seen near St Andrews on 11th November.

STONECHAT, *Saxicola torquata hibernans*.—A male was recorded from Vallay (O.H.) on 9th January, and a pair there on 28th February; three on Fair Isle on 14th March, and one on the Isle of May on 26th September.

REDSTART, *Phœnicurus phœnicurus phœnicurus*.—First reported from Contin (Ross) and Dunkeld on 26th April and Ailsa Craig on 30th. Much arrival took place in May up to the 18th; passage migrants visited Fair Isle on 7th, 8th, and 20th May, and a female was on the Isle of May on 20th and 22nd May. Passing south at Largo by 17th July, much movement took place in August. Last seen, Sidlaws on 2nd September, Ailsa lantern 7th, and Isle of May 26th September, and a passage migrant at Fair Isle on 6th October.

BLACK REDSTART, *Phœnicurus ochrurus gibraltariensis*.—See p. 75.

CONTINENTAL REDBREAST, *Erithacus rubecula rubecula*.—Northward movements of the typical form were recorded from Fair Isle between 26th April and 8th May, while return migration was noted at the same station from 4th to 20th October and at Dundee on 19th October; Redbreasts on Ailsa Craig on 12th and 24th October may have been of this subspecies.

HEDGE-SPARROW, *Prunella modularis*.—One was recorded on Lismore on 1st April, a few (doubtless *P. m. modularis*) on Fair Isle on 27th and 28th April, and one on the Isle of May on 30th May. Some Hedge-Sparrows (subsp.?) were reported on Ailsa Craig on 19th September, 12th and 24th October; immigrants on Fair Isle on 6th and 7th October, and Hyskeir on 9th and 12th October.

WREN, *Troglodytes troglodytes troglodytes*.—One or two were reported from Hyskeir from 27th to 30th April and 6th to 11th May; many on Ailsa Craig on 12th October and some there on 24th October.

SWALLOW, *Hirundo rustica rustica*.—First seen at Bardowie on 13th April, Duddingston on 17th, Jedburgh and Kilmacolm on 18th April; thereafter a big arrival to the end of the month. Smaller arrivals were noted from mainland stations up to 23rd May, passing the Isle of May up to 30th May and Fair Isle to 2nd June, one at Hyskeir on 20th June and one at Vallay (O.H.) on 24th June. From 26th August throughout September steady departure was noted. Last seen, Selkirk on 5th October, Buddon on 6th, Fair Isle and Elie (Fife) on 7th, Possil on 9th, Largo on 13th October, and Moncrieffe (Perthshire) on 1st November.

HOUSE-MARTIN, *Delichon urbica urbica*.—First noted at Duddingston on 17th April, St Boswells on 20th, Melrose on 22nd, Dairsie (Fife) on 23rd, and Dunkeld on 24th April. After this there were many records of arrival up to 17th May, by which time our breeding birds seem to have been well established. On passage at Fair Isle from 16th May to 9th June, and passing at the Isle of May up to 30th May. Most of the House-Martins had left Largo by 29th August, and throughout September many departures were noted. Last seen at Inveroran, Argyllshire, on 30th September, Balcaskie, E. Fife, on 10th October, St Andrews on 29th October, and Portobello on 9th November (1. 1924, 172).

SAND-MARTIN, *Riparia riparia riparia*.—An early arrival was reported from Colinsburgh, E. Fife, on 5th April: the next were from E. Lothian on 18th April and Hareshawmuir on 20th April. Thereafter much arrival was recorded up to 4th May. Sand-Martins were passing Fair Isle on 20th and 22nd May and the Isle of May on 21st, 22nd, and 28th May. Departures were reported during August. Last seen, near Westferry, Forfarshire, on 4th September, Coshieville, Perth, on 6th, and Isle of May on 17th September.

SWIFT, *Apus apus apus*.—Swifts were noted at Capenoch (Dumfriesshire) and Duddingston on 26th April, Selkirk on 27th,

and Lundin Links on 30th April. Many notes of arrival refer to the first half of May, but some breeding sites were not occupied till the end of the month, and at Aviemore the full numbers were not in till 20th June (r. 1924, 126). On 22nd June eleven Swifts were seen travelling N.N.W., 3000 feet above sea-level, on the Cairngorms (r. 1924, 126). Departure was reported by 26th July and continued throughout August. Last seen, Largo and Westferry on 29th August, St Andrews on 31st August, Foula on 1st September, and Fair Isle on 3rd September.

NIGHTJAR, *Caprimulgus europæus europæus*.—Recorded from Corsemalzie on 12th May, one at Leith flew off the rigging of a ship on to the West Pier on 15th May, and one at Kilchattan Bay, Bute, on 19th May. Last seen, Corsemalzie on 24th September.

KINGFISHER, *Alcedo atthis ispida*.—This species was reported from the R. Gryffe, Renfrewshire, on 17th April, Howden Burn, Selkirk, on 9th May, on Earn, near Moncrieffe, on 15th September, and at Gilston Pond, E. Fife, on 25th and 26th September.

WRYNECK, *Jynx torquilla torquilla*.—One on Fair Isle on 8th May.

CUCKOO, *Cuculus canorus canorus*.—First noted at Corsemalzie and Melrose on 18th April, Nevay, Forfarshire, on 22nd, Strathpeffer and Halmyre, Peeblesshire, on 23rd April. After this arrivals were noted up to 18th May. Last heard calling at Corsemalzie on 18th June. A Cuckoo was on Fair Isle on 24th June and two adults in Glen Clova on 19th July. Young birds were recorded as moving in August; last seen, Hareshawmuir on 20th August; a young one was killed at Barnsness lantern on 5th September, and one at the Bell Rock lantern about 20th September.

LITTLE OWL, *Athene noctua vidalii*.—See p. 75.

LONG-EARED OWL, *Asio otus otus*.—One was on Fair Isle on 19th May.

SHORT-EARED OWL, *Asio flammeus flammeus*.—One going north at Vallay (O.H.) on 3rd April.

WHITE-BREASTED BARN OWL, *Tyto alba alba*.—See p. 75.

MERLIN, *Falco columbarius asalon*.—Single birds were reported at Hyskeir on 11th February and 17th April; Fair Isle on 26th April, 9th and 12th September, and 1st December; Isle of May on 24th September, and Hyskeir again on 13th October.

KESTREL, *Falco tinnunculus tinnunculus*.—One or two Kestrels were noted at Ailsa Craig on 23rd July, Isle of May on 18th, 21st, and 24th September, Vallay (O.H.) on 20th September, and Fair Isle on 6th and 7th October.

ROUGH-LEGGED BUZZARD, *Buteo lagopus lagopus*.—Single birds were reported in Roxburghshire in January, and at Vallay (O.H.) on 7th May and 6th July.

COMMON BUZZARD, *Buteo buteo buteo*.—One was seen at Hyskeir on 1st May.

OSPREY, *Pandion haliaetus haliaetus*.—See p. 75.

HERON, *Ardea cinerea cinerea*.—Seven were seen at Vallay (O.H.) on 6th April, one at Fair Isle next day, and one at Hyskeir on 10th May. Single birds visited Ailsa Craig on 17th July and 1st September, Hyskeir on 31st July, and one or two Herons were recorded frequently from Fair Isle from 29th July to 29th November.

BITTERN, *Botaurus stellaris stellaris*.—See p. 75.

WHOOPEE SWAN, *Cygnus cygnus*.—Recorded frequently in January and February; last seen, Possil Marsh, on 28th February and Vallay on 31st March. Returns were noted from Lochwinnoch on 3rd November, and from Fair Isle two days later.

BEWICK'S SWAN, *Cygnus bewickii bewickii*.—Three were seen at Corsemalzie on 11th February, eight on R. Dee near Livingstone on 25th December, while seventy-six were on a sea-loch in Mull in December.

GREY LAG-GOOSE, *Anser anser*.—Northward migration was recorded during April; last seen, Hareshawmuir, on 4th May. On 14th July a flock of thirty Grey Lags flew low to the S.E. at Stairhaven, Old Luce, and on 28th September twelve were at the Fair Isle lantern (S. Lighthouse), two being caught.

WHITE-FRONTED GOOSE, *Anser albifrons*.—Flocks were noted at Vallay (O.H.) on 2nd January and 13th February, and six flying low to the east at Corsemalzie on 16th January. Seen again at Vallay on 26th and 30th October.

BEAN-GOOSE, *Anser fabalis fabalis*.—A flock of forty were at Kilconquhar (Fife) on 10th January (1. 1924, 35), and on 17th January, 12th February, 19th, 20th, and 21st March, and 4th April flocks believed to be of this species were seen at Vallay. On 10th December two were recorded from Corsemalzie.

PINK-FOOTED GOOSE, *Anser brachyrhynchus*.—Large arrivals took place at Pitgavenny, Elgin, in mid-February, and exceptional numbers were still there on 11th May. Last seen, Kirkcaldy on 2nd April, and Kingoodie on 27th April. First noted in autumn at Moncrieffe on 20th September and Kingoodie on 29th September, while a flock of about 1400 was seen at Tentsmuir Point on 14th October.

SNOW-GOOSE, *Anser hyperboreus subsp.?*—See p. 76.

BARNACLE-GOOSE, *Branta leucopsis*.—Northward movement was reported from Vallay in April, and a Barnacle-Goose was seen there as late as 7th June. Returns were noted from the same station on 29th September and in October.

SHELD-DUCK, *Tadorna tadorna*.—The numbers increased at Kingoodie by the end of March, and by 18th April this species had returned to an inland nesting place in Forfarshire. Single birds were recorded from Ailsa Craig on 26th July and the Isle of May on 24th September.

RUDDY SHELD-DUCK, *Casarca ferruginea*.—See p. 76.

MALLARD, *Anas platyrhynchos platyrhynchos*.—During hard frost in March unusual numbers were on Tweed at Melrose. The break-up of the big wintering flocks in the sea and estuaries went on during March, till by mid-April all had left salt water. By 15th June fifty were on the mudflats at Invergowrie, and a few Mallard were noted now and again at Fair Isle from 29th August onward.

GADWALL, *Anas strepera*.—Three were on the White Loch, Ravenstone, on 2nd December.

TEAL, *Anas crecca crecca*.—Big flocks were noted at Loch Gower, Corsemalzie, on 11th February, and Kilmacolm on 2nd March. A pair were seen at Vallay on 4th April, a male at Hyskeir on 7th July, small numbers at Fair Isle and Isle of May occasionally from 9th September to 10th November, a flock of 100 at White Loch, Ravenstone, on 2nd December, and one on Hyskeir on 17th December.

WIGEON, *Anas penelope*.—Much movement was reported during March and April, five Wigeon off Kingoodie on 1st May, and a drake in the sea off Corsewall on 9th May. Arrivals were noted in September and October, and a few Wigeon about Fair Isle to 5th December.

PINTAIL, *Anas acuta acuta*.—Four were seen at Loch Chesney, Wigtownshire, on 11th February, a few frequented Invergowrie Bay from 24th February to 27th April, and a pair were at Vallay (O.H.) on 2nd May. On 6th December a Pintail was seen on Duns Castle Loch.

SHOVELLER, *Spatula clypeata*.—Two were on Loch Chesney on 11th February, several pairs on R. Dee, Kirkcudbrightshire, on 23rd April, and Lochindores on 16th May. Recorded from Duddingston on 3rd and 10th August, Lochindores on 26th October, White Loch, Ravenstone, on 2nd December, Loch Chesney on 10th, and Bardowie Loch on 11th December.

RED-CRESTED POCHARD, *Netta rufina*.—See p. 76.

POCHARD, *Nyroca ferina ferina*.—Unusual numbers were on Tweed at Melrose during hard frost in March, one at Dundee on 9th March, and one at Kilmacolm on 21st April. Small numbers were reported from Forfarshire lochs from 25th July to 13th September, a pair at Bowhill (Selkirk), on 16th November, and a flock of thirty on Loch Chesney on 10th December.

TUFTED DUCK, *Nyroca fuligula*.—A flock of forty were on Loch Elrig, Wigtownshire, on 24th January, and unusual numbers on Tweed at Melrose in hard frost in March. Most left the Forfarshire lochs during the first half of September, and from 25th December onwards one or two were at the Gilston Pond, E. Fife.

SCAUP, *Nyroca marila marila*.—Last seen, Tayport Bay on 12th April, and the first returned there on 27th August.

GOLDENEYE, *Bucephala clangula clangula*.—Recorded pretty generally up to the end of March. Last seen, Tay Estuary on 13th April and R. Dee, Kirkcudbright, on 23rd April. Two were seen on Thrieply on 24th July and a few on R. Eden, Fife, on 22nd August: after 4th October there were a good many notes of arrivals up to 25th November.

LONG-TAILED DUCK, *Clangula hyemalis*.—Last seen off Buddon, Forfarshire, on 3rd May. First recorded in autumn off Balcomie, E. Fife, on 4th October, and Fair Isle next day.

BLACK SCOTER, *Oidemia nigra nigra*.—Last seen, Monifieth on 21st April, 500 off Tentsmuir on 17th May, and one off the Isle of May on 30th May. Two large flocks were seen off Balcomie, E. Fife, on 29th July, and from 9th August onwards there were about 1500 off Tentsmuir.

VELVET SCOTER, *Oidemia fusca fusca*.—Arrivals in autumn were noted at Tentsmuir Point on 27th September and Lunan Bay next day.

GOOSANDER, *Mergus merganser merganser*.—Recorded from several parts in winter: two at Moncrieffe, Perthshire, on 19th March, the R. Dee, Kirkcudbright, on 21st April, and Kinclaven, Forfarshire, on 29th April. Three were on Lintrathen, Forfarshire, on 13th September, some on the Tay Estuary from 5th October to 8th November, and a party on Balgray, Clyde, on 13th December.

RED-BREASTED MERGANSER, *Mergus serrator*.—A good deal of movement was reported during April, two at Hyskeir on 5th May, and one in New England Bay (Stoneykirk) on 12th May. Twenty were seen off Tentsmuir Point on 17th May, and one there on 28th June. By 9th August a return was noted at Tayport Bay and a good deal of movement from various stations in September.

SMEW, *Mergus albellus*.—See p. 76.

GANNET, *Sula bassana*.—Many Gannets remained at the Bass Rock all winter, and from 8th January onward further arrivals took place. One was at Ailsa Craig on 22nd January and they were numerous there by 2nd March.

STORM PETREL, *Hydrobates pelagicus*.—One was at the Ailsa lantern about 26th August.

FORK-TAILED PETREL, *Oceanodroma leucorhoa leucorhoa*.—On 12th September one was seen off Ardnamurchan and three at Vallay (O.H.) on 31st October.

MANX SHEARWATER, *Puffinus puffinus puffinus*.—A bunch of fifty to sixty were seen near Hyskeir on 17th April and a few came to the lantern there on 24th and 30th April. One was off Fidra on 15th May and one or two off the Isle of May from 26th to 29th May. One or two were again noted at the Hyskeir lantern on 20th September and 1st October.

GREAT CRESTED GREBE, *Podiceps cristatus cristatus*.—Returns to breeding lochs were noted from 18th March to 19th April, while by 18th August this species had returned to the sea at St Andrews, and by 15th September at Buddon Ness. Adults left Thrieply, Forfarshire, on 26th October, but a young bird was seen there as late as 6th December.

SLAVONIAN GREBE, *Podiceps auritus*.—Single birds were noted at Tayport on 16th March, Loch Spynie on 29th April, Largo Bay on 24th July, and in Luce Bay on 28th October.

RED-NECKED GREBE, *Podiceps griseigena griseigena*.—See p. 76.

LITTLE GREBE, *Podiceps ruficollis ruficollis*.—Returned to Lochindores on 30th March and on Possil 12th April: one on Fair Isle on 8th October.

GREAT NORTHERN DIVER, *Colymbus immer*.—Last seen off Luce Sands on 8th April, Buddon Ness on 14th April, and Balcomie on 3rd May. Three were at Fair Isle on 18th October.

BLACK-THROATED DIVER, *Colymbus arcticus arcticus*.—Last seen, Balcomie on 7th April and Buddon Ness on 14th April. One was at Balcomie on 29th July and one at Lunan Bay on 23rd August.

RED-THROATED DIVER, *Colymbus stellatus*.—Returns to breeding lochs were reported in the second half of April; last seen off Buddon on 3rd May. Returns to the sea-coast were noted from 6th September onwards.

WOOD-PIGEON, *Columba palumbus palumbus*.—Great numbers were recorded from Glenorchard on 6th January and 24th February, E. Fife from end of January to 10th February, and again at both these places from 23rd March to 2nd April. One or two Wood-Pigeons visited Ailsa Craig on 13th March, Fair Isle on 27th April and 17th June, and Isle of May from 17th to 24th May. On 2nd July a flock of about 200 was seen near Largo.

TURTLE-DOVE, *Streptopelia turtur turtur*.—On the Isle of May a Turtle-Dove was recorded on 28th and 29th May and two on 30th May. One was seen several times in Mull in early June, and a female was shot on 13th June at Whitecroft, Ruthwell, Dumfriesshire. One was on Fair Isle on 6th September and two on 8th and 9th September, while on 1st October two visited Vallay (O.H.).

OYSTERCATCHER, *Hematopus ostralegus ostralegus*.—Three were seen at Moncrieffe, Perthshire, on 2nd March, and returns to inland breeding places are noted to 18th April, and on 24th April two were at the Hyskeir lantern. Flocks, sometimes of considerable size, were reported from various localities on our coasts in May. Returns to the shore were noted from 18th July to end of August.

DOTTEREL, *Charadrius morinellus*.—One was seen going east at Remoney, Perthshire, on 24th August.

RINGED PLOVER, *Charadrius hiaticula hiaticula*.—Arrivals at breeding sites were reported in the latter half of March, while as late as 3rd May a flock of twenty was seen in Monifieth Bay. On

30th July at 2 A.M. a young bird was killed at the Hyskeir lantern, and by August flocking was general on our shores.

GOLDEN PLOVER, *Charadrius apricarius*.—By 20th February Golden Plover had begun to arrive on Quhillart Moor, Corsemalzie, but were all driven away again by snow in early March. Returns to breeding places in Scotland were reported after this to 5th April, these movements being evidently those of the Southern Golden Plover (*Ch. a. apricarius*). What look like large northward movements of the Northern Golden Plover (*Ch. a. altifrons*) were noted from Hyskeir and Fair Isle from 19th April to 11th May. From 15th August onwards to 20th October constant small movements took place at Fair Isle, and in a much lesser degree at Hyskeir and the Isle of May. By 7th October very large flocks had appeared in East Fife.

GREY PLOVER, *Squatarola squatarola squatarola*.—Seven were seen on 27th September, and one on 11th October at Tentsmuir Point, N. Fife.

LAPWING, *Vanellus vanellus*.—Weather movements were noted in January, and the snow at the beginning of March drove away Lapwings which had reached their inland nesting places. From 8th March to the end of the month returns to breeding places were noted; small numbers visited Hyskeir and Fair Isle from 11th to 23rd April, and the Isle of May from 19th to 30th May. Flocking after nesting was in progress by 2nd June. One or two were on Ailsa Craig on 2nd July, Hyskeir on 9th and 19th July, and departures from the higher grounds inland were reported in August. Small numbers were on Fair Isle on 4th, 6th, and 18th October and 4th December, and Hyskeir on 28th October, 3rd and 4th December, and a weather movement was noted at the Tay Estuary from 30th November to 4th December.

TURNSTONE, *Arenaria interpres interpres*.—Last seen, Isle of May on 21st May, Bunchrew, Inverness-shire, on 23rd May, and Hyskeir on 21st June. Arrivals were reported from Hyskeir on 16th July, Largo Bay on 24th July, and from a good many other localities in August.

RUFF, *Philomachus pugnax*.—This species was recorded as follows: A female a few days before 30th August near Kirkwall (2. xviii. 174), about a dozen at Fair Isle on 1st September, four there on 6th, one at Glenorchard on 9th, and one at Paible (N. Uist) on 23rd September.

SANDERLING, *Crocethia alba*.—Seen on Tayport shore (N. Fife) and near Broughty Ferry on 11th January. A decided northward

passage was reported from 12th April to 24th May, and one was at Tentsmuir Point on 28th June. Southward movement took place from 1st August to 6th September, and one was seen at Monifieth on 1st November.

KNOT, *Calidris canutus canutus*.—Arrivals were reported from Tayport Bay on 1st August and East Lothian next day, and a good deal of movement took place up to 24th October.

CURLEW-SANDPIPER, *Calidris testacea*.—Single birds at mouth of R. Eden, N. Fife, on 18th August, and of R. Bladenoch, Wigtownshire, on 18th October.

