

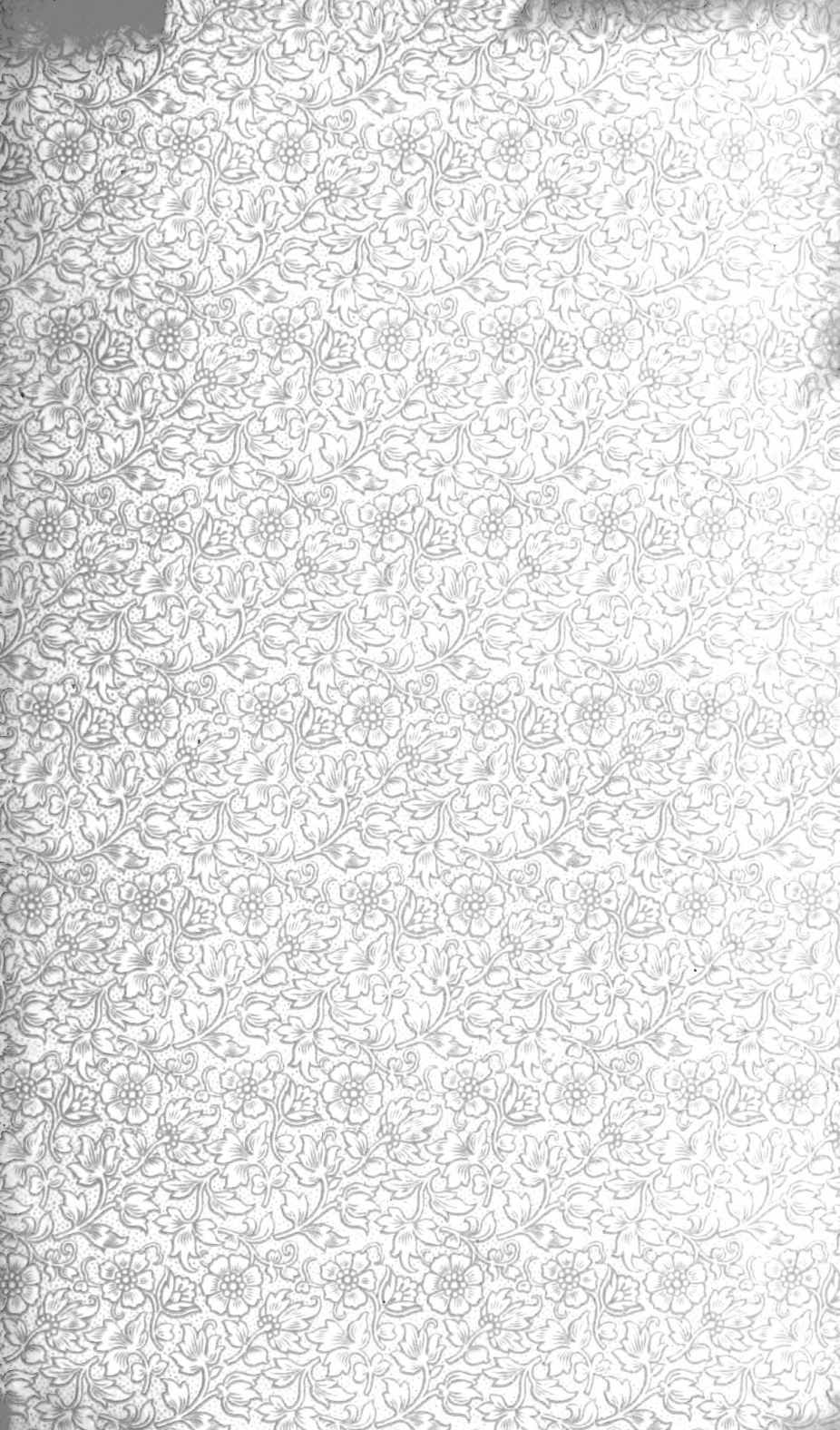
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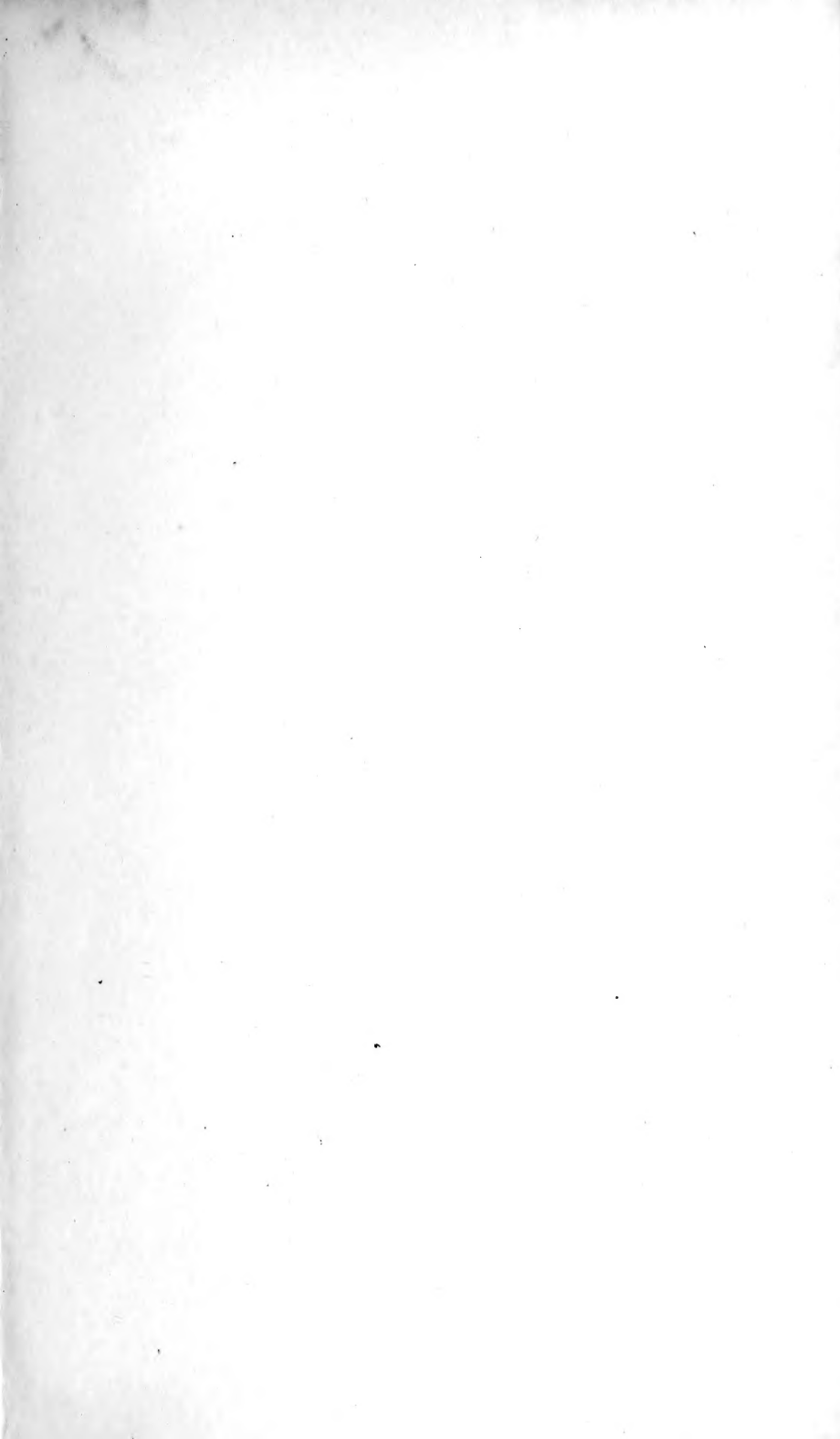
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J. E. HARTING, F.L.S., F.Z.S.,

MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION.

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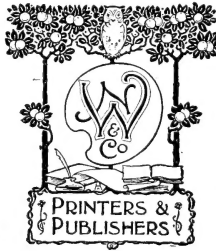
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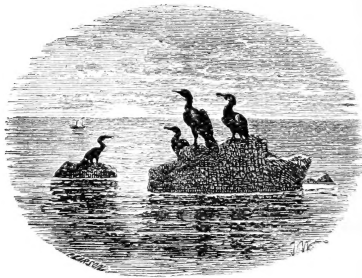
EXACTLY twenty years ago, on the death of the late Edward Newman, who founded 'The Zoologist' in 1843, and edited it until 1876, I undertook at the request of his son, Mr. T. P. Newman, and by desire of many of the contributors, to act as Editor of this Journal. For twenty years I have endeavoured to discharge the duties which thus devolved upon me to the best of my ability, and the task has been made a pleasant one by the cordial support which I have received on all sides from friendly correspondents. Had there been no other occupation for my leisure hours, I would have gladly continued in office, and worked with what energy I possess to carry on the editorship. Increase of years, however, has brought increase of work in other directions, and the demands now made upon my time have shown the desirability, if not the necessity, of relinquishing some portion of the work in hand. In no other way can I see a prospect of being able to accomplish what I have long contemplated, namely, the publication of new editions of my 'Handbook of British Birds,' 'The Birds of Middlesex,' 'Hints on the Management of Hawks,' and the preparation of an original work on 'British Quadrupeds,' for which I have been collecting material ever since 1874, when the second edition of Bell's standard work was published.