LITTLE STINT, *Calidris minuta*.—See p. 76.

PURPLE SANDPIPER, *Calidris maritima maritima*.—At the Hyskeir lantern on 27th January and 11th April; last seen, Corsewall on 9th May and Isle of May on 17th May. First noted at Hyskeir on 25th July, and on 27th September seven were seen going N.E. in fog in the middle of the Firth of Forth opposite North Berwick.

COMMON SANDPIPER, *Tringa hypoleucos*.—First reported from Selkirk and Thrieply, Forfarshire, on 17th April, Blanefield, Kilmacolm, Melrose, and Peebles next day. After this there were many notes of arrival up to 11th May, Fair Isle on 20th May, and Vallay (O.H.) on 3rd June. Autumn movement was in progress by 29th July and continued during August. Last seen, Johnstone on 2nd September and the Isle of May on 19th September.

REDSHANK, *Tringa totanus totanus*.—Returns to breeding grounds were noted from 9th March onwards, though the birds were driven away again from Corsemalzie by snow on 13th April. Many Redshanks were at the Hyskeir lantern on 24th April, but these may have been the Icelandic *T. t. robusta*. In July and August returns to the shore from inland breeding places was recorded.

GREENSHANK, *Tringa nebularia*.—One was noted at Hyskeir on 4th April and one in Mull the last week of April. Autumn movement was recorded from Hyskeir from 26th July to 12th September, from the Mortons, N. Fife, on 1st and 8th August, Corsemalzie on 19th, Tynninghame on 20th August, Aberlady on 2nd September, Largo Bay on 6th and Buddon Ness on 15th September, and Vallay (O.H.) on 25th October.

RED-NECKED PHALAROPE, *Phalaropus lobatus*.—Recorded from one of its breeding places on 1st June. On 3rd September one was found dead at Langass (O.H.).

BAR-TAILED GODWIT, *Limosa lapponica lapponica*.—Last reported at Vallay on 30th May and Tentsmuir Point on 21st June. Returns were noted at Vallay on 6th July and Tentsmuir Point on 1st August, and further arrivals occurred up to 11th October.

BLACK-TAILED GODWIT, *Limosa limosa limosa*.—See p. 76.

CURLEW, *Numenius arquata arquata*.—Returns to breeding sites were noted in February, but the snow on 1st March drove some, at least, away again. Further arrivals at nesting places took place up to 5th April. Passing over Largo at night on 25th April, several were at the Ailsa lantern on 2/3rd May, and a flock of fifty-five on Kingoodie flats on 11th May. In the latter half of July and August returns to the shore were recorded, and arrivals (possibly from overseas) continued at Kingoodie up to 17th October.

WHIMBREL, *Numenius phaeopus phaeopus*.—Passage of Whimbrel was recorded steadily from both east and west coasts from 1st to 19th May, and again from 20th July to 13th October.

SNIFE, *Capella gallinago gallinago*.—Many Snipe were seen near Loch Elrig on 24th January; returned to breed at Lochindores on 16th March; a few at Fair Isle on 1st and 17th April, one or two at Hyskeir on 24th April (L) 9th, 11th, and 13th May. Seen off and on at Hyskeir and Fair Isle from 19th September to 29th October, 7th and 10th November, 30th November to 4th December and 27th December.

JACK SNIFE, *Lymnocyptes minimus*.—A few were at Fair Isle on 1st April, single birds at Castle Loch, Mochrum, on 2nd April, Vallay on 4th, and Hyskeir on 30th April. In autumn returns were reported from Fair Isle on 8th September, the Hirsell, Berwickshire, on 16th, Glenorchard, Isle of May, and Fair Isle on 26th, and Possil on 28th September, and further arrivals in October. Eighteen were on Hyskeir on 28th November and a few on Fair Isle on 27th December.

WOODCOCK, *Scolopax rusticola rusticola*.—A few Woodcock were on Fair Isle on 3rd and 15th April, and on 27th April one was killed by striking a telegraph wire in South Street, St Andrews, about 4 P.M. A Woodcock was on Fair Isle on 17th June, and a few visited this station off and on from 4th September to the end of the year, while three were seen at Vallay on 19th November.

SANDWICH TERN, *Sterna sandvicensis sandvicensis*.—First recorded off Buddon Ness and at Monifieth on 14th April and Largo Bay on 26th April. Last seen, Balcomie, E. Fife, on 4th October and Tentsmuir Point on 11th October.

ROSEATE TERN, *Sterna dougallii dougallii*.—See p. 76.

COMMON TERN, *Sterna hirundo hirundo*.—First seen off Dundee on 27th April, Balcomie and Loch Naw, Leswalt, on 3rd May. Many left towards the end of August. Last seen, Isle of May on 24th September and Lunan Bay on 28th September.

ARCTIC TERN, *Sterna macrura*.—Arrived at Vallay on 14th May and Tentsmuir on 17th May.

LITTLE TERN, *Sterna albifrons albifrons*.—Several were off Buddon on 3rd May and a pair at Vallay on 18th May. Last seen between Arbroath and Elliot on 20th October (i. 1925, 22).

LITTLE GULL, *Larus minutus*.—See p. 76.

COMMON GULL, *Larus canus canus*.—A big passage to E.N.E. took place at Largo on 9th May. From 8th to 18th August much movement of adults through Fife was recorded, and on 1st October many (both adult and young) were on the move there.

HERRING GULL, *Larus argentatus argentatus*.—Hundreds arrived on the Isle of May on the evening of 24th September but had left by next morning.

SCANDINAVIAN LESSER BLACK-BACKED GULL, *Larus fuscus fuscus*.—One was noted at the Isle of May on 25th May and two on 29th May, one at Lunan Bay on 23rd August, two at Tentsmuir Point on 30th August, and one on the Isle of May on 25th September.

BRITISH LESSER BLACK-BACKED GULL, *Larus fuscus affinis*.—One was on Kilconquhar Loch on 9th February, and arrivals were noted at Glasgow Harbour on 9th March, Waulkmill Glen Reservoir (Clyde) on 15th March, and at other stations up to 18th April. On 14th August one had returned to Balcomie (E. Fife).

GREAT BLACK-BACKED GULL, *Larus marinus*.—A big influx of adults took place on the Isle of May on 18th September.

GLAUCOUS GULL, *Larus hyperboreus*.—Recorded from Fair Isle in January and one found dead between Longniddry and Aberlady on 9th January (i. 1924, 36). Noted again on Fair Isle on November, many being there on the 10th.

ICELAND GULL, *Larus glaucoides*.—One was on Fair Isle on 23rd January and two there on 27th January, while one was seen near Duddingston on 16th September (I. 1924, 164).

GREAT SKUA, *Stercorarius skua skua*.—First seen Foula 17th April, one at Vallay (O.H.) on 10th July, and one at the Isle of May on 22nd September.

ARCTIC SKUA, *Stercorarius parasiticus*.—One at Hyskeir on 10th May. Some were still at Foula on 6th September, but from 29th July to 28th September Arctic Skuas were noted at many stations on the east coast.

LITTLE AUK, *Alle alle*.—Single birds are recorded near Kirkcaldy early in January and in the R. Eden, Fife, on 6th December.

GREAT BUSTARD, *Otis tarda tarda*.—See p. 76.

CORNCRAKE, *Crex crex*.—First reported at Hareshawmuir (Ayrshire) on 22nd April, Fair Isle on 26th and Summerston on 27th April. After this arrivals were noted up to 18th May. Late autumn records come from Derrie, Mochrum, on 2nd October, Cutcloy, Whithorn, on 23rd October, and near Kirkcaldy in the first week of November.

WATER RAIL, *Rallus aquaticus aquaticus*.—Single birds were recorded at Low Malzie, Wigtownshire, on 29th January, near Largo on 2nd and 9th March, Pot Loch, Selkirk, on 23rd August, and Hyskeir from 10th November to 20th December.

MOORHEN, *Gallinula chloropus chloropus*.—Twelve were back at Possil by 30th March, and one on Fair Isle on 5th May.

COOT, *Fulica atra atra*.—Six or eight were back at Possil on 10th February, and over twenty there by 30th March, while most had arrived on the Forfarshire lochs by the end of February.

CAPERCAILLIE, *Tetrao urogallus urogallus*.—A female was at Teasses in the beginning of the year, and one at Gilston (both S. Fife) on 2nd February.

PARTRIDGE, *Perdix perdix perdix*.—A male was killed on a wire fence right out on Darsnag Flow, Wigtownshire. Mr Gordon writes that he never before saw a Partridge within miles of the spot.

QUAIL, *Coturnix coturnix coturnix*.—A Quail was reported from Bordlands, Peeblesshire, on 31st October.

Amphipod Crustaceans attacking Cod Ovary. — Some small Amphipods were recently handed to me by Professor J. Arthur Thomson for identification; they had been taken from the interior of a cod ovary bought in a fishmonger's shop and sent to us dried. The roe was described as looking perfectly normal, with no external signs of the presence of the Amphipods, and with no injuries or perforations of the walls. It would seem, therefore, that the crustaceans had passed up the oviduct of the fish, and it is probable that this occurred after the fish's death, while it was still on the line. The individuals in this collection, with one exception, conform to the description of *Hoplonyx leucophthalmus* (Sars), and although Sars does not record it from such a remarkable source as this, he mentions that he obtained his examples by lowering pieces of fish into deep water; on drawing these up, the crustaceans were found attached. In our sample there were 130 individuals, males and females, showing all possible variations in size between the extremes of 0.4 cm. and 1 cm. length. (As they all had the abdomen more or less flexed, and were too brittle to extend, this is not the actual full length measurement, but as taken with a pair of callipers.)

The most striking feature of this species of *Hoplonyx* is the complete absence of colour. The carapace is white and very glossy, and even on the cephalon there is no trace of pigment to mark the position of eyes. However, by means of stained preparations, structures were seen on the head resembling corneal facets. The distribution of these varied. In some cases they formed a compact comma-shaped area at the side of the head; in other cases they were arranged in scattered patches each with 8 to 9 hexagonal facets; and in still others, larger circular isolated facets were seen. The two sides of the head did not always agree in this feature.

The one individual which differed from the rest, was conspicuous by reason of its brownish-grey colour. It was small, length 0.4 cm., and there were no traces of eyes on the unstained head. It seemed to belong to the genus *Lepidepecreum*, and came nearest to the species *carinatum*, differing from it in the lesser development of the carina, which was confined to the three metasomal somites, but anterior to this, in the mesosomal region, the carapace was so highly vaulted as to be almost keeled.

The occurrence of *Hoplonyx leucophthalmus* seems worth recording, especially as a similar case was noted here two or three years ago. The species is apparently a light-avoider and a scavenger. Dr Bowman suggests that the cod attacked had been left long on the line, probably in stormy weather. The ova were

obviously being devoured, as clumps of them were in the grip of the very powerful mouth appendages. Dr Williamson tells me that in the case of most ovaries which he has seen infested in this way with small crustacea, it is an Isopod that is concerned—*Cirolana*.—GWEN. H. FAULKNER, Department of Natural History, University of Aberdeen.

Habits of "Domesticated" Mandarin Duck.—With reference to Mr Berry's note on the presence of a Mandarin Duck at Newport (SCOT. NAT., 1925, p. 56), it would not surprise me to hear that a bird of this species bred at Woburn had been shot anywhere in the British Isles, as flights of twenty to a hundred have been seen in recent years in our neighbourhood. Nor is there anything unusual in finding the Duck in the situation described. The Mandarin Duck spends far more time on the bank than in the water. It habitually hops up on a bank if near it when disturbed. It frequently nests in trees and still more frequently sits in the branches.

It is very closely allied in all its habits to the Wood Duck (*Aex sponsa*), but whereas the Mandarin has remained and thriven with us as described above, the Wood Duck has almost entirely died out, though it bred and throve more freely than the Mandarin until we gave the latter its entire unpinioned freedom. My knowledge of the bird and its habits is entirely confined to birds in this country.—M. BEDFORD, Woburn.

Great Destruction of Marine Animals by Severe Weather.—I have sent to the Royal Scottish Museum some remnants of the amphipod crustacean *Corophium grossipes* (Linn.), the bodies of which were washed up in myriads along the Clyde shore above Langbank about the beginning of May 1924. Frost has been suggested as the cause of such great destruction, and the cold weather about that time makes that explanation quite likely. The animal matter occurred in such quantity as to be matted together to form sheets, or scum, along some parts of the water-line.—THOMAS MALLOCH, Johnstone.

[The material consisted of an intermixed mass of the bodies, limbs, and antennæ of this small crustacean, about half an inch long, matted into a mossy sheet by the action of the waves, and must in a small space have contained very many thousands of individuals. As well as *Corophium* it contained a few examples of other Amphipods. *Corophium* is a shallow-water species, and Quaterfages states that it approaches the shore in myriads from the open sea about the end of April.—Eds.]

(Authors are responsible for nomenclature used.)

The Scottish Naturalist

No. 155.]

1925 [SEPTEMBER-OCTOBER

HUMAN TRANSPORT AND WILD LIFE.

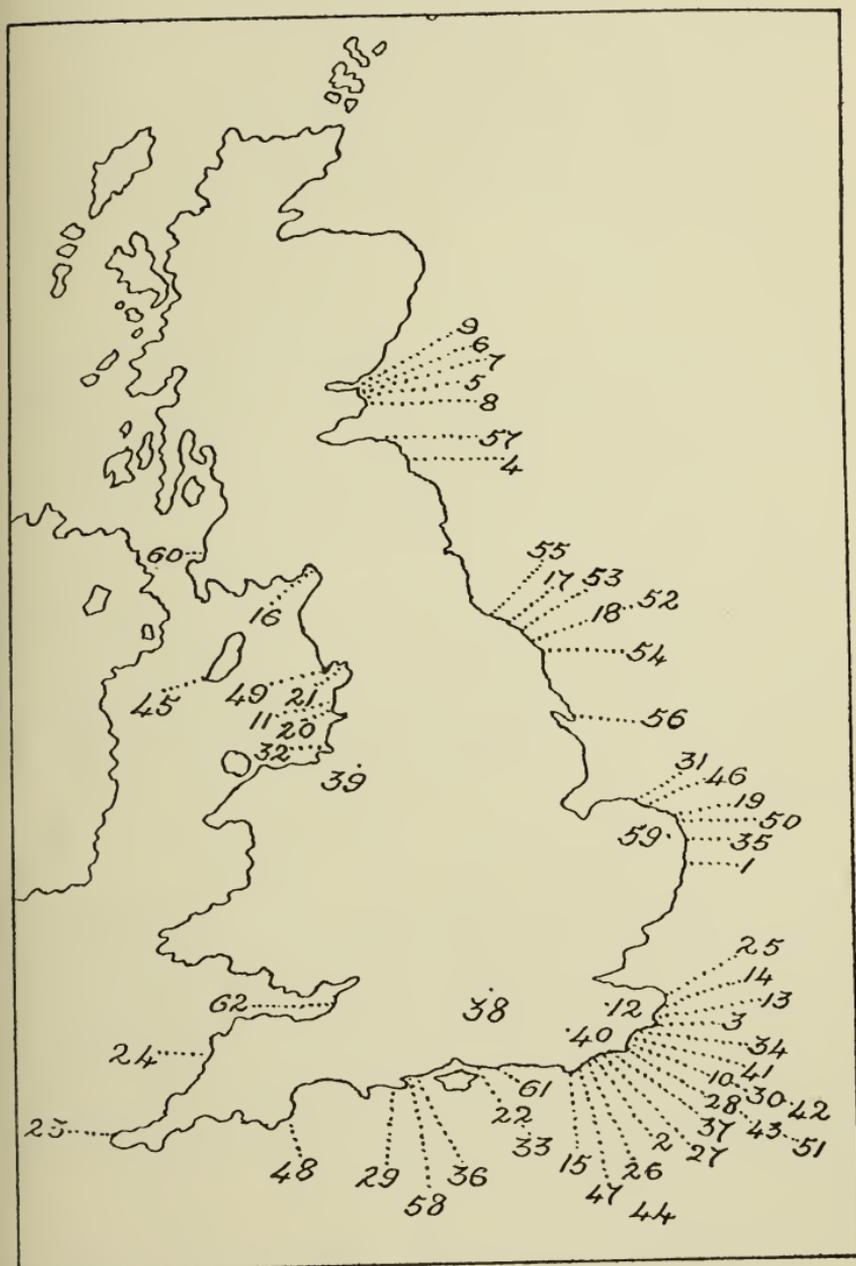
MORE and more the refinements of human progress impinge upon the liberties and the lives of wild creatures, a simple truth well illustrated by the results of recent developments in modes of human transport, by land and sea. Motor traffic on land is directly responsible for a larger number of deaths than might be supposed. Professor Stoner of Iowa University recently counted 225 dead bodies of vertebrates lying by the roadside, on a journey of 316 miles and back in the central United States, the list containing representatives of twenty-nine species of reptiles, birds, and mammals. Not only so, but the reforming of roadways for the new traffic has had a deleterious effect upon the life of streams and ponds owing to the highly noxious properties of waste petrol and heavy oil washed off the roads by rain.

Marine transport has proved equally baneful. In enclosed areas where sea-traffic is heavy, as in the Firth of Forth, the casting overboard of cinders has resulted in their accumulation on many parts of the shore, in black beds which have smothered the shore animals. The development of the use of oil fuel has had more far-reaching effects. In this and other journals there have been published many notes recording the death of hundreds of sea-birds whose

plumage has become fouled by the skin of oil which sometimes clothes the surface of inshore waters. These records have been gathered together by Mr Hugh S. Gladstone in a pamphlet, "The Oil Menace to Birds," published at the instance of the International Committee for Bird Protection. From it we are permitted to make use of the map showing the areas from which oiled birds have been recorded. It will be noticed that the damage done to birds, so far as it has been observed, is on the whole concentrated about the great centres of maritime industry. And this is not to be wondered at when it is recollected that less than six quarts of oil are sufficient to cover one square mile of water (Lord Rayleigh has calculated that half-a-million tons would cover the whole ocean), and that oil tankers which use their empty tanks for water ballast are frequently discharging large amounts of a mixture of oil and water into the sea.

So serious had the position become that the law took the matter in hand, and by the Oil in Navigable Waters Act of 1922, steamers were prohibited from discharging such mixtures within the three-mile limit around the coasts of Britain. The prohibition has had a good effect in this country, as well as in America, where also it was adopted in 1924; but is it enough? If allowance is made for the transporting power of an inflowing tide, which may carry the oil far within the three-mile limit, or for the influence of wind and currents, which are known to carry living and dead objects from the tropics and further, to our shores, it will be seen that abundant danger to wild life may still arise from the oil menace even in inshore or estuarine areas. A fresh contribution to the problem has been published, by H.M. Stationery Office, for the Board of Trade under the title of *Oil in Navigable Waters* (1925, price 6d.). The reports received by the Board from coast guards, harbour authorities, and other officials, confirm and extend the complaints regarding the destruction of wild life with which we have been familiar for several years.

How is the matter to be remedied? Prohibition within the three-mile limit has been helpful, but it is not enough.



Localities on coasts of Britain from which oiled birds have been recorded.
The numbers indicate the order of the records in time.

Yet beyond this narrow belt of territorial waters no nation can enforce its will. Clearly here is a case for international agreement, so that a much wider oil-free belt shall be respected around the coasts of every land, and that general use may be made, where oil discharge is likely to happen, of mechanical separators to sort the oil from the water, and thus ensure the return of the latter unpolluted to the ocean whence it came.

* * * *

A valuable account of the vertebrate fauna of Peeblesshire, by Mr W. T. Blackwood, forms part of a new and comprehensive History of Peeblesshire. For the first time the animal inhabitants of the county have been dealt with as a whole, and the account establishes the existence of 35 species of mammals, of which 23 still survive, and of 155 species of birds, of which 86 are known to have nested. The chapters, which include, besides mammals and birds, reptiles, amphibians, and fishes, in addition to being of great use for what they contain, should also be helpful in suggesting where further observation and record are desirable.

* * * *

The blank left by the demise of the *Irish Naturalist* has not remained long unfilled; for in September appeared the first number of *The Irish Naturalists' Journal*, published in Belfast. The frontispiece illustrates the old-fashioned shell necklaces of Bundoran, described by Mr R. J. Welch, who suggests that this curious industry may be a survival from prehistoric times. We wish the new magazine every success.

* * * *

An obvious error crept into a statement (p. 99) in our last editorial, which should read: "each individual of 44,597 bees carried a load averaging 25.3 mgrms., or almost nine-tenths of an ounce *per thousand bees*." The words in italics were unfortunately omitted,

THE WHALE REMAINS OF THE CARSE OF
STIRLING.

By DAVID B. MORRIS.

THE plain through which the River Forth follows its winding course is known as the "Carse of Stirling." The word "carse" is a very old one, of somewhat obscure derivation, and though now applied to a stretch of fertile land, seems to have indicated originally a wet or marshy place, a meaning quite appropriate to the early condition of the valley of the Forth. To-day the scene is a quiet and peaceful one, which presents landscape features not usually seen in combination. The flat plain and its sluggish winding river with the muddy banks and fringes of willows, the wide sky overhead, all suggest a scene in mid or eastern England. But the plain is bounded north, south, and west by precipitous mountain slopes, and away in the distance can be seen many of the giant peaks of the Grampians, upon which the snow lingers long into the summer.

The plain is an old ocean floor, a "raised beach," as the geologist would term it. The general level is about 50 feet above the Ordnance datum, but considerably less above high-water mark of the river, which is tidal through many miles of its windings as far west as the old salmon cruive, two miles beyond Stirling. Standing on the edge of the carse, no great effort is required to imagine the time when the blue waves of the ancient firth covered all the flat expanse below. At no point can you leave the level of the carse without climbing a decided and generally rather steep slope. The flat is the old ocean bed, while the rim is the ancient shore line. The old coast line can be distinctly traced throughout its entire length: at some points indeed, the sharp edges of the cliffs look as if the ocean had receded from them but a few hours before, and would return with the next tide.

The surface stratum of the carse consists of yellow brick clay, several feet thick; and, when it is pierced, unmistak-

able evidence of its marine origin is disclosed. Over wide areas there have been found continuous beds of shells, whelks, cockles, mussels and other species, and oysters in great abundance. No fewer than twenty instances of the discovery of the remains of whales have occurred, chiefly in the course of road-making operations. In most of these instances the skeletons of the whales were complete, the bones being well preserved in the clay; and the lengths varied from 40 to 85 feet. The following is the record of these whale remains so far as I have been able, after prolonged inquiry, to trace them. A fuller account is given in papers read to the Stirling Natural History and Archæological Society on 15th November 1892 and 22nd April 1924.

(1) *Airthrey Whale*, found in July 1819 on Airthrey estate, two miles east of Bridge of Allan, about $4\frac{1}{2}$ feet below the surface. The skeleton lay with the head east and the tail west, and was stated to be 72 feet in length. Beside it were two pieces of stag's horn, one perforated. Sir William Turner identified the specimen as *Balænoptera sibbaldi*.

(2) *Blair Drummond Whale*, found in October 1824 three-quarters of a mile from the Parish Church of Kincardine in Menteith, "on a stratum of moss 4 feet below the clay." The bones were imbedded in the clay and did not penetrate into the moss below. Alongside was a fragment of stag's horn with a round hole bored through it.

(3) *Woodlane Whale*, found at Woodlane on Blair Drummond estate.

(4) *Cornton Whale*, found in 1864 at Cornton brickwork, now the site of the Bridge of Allan gasworks, about 6 feet beneath the surface. Mr D. Milne Home found along with the remains a stick having the appearance of the handle of an ancient implement. Sir William Turner regarded this whale as a young *Balænoptera musculus*.

(5) *Cowpark Whale, No. I*, found in 1859 at Christie's brickwork, a short distance from Stirling quay, in the slech below the brick clay.

(6) *Cowpark Whale, No. II*, found in 1863 at the same brickwork, 10 to 12 feet below the surface, and believed to be 70 feet long.

(7) *Meiklewood Whale*, found in the summer of 1877 on the farm of Woodyett on Meiklewood estate, near Gargunnoch,

Beside it was found a perforated deer's horn implement, now in the Smith Institute, Stirling.

(8) *West Carse Whale*, found when the turnpike road from Stirling to Gargunnock was being formed about the beginning of the nineteenth century, at West Carse on Touch estate. The skeleton lay north-west and south-east, a few feet below the surface, and was stated to be 50 feet long.

(9) *Dunmore Whale, No. I*, found in 1817 when the road from Airth to Stirling was being formed. It was traced to the extent of 75 feet.

(10) *Dunmore Whale, No. II* and (11) *Dunmore Whale, No. III*. These skeletons, of which one was 85 feet long, were found in 1846 and 1857 to the north of Dunmore. They were each 3 or 4 feet below the surface and three-quarters of a mile from the sea.

(12) *Falkirk Whale*, found prior to 1842 at the Earl of Zetland's brickfield, 18 inches below the surface, about three miles from the sea.

(13) *Grangemouth Whale*, found at a date not ascertained, but prior to 1869, 9 feet below the surface.

(14) *Causewayhead Whale*, found in May and June 1897 and August 1906 at Causewayhead village near Stirling, from 5 to 10 feet below the surface. A fragment of a whale rib showed traces of human workmanship. There were also found a boring implement of red deer horn and two right horn cores of *Bos longifrons*.

(15) *Forthbank Whale*, found at a date not known but probably early, near Stirling, at Forthbank, the former name of which was "Whalefield."

(16) *Ballinton Whale*, found, prior to 1815, in casting peats at Ballinton, near Thornhill village.

(17) *Cambus Whale*, found, between 1819 and 1824, in a locality now forgotten, somewhere between Airthrey and Cambus.

(18) *Dunmore Whale, No. IV*, found in 1823 in deepening a drain at Dunmore Park in the stiff clay subsoil, about 2 feet from the surface.

(19) *Broomhall Whale*, found in February 1912, when digging a trench at Lord Elgin's garden at Broomhall.

(20) *Cardross Whale*, recorded by the Rev. William Macgregor Stirling in 1815, and stated to have been found at various times, dates mentioned being 1660 and 1723. Possibly there was more than one whale.

It is a most interesting fact that in several instances human implements were found beside the whale skeletons.

These were formed of deer's horn, artificially shaped, and in three cases bored to fit them for attachment to wooden handles. They were not of the nature of harpoons, and appear rather to have been tools for use in removing the flesh of the monsters of the deep, which the receding tide had stranded in the shallows of the ancient estuary. Several canoes have been found, in each case formed out of the hollowed trunk of a single oak tree, and along the old shore line where the Avon enters the carse is a line of "kitchen middens," the contents of which give interesting information as to the food of the people.

It seems clear that man was an inhabitant of our country when the ocean covered the whole of the carse of Stirling, and when Scotland would have been cut in half by the sea but for an isthmus eight miles wide between Gartmore and Loch Lomond, which was then a sea loch. The relics indicate that he was Neolithic man. By the time the Romans came, the relative levels of land and sea were much the same as at present, and the carse was covered by a dense forest. Somehow this forest came to an end, whether by human agency or by natural causes is not clear, perhaps by both. The fallen trees obstructed the natural drainage, and a vast swamp was created, in which in course of time a layer of peat was formed several feet thick. Much of this peat, covered with heather, still remains, and to-day glows with purple brilliance as the autumn sun streams athwart the carse. Over wide areas the peat has been removed, and the rich clay underneath exposed to the operations of agriculture. This was carried out on an extensive scale at Blair Drummond in the eighteenth and beginning of the nineteenth centuries. And now, where once the waves of the old ocean rolled, we see a rich and fertile country, dotted with farmhouses and covered with fields of waving grain.

THE PETCHORA PIPIT AT FAIR ISLE: AN ADDITION TO THE BRITISH AVIFAUNA.

By Surgeon Rear-Admiral J. H. STENHOUSE.

WHILE on a visit to Fair Isle this autumn, I obtained, on 24th September, an example of the Petchora Pipit (*Anthus gustavi* Swinhoe). It was flushed from the edge of a patch of turnips and settled on a stook of oats nearby, where it was shot. On the previous day it had been flushed from the same place and settled on the same stook, but flew off whilst being examined through binoculars. On neither occasion did I hear it make any sound, but one of the islanders, James Stout, who was with me on both days when the bird was flushed and who has a keen ear for notes, stated that he had watched it early on the morning of the 24th in another patch of oat stubble, and that when disturbed it flew off, uttering a treble note not unlike that of the Meadow Pipit but softer and lower.

Its measurements (in millimetres) in the flesh were:—

Wing	81	Bill from feathers	11
Tail	53	Bill from gape	17
Tarsus	23.5	Hind claw	11
Hind toe	10		

The legs and feet were pale pink, the "flesh-pink" of Ridgway's *Colour Standards*, Pl. XIII.; the bill dark horn above, below pale pink at the base with a dark tip; the iris very dark brown, and the inside of the mouth pale flesh. The stomach contained insect remains, chiefly those of a tiny black beetle.

This is the first recorded occurrence of this Pipit in the British Isles, and, as far as I can ascertain, in Europe outside of Russia. According to Dr Hartert (*Vögel der Paläarktischen Fauna*, p. 274), it is stated to have been once obtained in Galicia, but the record is not considered satisfactory.

The Petchora Pipit breeds in N.E. Russia (Petchora District), and widely across Northern Asia east to

Kamchatka. Its migration appears to be to the south-east, and it is found in winter on the China coasts as well as in the Philippines and the Malay Archipelago.

The specimen obtained is a male and probably a bird of the year, the throat being slightly spotted. The distinguishing characteristics of this species are all well marked: the buffish white stripes on each side of the back; the buffish white tips to the median and greater wing coverts; the streaked rump; the slightly curved hind claw which is just appreciably longer than the hind toe; the wing emarginate on the 2nd and 3rd visible primaries (in the left wing the 4th primary shows a faint trace of emargination—this is not present in the right wing); whilst the culmen is not quite straight, being slightly sunk in front of the line of the nostrils. In the field the bird has a much greyer look than the Tree Pipit, which it approaches closely in size.

Dr Eagle Clarke has examined the skin and has compared it with specimens in the Royal Scottish Museum, and entirely agrees with the identification.

The bird has been presented to the Royal Scottish Museum, and will be mounted and placed on exhibition there.

BIRD LIFE ON HANDA IN 1925.

By CHARLES G. CONNELL, B.L.

A VISIT to a sea-birds' haunt must always be invested with a certain charm and, when it is in one of the less accessible parts of Scotland, it has perhaps for that reason an added interest. While the small island of Handa, off the west coast of Sutherland, cannot be said to be as difficult of access as the islands of the Hebrides, it offers attractions well-known to ornithologists. The following notes were made on a visit to the island in June of this year.

The physical appearance of the island is striking. On the side nearest the mainland the seaboard consists of low rocks broken by short spits of the finest sand, and from this low-lying part the island rises gradually to the considerable cliffs on the western side, against which the Atlantic rollers break incessantly and on which myriads of sea fowl find a safe retreat in the nesting months. The island has several small fresh-water lochs. Fences have been erected on some parts of the cliff-top, but, even so, accidents to the grazing sheep stock are not infrequent.

The bird life of the island is confined to the types found on moorland and coast.

On the shingle on the south-east of the island were two pairs of Ringed Plovers. Oyster-catchers were not numerous, but the position of one nest with three eggs, on the smaller rocky isle lying between Handa and the mainland, may be worth noting. The eggs were laid on a narrow ledge of a rock, 20 to 30 feet high, sloping down to the water's edge and affording no foothold, apart from the ledge itself, which the bird could use in going to its eggs.

Meadow Pipits and Sky-larks constitute the largest part of the bird population of the grass land, although there were numbers of Wheatears and Rock Pipits, one or two Snipe, and probably other small birds which we did not observe.

On the rocky islet referred to above, there were several pairs of Arctic Terns, but, although they displayed some anxiety, no eggs could be found and apparently nesting had not at that date (8th June) commenced. Only one Eider Duck's nest was noted and from this the young had hatched. There were probably numbers of other Eiders' nests, as much of the ground is suitable and the species is not an uncommon one in the district.

The main bird population is ranged on the ledges and stacks of the western and northern coast line. Puffins and Razorbills are probably the first birds to come into view, as they appear to choose sites for their eggs considerably nearer the tops of the cliffs and in more accessible positions than the Kittiwakes and Common Guillemots which rival them in numbers.

This part of the coast presents a series of indentations, exposing a large cliff surface with whitened ledges and cracks on which serried ranks of birds remain patiently incubating their eggs. Their colonies are in constant motion. The air is filled with the continual murmur of chattering birds, and the space between cliffs and sea has the appearance of being spanned by innumerable and invisible passage ways, up and down which on whirring wings pass Puffins and Guillemots and Gulls. The sea itself is dotted with birds swimming leisurely or diving in active search of food for their young. Later in the season the scene must increase in animation, as comparatively few birds appeared to be burdened, at the time of our visit, with the cares of a family. The steady hum from the cliffs mingles with the sound of the breakers and is only broken by hurried squeals of anger from neighbours engaged in conflict on some dizzy height. These conflicts on the ledges do not appear to be matters of great seriousness, and the real trouble arises when the raiding Herring Gulls descend on an unguarded egg and carry it to the cliff top for consumption. The top of the cliffs is littered with shells of eggs which these and other marauders have secured from the weaker birds. One of the Guillemot shells found was of the rich brown spotted variety, which commands a considerable sum from collectors.

With the exception of the Gulls and to some extent the Shags, all the birds breeding on the cliffs allow a close



A corner of Handa, with colonies of Puffins and Razorbills.

approach, which argues either an intense stupidity or a remarkable bravery.

It is an interesting speculation, which was commented

on by Sir Herbert Maxwell in a recent issue, whether this attitude is due to confidence in man or fear that natural enemies may, if the eggs are left unguarded, swoop down and remove them. The latter argument is open to the objection that many of the birds which show great confidence are not sitting on eggs at all, or are one of a pair of birds, the presence of both of which could not be necessary to ensure the safety of the egg. It does not seem likely that numbers instil confidence, as many solitary birds display a similar attitude.

Ignorance of mankind cannot be said to explain such fearlessness. The ledges are plundered often enough, and men are not infrequently about the cliffs. We tried to dislodge a number of the birds from the ledges by hurling over the cliff large pieces of turf which had been cut from drains, and even this startling occurrence appeared to create in Puffins and Guillemots only the remotest interest. It may be suggested as a possible explanation that birds nesting on sea-cliffs have a particular kind of danger to combat, and that they will react only to occurrences which suggest such danger. Possibly the main dangers which these birds have to face are from storms at sea which buffet them on the waves, make their food supply seek the lower depths of the sea, or render their stances on the stacks precarious. Another danger is that from raiding falcons or gulls, and it may be that concentration of the attention on the visits of these birds to some extent accounts for the indifference of cliff birds to the presence of mankind.

The Fulmar Petrel is found in considerable numbers scattered here and there on the cliffs. Probably the first indication a visitor gets of the presence of the Fulmar is the sight of a grey "gull" with inordinately long wings swerving or banking along a cliff face lined with other birds. At rest, the appearance of the bird is not, apart from the petrel nostrils, distinctive, but on the wing its incomparable flight renders it easy to identify. On grey wings, which in some cases appear to have lighter transverse bars, the Fulmar moves with easy gliding movements from one part to another with apparently effortless grace, at one moment

slowly, at the next with suddenly acquired speed. Numbers of the Fulmars had eggs in slight hollows on the ledges of the cliffs, sometimes at no great distance from the top. The birds sat closely, and one which I tried to dislodge shuffled off its egg but remained on the ledge without taking to flight. Fulmars were seen to display affectionate nuzzlings, and I think that one of a pair brought food to its sitting mate. At times both birds were at the nest, but I did not observe whether both took part in the duties of incubation.

Herring Gulls nest in small numbers, but Common Gulls, though they were observed, appear to nest only on the rocks on the mainland. One of the fresh-water lochs of the island was continually used by flocks of Kittiwakes for bathing. On a small stack at one end of the island Great Black-backed Gulls were found to the number of ten to fifteen pairs. They rose in the air to the accompaniment of hoarse croaks and flew heavily round until I had moved from the neighbourhood of the stack. Only one bird, which was sitting among some thrift on the top of the stack and returned to the same position after being disturbed, appeared to be nesting. In the same neighbourhood, Shags were numerous and nests were seen with two and three eggs on ledges at varying heights above the sea.

Several Hooded Crows were noted, and off the east end of the island was a solitary Black Guillemot.

Field Vole at Great Altitude in Skye.—While on the summit of Bruach na Futha, one of the Coolins, at a height of 3137 feet above sea-level, we saw, early in September, a Short-tailed Field Mouse or Field Vole. It is difficult to know upon what they feed up there, for there is practically no vegetation—nothing but rocks and stones.—AUDREY GORDON, Aviemore.

[The Field Vole recorded from Skye belongs to the race *Microtus agrestis exsul*, found in the Outer and Inner Hebrides. The height limit at which this form can survive has not been ascertained but the highland form of the Scottish mainland is known to live about the old summit observatory on Ben Nevis—at an altitude of 4000 feet.—EDS.]

Rose-coloured Starling in the Outer Hebrides.—A fine adult male of this species was captured at St Kilda on 9th July 1925, and was kindly forwarded to me by my correspondent at this remote group. It is being mounted for the British collection in the Royal Scottish Museum. This gipsy migrant has not hitherto been known to have visited the Outer or Inner Hebridean Islands, and has rarely been detected in western Scotland, where it has occurred as far north as West Ross and once in the Isle of Skye.—WM. EAGLE CLARKE.

Snow Bunting nesting in Southern Inverness-shire.—Early in June a nest of this arctic and sub-arctic bird was found in a lone corrie in the mountains flanking the west side of Loch Trieg at an elevation of about 2000 feet. It was situated under a stone amid rough rocky and heathery ground and contained five eggs which were *not* taken. Snow Buntings are common in the district during autumn, winter, and early spring, but had not been detected hitherto in summer.—WM. EAGLE CLARKE.

Further Altitude Notes from the Cairngorms —

1. *Meadow Pipit at High Altitude on the Cairngorms.*—Referring to Mr Seton Gordon's note under the above heading (*ante*, p. 108), we were on Brae Riach during the last week in May 1916, and while taking our lunch very near to the summit we were surprised to hear a Meadow Pipit singing lustily and continuously not far from the summit and above the 4000 feet level. Later we saw another Meadow Pipit near by, which we took to be the mate of the singing bird, and probably they were nesting somewhere in the neighbourhood, as on the same day we stumbled across two nests of Meadow Pipits containing eggs; but at much lower altitudes. It was a very cold season with a heavy snowstorm in May, and there was still a large snow-field near the top of Brae Riach when we were up.—H. B. BOOTH, Ben Rhydding, Yorks.

2. *Red-Admirals and Wheatears.*—Since I sent you my last note I have seen, on 27th July, a Red-Admiral Butterfly at 4000 feet on Brae Riach, where Dandelions and Buttercups were growing at 4200 feet; and on 29th July a family party of Wheatears was hawking round and standing *on* the Cairn of Brae Riach 4248 feet above sea level.—SETON GORDON, Aviemore.

I.—ASSOCIATIONS BETWEEN THE AMPHIPOD GENUS *METOPA* AND CŒLENTERATES.II.—THE FEEDING HABITS OF THE SEA-ANEMONE, *ACTINOLOBA*.*(Notes from Millport Marine Laboratory.)*

By RICHARD ELMHIRST, F.L.S.

I.

FOR a number of years a small white Amphipod crustacean occurring occasionally in tow-nettings taken from Keppel Pier has been recognised as a *Metopa*, the species not being identified. In May 1922 when a few piles of the pier were drawn out during repairs, the length below low water mark, some 12 or 15 feet, was seen to be coated with the Sea-Anemone, *Actinoloba dianthus*. When these were examined the white Amphipods were noticed in some numbers creeping about on the Anemones apparently unhampered by their stinging powers and able to enter and leave the mouth (stomodæum) as they wished. These Amphipods were finally identified as *Metopa solsbergi*, Schneider (see Sars, *Crustacea of Norway*, vol. i., p. 266, pl. 94, 1895; and Stebbing, *Das Tierreich, Amphipoda*, p. 181, 1906), a species hitherto only recorded from Norway.

To the naked eye *M. solsbergi* is a small active white species; closer examination shows a greenish tinge in the stomach and cœca with a bright red streak running from the 2nd to 5th body segments. This red is due to the presence of red oil globules which are abundant in the young, less plentiful in moderate sized females with filling ovaries, and often absent in ripe females. Eggs when present are brownish. The structure agrees very closely with Sars' figure of *M. solsbergi*, the only differences being that the spinulation of the uropods is rather stronger than indicated, and the occasional presence of spines on the telson.