My first duty being to the learned Society which I have the honour to serve, everything must give place to the official work

which is daily cast upon me. Such other work as I may be able to accomplish can only be undertaken before that official work commences, or after it has ended.

Under these circumstances I must reluctantly resign the editorship of 'The Zoologist,' and in doing so I desire to express my warmest thanks to the many friends who have helped to lighten my labours. Without such assistance as I have received from them it would have been impossible for me to carry on the undertaking to the present time.

In placing the editorial pen in the hands of my successor, the accomplished naturalist, Mr. W. L. Distant, I can only wish him that measure of support which has been so long accorded to myself, and express the hope that under his guidance 'The Zoologist'—"that storehouse of information on British Zoology"—may long continue to flourish.



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NOTES ON A NEWLY-DISCOVERED HABIT IN THE BLACKCAP WARBLER AND OTHER BIRDS.

BY JOHN LOWE, M.D., F.L.S.

THE first part of this paper appeared in the pages of 'The Zoologist' for 1893. The later observations were made in Algeria and Corsica in the years 1894-5. Through the kindness of the Editor, I am enabled to give the whole of the notes in a continuous form. This it is advisable to do, as the later observations have to do with plants of species differing from those in the Canary Islands, although the habits of the birds are very similar.

In the garden of the Mariane Hotel, Orotava, Tenerife, are some large bushes of *Hibiscus rosa-sinensis* which in March are covered with brilliant scarlet blossoms. These being situated only a few feet from the balcony, one could, when sitting there, observe with great facility everything that passed on them. They were, at the time of my visit, a favourite resort of the Blackcap Warblers,* which came there to feed, taking but little notice of any one who might be on the balcony.

My attention was first called to these birds by observing the male every now and then fly to one of the flowers, creep along its stem, and peck at the calyx. On examining the flower to see what this proceeding meant, I found, in almost every instance,

* The Italians call the bird "Capo-nera."

that the two upper segments of the calyx had a small piece bitten out, leaving an oval opening, while in some cases the calyx was torn right across. On opening the calyx of a large number of flowers, it appeared that under each of the two upper segments there was a drop of slightly sweet, watery fluid. There was no semblance of a distinct nectary or of a glandular structure. The fluid was not found under any of the other segments, nor was it present in flowers growing low down on the bushes, and it was also absent from the flowers of a pink variety which grew near.

In none of these instances was there any laceration of the calyx, but a few scarlet flowers which occurred here and there on trees of the pink variety had nectar on the two upper calyx-segments, and these were always bitten. The object with which these perforations are made is, as it would seem, not merely for the purpose of sucking the nectar, but in order to furnish a bait to attract insects to serve as prey: at any rate, whether made primarily with this view, they certainly answered this purpose, for several times I observed the bird seize an insect in the act of visiting the pierced calyx, which after being bitten shows a moist spot. When this dried up I observed the bird tear the calyx across, so as to cause a fresh exudation of moisture, but this was never done until late in the day, when the moisture around the original openings had disappeared; all the newly-expanded flowers had the oval opening in the calyx unlacerated. After prolonged watching, I could not find that more than two species of insects visited the calyx, and these—one a small species of bee and the other a small wasp—flew directly to the calyx without visiting the flower. No flies of any kind came, and no other insect except a species of ant, which evidently came to visit the few aphides living on the calyx. They did not enter the calyx, however, to feed on the nectar, as I subsequently found another species doing on the flowers of *Abutilon*.

It did not appear that any insect visited the interior of the flowers except a large species of *Bombus*, and this always went straight to the flower itself, and never attempted the calyx. It was able to reach the fluid through the openings which exist betwixt the petals at their base, and did not probe any openings between the petals other than the two upper ones. It did not visit the flowers which were situate low down on the bushes, and never entered the pink flowers, though the scarlet

ones on the same bush were visited. The reason of this was obvious, for the petals of all the pink flowers overlapped at the base, leaving no opening by which the calyx could be reached. Honey-bees, which abounded on the neighbouring trees, did not visit the *Hibiscus*.



FIG. 1.—*Abutilon*, with calyx torn by *Sylvia atricapilla* and *Parus tenerife*.

At Monte, near Las Palmas, Grand Canary (March 22nd), I found that *Hibiscus rosa-sinensis* had been treated in the same way as at Orotava, by the "Capirote" (*Sylvia atricapilla*). But I also found that a shrubby species of *Abutilon*, another plant of the *Hibiscus* family, with large pendant orange-coloured flowers, had undergone a similar mutilation of the calyx.

In this instance, however, there were notable differences. The base of the calyx has nectar all round the receptacle, and not, as in *Hibiscus*, only on the inner surface of the two upper calyx-segments. Hence the openings were made on any or all of the calyx-segments. I did not observe that they were made by the Blackcap, though they might have been in some instances. The chief agent was a black-headed Titmouse (*Parus tenerife*, Tristram), which can scarcely be regarded as a nectar-eater. The object of this proceeding seems to be to afford a ready means

by which the ants may arrive at the nectary. These, after the calyx is torn (never before, owing to the pendant character of the flower), enter in great numbers, and after consuming the nectar are found in a semi-torpid state, making no attempt to escape on being disturbed. They thus fall an easy prey to the Tits, which visit all the flowers at short intervals during the day, and clear off the ants. Another bird closely resembling the Willow Wren, but which builds its nest in palm and ficus trees, also makes periodic visits to the *Abutilon* flowers for the purpose of feeding on the ants. Canon Tristram informs me that he has named this *Phylloscopus fortunatus*. I could not observe that it took any part in lacerating the calyx. Late in the day the Titmice may be seen vigorously tearing the calyx, apparently with the object of producing a fresh exudation to attract the ants, the supply of nectar having been exhausted.



FIG. 2.—*Hibiscus rosa-sinensis*.

A. Openings visited by *Bombus*; B, ditto, by *Sylvia atricapilla*.

The only insect which I found visiting the interior of the flowers of *Abutilon* was a large species of *Bombus* which climbs up the stamens of the pendant flower and probes the nectary through all

the openings at the base of the petals. These are much wider than in *Hibiscus*, and all equally visible to the bee. The axis of the flower of *Hibiscus*, on the contrary, being horizontal instead of vertical, the bee on entering along the upper surface of the stamens sees only two openings through which light appears, the other three being below the point of vision and partly concealed by the stamens. These two openings are probed by the bee, and they exactly correspond with the spots on the two upper calyx-segments where alone the nectar is found.

In this fact, and in the absence of nectar in the pink variety, where, from the overlapping of the petals, no openings exist at the base, and also from the fact that no nectar is found in the lowest flowers on the *Hibiscus* which are not visited by the bees, we see a striking proof of the correctness of the theory that nectaries are due to the irritation caused by insects.

On this subject Professor Henslow says:—"The glands are occasionally borne on the sepals, as of the Lime. . . . Hence no rule can be established as to the places where one would be likely to find honey on *à priori* grounds. . . . With regard to the origin of honey-bearing organs or 'nectaries,' there are many reasons for inferring their existence to be due to the direct irritating action of insects themselves when searching for juices as food or otherwise."*

A device, similar to those above mentioned, I found practised in the Grand Canary on another species of plant, *Aloe vulgaris* or *vera*. In this instance the corolla was bitten on the upper surface, close to the base, thus enabling insects to arrive at the nectar easily, which, in consequence of the length and narrowness of the tube, they could not otherwise do. All the flowers of this plant growing near the Gran Caldero were thus mutilated.

Sitting down to watch, I found that the Blackcap and the smaller Warbler (*Phylloscopus fortunatus*) visited all the flowers in search of insects. Being somewhat late in the day, I did not see either of them tear the flowers, but this, as a rule, is done in the early morning. The *Phylloscopus*, indeed, so far as I could observe, did not in any case tear the flowers, but only made use of them when torn by the two other species.

It is, of course, possible that the Blackcap may, in the first

* 'The Making of Flowers,' pp. 107, 108.

instance, feed on the nectar, but certainly neither it nor *Phylloscopus*, at their subsequent visits, does anything more than search for insects.

Since the foregoing observations were written I have had the opportunity of making fresh investigations on this subject in Algiers.

In the garden of the Hôtel St. George, Mustapha Supérieure, a number of good-sized shrubs of *Abutilon* were found in full flower. These were of several varieties. At the time of my arrival I examined them all carefully. On March 12th, 1894, not a single flower had its calyx torn, and though I watched diligently I could not discover, either in this or the adjoining gardens, any Blackcap or other Warbler. Nor were there any species of *Bombus* visiting the flowers. Hive-bees were there in profusion, but they did not, as a rule, enter the flowers, as they could probe the nectary through the openings at the base of the petals. On one plant, however, where the flowers were large and well formed, they did enter in the usual way. A few days later, at the Jardin d'Essai, numbers of Blackcaps were seen, and I found a good-sized bush of *Abutilon* on which all the calyces were torn, just as had been observed in the Grand Canary.