The male has not yet been described. It is smaller, having a length of 3 mm. against 5 mm. in the female; very like the female but narrower; definite penes occur on the coxal joints of the 7th segment; there is no marked sexual dimorphism, although the hand of the 2nd gnathopods is proportionately larger than in the female. Carrying never seems to occur, as in certain Gammarids. *M. solsbergi* leads a semi-parasitic life on *Actinoloba*, creeping at will over the disc and tentacles or into the stomodæum. On placing specimens on other Anemones, *Tealia crassicornis* ate them without hesitation, *Actinia equina* took them slowly, but after some minutes the *Metopa* generally emerged again. In captivity away from their hosts they do not thrive, refusing food such as mussel. The slime of the *Actinoloba* seems to be their natural food.

In the autumn of 1922 Miss S. M. Marshall found Amphipods occurring occasionally in the plankton associated with the medusoid *Phialidium*. These I have identified as *Metopa borealis*, Sars (Sars, p. 254, pl. 89, and Stebbing, *op. cit.*, p. 180), as they agree with that species in the rounded frontal angle, irregularly serrate hand of the 2nd gnathopod, and acute angle of the 3rd pleon segment, although the proportions of the 1st and 2nd antennæ, particularly in small specimens, are very near those of the closely related species *M. rubrovittata*.

The coloration is a pale greenish tint over the body with some red on the limbs and pleura. In captivity they were seen to creep about on *Phialidium*, either above or under the umbrella, to leave them temporarily or pass from one to another. In no case was the *Metopa* seen to be eaten.

Their occurrence in association with *Phialidium* has been noticed during the period October to March. In July Mr Macdonald took one in 50 fathoms west of Cumbrae lighthouse.

II.

The association of *Metopa* with *Actinoloba* suggested a study of the feeding habits of the latter.

Actinoloba dianthus lives well in captivity, particularly where the water is circulating, and in the Millport Aquaria lives for years without any solid food, in fact if mussel is given to the individuals it is often discarded. The whole upper part of the animal responds rapidly to a touch of the finger or a piece of mussel, but by a quite different type of reaction from the feeding reaction of such an Anemone as *Tealia*.

If small examples of *A. dianthus* are watched under the microscope the use of carmine will show that a steady centrifugal ciliary flow passes along the bases of and up the tentacles. For example a drop of carmine and water placed over the mouth will gradually disperse centrifugally and fall off the tentacle tips. On the other hand a suspension of food in water, e.g. diatom culture or carmine and crushed mussel, will be seen to be drawn down into the mouth—any particles falling within reach of the outgoing tentacular current being swept away. When the anemone is expanded the effect of the centrifugal flow along the numerous tentacles is to cause a compensating current to set in towards the middle of the disc, i.e., the mouth, and any suitable particles so brought in are usually swallowed. This mode of feeding is admirably suited to the habit of *Actinoloba* of living on exposed boulders and piers in places where the tidal flow is strong, for plankton is then swept into the flow impinging on the disc.

Experiments made with Copepods and Crab larvæ tend to show that *Actinoloba* does not feed readily on such animals but prefers microplankton. In a few cases where the Copepod crustacean *Calanus* darted right into the tentacles, it has been seen to be held and eaten, but most of the *Calanus* which come in contact with *Actinoloba* seem to escape.

Observations show that *Metopa* can wander about on the *Actinoloba* while feeding is in progress.

Longitudinal grooves run down the gullet, and when food is being swallowed the in-flow is along the grooves; conversely a ciliary out-flow runs up the ridges, for example when a bolus of waste is discharged it is passed out by the cilia on the ridges aided by a certain amount of

contraction of the stomodæal wall. At times there is a vortex in the gullet when both sets of cilia are in action at once.

The normal food reaction of *A. dianthus* is seen when a drop of food suspension falls on the disc. A fairly rapid partial contraction occurs, and the inner tentacles bend inwards. When this happens the escape of any organism which has caused the food reaction is prevented, and the ciliary flow along the tentacle tips tends to send it into the mouth.

These observations on ciliation agree with Carlgren's (*Biol. Centralbl.*, vol. xxv., 1905), except that he does not recognise the out-flow of the cilia on the ridges where the complete mesenteries abut on the stomodæal wall.

Pheasant eating Field Vole.—On 27th July 1925 I saw a young Pheasant, just two months old, catch and eat a half-grown Field Vole, at Balhousie, near Largo. The Vole was running about where the Pheasants are fed, and the Pheasant went after it, caught it, and then beat it on the ground until its bones must have been broken, after which it swallowed it. As this seems an uncommon occurrence I think it may be worth placing it on record.—F. L. S. WEDDERBURN, Balhousie, Largo.

Starling feeding Young on Buds of Nipplewort.—Several times in June I watched Starlings feeding their fledged young on the buds of the Common Nipplewort, *Lapsana communis*. This took place just under my windows, so that I had an excellent view of what happened and saw that in each case the bud was swallowed whole by the young bird.—EVELYN V. BAXTER, The Grove, Largo.

White Wagtail nesting near Oban.—This summer (1925) a pair of White Wagtails nested a short distance outside Oban, and also in a small disused quarry in the town I found a nest and six eggs belonging to a hen White and a cock Pied Wagtail. I am positive of this, because I passed the nest twice daily and watched them from the commencement of nesting operations. I am told this is the first time the White Wagtail has been known to breed in this area.—JOHN BAIN, Hyskeir Lighthouse.

NOTES FROM THE SCOTTISH ZOOLOGICAL PARK

THE KING PENGUINS.

(Continued from p. 32.)

FEEDING OF GROWING CHICK.

When it had attained the age of six weeks the "baby" was weighed for the first time and turned the scale at $9\frac{1}{2}$ lbs., its height then being 20 inches.

It was noted that as the chick grew a change took place in the condition of the food disgorged for it by the old bird. At first the fish was disgorged in small quantities in a partly digested and almost liquid state, but gradually the food was brought up in larger pieces and in greatly increased quantity. By the time the "baby" was about eight weeks old the strain of the long period of incubation and of feeding the chick began to tell upon the adult known as "C," which exhibited loss of appetite and strength, while the "baby" made it perfectly clear at the same time that it was not receiving as much food as it considered necessary. The experiment was accordingly tried of giving it a fish allowance of its own, more or less a counsel of despair, since it was evident that if matters continued as they were both C and the chick would be lost. The experiment was, however, quite successful. It was given in the morning, as a first meal, three herrings, which it swallowed with ease, and three more in the afternoon. As it was none the worse next day the allowance was increased in a day or two to fourteen herrings, and very soon it could take twenty a day as well as its parents. At this time, as C seemed inclined to mope and the "baby" was more or less independent, the other adult penguins were brought back to the enclosure. They were allowed to walk down the path to the gate, and the "baby" seeing them coming went across the enclosure to meet its "father" as the latter reached the gate. It seemed quite touching, but it was not really filial affection; this "baby" showed the keenest interest in everything going on around it, and an advancing procession of penguins was a novelty of a most exciting kind. Birds flying overhead it would stand watching with head on one side, and more accessible objects of interest it would investigate by gently feeling with his beak.

A further milestone on the road from babyhood was reached when the chick acquired the art of trumpeting like its elders. It was a rather thin and shrill little "trumpet" at first and was mixed with its charming flute-like warble. When handled at this time it would at one moment strike at one with its soft and innocuous flippers, trumpeting shrilly, and the next moment cuddle up to one with a contented warbling.

RAPID INCREASE IN WEIGHT AND SIZE.

After independent feeding began, the "baby" was weighed weekly, and increased, on an average, by 2 to 3 lbs. each week. At seventeen weeks old it weighed 23 lbs., while the weights of A and C at the same time were respectively 28 lbs. and 25 lbs. It was also by this time as tall as its parents and might be regarded as practically full-grown. It looked much more than that, however, for the feathers of the nestling coat were now so long—about $2\frac{1}{2}$ inches—that it seemed huge in comparison with the slim adults alongside; its figure was certainly more imposing than shapely, especially after the daily twenty herrings had been consumed. It continued to increase slightly in weight till, by the end of the fifth month, it attained 25 lbs., which may be regarded as about the average weight of an adult King Penguin.

FIRST ACQUAINTANCE WITH WATER.

When the adult penguins were returned to the enclosure, the pool, which had been emptied while the chick was small, lest it should fall in and be drowned, was refilled with water, but C remained with the "baby" and did not enter the water when the others did so. As the spring advanced, however, C began to leave the chick and associate more with the others, and one day entered the water along with them. When the "baby" found itself alone, it presented the most amusing and delightful picture of surprise and bewilderment. It looked at the place where they had seemed to go, and where, according to its experience of things, they ought still to be, but the properties of water and the delights of swimming and diving were as yet things it knew nothing about; it looked upwards and then all round the enclosure and seemed much worried to find itself the only penguin in its world. When the elders reappeared on the surface and presently came ashore, it bent forward to examine them with an appearance of as great interest as relief. Soon it became quite accustomed to these occasional disappearances and



Photo.]

The young King Penguin, after completing its first moult, takes to the water.

J. C. M. Kechnie.

showed no further anxiety, but as yet it made no attempt to enter the water itself. It was not until the first moult was on the point of beginning that it began to experiment with the water. One day it was noticed that its feet and legs were wet; a day or two later its breast was seen to be soaked as if the bird had been lying in the shallow edge of the pool.

ADULT PLUMAGE ASSUMED.

At the end of April, six months after it was hatched, new tail feathers had appeared, and by the end of the first week in May the brown nestling feathers were beginning to be shed, and the "baby" was rapidly passing into a full-fledged penguin. As the long loose fluffy nestling coat gave place to the close-fitting adult plumage, the appearance of the chick was most comical, especially when it had shed all but a patch at the back of its head which looked like long hair, and a cape-like patch on the shoulders. The moult was completed by the third week in May, and the "baby" was distinguishable from the others only by the paler tone of the yellow patches on head and throat, which were of a lemon instead of a rich orange tint.

THE CHICK'S TEMPERAMENT.

This chick showed two peculiarities of temperament. The first was a curious aloofness towards the other penguins. If they were absent it might show a certain amount of uneasiness, but when with them it generally stood a little apart, often with its back to them, and seemed to take little interest in them or their affairs. It was with them but not of them, in a sense. This was most marked and most amusing during the next breeding season when, after the first egg had been laid, there was much excitement and squabbling among the adults. The attitude of the chick amid the disturbance was one of lofty detachment, its back being turned to the disputants and his beak skywards. Only when its quietude was interrupted by the jarring of some angry claimant of the egg, it would move a few steps away with an air of extreme boredom.

The other peculiarity was that never during its whole life would it take fish from the keeper's hand as the others did, but had always to be fed more or less by force; it had to be held by the keeper and the fish placed in its beak, when it was at once swallowed. The historic "baby," which was a female, flourished for five years and died on New Year's Day 1925, the cause of

its death being a large blood clot which formed in one of the principal veins. It may safely be claimed that this was the first King Penguin hatched and reared outside those Antarctic islands where the birds naturally breed.

SUBSEQUENT EGGS AND DOMESTIC RIVALRY.

The successful rearing of this chick led one to hope for more, and to build up over-confident expectation of an annual increment of King Penguin chicks. Unfortunately the experience of the next four years emphasised the folly of counting penguin chickens before they are reared.

In 1920 two eggs were laid, the first on the 10th of July. When the egg was first seen in the evening, it was in the possession of C which was again paired with A. B was making persistent efforts to obtain the egg from C who defended its property savagely, assisted by A who stood near, but seemed somewhat lukewarm in the matter. The belief was still held at this time that A was a male and B and C females. At this date D (which was regarded as a female) was still moulting, and showed little interest in the matter; but when once or twice its mate E showed signs of taking part with B, it roused itself sufficiently to go after its partner and call it back to duty, before sinking back into bored indifference. On the following morning the struggle over the egg had become more fierce. A had it then and seemed to want to transfer it to C, but every time they attempted to make the exchange B made a rush for it, and all the pecking and trumpeting possible on the part of A and C were required to drive B off. It was noted that during this time B was holding itself exactly as if it were carrying an egg, shuffling along with feet close together and constantly looking down and feeling with its beak beneath the flap of skin and feathers which, when brooding, covers the egg. At the same time A, who had the egg, was holding it rather carelessly, so that once or twice when the struggle was most fierce the egg slipped from its hold and rolled on the sand. There was in fact much to support the suggestion that the egg had already been stolen, and it became a question whether B was really a would-be thief of strange persistence or a much-wronged owner fighting to recover its own property.

T. H. GILLESPIE.

NOTES

Nesting Habits and Incubation Period of the Redwing.

—In Syd Varanger far within the Arctic Circle the Redwing (*Turdus iliacus*) is common in the birch woods and willow groves on the low ground and far up the hillsides. When I arrived there towards the end of June 1925, I saw nests containing young birds almost ready to fly. Building is accomplished rapidly: a second nest, begun on 28th June, was finished three days later, on 1st July, and the first egg was laid on the following day. Each day an egg was laid until the clutch was completed by the laying of the fourth egg on 5th July. Three eggs hatched on 17th July, after twelve days' incubation. The remaining egg was hatched on the next day, 18th July. When brooding the Redwing is very shy and wary, and the bird would never allow me within ten yards without flying off. Both birds are very noisy when an intruder comes near a nest containing young ones, and dart wildly past his head. Nests seemed never to be more than six feet from the ground, and were sometimes built in the fork of a tree, on the stump of a felled tree, in a crevice of a rock, or in a bank. Up to a certain stage the nest is like the Song-Thrush's, being plastered inside with mud or other material, but it is ultimately lined with fine grasses. The eggs are much like those of the Blackbird, but the ground colour is slightly darker, and they are rather smaller.—DOUGLAS G. HUNTER, Arbroath.

Hoopoe in Berwickshire.—I have had an opportunity of seeing a Hoopoe which was shot on 18th September at Berrybank, near Reston. It appears to me to be a female in poor condition. There is no buff on the tertiaries and the breast is without the dusky streaks of a young bird.—JAS. HEWAT CRAW, West Foulden.

Strange Death of Rook.—A young Rook which showed an unusual mode of progression, was shot at Tayfield by my son in August. He said it appeared to be flying with its head tucked in, and was progressing mostly sideways. Examination revealed that it must have 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 is much emaciated, but it must have been a fairly recent accident, since feeding must have been quite impossible with the head thus fixed.—WILLIAM BERRY, Newport, Fife.

Slow-worm on Ailsa Craig.—A fine example of this snake-like lizard, *Anguis fragilis*, was obtained for me by Mr S. Baigrie, on Ailsa Craig, on 28th June. Its presence on so isolated an islet indicates a long history there, for presumably its ancestors reached the island before it was separated, or at any rate far separated, from the mainland. The specimen has been sent to the Royal Scottish Museum.—J. M. M'WILLIAM, Craigmore.

Malarial Mosquito, *Anopheles bifurcatus*, L., near Edinburgh.—In view of the campaign which is being carried on at present against mosquitoes in Britain, it may be of interest to place on record the occurrence of *Anopheles bifurcatus*, L., a noted malaria carrier, in a pond at Cammo, near Cramond Bridge. In August last Mr James Coltman brought to me a sample of water from this pond, in which were numerous larvæ in all stages, and many pupæ of the species in question, and a few days later several specimens of the imago of both sexes. After a careful examination of both larvæ and adults I had little difficulty in satisfying myself as to the identity of the insect. The pond was very rich in insect, crustacean, and other life, and I noticed in the sample several examples of the curious "phantom-larva" of *Corethra*, innumerable specimens of *Daphnia pulex*, some Polyzoa (*Plumatella*), and lastly, several individuals of a *Hydra* of a brownish tint. Mr Coltman has given about twenty examples of the *Anopheles* to the Royal Scottish Museum.—PERCY H. GRIMSHAW, Edinburgh.

The Death's Head Moth at Sea—1. At the Bell Rock.—At noon on 12th June 1925 I was going from the lower door of the tower to the rock when I observed a large Moth clinging to one of the rungs of the ladder. I secured it and kept it alive for five days in a glass jar with a perforated top. During this time it was quite active and made a strong noise which I took to be caused by its wings. The weather at the time of capture was clear with a light breeze from the north-east. I sent the moth to Miss Baxter and Miss Rintoul, who tell me it is a Death's Head Moth (*Acherontia atropos*).—ANDREW BLACK, Bell Rock Lighthouse.

2. *In mid North Sea.*—Some months ago a Death's Head Moth caught on the Scottish trawler *Rose O'Doune*, in the middle of the North Sea, was received for identification at the Natural History Department, Aberdeen University. The skipper, Mr W. Paterson, supplied the following information: "The moth was caught outside the wheelhouse window about mid-day on 29th August 1924, 187 miles due east from Aberdeen. The most remarkable thing

about it was that it blew a severe gale from the N.N.W. two days before, and that would have been approximately from the direction of the Shetland Isles."—R. M. NEILL, Natural History Department, University of Aberdeen.

Rhyssa persuasoria, Linn., in Edinburgh.—The occurrence of such a striking insect as *Rhyssa persuasoria*, which is parasitic in its larval stage on the grub of the Wood-Wasp (*Sirex gigas*), usually attracts a good deal of attention, and although with the rapid spread of its host it also is attaining a wide distribution in Scotland, yet its capture in an Edinburgh house on the 20th August last is perhaps worthy of record. The species is the largest and handsomest of the British Ichneumonidæ, and the specimen now recorded is a perfect female, with an ovipositor over an inch and a half in length. Its captor, Miss C. Aitken, 16 Scotland Street, Edinburgh, in whose house the insect was taken, has presented it to the Royal Scottish Museum.—PERCY H. GRIMSHAW, Edinburgh.

Convolvulus Hawk Moth in Berwickshire.—I have received from Miss Homes, Paxton, an example of the Convolvulus Hawk Moth, found crawling on the public road in Paxton Village on 18th September 1925, by a forester on Paxton estate.—W. M. LOGAN-HOME, Edrom.

A Rare Spider, Dysdera crocota, C.L.K., in Fife.—About the middle of June last I received from Mrs J. H. Gaskell for identification a strikingly coloured Spider which I had little difficulty in referring to the genus *Dysdera*, and, after careful examination, to the species *crocota* of C. L. Koch. The first Scottish example of this rare Spider was captured on the links to the west of Pettycur, Fife, in June 1889, and was recorded by the late William Evans in the *Proceedings of the Royal Physical Society* (vols. xii. and xiv.), and since then it has been taken at North Berwick, Eyemouth, Dunbar, Bo'ness, and Edinburgh (Calton Hill)—all in the Forth area—and at Ayr and Kirkintilloch in the west. Mrs Gaskell states that her specimen, which she has kindly presented to the Royal Scottish Museum, was dug up in a garden at Colinsburgh, Fife, on 15th June. Since I cannot trace any Scottish records beyond those mentioned above, this constitutes the most northerly locality for the species in Britain.—PERCY H. GRIMSHAW, Royal Scottish Museum, Edinburgh.

BOOK NOTICES

WATERSIDE CREATURES. By Frances Pitt. London: George Allen & Unwin, Ltd., 1925. Pp. 252. Price 12s. 6d. net.

There is something specially attractive about the habits of the birds and mammals which make a half-home in the water, perhaps because the adaptations enabling them to return to the ancestral element are out-of-the-common, perhaps because, as Miss Pitt suggests, the creatures betray special intelligence. In this series of essays Miss Pitt discusses the lives and habits of a range of beings varying from the sea-birds of Black Guillemot island and the Wild Duck, Heron, Wagtails, and Dipper of fresh-water haunts to the semi-aquatic Water-vole, Water-



The Water-vole; "Startled."

shrew, and Otter. Everywhere she shows an intimate field-knowledge of the ways of these creatures, and this she has supplemented by keeping and observing some of them in captivity. Her observations, often the result of prolonged effort and study, are fresh, personal, and expressed with a liveliness of diction, all of which contribute to make her volume at once interesting and instructive. There are fifty-four excellent photographic illustrations, of which we select as typical the picture of a startled Water-vole.

GROWTH. By G. R. de Beer, B.A., B.Sc., F.L.S., University of Oxford. London: Edward Arnold & Co., 1924. Pp. vii + 120.

During recent years a great stimulus to the study of growth in plants and animals has been derived from the development of the experimental method of stimulating and controlling growing things. Fragments of living tissue have been isolated, and under proper care have been seen to form new cells and to continue to grow for many years. Kidney tissue, thus grown, forms a layer of simple cells, having none of the specific structure of kidney, but add a fragment of connective tissue, and at once some of the simple cells develop into the tubules characteristic of kidney structure. Experiment has shown that the influence of the ductless glands is profound: absence or deficiency of the thyroid leads to dwarfing; excess of pituitary secretion creates giants. Such results have led to a new understanding of the intimate influences which connect various parts of the body; and Mr De Beer offers in this volume a summary of the results of recent investigations regarding growth in its many aspects. The main theme around which the book is written is that "growth is a fundamental property of living matter," "intimately connected with the self-perpetuating nature of the processes of life itself." In following his theme the author discusses growth in plants and animals, regeneration, sexual and asexual reproduction, size, rate of growth, causes and nature of growth, substances which speed up growth, and so on, and, although we feel that further study might have made a better book, he has collected a vast amount of interesting and important information on a subject regarding which there is still much to be discovered.