The reason why those in the garden of the "St. George" were not torn was apparently that, owing to the cold wet weather which had lately prevailed to an unusual degree, there were scarcely any insects to be seen. Even the ants, the nests of which were abundant, did not stir abroad, and were not to be seen on the plants or trees. It was not until finer weather set in, on March 23rd, that the warblers put in an appearance. On this day the Blackcap, Garden Warbler, and a *Parus* closely resembling *P. tenerifæ*, were seen. The first of these was observed tearing the calyx of *Abutilon*, which had hitherto shown no trace of laceration; a day or two subsequently nearly the whole of them were torn on all the trees, with one exception. This was a large, coarse-leaved variety with yellow flowers, which I found entirely devoid of nectar. For some unexplained reason the *Bombus* did not visit this plant.

The Garden Warbler, when first noticed, was busily engaged in creeping up the flower-spikes of *Gladiolus* (*Antholyza*) *ethiopicus*, which is very abundant in most of the gardens in Algiers. Beginning at the lowest flower, it was seen to pick out a small

piece at the base of each corolla-tube in turn as it ascended the stem. I could not ascertain whether this was done for the purpose of sucking the nectar, of which the corolla was full, but it seems probable that this was the case. The act was very quickly performed, if there was any suction, as only two or three seconds were spent at each flower. As to the question of these openings being made for the purpose of attracting insects, there were so few of these about, owing to the cold, that it was impossible to arrive at any definite conclusion. There was, however,

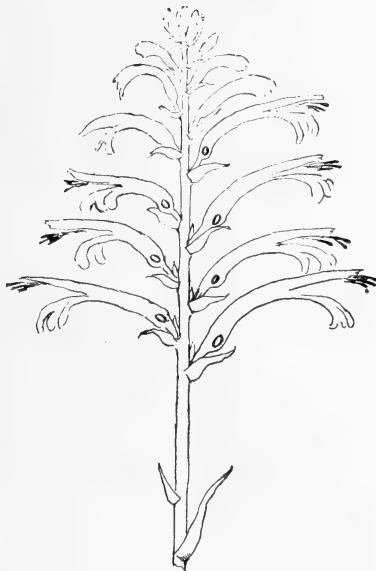


FIG. 3.—*Antholyza ethiopica*, showing punctures made by the Garden Warbler, *Sylvia hortensis*.

no doubt that, with one insect at least, they had this result. The hive-bees, which up to the time of the appearance of the birds had frequented these flowers in great numbers, but invariably entering at the mouth of the corolla, and never attempting to obtain the nectar along the tube, or showing the least tendency towards making an opening there, now took their way direct to the openings made by the birds, seldom entering the corolla at all. I was told that an opinion had been expressed by an eminent naturalist that these openings were made by mason-bees. Some fine punctures on the corolla-tube seem to give an air of prob-

ability to some such idea. These are occasionally, but not frequently, found about half-way up the corolla. They are circular and very minute, not at all what one would expect as the work of a mason or any other bee. The former I have watched for carefully, but have never seen one near the flowers, and I cannot learn that any one has seen them in the act of making the openings. They are admitted to be very rare, whilst the openings at the base of the flower are almost invariably present. The hive-bees certainly do not make them, and humble-bees do not appear to visit these flowers at all; at least I have never seen one do so, whilst I have seen the openings actually made by the Garden Warbler.

On one exceptionally fine day I found the ants visiting the flowers on a few of the stems, and I cannot doubt that in prolonged fine weather they would swarm over the places where food is so abundant, and that other insects would do the same.

It seems more than probable that the habit displayed by the Blackcap has the same object which it clearly had in the Canary Islands; and it is remarkable that in Algiers the only plants thus dealt with are not natives. I could not find throughout Algeria any native plant that had been thus dealt with.

In the following year (March 13th, 1895), numbers of *Sylvia atricapilla* were observed at Ajaccio, in Corsica. At short intervals they were seen to visit ripe clusters of the fruit of the *Yucca* in the hotel garden. After creeping over the fruit-spike, searching for insects, which they were seen to take, they afterwards spent some time pecking at the ripe pulp and tearing off pieces of the outer skin. This is done in the early morning; later in the day they do not peck at the fruit in this way, but at regular intervals creep over the spike, evidently in search of insects.

All the preceding observations were carefully and repeatedly made, and though it is desirable that they should be confirmed by other observers, I am well assured of their exactness. They suggest some striking points for consideration:—

(1.) As to the object with which the openings are made: is it for the purpose of obtaining the nectar? To a certain extent this may be so. It shows a marvellous instinct in the Blackcap that it can find out the exact spot in the calyx under which the drop of nectar lies, and if to obtain this is its sole object in making the openings, it is difficult to understand why it should, later in

the day, tear the calyx across. This could only cause an exudation of sap which might attract insects, but could not serve as food for the bird. So far as the *Hibiscus* is concerned, it is scarcely credible that the nectar is the sole object sought by the bird. At any rate, it is obvious that it takes advantage of its own act to secure insect food. Whether this is the primary object is not so clear. It may be that the Blackcap is a nectar-eating bird, though there are no observations to show this. I certainly think it very probable that the Garden Warbler punctures *G. antholyza* for the purpose of obtaining the nectar, in the first instance; but in the case of *Abutilon*, I cannot believe that *Parus* would search for nectar; and very clearly I think the laceration of the calyx was made with the object of enabling the ants to reach the nectary. *Phylloscopus* may possibly be a nectar-eater, but this is doubtful. It certainly does not tear the flowers, and only acts as a poacher, visiting the flowers torn by other birds for the purpose of taking its insect prey. An interesting example of this kind of poaching is given below.*

(2.) How far is the habit of puncturing the flowers and afterwards searching for the insects an acquired one? The puncturing is common with true nectar-eating birds—*Zosterops*, *Nectarinia*, and others. My friend Dr. Percy Rendall says of *Cinnyris senegalensis*:—"Scarcely a flower in my garden yielded any flowers the corollas of which had not been pierced by individuals of this species" ("Ornithology of the Gambia," 'Ibis,' April, 1892).

* Mr. N. B. Moore has made observations at the Bahamas on the *Certhiola flaveola*, which obtains nectar from the flower of *Verea crenata* by thrusting its bill at once through the petals into the nectary. It is only after the bird has made an opening that black ants are found in the nectary. But these birds also poach on the Woodpecker's preserves. One day Mr. Moore observed a *Picus varius* extracting sap from a logwood sapling, and as the Woodpecker flew away two *Certhiolæ* appeared, perched near the sapling from which the juice was oozing, and by cunningly thrusting in their penicillate or bristle-tipped tongues commenced to lap or suck the fluid into their mouths. This practice was constantly observed afterwards. Mr. Moore fixed the bowl of a teaspoon in a fork of the same tree and placed some strained honey in it. In three days the *Certhiolæ* found this, and commenced to feed on it. They were followed by another bird, *Dendrocæca tigrina*, and other species, which also attacked the Woodpecker's sap-pits. These are interesting instances of apparent intelligence on the part of birds. (Proc. Boston Soc. Nat. Hist., Jan. 1878). — From 'Nature,' April 25th, 1878, p. 509.

"*Cinnyris olivaceus* and *perrauxi* split open the flowers of *Loranthus kraussianus*, and cause their fertilisation. Bees follow in their wake to obtain their nectar" (M. S. Evans, 'Nature,' Jan. 3rd, 1895). While examples of this kind can be multiplied, there are no recorded instances, so far as I know, of birds visiting the flowers which they have themselves torn for the purpose of capturing insects. It is especially noteworthy that the three plants which are thus dealt with in the Canary Islands are all exotics, and that no native plants are treated in the same manner. Thus *Hibiscus rosa-sinensis* is a native of China, *Abutilon* of S. America, and *Aloe vulgaris* of the West Indies. There is thus every reason for believing the habit to be an acquired one.

(3.) I may note that *Bombus* goes directly to the flower of *Hibiscus*, and though the openings are made in the calyx it never visits these; while in this country it even makes openings in the calyx of the *Fuchsia* in preference to visiting the flower.

(4.) So far as I could observe, the punctures were made only by the male Blackcap, and never by the female. Further observation may, however, disprove this.

MEMOIR OF THE LATE HENRY SEEBOHM, F.L.S., F.Z.S.,
SECRETARY TO THE ROYAL GEOGRAPHICAL SOCIETY.

JUST as our last number was going to press we received the sad and unexpected intelligence of the death of this distinguished ornithologist, who passed away on November 26th, at his residence in London, at the comparatively early age of sixty-three. His loss will be deplored by a wide circle of friends, amongst whom may be reckoned very many readers of this Journal, to say nothing of those to whom he was known only by his published works as a leading authority in his special department of zoology.

Few names indeed are better known than his in connection with Birds, not only of the British Islands, but, it may be said, of the world. As a traveller and collector in four continents he had made a special study of bird-life in all the countries he visited, and few naturalists probably have seen and studied a larger number of species in their proper haunts, or made better use of opportunities for observing them. We need only turn to

a single work of the many he published, namely, his 'British Birds,' in four royal octavo volumes, to be assured of this; for it abounds in original observations which have thrown much light on the geographical distribution, migration, and nesting haunts of many of the rarer species concerning which previous writers, from their own knowledge, had comparatively little to relate. Indeed, as regards several of these, we are indebted to him for the discovery of their breeding-places, and for original descriptions of their nests, eggs, and young. His extensive collection of bird-skins and eggs, so many of which were obtained by himself, furnished the most ample materials for his descriptions, and enabled him to correct the misapprehensions of some of his fellow-workers, and to supplement their remarks with valuable observations of his own. That his teaching in some respects was not universally acceptable, or implicitly followed, is perhaps not to be wondered at, for he held peculiar views on the subject of classification and nomenclature—views which, though often striking in their novelty, will scarcely stand the test of serious criticism (*cf.* Zool. 1890, p. 230). For this reason, so far at least as classification is concerned, it may be safely predicted that his reputation will not depend upon this portion of his work.

Nor can we believe that certain fanciful theories of his—for example, that concerning the original dispersal of the *Charadriidæ* from the shores of the Polar Sea, during the Glacial Epoch (*cf.* Zool. 1886, p. 43)—will find general acceptance.*

We do not propose, however, in this place to offer any detailed criticism of his work, for which the space at disposal would be wholly insufficient. We desire rather to call to mind the extent of his labours in the cause of ornithology, and to show how much we are indebted to him for the amount of useful information which he has disseminated by his writings, and for his encouragement of research by collectors in little-known parts of the world.

Born at Bradford, in Yorkshire, in 1832, of an old Quaker family, Henry Seebohm was educated at the Friends' School at York, where his early love of Nature was shown by the creditable collections which he there formed of birds and birds' eggs. As he grew up, he became filled with a desire to travel, and though for many years engaged in business in Sheffield, as a manufacturer

* See also 'Zoologist,' 1888, p. 198.

of steel, he found time to make periodical excursions on the continent, at first to Holland, France, Germany, Denmark, Norway, and Heligoland, and thence to more distant countries, as Russia, Greece, and Asia Minor, eventually going as far south as the Cape of Good Hope, and as far west as the United States of America.

In the summer of 1875, in company with Mr. J. A. Harvie Brown, he undertook a journey to the valley of the Lower Petchora in North-Eastern Russia, for the purpose of discovering, if possible, the breeding-haunts of such birds as the Grey Plover, Little Stint, Knot, Curlew Sandpiper, and Sanderling; and having found the eggs of the two first-named species (subsequently figured in 'The Ibis'), he started two years later with Capt. Wiggins, and penetrated still further east to the valley of the Yenesei in Siberia, in hope of further oological discoveries. The accounts which he published of these journeys in his two volumes, 'Siberia in Europe' and 'Siberia in Asia' (both now out of print), are amongst the most entertaining and instructive narratives of travel and natural history which have been written in the present generation.*

In the earlier of these two volumes he gave an account of a visit to Heligoland and his meeting with the veteran ornithologist Heinrich Gätke, whose now famous work on the Birds of that remarkable island† is by this time in the hands of every naturalist.

The ornithological results of these two expeditions induced him to turn his attention more closely than he had previously done to the unexplored parts of Northern Asia, where it was thought that time would reveal the undiscovered breeding-haunts of several birds known only as periodical visitors to the coasts of Great Britain. To the birds of Japan, also, he paid particular attention, and having, with the assistance of Capt. Blakiston and other correspondents, formed an extensive collection of the birds of that country and their eggs, he published a comprehensive work, 'The Birds of the Japanese Empire,' which at once took rank as the most authoritative work on the subject. In the

* Outlines of these expeditions have been already given in the pages of this Journal in reviews of the books named. See 'Zoologist,' 1881, pp. 75, 116, and 1883, p. 41.

† See 'The Zoologist,' 1894, p. 363.

prosecution of this undertaking, he employed collectors and purchased specimens from every available and reliable source, determined to make his work as complete as possible. These collections, with the greatest liberality, he subsequently presented to the British Museum, and still further benefited science by writing one of the volumes of the great 'Catalogue of Birds'—that containing the Thrushes and Warblers—and by arranging and cataloguing the unrivalled collection of eggs, to which he was a munificent donor.

From a pictorial point of view, few more beautiful works have been issued from the press (if we except those of Gould and Elliot) than his quarto monograph of the Plovers, Sandpipers, and Snipes. In this he figured all the most remarkable species of which no adequate illustrations had been previously published, and furnished analytical keys to the genera and species.*

To enumerate the many important papers on ornithological subjects which he contributed to 'The Ibis,' 'The Zoologist,' and to the 'Proceedings of the Zoological Society,' would require the preparation of a list that would fill several pages. It must suffice if we remind our readers of his contributions to this Journal only.

Dating from the commencement of the Third Series (1877), we find him credited with the following communications:—

Blue Eggs of the Cuckoo, 1880, p. 361.

Field Notes on the Reed and Marsh Warblers, 1880, p. 377.

A Visit to the Colony of Spoonbills near Amsterdam, 1880, p. 457.

On the Occurrence of the Rusty Grackle and Pallas's Grey Shrike in Wales, 1882, p. 109.

On a New Species of British Wren, *Troglodytes hirtensis*, 1884, p. 333.

On the Occurrence of the White-billed Diver, *Colymbus adamsi*, on the British Coasts, 1885, p. 144.

On the genus *Hematopus*, or Oystercatchers, 1886, p. 41.

The Black-throated Wheatear, *Saxicola stapazina*, and its Allies, 1886, p. 193.

On the Pheasant of St. Helena, 1886, p. 225.

On the Breeding of Arctic Birds in Scotland, 1887, p. 21.

Birds' Nests and Eggs, 1887, p. 137.

Turdus migratorius in the British Islands, 1891, p. 219.

A Comparative List of the Birds of Heligoland and those of the British Islands, 1891, p. 261.

* For a detailed notice of this work see 'The Zoologist,' 1888, p. 197.

On the Common Wren of the Shetland Islands, 1891, p. 294.

The Proportion of Adult and Immature Birds amongst Accidental Visitors to the British Islands, 1893, p. 71.

Plumage of White's Thrush, 1893, p. 267.

At the time of his decease he was engaged upon a monograph of the Thrush family, and a new work on the Eggs of British Birds, with coloured plates, which, we understand, is in the hands of the publishers (Messrs. Pawson & Brailsford, of Sheffield), and may be expected to appear in June next.

Mr. Seebohm was a Fellow of the Linnean and Zoological Societies, and in 1890 was elected one of the secretaries of the Royal Geographical Society. A member of the British Ornithologists' Union since 1873, and of the more recently formed Ornithologists' Club, the latest honour conferred upon him was his election as President of the Hertfordshire Natural History Society. In all these various capacities he was widely known, and as widely esteemed.

ON THE OCCURRENCE OF THE WHITE-BILLED NORTHERN
DIVER, *COLYMBUS ADAMSI*, IN NORFOLK.

By A. F. GRIFFITH, M.A.

AMONG a considerable number of uncased birds obtained by the late Mr. E. T. Booth, and presented to the Brighton Museum by his widow since his death, is the specimen referred to by Mr. Howard Saunders on p. 695 of his 'Manual of British Birds.' Acting on the hint there given, the specimen has been carefully compared with others in the British Museum, and there is no doubt as to its identification. It was shot by Mr. Booth on Hickling Broad on December 14th, 1872.

His note-book for that period is still extant, though unfortunately all but three were destroyed after his death. An extract, I feel sure, will be interesting, not only on account of the description it contains of this bird, but also as an example of his method of observing and noting facts. It is a complete copy of the note-book for the eight days from Dec. 9th to 16th:—

"Dec. 9. Fearful gale from the S.W. Being unable to get on the open broad for the swell, I went all round the rondes, but saw no fowl of any sort.

12. Wind W. Ditches laid with ice. I noticed the Grey Crows hunting all round the water line of the Broad in hopes of finding some crippled ducks. I observed that they hardly took any trouble on the windward side, but on the lee side they searched carefully among the rubbish that had been blown on shore. Flying one after the other about two or three feet from the ground, and alighting whenever they thought they had a prize.

13. Frost, and the ditches all laid with strong ice. As very few fowl had appeared, we did not expect a continuance of severe weather, and before mid-day it came on to rain.

14. All signs of frost vanished. The morning was still, without a breath of air, and the water as calm as glass. Soon after daybreak I made out a Great Northern Diver on the south part of the Broad. The bird was busily engaged in diving for food, and I was able to scull up near enough to examine all its actions closely with the glasses. When I was between 70 and 80 yards off, it came up with a small Jack of 10 or 12 inches in length in its beak, held crosswise. This it kept shaking, apparently wishing to kill it before swallowing. After the bird had held it for four or five minutes it swam up within 60 yards of where I was, so I fired the big gun. It dived immediately, but soon reappeared on the surface badly wounded, and uttering the most mournful cries I ever heard proceed from the throat of a bird. I soon got close enough for a shot with the shoulder-gun at about 50 yards, which I thought would have ended the matter; but after receiving the charge the bird swam straight to the punt and came at me open-mouthed, scrambling on to the after-deck, and would have come right on board had it not been seized by the neck. It was an immature specimen, in good condition, weighing $8\frac{1}{2}$ lb.; the beak white, with the exception of a dark mark down the upper ridge extending almost to the point; the inside of the mouth a dirty white; eye a very warm olive-brown; leg, outside black, inside white, edges light grey, toes black, webs white, with veins showing very plain down the centre.