LIVING ORGANISMS; AN ACCOUNT OF THEIR ORIGIN AND EVOLUTION. By Edwin S. Goodrich, F.R.S. Oxford: at the Clarendon Press, 1924. Pp. 200. Price 6s. net.

The progress of biological knowledge, particularly of the physical factors of growth and of heredity, has been so rapid of recent years, that we are in danger of being left far behind the van. Periodically the need arises of a restatement of the biological creed in the light of modern investigations, and such a restatement Professor Goodrich has successfully accomplished in this compact volume, designed for the student or intelligent reader. The subjects are the old subjects, such as life and its physical basis, heredity, variation, the struggle for existence and natural selection, isolation and sexual selection, the evolution of intelligence, but the treatment is fresh, individual, and up-to-date. In a suggestive chapter on the geological record of success and failure the author indicates the significance of failures and the causes which have led to the extinction of multitudes of animal groups, but it is surprising that the factor which to-day is one of the most potent in deciding the fate of animals, the influence of man himself, is not even mentioned,

THE BRITISH HYDRACARINA. By Charles D. Soar and W. Williamson. Vol. I. London: Printed for the Ray Society, 1925. Pp. 216. With 20 plates.

This fine volume, giving for the first time a consecutive description of the Water-Mites of the British Isles, is a tribute not only to the Ray Society but to British amateur zoology; for it embodies the labours of two business men, one English, the other Scottish, who have devoted their leisure to the elucidation of this obscure but universally distributed group. Water-Mites are minute creatures to be found in ponds and streams, attached to water-weeds, on which the eggs are often laid, wandering on the surface of submerged boulders, concealed amongst moss, or attached to aquatic insects. The introduction gives a detailed account of what is known regarding their somewhat obscure life-histories, and a useful chapter contains hints on the collection and preservation of specimens. The salient characters of a large number of species, of which twenty-seven have been recorded from Scotland, are described, and by tables of key characters identification is simplified. The plates, several of which give a fine idea of the vivid and beautiful colouring of the mites, deserve a special word of praise.

QUEER FISH: AND OTHER INHABITANTS OF THE RIVERS AND OCEANS. By E. G. Boulenger. London: Partridge, 1925. Pp. viii + 189. Price 3s. 6d. net.

A vast number of interesting facts regarding the habits, development, structures, and utilities of fishes have been gathered together and presented in simple and lively language in this readable volume. To many an inland naturalist it will reveal a new world for contemplation. There are occasional lapses; as when it is stated that in feeding the "strainer" of the whale-bone whale keeps back the *water*, or when the greatest tentacle expanse of an octopus captured off our coasts is stated to be 8 feet, while the occurrence of a squid with a tentacle expanse of 28 feet is omitted; and it is unfortunate that in the picture entitled "flying-fish pursued by dolphins," the latter name should be applied, without explanation, to a true fish, whereas the accompanying description suggests the real dolphin—a mammal. Otherwise the illustrations are excellent and add to the vividness of the text.

THE ROMANCE OF THE FUNGUS WORLD. By R. J. and F. W. Rolfe. London: Chapman & Hall, Ltd., 1925. Pp. xx + 309. Price 12s. 6d. net.

This is an unusual book, for it invests with so much human contact the toadstools and their allies as to make this lowly group of plants

throb with interest. This was the aim of the authors, and they have succeeded partly because of their enthusiasm and partly because of the wide net they have cast. Structures and life-histories receive their share of discussion, but the damage done by fungi, their folk-lore, their place in fiction, their uses in medicine, in industry and for food, their artificial cultivation, luminosity, and so on, are happily treated with much knowledge. The book is illustrated by many text-figures and a large number of beautiful photographs.

CONCERNING THE HABITS OF INSECTS. By F. Balfour-Browne, M.A., F.R.S.E., etc. Cambridge: University Press, 1925. Price 6s. net.

This book, running to a little more than 160 pages, is the outcome of a series of six lectures delivered at the Royal Institution at Christmas time, 1924, and adapted to a youthful audience. The author is a well-known investigator of the habits and distribution of British insects, especially the fascinating group of Water-Beetles, and we may take it for granted that anything he has to say on these subjects is well worth our perusal. These lectures are something quite out of the ordinary run of the entomological text-book, for they are very largely founded upon the original personal observations of the author, and his experiences, so charmingly told, are well calculated to inspire the juvenile who may be so fortunate as to possess the volume, to go and do likewise. We wish that Mr Balfour-Browne's lectures could have a wide circulation north of the Tweed, for were the volume brought to the notice of our Scottish youth there might result a very welcome recruiting of our entomological ranks. Such a volume teaches that the science of entomology includes something more than the mere capture and labelling of specimens, and that there are still many problems to be solved concerning the bionomics of some of our commonest insects.

(Authors are responsible for nomenclature used.)

The Scottish Naturalist

No. 156.]

1925 [NOVEMBER-DECEMBER

SCOTTISH WILD LIFE RESERVES.

IN spite of the surpassing interest of the native life of Scotland, and of its tracts of country, better fitted because of their wildness and their remoteness from the activities of civilisation than any to be found elsewhere in Britain, Scotland has lagged behind in the movement for nature reserves. This is partly due to the existence of great deer forests, which, in all but name, approach the conditions of the true nature reserve, but it is also partly due to the fact that the people of Scotland do not realise how great a part the nature reserve plays in the modern development of almost all countries but their own.

The enormous national parks of Canada and the United States of America, to be preserved for all time for the education and delectation of the peoples of North America, have their counterpart in the reserves of most of the States of South America. Even conservative England, under the guidance or with the support of the Society for the Promotion of Nature Reserves, has begun to lay aside considerable areas where wild vegetation and wild animals may have their will. There are the 120 acres of Meathop Moss in Westmorland, interesting for its plants and butterflies, Swaddiwell Field in Northamptonshire, the 538 acres of

primitive fenland at Woodwalton Fen in Huntingdonshire, Wicken Fen in Cambridgeshire, and the great sea-bird nesting tract of Blakeney Point in Norfolk. There are other preserved areas, such as that of the Selborne Society, and recently the Government has started a venture of its own, on a small scale it is true, by creating bird sanctuaries in the Royal Parks in London.

How has Scotland responded to this new and extending movement for the preservation of native plants and animals? A few years ago the Murchison of Tarradale Trust set aside the policies about the house of the great geologist, Sir Roderick Murchison, in Muir-of-Ord, Ross-shire, as a miniature reserve. Recently the Corporation of Glasgow created bird sanctuaries in the public parks of their city, and discussed the possibility of forming a reservation in a considerable and highly suitable area of south-eastern Argyllshire.

But perhaps the most important step yet taken in Scotland has been the acquirement of Duddingston Loch and the adjoining land through the generosity of Mr W. H. Askew of Ladykirk, and the handing over of this noted resort of bird life to H.M. Office of Works for the purpose of creating a bird sanctuary. In order to make use of this excellent site to the full an arrangement was made whereby the sporting rights over the Loch were renounced, and a further development was the creation by Lord Peel, the First Commissioner of H.M. Works and Buildings, of a small committee to advise regarding the creation of bird sanctuaries in the Royal Parks, consisting of the Right Hon. Lord Elphinstone as Chairman; Dr W. Eagle Clarke, Dr James Ritchie, Mr W. Home Cook, Surgeon Rear-Admiral J. H. Stenhouse, and Councillor Dr J. G. Nasmyth, with Mr W. Wright of H.M. Office of Works as Secretary.

In order that advantage should be taken of the autumn planting season, the Committee made reconnaissances of the Loch and its surroundings, and on its recommendation, the Office of Works has undertaken the planting of a limited amount of close shrubbery and of willow, alder, and other suitable trees, the former to afford food in winter and nesting

sites in summer for small birds, the latter particularly to add to the seclusion of the sites suitable for the nesting of the various species of ducks and water-fowl which frequent or may be induced to frequent the Loch.

It is obvious that such steps are but preliminaries to the creation of a successful sanctuary, and that the value of all such may be annulled by reckless disturbance of nesting birds or harrying of nests during the breeding season. Steps must be taken to protect the sanctuary during this all-important period, but we trust that the Office of Works will have not only the good will but the active assistance of the public in making this ideal site a safe resort for birds and a source of pleasure and education to the lover of nature and the people at large.

* * * *

Professor J. R. Henderson, C.I.E., who died in Edinburgh on 26th October 1925, was a Scottish zoologist of note. Although the greater part of his zoological work was carried out in India, where he was Professor of Zoology in Madras Christian College, and later Superintendent of the Government Museum and Keeper of the Aquarium in Madras, he made several valuable contributions to our knowledge of the marine faunas of the Firths of Forth and Clyde during the eighties of last century, and was responsible for the fine report upon the Crustacea Anomura collected by the *Challenger* Expedition.

Pied Wagtails hatching and rearing Blackbirds.—In June this year (1925) my neighbour, Mr Leadbetter, Knowesouth, noticed a Pied Wagtail sitting in a Blackbird's nest, built in the creepers on the house. On examination he found that it was sitting on four Blackbird's eggs,—what had happened to the Blackbirds is not known. The Wagtail could not cover the four eggs, so it built in the nest so that the eggs were gathered into a heap in the middle. Four Blackbirds were hatched out during the last week of June; two died, owing, it is thought, to improper feeding, but two were successfully reared and flew away. I think this is worth recording, as I have never known a similar case.—A. JEFFREY RINTOUL, Ancrum, Roxburghshire.

Black-throated Divers on Dunfermline Loch.—On 6th December 1925 we were much surprised to see two Black-throated Divers on the Town Loch, Dunfermline. We also saw Pochard, Tufted Duck, Goldeneye, Goosander, and Little Grebes, all in small numbers with the exception of the Tufted Duck which were numerous. We expected to find an assemblage of duck on the Loch, as it does not freeze as soon as others in the neighbourhood, owing to the electric plant on its shores; but we have never seen Black-throated Divers inshore at this season, nor can we think why they should have come there.—F. S. BEVERIDGE and NORMAN M. JOHNSON, Dunfermline.

Bean Geese in the Tay Area.—At 10 A.M. on 20th October 1925, I saw a large party (several hundreds) of Grey-lag Geese feeding on a stubble on Mugdrum Island on the Tay. With them were seven other Geese which I at first thought were Pinkfoot, but as I have always noticed it is most unusual for Grey-lag and Pink-footed Geese to mix, I went for my very large telescope and saw at once they were Bean Geese. The light was very strong with the sun behind me, and the yellow legs of the Bean Geese, beak marking, etc., were almost as clear as if the Geese had been within gunshot of me. I may say that this is the first and only time I have ever seen a Bean Goose in the flesh, and I probably have done as much wild goose hunting as any one round this district. I have now shot Grey Lag, Pinkfoot, and one White-fronted Goose, and have seen Brent, Bernacle and Bean Geese on the Tay.—CHARLES S. WEDDERBURN, Newburgh.

A RAT MIGRATION.

By W. M. C. MILLAR, M.R.C.V.S.,
Royal (Dick) Veterinary College.

[NOW and again great migrations affect rat populations, and by such movements, as when invading armies of Brown Rats rolled westwards from the Caspian region in 1727, extensive territories have sometimes been overwhelmed. But apart from such great movements there are more regular seasonal migrations, as when in autumn companies of rats leave the open country for sheltered stackyards and farm buildings, and irregular local movements, when scarcity of food in one part and abundance in another, compels a sudden change in the density of the rat populations. Although we have frequently heard of movements of rats in companies, even within the city bounds of Edinburgh, it is difficult to obtain authentic information regarding them, and we have therefore pleasure in printing Mr Millar's vivid account of the impressions made upon him by such a migration. In some respects it recalls an experience of Mr Cocks in Heligoland, recounted by him in Barrett-Hamilton and Hinton's *History of British Mammals*, 1916, p. 624.—EDS.]

About the middle of October 1924, the writer was spending a short holiday in East Anglia, on a farm in West Suffolk. East Anglia is usually associated with flat stretches of fen-lands unrelieved by hills or hollows, but the particular district referred to is not of this type; rather is it a region of more or less parallel undulations, where the land is mostly fertile and highly cultivated, and the abundance and variety of the timber is striking. Small streams, tributaries of the sluggish River Stour, wander between rush-grown meadows, while on the higher slopes of each valley farm-steadings nestle among clumps of trees. I give this description because I believe the lie of the land has something to do with the frequency of

rat migrations, which are commoner there than in most places.

It was one of those nights when the rattle of a train four miles away is so plain that the country folks say it is a sign of coming rain. The day had been warm, but there was a "touch of frost" towards evening, and the night was chilly. These conditions also, I believe, are associated with rat migrations.

A hen during the latter part of harvest had "sat away" and brought out a dozen chicks, and these were housed in a rat-proof coop, which stood under the shelter of one of the outermost stacks and was shut up each evening. On the night in question I volunteered to shut up the coop. Darkness had fallen, and armed with an ordinary stable hurricane lantern I set out. Passing through the stack-yard I disturbed a Barn Owl from the thatch of a wheat stack, hearing the "whee-whee-whee" of its wings, and seeing it momentarily silhouetted against a lighter part of the sky as it sought a hunting-ground elsewhere. The golden ball of the "Hunters' Moon" was just lifting itself clear of the tree-fringed horizon, and the sky was spangled with stars.

Arriving at the coop I fastened the galvanised-iron sheet against its front, laid a couple of bricks at either side, and paused to ascertain the origin of a subdued "swish-swish" some little distance out in the stubble field. I stood still and listened, every sense alert. Although I hardly think I am a coward, I must confess that a sudden chill struck through me as I listened to one of the most eerie sounds I had ever heard. I stood spell-bound, gazing into the semi-darkness beyond the ring of light shed by my lantern. However, my curiosity got the better of my mental fear, and I moved forward and raised the lantern. There was immediate stillness when I moved, and once more I stood listening. The sounds commenced again, and I realised that mixed up with the rustling, just as the tuning-up of an orchestra mixes with the muttering of the people in a theatre, there were other sounds, little half-suppressed squeakings. Then it flashed through my mind that a

late-hatched covey of partridges had been disturbed and were collecting again; and regaining confidence with this explanation I went forward to look at them.

Twenty yards from the coop I realised that the rustling was coming from what seemed to be all directions, and I vaguely wondered why so large a covey, as I imagined it to be, should be moving in this way after dark. But I was to get another surprise, for, as I held the lantern up and gazed from below it, I saw the ground ten yards away from me twinkling with myriads of little green points of light. Two little spots of pale emerald flame nearest to me remained fixed, and here and there behind these were others, also quite stationary but set in a background of twinkling, flashing, sparkling, paired dots of light which appeared for a moment only to vanish immediately. For an instant I wondered what so many "glow-worms" could be doing at that time of night out in the middle of a stubble field, but the thought was barely registered before I suddenly knew that these were the eyes of animals, and that the animals were Rats. At once there rushed through my mind all I had heard from the rustics about armies of rats which moved in from fields to the stackyards and farm buildings about the beginning of autumn, and about how dangerous it was for any living creature to get in their way; how even dogs and cats were supposed to have been attacked by the swarming rodents and to have been obliterated; how they would enter a fowl-house, kill the inmates, and leave hardly a feather behind them; how the smell of blood after their long vegetarian sojourn in the fields would lead them to attack newly-calved cows and do them serious injury; and a number of other equally gruesome stories. So I turned aside out of the line of march.

There was a fascination in watching the advance of the army; so far as I could make out, aided by the moon which rose higher and higher while I watched, the rats progressed in a roughly crescentic formation, near the middle of which was a single larger rat a little in advance of its fellows. It must have been this creature which gazed at the lantern

so steadily when I first saw them. They advanced at what would be a slow walking pace for a man, and seemed to keep in a more or less regular formation, those in front frequently sitting upright and sniffing the air for a moment or two. At first I thought they were going to follow the light, and for a few seconds I felt something like the Pied Piper of Hamelin (only much less confident), but they were obviously making for the stackyard. As the foremost reached the hen-coop there were shrill squeakings and squealings, and the hen became disturbed. Sounds as of sharp teeth or claws being tested against the galvanised-iron of the coop reached me, and I realised that had I been a minute or two later the hen and her brood would have been no more. Next day the surface of the coop showed innumerable scratches and markings where the rats had attempted to gnaw through.

In the stackyard I lost sight of the rats as they disappeared into the shadows thrown by the stacks, but we found out subsequently that the whole yard was infested with them, and a total of 160 were killed within the next three months.

I have since wondered whether the Barn Owl which I disturbed from the wheat stack had had a premonition that food in plenty, in the form of rats, was on its way to the stackyard, and whether it was awaiting its supper; and I have also wondered, if this was the case, why the Owl did not attack the moving rats while they were out in the open.

Blue Shark in Largo Bay.—On 1st November 1925 I found a Blue Shark (*Carcharias glaucus*) about three feet long, which had just been washed up in Largo Bay. I suspect that this shark cannot be as uncommon in the Firth of Forth as the records indicate, as this is the fourth individual that I have found in the Bay in the last fifteen years. It seems curious, therefore, that there should be only two other records for Forth. The above specimen was sent to the Royal Scottish Museum.—EVELYN V. BAXTER, Largo, Fife.

JERDON'S REED-WARBLER, *ACROCEPHALUS AGRICOLA*, AT FAIR ISLE; AN ADDITION TO THE BRITISH AVIFAUNA.

By Surgeon Rear-Admiral J. H. STENHOUSE.

AT Fair Isle this year, a male example of this Reed-Warbler was brought to me on 1st October. It had been obtained that afternoon by Mr George Stout, who found it in a field of turnips. In its behaviour it was very elusive and secretive, and it was only secured by him after a long and persistent chase. There is no doubt as to its identity with a bird seen by his son, James Stout, and myself on 26th September in another patch of turnips. We pursued it for some time but had finally to give it up as lost. It probably had arrived that day; there had been a little east wind during the previous night.

In the flesh the measurements (in millimetres) were as follows:—Wing, 57; Tarsus, 20·5; Tail, 52; Bill, from feathers, 9; from gape, 12. The legs and feet were very pale brown; the bill dark horn above, pale below; the iris grey brown, and the inside of the mouth pale flesh.

This is the first recorded occurrence of this Warbler in the British Isles. It has once been obtained at Heligoland, and there is no other record for Western Europe.

In general appearance Jerdon's Reed-Warbler closely resembles the Marsh-Warbler (*A. palustris*), having the pale legs of that species, but it is a smaller bird and has a different wing structure, the 2nd primary being shorter, while the 3rd, 4th, and 5th primaries are emarginate; in *palustris* only the 3rd shows emargination.

It has been stated to breed in the Danube Delta and does so in European Russia in the Crimea, and in the Central and Southern Urals. In Asia its breeding range extends from the European border through Transcaspia and Turkestan to Nepaul and Kashmir in the Himalayas, and possibly to Tibet. In winter it is found in India and has also been recorded from North-East Africa at that season.

Dr C. B. Ticehurst in his paper on the Birds of Sind (*Ibis*, 1922, p. 550) states that it is common there in winter in suitable localities, for which "it only seems to have two requirements—the ground must be damp or wet and cover must be thick. From the nature of its haunts it necessarily appears to be rather a skulker." He calls it the Paddy-field Warbler, a name which is used by Indian ornithologists, but Seebohm (*Catalogue of Birds in the British Museum*, vol. v.) gives it the name of Jerdon's Reed-Warbler, after the ornithologist who first described the bird. The name Paddy-field Warbler may be quite appropriate as regards its winter quarters in India, but can hardly be suitable as regards its breeding-grounds, and anything less like rice-fields than the small patches of turnips in which it was found at Fair Isle it is difficult to imagine.

The specimen obtained is in all probability a bird a year old in worn dress, certainly the primaries and tail feathers have not been moulted this season. Its plumage, which is somewhat bleached, approaches that of summer birds. Authorities give the second primary as equal to the 6th or 7th, or between the 6th and 7th, or even 7th and 8th, but in this bird the second primary is somewhat longer than the 6th, and in that respect it closely agrees with a bird from Sarepta (Tring Museum). The tail is shorter than usual (authorities give the tail as about the same length as the wing), but a bird from Turkestan in the Tring Museum and another from Astrakhan in the British Museum have also short tails.