16. Wind E. There were to-day hundreds of fowl—Mallard, Wigeon, Teal, and Pochard. The newspapers had announced a frost in the north, and although we felt no signs of hard weather in Norfolk, it was, I supposed, the cause of so many fowl being observed. I might have had several shots with the punt-gun

just after daybreak on Hickling Broad; but it being the day appointed for the Coot-shooting, I did not like to disturb them by firing at the fowl. The Coot-shooting was almost a failure, as there were hardly boats enough to surround the birds, and consequently but few were killed. I had left half-a-dozen wooden decoy ducks on the Sounds [at Potter Heigham], and they were carefully approached by two different boats during the afternoon, receiving in all the contents of no less than twelve barrels, and being so severely peppered that they had to be taken home to be repaired ”

[The specific characters which distinguish the White-billed Northern Diver from the closely-allied *Colymbus glacialis* have been pointed out by Mr. Saunders in his ‘Manual,’ and in greater detail by the late Mr. Seebohm in ‘The Zoologist,’ 1885, p. 144 (wrongly cited by Mr. Saunders as 1884, p. 140). Not only is there a difference in the colour of the bill, which has suggested the trivial name “White-billed,” but the head and upper neck are glossed with green, while the lower neck is tinged with purple (the reverse being the case with the Great Northern Diver), and the white streaks on the upper throat-band are 6 in number with 10 on the lower one, instead of 12 on the upper and 18 on the lower as in *Colymbus glacialis*. It is also said that in the summer plumage the white spots on the scapulars are larger in the White-billed species, while those on the flanks and upper tail-coverts are smaller than in the allied species. Specimens of the rarer bird have been obtained on the coasts of Suffolk and Northumberland, the Suffolk specimen being figured from a photograph in Babington’s ‘Birds of Suffolk.’ This example, however, being in immature plumage, the distinctive characters, seen only in the adult, are not apparent.—ED.]

NOTES AND QUERIES.

MAMMALIA.

The Harvest Mouse in Lancashire.—The wording of Byerley’s remark in his ‘Fauna of Liverpool,’ referred to (Zool. 1895, p. 419), is, as follows:—“Not unfrequent in wheatstacks, barns, and fields.” A large proportion of Byerley’s records for other species are from the Wirral district of Cheshire, and many of his records want verification. Though it occurs sparingly in Lancashire and Cheshire, it is certainly not as plentiful as might be inferred from Byerley’s remarks. A short time since I came across a report of the Council of the Manchester Natural History Society for 1864, which mentions the gift, by J. Glover, Esq., of a Harvest Mouse and nest

from Halsall Moss, Southport. This nest is now in the Owens College Museum, Manchester.—T. A. COWARD (Bowdon).

Wolves in France.—The Bulletin of the Ministry of Agriculture gives the number of Wolves destroyed in France last year, or rather of those for the destruction of which a premium was asked, as being 245, as against 261 in 1893, and it has to be noted that the total has been decreasing since 1883, when the Government increased the premium. In the following year 1316 Wolves were accounted for, but they seem now to be extinct in many departments, the majority of those killed last year being in the central region of France—the Charente (51), the Haute-Vienne (42), the Dordogne (33), the Vienne (19), and the Creuse (14), being all contiguous departments—whereas in the eastern departments, where at one time they abounded, there are now very few.

Marten in Co. Limerick.—I have to report the capture of a Marten (*Martes sylvatica*) in the Co. Limerick. It was caught in a trap on a heather-clad hill at Glinstal, the property of Sir C. B. Barrington, some time last autumn. I do not know the exact date of the capture, but I saw the skin, which appeared to be that of a full-grown animal. In your article on the Marten in Ireland, in 'The Zoologist' for March, 1894, you stated that you had no records of the Marten in Co. Limerick, so this capture will be of interest.—G. H. PENTLAND (Black Hall, Drogheda).

BIRDS.

Eagles in Kent.—Towards the end of December last, the daily papers contained numerous letters, paragraphs, and even articles, referring to the destruction of certain Eagles in Kent, which, of course, were termed "Golden Eagles," as is usually the case in provincial newspapers when any large bird of prey happens to get shot or trapped. A great deal of ink is generally wasted over the matter, and it is curious to note the different light in which such an incident is regarded by different classes of writers. The provincial paragraphist considers the death of a supposed "Golden Eagle" as an event to be announced with some flourish of trumpets; dimensions and weight are given, and usually exaggerated. In one such paragraph we read that the height of the bird was 3 ft. 6 in., and its weight 30 lbs., or three times as heavy as it was likely to be! The writers of letters "to the Editor" which follow the insertion of such paragraph, usually, and very properly, give vent to some expression of indignation at the wanton destruction of rare birds, and after bestowing various laudatory epithets on what they suppose to be this "king of birds," usually conclude by suggesting that an Act of Parliament should be at once passed to put a stop to such slaughter. The writer of an article on the subject in a daily paper goes a step further, and supplies a column or two about Golden Eagles and their ways, the nature of their haunts, food, and

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so forth; often very well written, but wholly inapplicable to the species whose recent demise is deplored. As a matter of fact, the so-called Golden Eagles which happen to be shot or trapped in the South of England in late autumn or early winter, hardly ever prove to belong to that species. If they are Eagles at all, which is not always the case—for many people do not know an Eagle from a Buzzard—they are in nine cases out of ten the young of the White-tailed Eagle, *Haliaeetus albicilla*, which, as a British species, is much commoner than the Golden Eagle, and in the eastern and south-eastern parts of England may be considered to be an annual visitor in autumn and winter. As to the birds which were taken in Kent in December last, and were almost universally chronicled as “Golden Eagles,” it may be well to give publicity to a contradiction of the statement in the following letters which were addressed to the editor of the ‘Standard,’ and were printed in the issue of that paper for Dec. 30th:—

“Sir,—A notice appears in the ‘Standard’ of Dec. 27th of another Golden Eagle being shot in Kent. It may interest some of your readers to learn that the one reported to have been shot at St. Lawrence, Kent, a short time back (Dec. 22nd) was an immature specimen of the White-tailed Sea Eagle, and in all probability the one now reported at Eastwell will prove to belong to the same species. The Golden Eagle is very rare in the South of England, and each year its appearance becomes more and more improbable, from its ceaseless persecution, both for the sake of its eggs and skin. One cannot but deplore the ruthless slaughter of these noble birds when tired out on migration to safer and more peaceful latitudes.—F. DYER (Grange Road, Ramsgate, Dec. 27th.)”

“Sir,—The Eagle captured in Eastwell Park on Dec. 22nd is not a Golden Eagle, but a young specimen of the White-tailed Eagle.—J. T. CROCKETT AND SONS, Naturalists (7A, Princes Street, Cavendish Square, Dec. 28th.)”

Blackgame in Lancashire.—On Nov. 18th a Grey-hen was shot by Mr. W. King-Wilkinson’s keeper on Easington Fell, about twelve miles north of Blackburn. The nearest moors frequented by Black Grouse are those in the neighbourhood of Huddersfield (30 miles S.E.), Nidderdale (30 miles E.), and Cartmell Fell (30 miles N.W.). In 1864 an unsuccessful attempt was made to introduce the species at Whitewell. I cannot learn that any Black Grouse have been seen here since that date, until the occurrence of the present bird, which Mr. King-Wilkinson has kindly presented to the Blackburn Museum.—ROBERT J. HOWARD (Hawkhurst, Blackburn).

The Dispersal of Acorns by Rooks.—On this subject allow me to refer Mr. Clement Reed to a paper of mine in the ‘Proceedings of the Dorset Natural History and Antiquarian Field Club’ for 1891 (vol. xii. p. 132). The habit of Rooks carrying acorns to considerable distances and

burying them is there detailed; and the quotation from Robinson's 'Natural History of Westmorland and Cumberland,' 1709, is there given, having been kindly communicated to me for that purpose by the editor.—O. PICKARD CAMBRIDGE (Bloxworth Rectory, Dorset).

The Dispersal of Acorns by Rooks.—In Mrs. Hugh Blackburn's 'Sketches of Birds from Moidart,' of which a review is given in this number, the following observations on the habits of Rooks are of interest in connection with what has already been noted by other observers. Mrs. Blackburn says:—"The Rooks did not build here when we first came (in 1856), but only flew across the fen from Armadale on predatory excursions. At harvest-time they would carry off potatoes and hide them, sometimes forgetting where they were buried, and leaving them to come up in unexpected places the following spring. They also transplanted acorns we had sown, sometimes replacing them in a more favourable spot."

The Dispersal of Acorns by Rooks.—Referring to Mr. Clement Reid's observations under this heading in the last number of 'The Zoologist,' I may state that I once found a young oak-tree in a sheltered ravine amongst sea-cliffs on the northern coast of Hoy, Orkney. The tree was a little over six feet in height, and was growing luxuriantly amongst beds of primroses and ferns. A few Rock Doves bred near the place, and I concluded that an acorn had been brought by one of these birds; but where from? Unless it had been picked up on the sea-shore, it must have been carried a long way indeed. It could hardly have been brought by man, as the place was very remote, as well as difficult of access. Rooks occasionally crossed the Pentland Firth, and one of these birds might have conveyed the seed; but in any case the fact is interesting, and perhaps worth recording.—J. J. ARMISTEAD (Solway Fishery, Dumfries).

The Dispersal of Acorns by Rooks.—The U. S. Department of Agriculture has lately issued an exhaustive report by Messrs. Barrows and Schwarz, on the Common Crow of the United States (*Corvus americanus*), its food and habits in relation to agriculture. A careful examination was made of the contents of the stomachs of more than 900 of these birds, procured in different months of the year, and the results were tabulated. Several chapters deal respectively with the animal, insect, and vegetable food of the Crow, and the relative percentages of animal and vegetable food are considered. Under the heading "Vegetable Food," in chapter iv., we read (p. 97), "Acorns in Crows' stomachs reached the maximum in October, when they formed $15\frac{1}{2}$ per cent. of the contents of the stomachs examined. In November the percentage fell to $9\frac{3}{4}$; in December to about 4, with a slight increase in January; while in February this average was doubled, and in March reached almost $9\frac{1}{2}$. These figures naturally reflect the conditions of the food supply. In October most acorns ripen and fall,

and the Crows easily obtain large quantities, either directly from the trees, or from the ground. By the middle of November few acorns are left upon the trees, and the fallen leaves have hidden part of those on the ground. In December and January snow usually covers the ground, and the supply of acorns must be obtained from places swept bare by the wind, from edges of streams, and springy places where the snow does not accumulate, or from the bare ground during occasional thaws. A large proportion of the Crow stomachs taken in December and January were collected during snowy weather, when such food must have been extremely hard to find. In February and March the melting snow again exposes the acorns, which are all the more acceptable from the fact that the cornfields have been so carefully gleaned already. It is remarkable that, in spite of the abundance of fruit and other soft vegetable food, Crows continue to find and eat acorns all through the spring and early summer. The quantity eaten is small during most of this time, but some at least are found in every month except August, while in July the average exceeds 3 per cent. This surely indicates considerable skill and diligence in hunting out the old acorns which have laid hidden so long. It is by no means impossible that Crows, in times of scarcity, draw upon hoards of food hidden by themselves or by other animals during seasons of plenty. As to the agency of birds in the dissemination of seeds, the reporters above named remark:—"The number of seeds distributed by Crows is enormous, and since it has been shown by experiment that the vitality of such seeds is not impaired by the partial digestion to which they are subjected, it is evident that the Crows effect the distribution of many plants. Reference to the chapter on the vegetable food above quoted will show that the stomach contains fruit seeds at all seasons, but especially during the autumn. It is certain, therefore, that southward-bound Crows deposit the seeds of many common fruits all along their migration route. Some of these, as the wild cherry (*Prunus*), flowering dogwood (*Cornus*), and the red cedar (*Juniperus*), produce valuable and beautiful trees or shrubs, while others, like the poison ivy and poison sumach (*Rhus*), are detestable weeds. In the vicinity of roosts such seeds are sown by the million; many of these survive, and add to the store of food for birds, and some to the misery of mankind."

Nesting of the Goldcrest.—As to the nesting habits of the Goldcrest in this locality, to which my friend Mr. Mitchell lately drew attention (*Zool.* 1895, p. 385), I believe that these little birds depend a great deal on the character of the locality which they frequent. If it is sheltered from wind, and abounds in spreading young silver firs, the Goldcrests here build a very neat nest under the branch. There is such a place near my house, and I can always find two or three nests there in the season; but I have always noticed that in exposed places, where the wind would be likely to blow the branches about, the Goldcrests prefer to nest against an ivy-

covered tree, or in a furze-bush, and in such places their nests are not nearly so neat. Thus many birds adapt their habits to circumstances. I once found a Mistle Thrush's nest in a hole in a wall, the explanation being that there were no trees near.—G. H. PENTLAND (Black Hall, Drogheda).

Nesting of the Goldcrest.—Referring to the correspondence which has appeared on the nest of the Goldcrest (Zool. 1895, pp. 385, 431, 448), I send a few notes which may be of interest. I never saw the nest of this bird against the trunk of a tree, but always on a branch. It was generally in a young spruce, and a few feet from the ground, sometimes above, oftener below, the branch. Early in the nesting-season of 1888 I knew of a nest, the situation of which was rather unusual. It was near the top of a full-grown spruce, about forty feet from the ground, in the usual position under a branch well clothed with the green fir-needles. The birds forsook this nest before any eggs were laid. In May, 1889, I saw a nest built above a branch of spruce only three or four feet from the ground, and at a little distance from the trunk. I may mention that in this case, contrary to the usually shy habits of the Goldcrest, the bird would allow itself to be touched when sitting on its eggs.—J. W. PAYNE (Edinburgh).

Nesting of the Goldcrest.—I should like to point out to Mr. H. A. Macpherson that the *original* issue raised by Mr. A. T. Mitchell was confined solely to the fact of the Goldcrest building “commonly against the sides of *ivy-covered* trees” in a certain Irish district, in contradistinction, as he had supposed, to the habits generally adopted by the species in England. I deny that there was any question raised as to the nest being placed in other situations, such as in furze-bushes or low junipers; and Hewitson's statement, recorded in the fourth edition of Yarrell, and reproduced by Mr. Macpherson, is absolutely irrelevant. So far as my researches have extended—and I have consulted no less than thirty ornithological publications—Montagu and Mudie alone make any allusion to the Goldcrest nesting *amidst ivy clinging to the boles of trees*; and when I found Yarrell, Howard Saunders, Bowdler Sharpe, Seebohm, Harting, Meyer, Hewitson, Macgillivray, Adams, Syme, Selby, Jennings, Atkinson, Jardine, Stannard, Hudson, Neville Wood, Swaysland, Harcourt-Bath, Gordon, Knapp, Morris, Bewick, Johns, Bechstein, J. G. Wood, Butler, and C. Dixon never so much as making even incidental mention of this site being utilised, I said truly, and say again, that it is “one which authors with common consent have apparently ignored.” I repeat, the point of Mr. Mitchell's original note, and of my subsequent communication, had reference solely to the Goldcrest nidificating against the sides of *ivy-covered* trees, as the numbers of ‘The Zoologist’ for October and November will bear witness; and though Mr. Macpherson remarks that the fourth edition of Yarrell tells us “such a situation is occasionally adopted,” I beg to say,

with all deference, that it does nothing of the kind, as any one can see who will take the trouble to refer to page 451 of vol. i. of the fourth edition of that justly-famed work. So far as I personally am concerned, the matter ends here, though I may add that I strongly object to being misrepresented, and that I presume Mr. Mitchell would not have penned his note to 'The Zoologist' in the first instance, unless he too had studied the writings of ornithologists, on the specific point at issue to the same intent as myself.—H. S. DAVENPORT (The Cedars, Skeffington, Leicester).

The Jay: Extension of Range in Ireland.—There were two Jays here for some months last spring. I never heard of a Jay in Louth before. I also saw a Jay at Glenstal, in Co. Limerick, in November. None had been seen there for many years, and these occurrences make me think that the Jay may be extending its range in Ireland like the Squirrel. I should be glad to know whether any of your readers can corroborate this view. The Squirrel is spreading very fast indeed.—G. H. PENTLAND (Black Hall, Drogheda).

Quails in England in Winter.—In 'The Zoologist' for October last, a correspondent in the Isle of Wight reported seeing a Quail near Shanklin, early in that month, and enquired whether that bird is often met with here so late in the season. It may be of interest, therefore, considering the proximity of the locality in which I reside to the Isle of Wight, to state that two of these birds, at least, have been obtained here as late in the season as December; one in 1892, and the other on Dec. 12th, 1893.—ALEC GOLDNEY HEADLEY (Porchester, Hants).

The Soaring of Gulls.—Although Gulls cannot be regarded as typically soaring birds, they may be seen performing this phenomenon of flight, and sometimes under conditions which would appear to render the performance impossible to any but distinctly soaring birds. On Dec. 21st I observed a number of Gulls soaring at a great elevation for seventeen minutes, during which I failed to perceive the slightest movement of the wings. The birds (three immature examples of *Larus argentatus*, or *L. fuscus*) commenced soaring over a sloping cliff and gradually rose, at the same time extending seawards, until they appeared the merest specks, and were at last lost to view. The wind was a strong one, coming in straight from the sea. According to the views of Dr. Airy and Lord Rayleigh ('Nature,' xxvii. pp. 590-2, 534-5, as well as those expressed in Professor Newton's 'Dictionary of Birds,' p. 271, where will be found some admirable comments on this subject by Professor Roy), there is nothing remarkable in Gulls soaring over sloping ground facing a strong wind; but it is by no means easy to understand how these birds were enabled to prolong their soaring at great heights, and over the open sea.—W. C. J. RUSKIN BUTTERFIELD (St. Leonards-on-Sea).