The skin was forwarded to Tring to Dr Hartert who has examined it and confirmed the identification. I beg here to express my grateful thanks to him for his kindness and also for, in addition, sending to Edinburgh selected skins for comparison; a courtesy also extended to me by the authorities of the British Museum. The bird is now in the Royal Scottish Museum, but, the skin being badly damaged by shot, it is doubtful if it can be mounted and placed on exhibition.

FLUCTUATIONS IN BREEDING BIRDS ON
THE ISLE OF MAY.

By EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL.

WE have been interested for a good many years in observing the fluctuations in numbers and species of our breeding birds not only throughout the whole of Scotland but also in limited areas. We propose to study in this paper one of these limited areas, namely, the Isle of May.

This small island possesses natural advantages for such a study. The birds breeding there are limited both in species and numbers and it is possible to work the whole island very thoroughly. Moreover, a certain amount of data is available over a considerable period, and we feel it may serve a useful purpose to tabulate this and try to discover why these variations take place. Conditions have changed less on the May than in many other parts of the country, the only marked difference being that there used to be a little corn grown where now is only grass.

Frequently, it is possible to explain an increase in the numbers of a nesting species by some change in environment, such as new plantations which afford convenient nesting places. But on the Isle of May no such obvious alterations in environment have taken place. Nevertheless, the species come and go there, they increase and decrease, and the reasons are not, by any means, always easy to discover. Sometimes the movements appear to be purely local, sometimes they are part of a big spread. We will now consider under species the thirty-one kinds of birds which nest or have nested on the Isle of May.

There are no old records of the Carrion Crow having bred on the island. In 1921 a pair was suspected of having bred there, in 1922 we saw the nest and eggs, and a pair has nested there every year since. Starlings fluctuate somewhat as a breeding species: in 1886 Dr Harvie Brown wrote that "they were increasing annually," we found sixteen pairs breeding in 1921 and twenty-seven pairs in 1924, but they were distinctly fewer in 1925.

Writing in 1886 Dr Harvie Brown says that a few pairs of Linnets bred annually on the island, and that there was an increase in their numbers in 1884. By the time we went to the island in 1907, they had ceased to breed there. Two pairs, however, returned in 1920, and bred that year and the following, but since then we have not found them nesting. Sparrows are recorded as denizens of the May as far back as about 1831, but it is impossible to say whether this should refer to the House-Sparrow or the Tree-Sparrow. Mr Ross told us that a pair of House-Sparrows bred on the May in 1907, and we saw them there in autumn, but they left, and we never saw the species again till, very much to our surprise, this year (1925) we found five House-Sparrows on the island when we went there in May, and two pairs bred. It will be interesting to see whether they remain and establish themselves, or whether this is simply another sporadic occurrence.

Tree-Sparrows used to be regular residents on the May. Up to 1914 several pairs bred there every year, but in 1921 we found only two pairs breeding and one pair in 1922, since then none has nested on the island. We wonder if this decline and final extinction is attributable to inbreeding, as we noticed how much brighter and better in plumage were the migratory Tree-Sparrows than those which bred on the island. Meadow and Rock Pipits have decreased very markedly as breeding birds since we first went to the May, but Pied Wagtails have remained very stationary in numbers ever since 1886. We know of only one record of the Willow-Warbler nesting, a pair breeding there in 1922.

The Thrush has been lost as a breeding species, and we seem also to be losing the Blackbird. Writing, in 1886, Dr Harvie Brown tells us that the Thrush bred occasionally up to 1882, and afterwards regularly; we have never known it since 1907 except on migration. As to the Blackbird it had been known to breed on the May from the early "eighties," and up to 1914 we found it nesting freely. In 1921 four pairs bred, two pairs in 1924, while in 1925 the only Blackbird we saw in spring was one female on 11th May, and no nest was found. In 1886 about fifty pairs of

Wheatears bred, later for some inexplicable reason they ceased to do so, but by 1921 a good many pairs were again breeding; they have continued to nest but in much smaller numbers, two pairs only being noted in 1924. Dr Harvie Brown tells us that a pair of Hedge-Sparrows reared two broods in 1884, we know of no other breeding record.

In old times the Peregrine bred regularly on the May, in fact it was known in our part of Fife as "the Isle of May Falcon"; for some time before we went, in 1907, it had ceased to do so, but there was an eyrie on the cliffs in 1922, 1923 and 1924 which may possibly account for the diminution in numbers of some of the Passerine species.

Eider have bred on the island for a long time. In 1886 Dr Harvie Brown says they were decreasing, but in the years we have known the island they have increased as a breeding species, in 1921 we counted fifty pairs and in 1924 eighty-one pairs.

Dr Harvie Brown also said that a few pairs of Cormorants bred on the island; we have never seen any sign of the breeding of this species there, and are inclined to agree with Mr Evans that it and the Shag have been confused. Shags seem to remain pretty constant at two or three pairs, and a pair of Gannets built a nest in 1922 but laid no eggs.

The Fulmar is an acquisition to the island fauna. In course of its great spread it arrived at the May, and two pairs are believed to have bred in 1921; they have been there throughout the breeding season ever since. Rock-Doves seem to have bred on the May in Jardine's day (about 1843) but do not do so now: a pair of "Rock-Doves," which are said to have nested in 1909, being no doubt descendants of "doo-cot doos." Though Oyster-Catchers have been recorded on the island as early as 1792, we have no indication of how many bred till 1911, when two pairs were nesting; but by 1921 the breeding stock consisted of seven pairs and it has continued at this figure. The only breeding record of the Redshank is one nest and eggs which we found in 1912.

Common, Arctic, Roseate and Sandwich Terns are reported by Jardine to have bred on the May. In the "eighties" of last century none nested there, nor did they do so when we used to visit the island before the war. In 1921 about fifty pairs of Common Terns bred, three pairs in 1922, none in 1923 and 1924, but in 1925 great numbers appeared and nested. There was a good deal of mortality among the young.

The Herring Gull is a rapidly increasing species: one pair only in 1907, about twelve in 1914, about thirty-five in 1921, and about fifty-eight pairs in 1924, with a further increase in 1925. It is difficult to give numbers when we come to the cliff-breeding birds, although we have done our best to count them, but certainly Kittiwakes have increased somewhat in the last fifteen years, and Razorbills and Puffins have decreased, while the Guillemots seem to have remained fairly stationary. A few Black Guillemots nested on the island in Jardine's time, but this species no longer inhabits the Isle of May.

Arising from this survey we find that the following species are recent arrivals as breeding birds:—Carrion Crow, House-Sparrow (but this may be sporadic), and Fulmar. Increasing species are Eider, Oyster-Catcher, Herring Gull and Kittiwake. Decreasing are Meadow Pipit, Rock Pipit Blackbird (very marked), Razorbill, and Puffin (very marked). We have lost the Tree-Sparrow, the Linnet (except sporadically), the Song-Thrush, the Rock-Dove, Arctic, Roseate and Sandwich Terns, and the Black Guillemot. Fluctuating species are the Starling, Wheatear, and Common Tern. Sporadic nesting is recorded of the Willow-Warbler, Hedge-Sparrow and Redshank. The only fairly steady nesters are the Pied Wagtail, Shag and Guillemot. We think the Peregrine returned owing to the increase of the species during the war, and the same reason may account for the arrival of the Carrion Crow.

Protection has certainly done much for our breeding birds during the last quarter of a century; this is shown by the increase of various species all over the country.

The Fulmar and Eider are species increasing and spreading in Scotland as well as in the Isle of May, and we think that this and the increase of the Oyster-Catcher, Herring Gull and Kittiwake may, at any rate in part, be attributable to protection. The advent of the Carrion Crow, the return of the Peregrine, and the increase of the Herring Gull may have something to do with the decreases above mentioned; but this does not by any means account for all the diminutions, the loss, for instance, of the Linnet and Song-Thrush and the disappearance of the Wheatears having taken place before either the Carrion Crow or the Herring Gull bred on the island. It is difficult to suggest any adequate reason for the loss of the species which have ceased to breed, nor have we been able to find one for the fluctuations which take place in the numbers of the Starling, the Wheatear and the Common Tern.

We have written this paper to draw attention to the variations which take place in a limited area. It is a line of investigation which we think would well repay greater study, and which, if pursued in other areas showing different conditions, might yield sufficient data to make it possible to draw definite conclusions.

Albino Mole in Berwickshire.—I have sent to the Royal Scottish Museum a fine example of albino Mole, caught at Coveyheugh, Reston, on 8th October. I have heard of no similar occurrence in the district.—A. BAIRD, Reston.

Wood Sandpiper at North Uist.—A small wader, identified at the Royal Scottish Museum as a Wood Sandpiper, was shot by me on the shore at Lochmaddy, near Vallay, on 19th October 1925.—GEORGE BEVERIDGE, Lochmaddy.

Black Redstarts in Wigtownshire.—On 6th November I watched two Black Redstarts (*Phœnicurus ochrurus gibraltariensis*) on the Mull of Galloway; they were flitting about in the short heather and were within a few yards of me and comparatively tame.—M. BEDFORD.

Gulls and Corn.—This season we have made some enquiries regarding the damage said to be done to corn crops by Gulls, and find that east of Largo Herring Gulls took a lot from the stooks. Sir Thomas Erskine, Cambo (that is right out on the sea between Crail and St Andrews), cut a field before anybody in the neighbourhood, and he told us that practically the whole of it was eaten up by Herring Gulls, which sat on the stooks and devoured the grain. He found that the damage done was not quite so bad when other fields had been cut, as the Gulls, to some extent, forsook the first raided field for those newly cut. While we have been on the Isle of May we have seen quantities of Gull castings on the North Ness, composed entirely of corn, and these are castings of the Greater Blackback—there are comparatively few Herring Gulls on the May just now. As all the crop is stacked, the castings were probably corn picked up from the fields after the crop was in and so of no value. Herring Gulls have increased enormously as breeding birds on the Isle of May of recent years, so it may be these birds which devour the mainland crops.—LEONORA JEFFREY RINTOUL and EVELYN V. BAXTER.

Rose-coloured Starling in Perthshire.—On 5th October 1925, a beautiful specimen of the Rose-coloured Starling was shot at Invergowrie, Perthshire, where it was feeding in a stubble field in the company of a flock of Common Starlings.—R. KENNEDY, Invergowrie.

Seven-spotted Ladybird in Shetland.—I send you a Ladybird which was found here on 28th September 1925, at north part of the Isle. It may interest you as coming from Foula. Often Mrs Greenaway and I, during the summers we have been here, searched for a specimen, but always without result. I have made many enquiries locally and the people declare they have never seen a Ladybird on the Isle (I even had to tell them it was a Ladybird). Thinking the specimen may be of interest, I have pleasure in forwarding it to you.—WM. HARRY GREENAWAY, Isle of Foula, Shetland.

[*Coccinella septempunctata* does not appear to have been recorded from Shetland.—EDS.]

THE LAND AND FRESH-WATER MOLLUSCA OF BANFFSHIRE.

By JANE GOWAN.

IN *The Scottish Naturalist* for 1916, -17 and -18 the late Mr W. Denison Roebuck published lists of land and fresh-water mollusca for several Scottish vice-counties. At the same time he appealed to Scottish residents to help to increase the number of county records by collecting and sending him specimens for identification. In response to this appeal I forwarded a quantity of specimens from the neighbourhood of Cullen in Banffshire, and at the time of Mr Roebuck's death in February 1919, he had in preparation for *The Scottish Naturalist* a paper on the land and fresh-water mollusca of that county. Professor A. G. Boycott, in whose care Mr Roebuck's MSS. were placed, made search for the Banffshire list, but found only a number of incomplete slips. He, however, very kindly sent me a copy of the Banffshire records taken from the Conchological Society's census of British land and fresh-water mollusca, and also one of Mr Roebuck's notebooks, and from these was compiled the accompanying list of fifty-eight species for the county. The records are all authenticated by the Society's referees, Mr John W. Taylor, and Mr W. Denison Roebuck himself. Three of them, however, require confirmation, viz., *Helicella theripensis*, *Planorbis leucostoma*, and *Planorbis glaber*.

A few words on the physical features of the county may not be out of place. The vice-county of Banff coincides with the civil county. Extending from the Cairngorm Mountains in the south to the shores of the Moray Firth in the north, its surface is necessarily greatly diversified. The southern region includes the course of the Avon from its source to its junction with the Spey at Ballindalloch. It is wild and mountainous and to a large extent uncultivated. The central region comprises the basin of the Fiddich, a tributary of the Spey, and a large part of the upper valley of the Deveron with its tributary, the Isla. It is a pleasing combination of hill and heath, wood and water, with a

considerable proportion of arable land. The coastal region lies, roughly speaking, between the lower valleys of the Spey and the Deveron, with the parish of Gamrie extending some ten miles to the eastward of the mouth of the latter river. The hills are low and tame in outline, and most of the land is under cultivation. The coast-line is largely rocky, and at Gamrie the cliffs rise to a height of over 500 feet.

The names of collectors are, with a few exceptions, indicated in the list by initials only, as follows:—

(W. E.) W. Evans.	(L. H.) L. Hinxman.
(G. G.) G. Gordon.	(C. O.) C. Oldham.
(J. G.) J. Gowan.	(A. R.) A. Robertson.

1. LIMAX MAXIMUS—

Cullen, 24th May 1917 (J. G.).

var. *fasciata*, Tomintoul, 10th Sept. 1891 (W. E.).

„ *fasciata*, Cullen, 13th June 1917 (J. G.).

„ *obscura*, Cullen, 17th May 1917 (J. G.).

„ *mülleri*, Cullen, 17th July 1917 (J. G.).

2. LIMAX CINEREO-NIGER—

Cullen, 31st May 1917 (J. G.).

var. *maura*, Glen Fiddich, altitude 800 ft., 17th July 1891 (G. G.).

var. *maura*, Cullen, altitude 160 ft., 22nd Aug. 1917 (J. G.).

var. *intermedia*, Cullen, 21st June 1917 (J. G.).

„ *ornata*, Cullen, 15th Aug. 1917 (J. G.).

„ *luctuosa*, Cullen, 22nd Aug. 1917 (J. G.).

3. LIMAX ARBORUM—

Ballindalloch, 25th Aug. 1891 (W. E.).

Banffshire, Sept. 1891 (G. G.).

Fochabers, east of Spey, 7th Oct. 1910 (C. O.).

Cullen, 5th May 1917 (J. G.).

var. *alpestris*, Glen Fiddich, 17th July 1891 (G. G.).

4. AGRILIMAX AGRESTIS—

Macduff, Dec. 1890 (A. R.).

Cluny Moor, 700 ft., 17th July 1891 (G. G.).

4. AGRIOLIMAX AGRESTIS—*continued*.

Ballindalloch, 25th Aug. 1891 (W. E.).

Cullen, 17th July 1917 (J. G.).

var. *reticulata*, Tomintoul, 7th Nov. 1890 (L. H.).

„ „ Dufftown, Nov. 1892 (L. H.).

„ „ very dark, Cullen, 24th April 1917
(J. G.).

5. AGRIOLIMAX LEVIS—

Portknockie, 29th April 1917 (J. G.).

6. ARION ATER—

Ballindalloch, 25th Aug. 1891 (W. E.).

Dufftown, Nov. 1892 (L. H.).

Tomintoul, 10th Sept. 1891 (W. E.).

Cullen, 8th May 1917 (J. G.).

var. *livida*, Cullen, 15th Aug. 1917 (J. G.).

„ *nigrescens*, Cullen, 17th July 1917 (J. G.).

„ *trifascipes*, Cullen, 8th May 1917 (J. G.).

„ *fasciata*, Cullen, 24th April 1917 (J. G.).

„ *swammerdami*, Cullen, 24th May 1917 (J. G.).

„ *castanea* + *marginata*, Cullen, 11th Aug. 1917
(J. G.).

„ *olivacea* + *marginata*, Cullen, 2nd Aug. 1918 (J. G.).

7. ARION SUBFUSCUS—

Ballindalloch, 25th Aug. 1891 (W. E.).

Fochabers, east of Spey, 7th Oct. 1910 (C. O.).

Cullen, 6th Sept. 1917 (J. G.).

var. *rufofusca*, Deskford, 19th June 1917 (J. G.).

8. ARION HORTENSIS—

Macduff, Dec. 1890 (A. R.).

Tomintoul, 10th Sept. 1891 (W. E.).

Cullen, 24th April 1917 (J. G.).

9. ARION CIRCUMSCRIPTUS—

Tomintoul, 7th Nov. 1890 (L. H.).

Ballindalloch, 25th Aug. 1891 (W. E.).

Dufftown, Nov. 1892 (L. H.).

Aberlour, Nov. 1892 (L. H.).

Cullen, 24th April 1917 (J. G.).

10. ARION MINIMUS—

Ballindalloch, 25th Aug. 1891 (W. E.).

Dufftown, Nov. 1892 (L. H.).

Aberlour, Nov. 1892 (L. H.).

Cullen, 21st June 1917 (J. G.).

var. *grisea*, Portknockie, 29th April 1917 (J. G.).

11. VITRINA PELLUCIDA—

Tomintoul, Oct. 1890 (L. H.).

Macduff, Dec. 1890 (A. R.).

Ballindalloch, 25th Aug. 1891 (W. E.).

Banff. P. Burnett's Collection, Banff Museum.

Cullen, 21st July 1917 (J. G.).

12. HYALINIA CELLARIA—

Macduff, Dec. 1890 (A. R.).

Banff. P. Burnett's Collection, Banff Museum.

Cullen, 21st June 1917 (J. G.).

var. *albinos*, Deskford, 17th Aug. 1917 (J. G.).

13. HYALINIA ALLIARIA—

Tomintoul (L. H.).

Cullen, 16th June 1917 (J. G.).

14. HYALINIA NITIDULA—

Tomintoul (L. H.).

Cullen, 17th May 1917 (J. G.).

var. *lucens*, Portknockie, 26th July 1917 (J. G.).

15. HYALINIA PURA—

var. *margaritacea*, Ballindalloch, May 1893 (W. E.).

„ „ Cullen, 4th Aug. 1917 (J. G.).

„ *nitidosa*, Cullen, 20th July 1917 (J. G.).

16. HYALINIA RADIATULA—

Ballindalloch, 15th Aug. 1891 (W. E.).

Cullen, 21st June 1917 (J. G.).

17. HYALINIA ROGERSI—

Ballindalloch, 25th Aug. 1891 (W. E.).

18. HYALINIA CRYSTALLINA—

Ballindalloch, 25th Aug. 1891 (W. E.).

Tomintoul, Oct. 1890 (L. H.).

Cullen, 21st July 1917 (J. G.).

var. *contracta*, Tomintoul, Oct. 1890 (L. H.).

19. *HYALINIA FULVA*—
 Ballindalloch, 25th Aug. 1891 (W. E.).
 Macduff, 31st Aug. 1917 (J. G.).
 Cullen, 10th Sept. 1917 (J. G.).
20. *ZONITOIDES NITIDUS*—
 Cullen, 21st July 1917 (J. G.).
 Boyne, 15th Sept. 1917 (J. G.).
21. *PUNCTUM PYGMÆUM*—
 Ballindalloch, 15th Aug. 1891 (W. E.).
 Cullen, 11th Sept. 1917 (J. G.).
22. *PYRAMIDULA ROTUNDATA*—
 Ballindalloch, 15th Aug. 1891 (W. E.).
 Dufftown, Nov. 1892 (L. H.).
 Macduff. P. Burnett's Collection, Banff Museum.
 Cullen, 10th Sept. 1917 (J. G.).
 var. *rufula*, Boyne, 6th Aug. 1917 (J. G.).
23. *ACANTHINULA ACULEATA*—
 Cullen, 10th Sept. 1917 (J. G.).
24. *ACANTHINULA LAMELLATA*—
 Cullen, 4th Aug. 1917 (J. G.).
25. *HELIX ASPERSA*—
 Banff, W. Baillie.
 Cullen, 13th June 1917 (J. G.).
 monst. *sinistrorsum*, Banff. P. Burnett's Collection,
 Banff Museum.
26. *HELIX HORTENSIS*—
 Craigellachie (G. G.).
 var. *lutea*, Gamrie, 1881. P. Burnett's Collection.
 " " Glen Rinnes, 23rd June 1883. P. Burnett's
 Collection, Banff Museum.
 " " Tomintoul, Oct. 1890 (L. H.).
 " " Dufftown, Nov. 1892 (L. H.).
 " " Cullen, 5th June 1917 (J. G.).
 " *lutea roseolabiata*, Cullen, 17th May 1917 (J. G.).
 " *arenicola*, Cullen, 17th May 1917 (J. G.).
 " *carnea*, Cullen, 17th May 1917 (J. G.).
 " " Banff. P. Burnett's Collection.