[On this subject the reader may be referred to a valuable article entitled "The Problem of the Soaring Bird," which was originally published in 'The American Naturalist' for 1885, and is reprinted in 'The Zoologist' for 1886, pp. 54-67. When it is stated that the writer, Mr. J. Lancaster, devoted five years to the study of the birds on the Gulf-coast of South Florida (where soaring species were to be found in abundance), and that his daily observations were carried on sometimes (p. 60) for fourteen consecutive hours at a stretch, some idea may be formed of the attention which he must have paid to the subject, and of the consequent value of his published remarks.—ED.].

Sabine's Gull near Weymouth.—The autumn of 1893 was signalised by the occurrence of several examples of *Xema sabinii* on the western coasts of England. I have just had the pleasure of adding to the Carlisle Museum an immature bird which was killed near Weymouth early in November, 1893. It was shot by a Mr. Lee, and was examined while still warm by Mr. S. H. Wallis, through whose kindness I was recently able to purchase it. If, as I imagine, this specimen was not recorded at the time, it may perhaps be as well to publish its occurrence before it is forgotten.—H. A. MACPHERSON (11, Victoria Place, Carlisle).

Little Gull in Sussex.—Whilst walking on the beach near Winchelsea, on December, 14th 1895, I met a gunner with an immature specimen of *Larus minutus*, Pall., which had just been shot. During the winter of 1893-4 no fewer than eight of these beautiful birds were shot on this coast, most of which I saw. Particulars will be found in the following list, which I am able to supply through the kindness of Mr. Bristowe, of St. Leonards, and Mr. Jeffery, of Hastings:—

1. Immature male, Bexhill, Oct. 12th, 1893.
2. Adult male, Hastings, Dec. 20th, 1893.
3. Immature female, Hastings, Jan. 4th, 1894.
4. Adult male, Bexhill, Jan. 5th, 1894.
5. Immature female, Bexhill, Jan. 5th, 1894.
6. Immature female, St. Leonards, Jan. 8th, 1894.
7. Immature male, St. Leonards, Jan. 8th, 1894.
8. Adult male, St. Leonards, Jan. 8th, 1894.

It will be noticed that six of the birds were shot in the beginning of January, and that, while the males were mostly adult, the females were all immature.—W. C. J. RUSKIN BUTTERFIELD (St. Leonards-on-Sea).

Local Birds nesting in Perthshire.—With reference to Mr. Cordeaux's notes recently published in the 'Annals of Scottish Natural History,' it may be of interest to state that I have once—but only once—obtained the nest and eggs of the Garden Warbler in Perthshire. The site was a very unusual one, *viz.* high up in a tall hawthorn hedgerow. Local dealers

confound this species, *Sylvia hortensis*, with the Blackcap, *S. atricapilla*, which, though far from common, nests regularly in small numbers in the district. The Tree Pipit, *Anthus trivialis*, nests regularly in limited numbers. It appears, however, to be on the increase. The district to which these remarks apply is situated a few miles to the north of the city of Perth. It is richly wooded and well watered, and consequently favourable to the investigation of bird life. The Yellow Wagtail, *Motacilla raii*, and the Woodcock, *Scolopax rusticola*, nest every spring in very small numbers; but even in so small an area both species are unaccountably local in their nesting haunts. The former species is confounded with the Grey Wagtail, *Motacilla melanope*, by local dealers, a bird which is far from common. Perhaps the greatest treasure which I have found in this district is the nest and eggs of the Grasshopper Warbler, *Locustella naevia*. I have never known another instance of the eggs of this bird having been taken in the neighbourhood of Perth. The Nightjar, *Caprimulgus europæus*, is said to nest in this district; but though I have searched diligently, and have employed collectors for the purpose, I have never been fortunate enough to find its eggs; nor have I heard its cry in that part of Perthshire.—J. B. DOBBIE (3A, Pitt Street, Edinburgh).

Ornithological Notes from Mid Wales.—A few occurrences of the past year may be worth recording. On Jan. 26th Wood Larks were migrating, owing to the snow-fall of the previous night. A Bittern, in extremely poor condition, was sent from Pembrokeshire on Feb. 4th; and on the 18th a Great Crested Grebe was shot at Llanrhystyd. The frost brought Bramblings and Snow Buntings; a few Pintails and Golden-eyes visited the Dovey, but no rarities. Mistle Thrushes were so completely killed off by the frost that I did not see a single one for the next nine months. Very few Stonechats survived. Goldfinches have become scarce, and many birds which appear less likely to be affected—as Herons and Buzzards—show a similar marked decrease in numbers. On March 1st I found a pair of Ravens tenanted a new nest upon the sea-cliff near the usual site, and met with a pair of Choughs within a short distance of the town. The Chiffchaff was heard in the Mawddach estuary about Barmouth on March 23rd, and the Wheatear reached Aberystwyth on the 24th. On April 9th I looked into a Raven's nest which contained well-grown young ones. The site is a fine one—on rocks which overhang a deep and dark pool, whose Welsh name may be rendered “the Infernal Pit.” On the same day I saw a Kite, and may as well mention here that the attempts of these birds to breed were, as usual, unsuccessful. On May 19th two, if not three, sets of eggs were taken by one party. A dealer has disposed of several clutches at £4 the clutch, and it has now become usual to cut away the branches to take the nest as well. There may be five pairs of these fine birds left, but all chance of young ones being

reared is now at an end, and nothing is left for the Kite's well-wishers but to hope that it may find in speedy extinction its only possible refuge from persecution. The birds themselves are seldom shot, but must shortly succumb to the persistent and relentless attack of egg-collectors. It is doubtful if a watcher in the neighbourhood of each nest could give adequate protection. In regard to Welsh names of birds, it may be of interest to note that I have never heard the Buzzard called *boucath* in Mid Wales, but invariably *boda* or *boda llwyd*, i. e. "the grey Buzzard"; while the Kite is sometimes known as *barcud* or *barcutan*, but more commonly *boda wenol*, "the Swallow-Buzzard," from its forked tail.* On April 17th young Ravens were squeaking in a nest upon the cliff to the north of this town, some twenty-five feet above the beach. On the 18th I found the Cormorants already at their nests upon the Bird Rock; one was apparently sitting. On the 30th the first Whimbrel appeared, on the spring passage. Wheatears of the larger northern race were passing along shore on May 1st; one of them perched on a furze-bush. On the 8th I found well-fledged young in a Raven's nest near Plynlimmon; the nest was easily reached, being only fifteen feet from the foot of the rocks. A pair of White Wagtails were migrating along shore on the 11th. On the 15th I found two Kestrel's eggs in an untenanted Raven's nest. Upon a heather-grown peat bog, on the 22nd, I came across three nests of Teal with eggs: two of the nests were only fifteen yards apart. On the 25th I found the Pied Flycatcher numerous in its usual haunts in north Carmarthenshire. A Greater Spotted Woodpecker was breeding in a stunted oak, upon the side of one of the upland dales. On June 1st I saw the whole family of Ravens, referred to under date March 1st, upon the wing. On the 6th I found the dried remains of a Fulmar Petrel upon the beach. A party of Wood Larks, on the 14th, were feeding upon the seeds of the sea-campion (*Silene maritima*). Several of them, when approached, squatted, only rising as I came within four or five yards. On the 15th, near Devil's Bridge, I found young Buzzards fully fledged, in their nest at the top of a straight slender larch. At the end of the month, in a walk along the north Pembrokeshire coast, I visited some of the less-known sea-bird haunts of that county. Here the Shag, so scarce at Aberystwyth, largely replaced the Cormorant. More than one pair of Falcons had bred successfully, and the young were strong on the wing; and in two or three places the Buzzard appeared to be nesting in the sea-cliffs. I met with the Cirl Bunting at Newport, and again at Fishguard. The Stock Dove was numerous, but I failed to find the Rock Dove, though the coast appears well suited to its requirements. The well-known herd of goats at Dinas Island, where they have run wild for several generations, now numbers twenty-two. None at present have

* See 'Zoologist,' 1891, p. 173.—ED.

heads of a size to compare with two specially fine ones which were presented to the Zoological Society in 1869. Choughs are fairly plentiful, though there is a keen demand for their eggs, as for those of all the rarer birds, so that the chief sea-bird haunts near St. David's are harried every year to an increasing extent by the local fishermen. The Gannets at Grasholm, in whose favour popular sympathy was enlisted some years since, are now plundered almost annually.—J. H. SALTER (Aberystwith).

INSECTS.

Vanessa antiopa at Epsom in December.—A specimen of the Camberwell Beauty, *Vanessa antiopa*, was captured in the drawing-room of a house at Epsom on Dec. 19th. The family were seated round the fire at about 7.30 p.m., and a log of wood had been recently added to the coals, when the butterfly in question was observed crawling amongst the cinders and ashes in the grate. It was at first supposed to have come down the chimney; but the more reasonable explanation probably is that it had hibernated in the log of wood which had been recently put on the fire.—JOHN BUCKNILL (Hylands House, Epsom).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

December 5th, 1895. — Mr. C. B. CLARKE, F.R.S., President, in the chair.

Messrs. Bernard Arnold and Rupert Vallentin were admitted, and the following were elected Fellows of the Society:—W. M. Christy, Rev. H. P. Fitzgerald, A. W. Geffcken, Rev. E. A. Peacock, Rev. T. R. Stebbing, and W. O. Stentiford.