26. *HELIX HORTENSIS*—*continued*.
 var. *libellula*, Banff. P. Burnett's Collection.
 „ *castanea*, Cullen, 17th May 1917 (J. G.).
 „ *albina*, Cullen, 13th June 1917 (J. G.).
 „ *incarnata*, Banff, 31st July 1917 (A. E. Mahood).
 „ *lilacina*, Boyne, 15th Sept. 1917 (J. G.).
27. *ARIANTA ARBUSTORUM*—
 Dufftown, Nov. 1892 (L. H.).
 Tomintoul (L. H.).
 Inchrory, Glenavon, June 1893 (L. H.).
 Portknockie, 29th April 1917 (J. G.).
 Boyne. P. Burnett's Collection, Banff Museum.
 var. *fuscescens*, Cullen, 5th June 1917 (J. G.).
28. *HELICELLA HERIPENSIS*—
 Banffshire, no locality stated. Six in box labelled
Helix virgata and *Helix caperata*. P. Burnett's
 Collection, Banff Museum.
29. *HYGROMIA FUSCA*—
 Cullen, 21st July 1917 (J. G.).
 Boyne, 6th Aug. 1917 (J. G.).
30. *HYGROMIA GRANULATA*—
 Boyne, 6th Aug. 1917 (J. G.).
 var. *alba*, Boyne, 15th Sept. 1917 (J. G.).
31. *VALLONIA PULCHELLA*—
 Sandend, 27th Aug. 1917 (J. G.).
32. *ENA OBSCURA*—
 Dufftown, Nov. 1892 (L. H.).
 Tomintoul (L. H.).
 Inchrory, Glenavon, June 1893 (L. H.).
 Boyne, 6th Aug. 1917 (J. G.).
33. *PUPA UMBILICATA*—
 Whitehills. P. Burnett's Collection, Banff Museum.
 Cullen, 10th Sept. 1917 (J. G.).
 Dufftown and Tomintoul, Nov. 1892 and 1890 (L. H.).
 var. *edentula*, Cullen, 10th Sept. 1917 (J. G.).

To be concluded.

SCOTTISH DIPLURA (*CAMPODEIDÆ*).

By RICHARD S. BAGNALL, F.R.S.E., F.L.S.

ALTHOUGH Meinert, upon describing *Campodea fragilis* from Denmark in 1864, apparently realised that more than one species existed, it was only in 1912, when Silvestri published his "Contribuzione alla Conoscenza dei Campodeidæ (Thysanura) d'Europa," that the group was put upon a workable basis. Only *C. staphylinus* was then known as British, but since I first paid attention to the group in 1911 I have recognised some twelve British species of which eight occur in Scotland.

Of the British species, *C. fragilis*, Mein., *C. silvestrii*, Bagn., *C. giardi*, Silv., and *C. grassii*, Silv., also occur on the Continent; whilst *C. lubbocki*, Silv., *C. gardneri*, Bagn., *C. lankesteri*, Silv., *C. meinerti*, Bagn., *C. wallacei*, Bagn., *C. staphylinus*, Westw., *C. westwoodi*, Bagn., and *C. devoniensis*, Bagn., appear to be peculiar to Great Britain, the last two species belonging to a section of the genus that is essentially southern in its distribution.

I think that further forms may yet be discovered in the south of England and the mountainous regions of Scotland.

CAMPODEA FRAGILIS, Mein.

Isle of May, 5/1914 (W. Evans); Dunbar, 9/1922; and St Andrews, 5/1924, plentiful; Aberdeen district, 6/1925.

CAMPODEA LUBBOCKI, Silv.

Juniper Green, 9/1922; Dundee, 5/1924; Banchory, 6/1925.

CAMPODEA SILVESTRII, Bagn. (*staphylinus* Silv. non. Westw.).

Rare, Melrose, 11/5/1924 and St Andrews 29/5/1924. Coast near Aberdeen, 6/1925.

CAMPODEA GARDNERI, Bagn.

A small but common species. Edinburgh, Colinton, Melrose, Juniper Green, Dundee, St Andrews, Aberdeen and Potarch (Kincardineshire), 6/1925.

CAMPODEA LANKESTERI, Silv.

The largest species. Juniper Green, 9/1922.

CAMPODEA MEINERTI, Bagn.

Both this and the preceding species are found in a rich soil very often accompanied by *C. lubbocki*. Juniper Green, 9/1922 and Dundee, 5/1924.

CAMPODEA WALLACEI, Bagn.

A rare but widely distributed species found in beech woods. West Newport, 1/1925.

CAMPODEA STAPHYLINUS, Westw.

Common throughout the country.

BOOK NOTICES

A MONOGRAPH OF THE BIRDS OF PREY (Order Accipitres). By H. Kirke Swan, F.Z.S., M.B.O.U. Part I. London: Wheldon and Wesley. 1925. Price 26s.

This great work is devoted to a group of birds which are second to none in interest to ornithologists. It is especially welcome since such a monograph has been a desideratum for many years, for it is now over half a century since there appeared the late Dr Bowdler Sharpe's *Catalogue of the Accipitres*, hitherto the only complete work on the subject. During this long interval very great advance in our knowledge of the Order has been made—many new species have been described, numerous racial forms have been recognised, great changes in nomenclature have taken place, and great discoveries in geographical distribution of many species have been made. It is a task, however, which presents innumerable difficulties and involves an immense amount of research. The part under notice comprises an Introduction (11 pages), which affords much interesting historical and other matter. The systematic portion (52 pages) treats of the family Cathartidæ, or New World Vultures, which comprises five genera, six species, and six racial forms, and an instalment of the family Egyptiidæ, or Old World Vultures, which includes six genera, six species, and six forms. The characters of each of these families and their genera, species, and forms are described. Full references to literature, details of geographical distribution, food, habits, nesting, eggs, English and native names, and copious synonymy are afforded for each species and form. Five species are depicted on three excellent coloured plates by Mr Gronvold, one plate of eggs, and one photogravure plate, the nest and young of the Griffon Vulture. Mr Kirke Swan has undertaken so formidable and difficult a task that its performance is bound to give rise to much criticism. He will, however, earn the gratitude of ornithologists for having systematised the vast amount of valuable and wide-spread matter at his disposal. The get-up of the book is excellent in all respects. It is expected that it will be complete in 12 parts.

THE CAIRNGORM HILLS OF SCOTLAND. By Seton Gordon, B.A., F.Z.S., M.B.O.U. London: Cassell & Co., Ltd. 1925. Pp. xii + 220. Price 15s. net.

No one is more familiar with the high grounds of the Cairngorms and with the somewhat sparse but highly interesting fauna which they sustain, than Mr Seton Gordon. Here he has gathered together, in a series of more or less independent essays, observations made at all times of the year and during many seasons. They indicate a boundless enthusiasm for the untrodden ways of the mountains,



Red Deer Calf.

"He rises unsteadily to his feet and endeavours to follow the photographer."

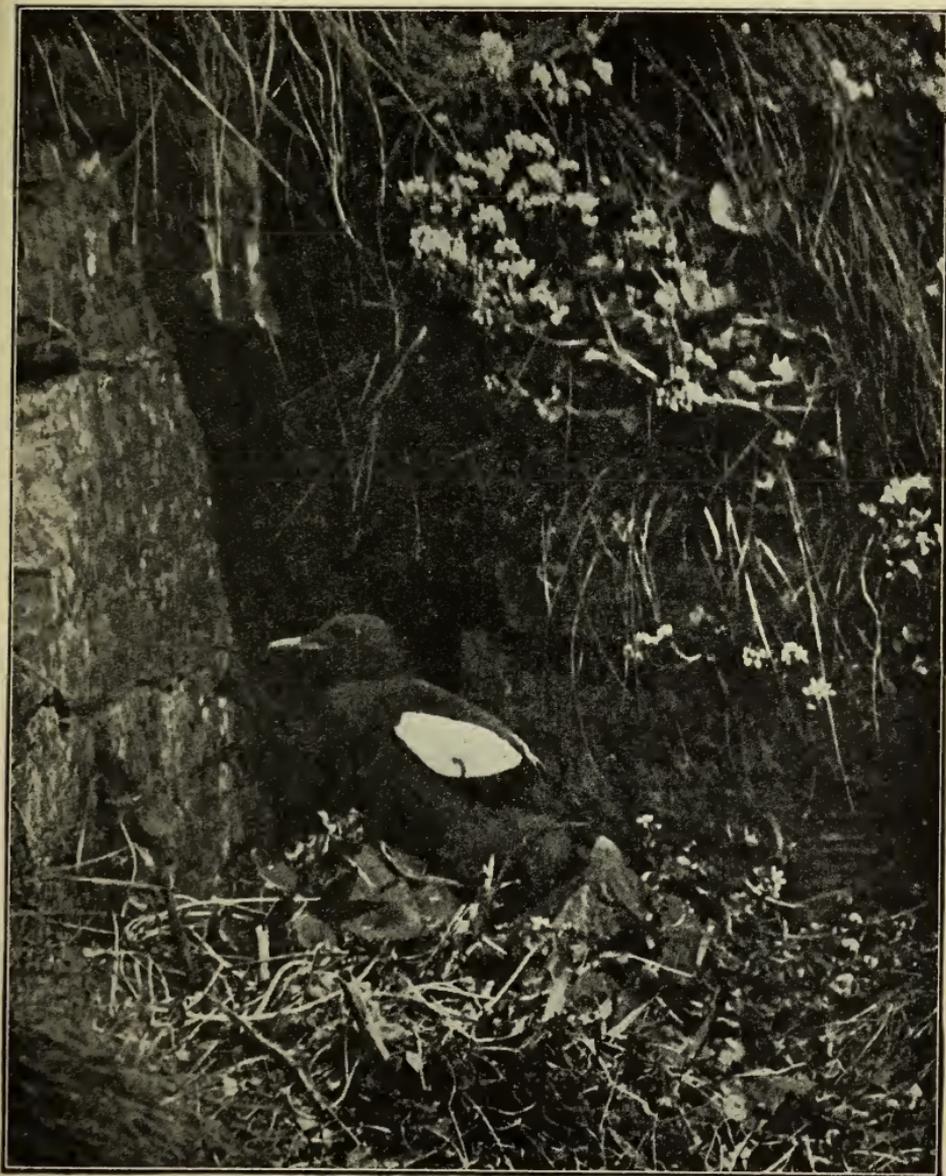
which his graphic prose passes easily on to the reader, but they show also close study of the ways of the hill animals, red and roe deer, foxes and mountain hares, and of such characteristic birds as the eagle, ptarmigan, red grouse, and the various waders which make their summer homes upon the uplands. Particularly interesting are his notes regarding the effects of late snow-storms upon the nesting of ptarmigan and red grouse, and odd observations, such as that of a dunlin upon the bleak summit of Monadh Mór, at 3600 feet, or the curious statement (which does not agree with MacGillivray's observations) that, while the calves of red and roe deer are born about the same time, the rutting season of the latter is earlier by two months. The attractiveness of the work is enhanced by a charming series of twenty-eight photographs taken by the author and Mrs Seton Gordon.

WOODCUTS OF BRITISH BIRDS. By E. Fitch Dalglish. With Descriptions by the Artist. London: Ernest Benn, Ltd. 1925. Price 25s.

The art of the wood engraver, as applied to book illustration, has unfortunately been long in abeyance. In connection with works on natural history, it was *the* feature of Bewick's *British Birds* in 1797-1804, and the work of the Thompsons contributed much to the attraction of Yarrell's classic in 1843. In late years, however, it has become almost a lost art in the delineation of natural history and other subjects. Now it is a pleasure to find it revived in the book under notice, wherein Mr Dalglish depicts twenty species of British birds—the Jackdaw, Jay, Bullfinch, Reed Bunting, Pied Wagtail, Red-backed Shrike, Ringouzel, Nightingale, Stonechat, Dipper, Wren, Spotted Flycatcher, Lesser Spotted Woodpecker, Long-eared Owl, Merlin, Heron, Ringed Plover, Puffin, Great Crested Grebe, and Black Grouse. Unique in their treatment, which is bold and in some cases unconventional, these are very fine examples of the wood engraver's art. The book is not an artist's work alone, but that of an ornithologist, for the accompanying letterpress is excellent, appropriate, and accurate in all respects, and affords information on the characteristics of his subjects, their distribution in our Isles, their instincts and habits, food, plumages, nesting and eggs, and their status as British birds.

THE SECRETS OF THE EAGLE AND OF OTHER RARE BIRDS. By H. A. Gilbert and Arthur Brook. London: J. W. Arrowsmith, Ltd. 1925. Pp. 196. Price 10s. net.

The world, as a whole, realises more clearly every year the pleasure there is in the observation of birds and how much more interesting it is to watch them and study their habits than to shoot them. This book should do much to encourage the protection of our rarer nesting birds. Anything more beautiful than Mr Brook's photographs of the Golden Eagle, in the air and at the nest, it would be difficult to imagine, and in addition to these he has pictures of many other interesting birds including Divers, Fulmars, Arctic Skuas and the Black Guillemot, here reproduced. Captain Gilbert, who accompanied Mr Brook on all his expeditions, contributes pleasantly written descriptions of their adventures on moorland and mountain, bogland and sea-cliff, and of the habits of the birds under observation. There is much in these descriptions of scientific value; both observers know their birds and they have combined to produce a book which should appeal to student and general reader alike.



Black Guillemot at entrance to nesting hole.

INDEX

NOTE.—No attempt is made to index in detail the species mentioned throughout articles.

A

Acherontia atropos, see Moth, Death's Head
Acrocephalus agricola, see Warbler, Jerdon's Reed-
Actinoloba, see Sea-Anemone
 Adaptations to habitat, the Sea-Slater, 13, 49
 Ailsa Craig, Slow-worm on, 159
 Altitude notes, further, from the Cairngorms, 148
 Amphipod Crustaceans attacking Cod ovary, 131
 Amphipod genus *Metopa* and Cœlenterates, associations between the, 149
Anguis fragilis, see Slow-worm
 Animal plagues, Sunspots and, 33
Anopheles bifurcatus, see Mosquito, Malarial
 Argyllshire, Pine Marten in, 4

B

BAGNALL, RICHARD S., *Ophiodesmus albanus* (Latz.), an addition to the Scottish Diplopod Fauna, 60; Two new Scottish Symphyles, 106; Scottish Diplura, 187
 BAIN, JOHN, White Wagtail nesting near Oban, 152
 BAIRD, A., Albino Mole in Berwickshire, 179
 Banffshire, Land and Fresh-water Mollusca of, 181
 BAXTER, EVELYN V., Starling feeding young on buds of Nipplewort, 152; Blue Shark in Largo Bay, 172
 BAXTER, EVELYN V., and RINTOUL, LEONORA JEFFREY, Report on Scottish Ornithology in 1924, 73, 109; Fluctuations in breeding birds on the Isle of May, 175; Gulls and corn, 180
 BEDFORD, DUCHESS OF, Habits of "Domesticated" Mandarin Duck, 132; Black Redstarts in Wigtownshire, 179
 Bell Rock, Death's Head Moth at, 159
 BERRY, WILLIAM, Generic habit

exhibited by "Domesticated" Mandarin Duck, 56; Strange death of Rook, 158
 Berwickshire, Convolvulus Hawk Moth in, 160; Hoopoe in, 158; Albino Mole in, 179
 BEVERIDGE, F. S., and JOHNSON, NORMAN M., Black-throated Divers on Dunfermline Loch, 168
 BEVERIDGE, GEORGE, Bean Geese in North Uist, 58; Wood Sandpiper at North Uist, 179
 Bird Life on Handa in 1925, 143
 Birds at high altitudes on Cairngorms, 108
 bold, and shy ones, 37
 breeding, fluctuations on Isle of May, 175
 new to Britain, 11, 141
 Scottish Ornithology in 1924, 73, 109
 Scottish Branch of the Royal Society for Protection of, 36
 Black, James E., death of, 99
Blattella germanica, see Cockroach, "German"
 BOOK NOTICES: The Biological Foundations of Society, Arthur Dendy, 27; Birds and their Relation to Man, Clarence M. Weed and Ned Dearborn, 27; Impressions of Great Naturalists, Henry Fairfield Osborn, 28; Insects: Their Structure and Life, George H. Carpenter, 28; Our Zoo and its Babies, W. Percival Westell, 61; Brian and the Wood-Folk, Maribel Edwin, 62; The Literature of the Charadriiformes from 1894 to 1924, George C. Low, 62; Supplementary Notes on the Birds of the Isle of Man, P. G. Ralfe, 62; Ross and Cromarty (Cambridge County Geographies), Prof. W. J. Watson, 63; The Biology of Flowering Plants, Macgregor Skene, 63; Catalogue of the Type Specimens of Lepidoptera Rhopalocera, Part I., Satyridæ, at present in the Collections at South Kensington, 63; A Hundred Years in the Highlands, Osgood Hanbury

Book Notices—*continued.*

- Mackenzie of Inverewe, 64; Water-side Creatures, Frances Pitt, 161; Growth, G. R. de Beer, 162; Living Organisms: an Account of their Origin and Evolution, Edwin S. Goodrich, 162; The British Hydracarina, Charles D. Soar and W. Williamson, 163; Queer Fish: and Other Inhabitants of the Rivers and Oceans, E. G. Boulenger, 163; The Romance of the Fungus World, R. J. and F. W. Rolfe, 163; Concerning the Habits of Insects, F. Balfour-Browne, 164; The Cairngorm Hills of Scotland, Seton Gordon, 189; A Monograph of the Birds of Prey, Part I., H. Kirke Swan, 188; Woodcuts of British Birds, E. Fitch Dalglish, 190; The Secrets of the Eagle and of other Rare Birds, H. A. Gilbert and Arthur Brook, 190
 Bunting, Snow, nesting in Southern Inverness-shire, 148

C

- Cairngorms, Birds at high altitudes on, 108
 Further altitude notes from the, 148
 CALDERWOOD, W. L., Malformed Salmon, 4
Campodeidæ, see Diplura, Scottish
 Carter, A. E. J., death of, 100
 Cat swimming a river, 12
Cerura vinula, see Moth, Puss-
 CHATTERTON, JOAN M., Land Rail in Orkney in Winter, 57
 CLARKE, WM. EAGLE, Rose-coloured Starling in the Outer Hebrides, 148; Snow Bunting nesting in Southern Inverness-shire, 148;
 Clyde, Firth of, increase of Eider Ducks in, 95
Coccinella septempunctata, see Ladybird, Seven-spotted
 Cockroach, "German," spread to Aberdeenshire, 96
 Cœlenterates, Associations between the Amphipod genus *Metopa* and, 149
 CONNELL, CHARLES G., Red-crested Pochard in Midlothian, 21; Bird Life on Handa in 1925, 143
 CRAW, JAS. HEWAT, Hoopoe in Berwickshire, 158
 Crows, Hybrid, mixed plumages in a brood of, 101
 Crustaceans, Amphipod, attacking Cod's ovary, 131

D

- DEAN, L. M. ISOBEL, spread of the "German" Cockroach to Aberdeenshire, 96
 Diploped Fauna, addition to Scottish, 60
 Diplura, Scottish, 187
 Divers, Black-throated, on Dunfermline Loch, 168
 Don, Bull-headed Sea-Trout in, 10
 Dove's, Stock, nest under a bridge, 108
 Duck, Mandarin, habits of "Domesticated," 132
 Mandarin, generic habit exhibited by, 56
 Duddingston Loch, Ruddy Sheld-Duck at, 68
 Dunfermline Loch, Black-throated Divers on, 168
Dysdera crocata, see Spider

E

- Eagle eccentricities, 1
 Golden, and Fox, 46
 Edinburgh, Malarial Mosquito, *Anopheles bifurcatus*, L., near, 159
Rhyssa persuasoria, L., in, 160
 District, Flocks of Tree-Sparrows in, 23
 Eider Ducks, increase in Firth of Clyde, 95
 ELMHIRST, RICHARD, Associations between the Amphipod genus *Metopa* and Cœlenterates, 149; The Feeding Habits of the Sea-Anemone, *Actinoloba*, 149
 EVANS, the late WILLIAM, The Starling (*Sturnus vulgaris*) in the Forth Area, 5
 EVANS, W. EDGAR, On the supposed Occurrence in Scotland of the Sea-Anemone *Hormathia coronata* (Gosse), with Notes on its Reproduction, etc., 89
 EWART, R. N. THOMAS, Smew in Forfarshire, 57

F

- Fair Isle, Faroese Snipe at, 58
 Petchora Pipit at, 141
 FAULKNER, GWEN. H., Amphipod Crustaceans attacking Cod ovary, 131
 Fife, a rare Spider, *Dysdera crocata*, C.L.K., in, 160
 Flies, The Future of the Study of, 19
 Forfarshire, late occurrence of Lesser Tern in, 22
 Little Gull in, 23
 Smew in, 57

Forth Area, Starling in, 5
Fox, Golden Eagle and, 46

G

Geese, Bean, in North Uist, 58; in the Tay Area, 168

GLADSTONE, HUGH S., Cat swimming a river, 12; pugnacity of the Red-breast, 96

GORDON, AUDREY, Field Vole at great altitude in Skye, 147

GORDON, SETON, Birds at high altitudes on Cairngorms, 108; Further altitude notes from the Cairngorms, 148

GOWAN, JANE, the Land and Fresh-water Mollusca of Banffshire, 181

GREENAWAY, W. H., Seven-spotted Ladybird in Shetland, 180

Greenshank nesting in Scottish Lowlands, 107

GRIMSHAW, PERCY H., Remarkable Cocoon of the Puss-Moth (*Cerura vinula*, L.), 25; The Food of the Ptarmigan, 69; Malarial Mosquito, *Anopheles bifurcatus*, L., near Edinburgh, 159; *Rhyssa persuasoria*, Linn., in Edinburgh, 160; A Rare Spider, *Dysdera crocota*, C.L.K., in Fife, 160

Grouse, Red, eggs of unusual colour, 107

Weasel and Sparrow-Hawk, 58

Gull, Iceland, in West Lothian, 22

Little, in Forfarshire, 23

Sabine's, in West Lothian, 22

Gulls and Corn, 180

GUNNIS, FRANCIS G., Golden Eagle and Fox, 46; Grouse, Weasel and Sparrow-Hawk, 58

H

HAMILTON, DAVID, and NASH, J. KIRKE, Rare Gulls in West Lothian, 22; Flocks of Tree-Sparrows in Edinburgh District, 23; The Ruddy Sheld-Duck at Duddingston Loch, 68

Handa, Bird Life on, in 1925, 143

Hare, Mountain, Increase in Scottish Lowlands, 47

Haswell, Professor W. A., death of, 36

Hawfinch in Scotland, 39

Hebrides, Outer, Rose-coloured Starling in, 148

Henderson, Professor J. R., death of, 167

Herring's Food, The food of the, 59

High altitudes, birds at, on Cairngorms, 108

Hive-Bee, new facts about the, 97; error corrected, 136

Hoopoe in Berwickshire, 158

Hoplonyx leucophthalmus, see Amphipod Crustaceans

Hormathia coronata, supposed occurrence in Scotland, 89

HUGHES - ONSLOW, J., Polygamy amongst Sparrow-Hawks, 95

Human transport and wild life, 133

Humble-Bees' unusual nesting sites, 26

HUNTER, DOUGLAS G., Late occurrence of the Lesser Tern in Forfarshire, 22

Little Gull in Forfarshire, 23

Nesting habits and incubation period of the Redwing, 158

I

Incubation period of the Redwing, 158

Inverness-shire, Southern, Snow-Bunting nesting in, 148

Irish Naturalist's Journal noticed, 136

J

JAMIESON, HENRY, Oyster-catcher eating Tern's eggs, 108

JOHNSON, NORMAN M., see BEVERIDGE, F. S.

K

KENNEDY, R., Rose-coloured Starling in Perthshire, 180

Kirkcudbrightshire, Albino Brown Rats in, 68

Golden Oriole in, 100

L

Ladybird, Seven-spotted, in Shetland, 180

Lammermoors, Mammals of the, 67

Lanarkshire, Crested Tit in, 46

Lanarkshire Rooks, roosting habits of — corrections, 23

Largo Bay, Blue Shark in, 172

Ligia oceanica, see Sea-Slater

LOGAN-HOME, W. M., *Convolvulus Hawk Moth* in Berwickshire, 160

Lothian, West, rare Gulls in, 22

Lowlands, Greenshank nesting in Scottish, 107

M

M'WILLIAM, J. M., Increase of Eider Ducks in Firth of Clyde, 95; Slow-worm on Ailsa Craig, 159

MALLOCH, THOMAS, Great destruction of Marine Animals by severe weather, 132

- Mammals of the Lammermoors, 67
 Marine Animals, Great destruction of,
 by severe weather, 132
 Marten, Pine, in Argyllshire, 4
 MAXWELL, Sir HERBERT, Bold Birds
 and Shy Ones, 37
 May, Isle of, Fluctuations in breeding
 birds, 175
 MENZIES, W. J. M., Bull-headed Sea-
 Trout in Don, 10
Metopa, see Amphipod
 Midlothian, Red-crested Pochard in,
 21
 MILLAR, W. M. C., A Rat Migration,
 169
 Mole, Albino, in Berwickshire, 179
 Mollusca, Land and Fresh-water, of
 Banffshire, 181
 MORRIS, DAVID B., The Whale
 remains of the Carse of Stirling,
 137
 Mosquito, Malarial, *Amopheles bifur-*
catus, L., near Edinburgh, 159
 Moth, Convolvulus Hawk, in Berwick-
 shire, 160
 Death's Head, at Sea, 159
 Puss-, remarkable cocoon of, 25

N

- NASH, J. KIRKE, The Hawfinch in
 Scotland, 39
 See under HAMILTON, DAVID
 NEILL, R. M., Death's Head Moth at
 Sea, 159
 Nesting habits of the Redwing, 158
Netta rufina, see Pochard, Red-crested
 North Sea, Death's Head Moth in mid,
 159

O

- Oban, White Wagtail nesting near, 152
Ophiodesmus albonanus (Latz.), an
 addition to the Scottish Diplopod
 fauna, 60
 Oriole, Golden, in Kirkcudbrightshire,
 100
 Orkney, Albino Shags in, 57
 Land Rail in, in winter, 57
 Oyster-catcher eating Tern's eggs, 108

P

- Penguins, King, in Scottish Zoological
 Park, 29, 153
 Perthshire, Rose-coloured Starling in,
 180
 Pheasant eating Field Vole, 152
 Pipit, Meadow, at high altitude on
 the Cairngorms, 148; Petchora, at
 Fair Isle: an addition to the British
 avifauna, 141

- Plumages, Mixed, in a brood of Hybrid
 Crows, 101
 Pochard, Red-crested, in Midlothian,
 21
 Polygamy amongst Sparrow-Hawks, 95
 Ptarmigan, the food of the, 69
 Pugnacity of the Redbreast, 96

R

- Rail, Land, in Orkney in winter, 57
 Rat Migration, A, 169
 Rats, Albino Brown, in Kirkcudbright-
 shire, 68
 Red-Admiral Butterfly at high altitude
 on the Cairngorms, 148
 Redbreast, Pugnacity of the, 96
 Redstarts, Black, in Wigtownshire, 179
 Redwing, Cinnamon variety of, 25
 Nesting habits and incubation period
 of the, 158
 Report on Scottish Ornithology in
 1924, 73, 109
Rhyssa persuasoria, L., in Edinburgh,
 160
 RINTOUL, A. JEFFREY, Pied Wagtails
 hatching and rearing Blackbirds,
 168
 LEONORA JEFFREY, see BAXTER,
 EVELYN V.
 RITCHIE, JAMES, Increase of the
 Mountain Hare in the Scottish
 Lowlands, 47
 ROBINSON, H. W., Albino Shags in
 Orkney and Shetland, 57
 Rook, strange death of, 158
 Rooks, roosting habits of Lanarkshire
 —corrections, 23

S

- Salmon, malformed, 4
 Sandpiper, Wood, at North Uist, 179
 Scotland, first recorded appearance of
 Black-headed Wagtail in, 107
 Hawfinch in, 39
 Ornithology in 1924, 73, 109
 Supposed occurrence of the Sea-
 Anemone, *Hormathia coronata*, 89
 Two new Symphyles, 106
 Whales stranded in 1923 and 1924, 59
 Scottish Diplopod Fauna, addition to, 60
 Diplura (*Campodeidæ*), 187
 Lowlands, increase of Mountain Hare
 in, 47
 Sea-Anemone, *Actinoloba*, feeding habits
 of, 149
 See *Hormathia coronata*
 Sea-Birds and Oil, observations on, 71
 Sea-Slater, a Study in adaptations to
 habitat, 13, 49
 Shags, Albino, in Orkney and Shetland,
 57

Shark, Blue, in Largo Bay, 172
 Sheld-Duck, Ruddy, at Duddingston Loch, 68
 Shetland, Albino Shags in, 57; Seven-spotted Ladybird in, 180
 SIMPSON, J. R., Stock Dove's nest under a bridge, 108
 Skye, Field Vole at great altitude in, 147
 Slow-worm on Ailsa Craig, 159
 Smew in Forfarshire, 57
 SMITH, J. AIKMAN, Albino Brown Rats in Kirkcudbrightshire, 68
 SMITH, J. N. DOUGLAS, Humble-Bees' unusual nesting sites, 26
 Snipe, Faroese, at Fair Isle, 58
 Wilson's, in South Uist, 11
 South London Entomological and Natural History Society, Proceedings for 1923-24, 59
 Sparrow-Hawk, Grouse and Weasel, 58
 Sparrow-Hawks, Polygamy amongst, 95
 Sparrows, Tree-, flocks of in Edinburgh District, 23
 Spider, a rare, *Dysdera crocota*, C.L.K., in Fife, 160
 Spring, Early, 1
 Starling feeding young on buds of Nipplewort, 152
 in the Forth area, 5
 Rose-coloured, in the Outer Hebrides, 148; in Perthshire, 180
 STENHOUSE, J. H., Faroese Snipe at Fair Isle, 58; Mixed Plumages in a brood of hybrid Crows, 101; The Petchora Pipit at Fair Isle: an addition to the British avifauna, 141; Jerdon's Reed-Warbler at Fair Isle, 173
 Stephen, A. C., appointment to Royal Scottish Museum, 100
 STEPHEN, A. C., Red Grouse eggs of unusual colour, 107
Sterna minuta, see Tern, Lesser
 STEWART, WALTER, Roosting habits of Lanarkshire Rooks—*corrections*, 23; Crested Tit in Lanarkshire, 46; Black-headed Wagtail—first recorded appearance in Scotland, 107
 Stirling, Carse of, the Whale remains of, 137
 Stock Dove's nest under a bridge, 108
 Sunspots and animal plagues, 33
 Symphyles, two new Scottish, 106

T

TAIT, Professor JOHN, The Sea-

Slater, *Ligia oceanica*: a Study in adaptations to habitat, 13, 49
 TAIT, ROBERT L., Golden Oriole in Kirkcudbrightshire, 100
 Tay Area, Bean Geese in, 168
 Tern, Lesser, late occurrence in Forfarshire, 22
 Tit, Crested, in Lanarkshire, 46
 Trout, Bull-headed Sea-, in Don, 10

U

Uist, North, Bean Geese in, 58; Wood Sandpiper at, 179
 South, Wilson's Snipe in, 11

V

VALPY, EDWARD, Pine Marten in Argyllshire, 4
 Vertebrate Fauna of Peeblesshire, new account noticed, 136
 Vole, Field, at great altitude in Skye, 147
 Vole, Field, Pheasant eating, 152

W

Wagtail, Black-headed, first recorded appearance in Scotland, 107
 Wagtail, White, nesting near Oban, 152
 Wagtails, Pied, hatching and rearing Blackbirds, 168
 Wanted—A "Nature Monuments Commission," 65
 Warbler, Jerdon's Reed-, at Fair Isle, 173
 Weasel, Grouse, and Sparrow-Hawk, 58
 Weather, severe, great destruction of Marine Animals by, 132
 WEDDERBURN, CHARLES S., Bean Geese in the Tay Area, 168
 WEDDERBURN, F. L. S., Pheasant eating Field Vole, 152
 Whale remains of the Carse of Stirling, 137
 Whales stranded in Scotland in 1923 and 1924, 59
 Wheatear at high altitude on the Cairngorms, 148
 Wigtownshire, Black Redstarts in, 179
 Wild life, human transport and, 133
 Wild life reserves, 165
 WILD, OLIVER H., Observations on Sea-Birds and Oil, 71
 WILSON, JEROME, Cinnamon variety of Redwing, 25

Z

Zoological Park, Notes from Scottish: The King Penguins, 29, 153

The Scottish Naturalist

No. 156]

1925

[NOVEMBER-DECEMBER



EDINBURGH: OLIVER & BOYD, TWEEDDALE COURT
LONDON: GURNEY & JACKSON, 33 PATERNOSTER ROW

Price 2s. 3d. Annual Subscription, payable in advance, 12s. 6d. post free

*Mailed Dec. 31, 1925
Recd Jan 15, 1926*

The Scottish Naturalist

A Magazine devoted to Zoology

With which is incorporated
"The Annals of Scottish Natural History"

EDITED BY

JAMES RITCHIE, M.A., D.Sc., F.R.S.E.,
Keeper, Natural History Department, Royal Scottish Museum

AND

PERCY H. GRIMSHAW, F.R.S.E., F.E.S.
Assistant Keeper, Natural History Department, Royal Scottish Museum

ASSISTED BY

EVELYN V. BAXTER, F.Z.S., H.M.B.O.U.	W. EAGLE CLARKE, I.S.O., LL.D.
LEONORA J. RINTOUL, F.Z.S., H.M.B.O.U.	ANDERSON FERGUSSON, F.E.S.
H. S. GLADSTONE, M.A., F.R.S.E., F.Z.S.	

All Articles and Communications intended for publication, and all Books, etc., for notice, should be sent to THE EDITORS, Royal Scottish Museum, Edinburgh.

Subscriptions and Advertisements should be addressed to the Publishers, MESSRS OLIVER AND BOYD, Tweeddale Court, Edinburgh.

Authors of General Articles will receive 25 Reprints (in covers) of their Contributions gratis. Additional Copies, in covers, may be had from the Printers, at the ordinary prices ruling, provided such orders accompany the Manuscript.

EVERY NATURALIST SHOULD READ

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

Observations on the Humble-Bees of Bute. (Illustrated.)

Observations on the Swift.

The Distribution of Ox Warble Flies in Scotland.

The Loggerhead Turtle in Scotland. (Illustrated.)

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.

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

The Scottish Naturalist

No. 154]

1925

[JULY-AUGUST



EDINBURGH: OLIVER & BOYD, TWEEDDALE COURT
LONDON: GURNEY & JACKSON, 33 PATERNOSTER ROW

Price 2s. 3d. Annual Subscription, payable in advance, 12s. 6d. post free

*Mailed Aug 21, 1925
Recd Sept 10, 1925*

The Scottish Naturalist

A Magazine devoted to Zoology

With which is incorporated
"The Annals of Scottish Natural History"

EDITED BY

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

Keeper, Natural History Department, Royal Scottish Museum

AND

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

Assistant Keeper, Natural History Department, Royal Scottish Museum

ASSISTED BY

EVELYN V. BAXTER, F.Z.S., H.M.B.O.U. | W. EAGLE CLARKE, I.S.O., LL.D.

LEONORA J. RINTOUL, F.Z.S., H.M.B.O.U. | ANDERSON FERGUSSON, F.E.S.

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

All Articles and Communications intended for publication, and all Books, etc., for notice, should be sent to THE EDITORS, Royal Scottish Museum, Edinburgh.

Subscriptions and Advertisements should be addressed to the Publishers, MESSRS OLIVER AND BOYD, Tweeddale Court, Edinburgh.

Authors of General Articles will receive 25 Reprints (in covers) of their Contributions gratis. Additional Copies, in covers, may be had from the Printers, at the ordinary prices ruling, provided such orders accompany the Manuscript.

EVERY NATURALIST SHOULD READ

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

- The Roosting Habits of the Rooks of Bute.
- Observations on a Pilot Whale. (Illustrated.)
- The Spread and Distribution of the Woodcock in Scotland.
- Observations on the Humble-Bees of Bute. (Illustrated.)
- Observations on the Swift.
- The Distribution of Ox Warble Flies in Scotland.
- The Loggerhead Turtle in Scotland. (Illustrated.)
- 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.

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

THE NATURALIST

A Monthly Illustrated Journal of Natural History for the North of England

Edited by T. SHEPPARD, M.Sc., F.G.S., The Museums, Hull, and
T. W. WOODHEAD, Ph.D., M.Sc., F.L.S., Technical Col., Huddersfield.

With the assistance, as Referees in Special Departments, of
GEO. T. PORRITT, F.L.S., F.E.S. ; JOHN W. TAYLOR, M.Sc. ;
RILEY FORTUNE, F.Z.S.

All Communications to be addressed to—

THE EDITORS, "THE NATURALIST," THE MUSEUMS, HULL
Annual Subscription, 15s. Single Numbers, 1s. 6d. net

LONDON: A. BROWN & SONS, Ltd., 5 Farringdon Avenue, E.C.

RECENTLY PUBLISHED

THE BORDERS AND BEYOND

ARCTIC . . . CHEVIOT . . . TROPIC

Being the experiences of a life-time devoted to the direct study
of nature in her wildest forms

By ABEL CHAPMAN, Author of "Bird Life of the Borders," and of Works
on Spain, Norway, British East Africa, and the Sudan. With Nineteen Coloured
Plates by W. H. RIDDELL and 170 Sketches by the Author. Maps, Diagrams, etc.

Large 8vo. 512 pp. 25s. net.

SAVAGE SUDAN

ITS WILD TRIBES, BIG GAME, AND BIRD LIFE

By ABEL CHAPMAN

Author of "On Safari in British East Africa," "Wild Spain,"
"Bird-Life of the Borders," etc.

With 248 Illustrations, chiefly from Rough Sketches by the Author

Large 8vo. 472 pp. 32s. net.

GUIDE TO THE BIRDS OF EUROPE AND NORTH AFRICA

By COLONEL R. G. WARDLAW RAMSAY, President of the British Ornithologists' Union, 1913-1918, Fellow of the Zoological Society. With a
Biographical Memoir by WILLIAM EAGLE CLARKE, LL.D.

Crown 8vo. 368 pp. Cloth, 12s. 6d. net.

LONDON: GURNEY AND JACKSON, 33 PATERNOSTER ROW
EDINBURGH: TWEEDDALE COURT

CONTENTS

	PAGE
Scottish Wild Life Reserves; and Editorial Note	165
A Rat Migration— <i>W. M. C. Millar, M.R.C.V.S.</i>	169
Jerdon's Reed-Warbler, <i>Acrocephalus agricola</i> , at Fair Isle; an Addition to the British Avifauna— <i>Surgeon Rear-Admiral J. H. Stenhouse</i>	173
Fluctuations in Breeding Birds on the Isle of May— <i>Evelyn V. Baxter and Leonora Jeffrey Rintoul</i>	175
The Land and Fresh-water Mollusca of Banffshire— <i>Jane Gowan</i>	181
Scottish Diplura (<i>Campodeidae</i>)— <i>Richard S. Bagnall, F.R.S.E., F.L.S.</i>	187
 Notes:	
Albino Mole in Berwickshire— <i>A. Baird</i> , 179; Pied Wagtails hatching and rearing Blackbirds— <i>A. Jeffrey Rintoul</i> , 168; Black-throated Divers on Dunfermline Loch— <i>F. S. Beveridge and N. M. Johnson</i> , 168; Bean Geese in the Tay Area— <i>Charles S. Wedderburn</i> , 168; Wood Sandpiper at North Uist— <i>George Beveridge</i> , 179; Gulls and Corn— <i>Leonora Jeffrey Rintoul and Evelyn V. Baxter</i> , 180; Black Redstarts in Wigtownshire— <i>Her Grace the Duchess of Bedford</i> , 179; Rose-coloured Starling in Perthshire— <i>R. Kennedy</i> , 180; Blue Shark in Largo Bay— <i>Evelyn V. Baxter</i> , 172; Seven-spotted Ladybird in Shetland— <i>Wm. H. Greenaway</i> , 180.	
Book Notices (<i>Illustrated</i>)	188
Index for 1925	192

PUBLISHERS' NOTE.

The Annual Subscription for 1926, payable in advance, 12s. 6d. post free, should be addressed to the Publishers, Oliver and Boyd, Tweeddale Court, Edinburgh.

COVERS FOR BINDING "THE SCOTTISH NATURALIST."

Special Cloth Cases for Binding the 1925 Volume can be supplied at 1s. 6d. each (by post 1s. 9d.), by Oliver and Boyd, Tweeddale Court, Edinburgh.



UNIVERSITY OF ILLINOIS-URBANA

570.5SCO

C001

SCOTTISH NATURALIST\$EDINBURGH

1923-25



3 0112 009740173