The President called attention to a portrait of the late Prof. Babington, of Cambridge, which had been lately presented by his widow to the Society. On the motion of Dr. Murie, seconded by Mr. A. W. Bennett, a vote of thanks to Mrs. Babington was unanimously accorded.

Prof. Stewart offered some remarks on the types of the axes of certain *Gorgonaceæ*, in which he referred chiefly to the alleged importance or otherwise of the presence of spicules in the axes, and exhibited the following species in illustration of his remarks:—*Paragorgia arborea*, *Melitodes ochracea*, *Suberogorgia suberosa*, *Corallium rubrum*, *Caligorgia verticillata*, *Verucella guadalupensis*, *Isis hippuris*, *Plexaurella crassa*, and *Eunicella verrucosa*. Some criticism was offered by Dr. Murie chiefly in relation to the structure of *Gorgonia flabellum* and *Gorgonia setosa*.

Mr. Martin Woodward exhibited and made remarks on a living specimen

of *Ouramæba*, which he thought should be regarded as a common *Amæba* attacked by a parasitic fungus.

Mr. G. C. Druce communicated a paper on a new species of grass in Britain belonging to the genus *Bromus*, for which, from the character of its inflorescence, the specific name *interruptus* was proposed. It appeared to have been characterized by Prof. Haeckel as *Bromus mollis* var. *interruptus*, but Mr. Druce considered that it was sufficiently distinct to be entitled to specific rank. He had found it growing abundantly in a field of vetches near Upton, Berkshire, and specimens had been examined from Headington, Oxford, and Dartford, Kent. In a discussion which followed, Dr. O. Stapf reviewed the literature of the subject, and gave reasons for regarding the so-called new species as merely an abnormal growth of *Bromus mollis*. Critical remarks were made also by Mr. H. Groves and Mr. A. B. Rendle, who were inclined to share the opinion of the last speaker.

A paper was then read by Mr. W. F. Kirby on some new or little-known *Phasmidæ* in the collection of the British Museum, with illustrative specimens.

Dec. 19th.—Mr. W. P. SLADEN, Vice-President, in the chair.

Mr. William Scott was elected, and the Rev. T. R. Stebbing, Rev. H. P. Fitzgerald, and Mr. A. W. Geffcken were admitted Fellows of the Society.

Mr. W. B. Hemsley exhibited specimens and photographs of *Cactææ* from the Galapagos Islands, and gave an account of some of the more remarkable species.

Mr. George Brebner exhibited and described, with the aid of microscope and lantern-slides, the following new and rare Algæ:—*Colaconema Bonne-maisoniæ*, Batters; *C. chylocladiæ*, Batters; *Trailliella intricata*, Batters (*Spermothamnion Turneri*, var. *intricata*, Holmes & Batters, 'Revised List Brit. Algæ'); *Ectocarpus velutinus*, Kütz., var. *laterifructus*, Batters; and *Hymenoclonium serpens*, Batters (*Callithamnion serpens*, Crouan). These were found by Mr. Brebner while studying the marine Algæ of Plymouth and the neighbourhood. The first two are endophytic and new to science; the discovery of the tetraspores of the third (which in regard to position and development are unique in the group to which it belongs) justified the creation of a new genus for its reception (*cf.* Journ. Bot. 1896, p. 8). The fourth is a variety of a well-known parasite on *Himanthalia lorea*, Lyngbye, probably only a late autumn and winter form not hitherto described. The fifth was a young specimen of a rare Alga first discovered in this country by Mr. Holmes, and found, like the others, in Plymouth Sound.

Mr. J. E. Harting exhibited a living specimen of the Snow Bunting, *Emberiza nivalis*, which had been captured with several others off Cape Race

on board the s. s. 'Ottoman' in October last, during the voyage from Boston to Liverpool, as mentioned at a former meeting (November 7th).

Mr. A. Rolfe gave an abstract of a paper entitled "A Revision of the genus *Vanilla*," in which some fifty species were enumerated, seventeen of which were described as new, though five of them had been previously confused with older forms. The paper was illustrated by a series of carefully-made drawings.

Mr. E. S. Goodrich communicated a Report on the collection of Cephalopoda in the Calcutta Museum. He explained that this collection had been forwarded from Calcutta to Prof. Ray Lankester, at whose request he had undertaken to examine and report upon the species. It contained 162 specimens, almost all of which were collected in the Indian seas from the Persian Gulf to the coast of Australia, during the cruise of H.M.S. 'Investigator.' Fifteen genera were represented, and several new species were described belonging to the genera *Cheiroteuthis*, *Histiopsis*, *Abralia*, *Doliolus*, and *Faonius*. The paper was illustrated by original drawings.

ZOOLOGICAL SOCIETY OF LONDON.

December 3rd, 1895.—SIR W. H. FLOWER, K.C.B., LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the months of October and November, 1895, and called attention to the acquisition of a specimen of the Wild Goat of the island of Giura, in the Ægean Sea (*Capra dorcas*).

Mr. Tegetmeier exhibited a Crab with a supernumerary claw.

A communication was read from Dr. G. S. Brady, containing a supplementary report on the Crustaceans of the group *Myodocopa* obtained during the 'Challenger' Expedition, to which were added notes on other new or imperfectly known species of this group.

Mr. F. E. Beddard communicated some points in the anatomy of *Pipa americana* and on the diaphragm and the muscular anatomy of *Xenopus*, with remarks on the affinities of these two anomalous Batrachians, which he considered as correctly placed together in the system.

Mr. W. Bateson gave an account of the colour variations of a variable Beetle of the family *Chrysomelidæ* (*Gonioctena variabilis*) statistically examined. It was shown that the individuals are chiefly red spotted with black, or else greenish grey striped with black. Intermediate forms occurred, but were less common than the type-varieties. These facts illustrated the phenomenon of organic stability.

A communication from Mr. R. Lydekker contained remarks on the affinities of the so-called extinct Giant Dormouse of Malta, to the effect that this extinct rodent did not belong to the *Myoxidæ*, but rather to the *Sciuridæ*,

unless it were necessary to assign it to a separate family. He proposed for its reception a new genus, *Leithia*.

A communication was read from Mr. W. E. J. Bramley describing the mode of capturing Loder's Gazelle, *Gazella loderi*, adopted by the Arabs of the Western Desert of Egypt.

Mr. G. A. Boulenger described a new Snake, *Typlops nigricauda*, and a new Frog, *Chiroleptes dahlii*, from Northern Australia. A second paper by Mr. Boulenger contained an account of the type-specimen of *Boulengerina stormsi*—an Elapoid Snake from Lake Tanganyika, recently described by M. Dollo.

December 17th.—Sir W. H. FLOWER, K.C.B., LL.D., F.R.S., President in the chair.

Dr. Donaldson Smith offered some remarks on some of the animals observed by him during his recent journey to Lakes Rudolph and Stephanie, and alluded especially to the species of Zebras and Antelopes encountered during his journey.

Mr. Sclater exhibited and made remarks on the head of an Antelope obtained in Kavirondo, British East Africa, by Mr. E. Gedge. This Antelope had been hitherto identified with the "Kob" of Western Africa, but appeared to belong to a distinct species, to which the name *Cobus thomasi* had been given by Herr Neumann.

Mr. G. F. Hampson read a paper on the classification of two subfamilies of the Moths of the family *Pyrallidæ*, the *Schænobiinæ* and *Crambinæ*: in the former subfamily twenty-five genera were classified, in the latter thirty. Both subfamilies were stated to be parallel developments with the *Hydrocampinæ* from the primitive stock of the *Pyrallidæ*, represented among living forms by the more generalized *Pyraustinæ* and the *Scopariinæ*.

A communication was read from Mr. Oldfield Thomas on *Cænolestes*, a still-existing survivor of the *Epanorthidæ* of Ameghino, and the representative of a new family of recent Marsupials. The specimen upon which the new genus and species (*Cænolestes obscurus*) was based had been received from Bogota. The mammal described by Tomes in 1860 as *Hyracodon fuliginosus*, from Ecuador, was a second species of the same genus, and the name *Hyracodon* being preoccupied, *Cænolestes* was proposed in its place.

Mr. Walter E. Collinge read a paper on the sensory and ampullary canals of *Chimara*, and the innervation of the same. After describing the Elasmobranch character of the sensory canals, the author pointed out that, in addition to the ampullary canals described by Leydig, there were two other forms which were now described for the first time.

Mr. F. A. Bather read a paper on the fossil crinoid *Uintacrinus*, containing a complete morphological description of *Uintacrinus socialis*, based on specimens from the Upper Cretaceous Beds of Western Kansas, now in

the British Museum. The deficiencies of previous accounts were made good, and their errors corrected.

A communication from Mr. W. Bateson contained a correction of a passage in a paper on Colour-variation in Flat Fishes recently read before the Society.

A communication from Dr. C. Brunner von Wattenwyl gave a list of the Orthoptera of the Hawaiian Islands. It combined the result of the examination of Mr. Perkins's first collections with what was previously known on this subject, a total of twenty-nine species being thus obtained. A new genus and six new species were described.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

October 16th.—Prof. RAPHAEL MELDOLA, F.R.S., President, in the chair.

Sir Gilbert T. Carter, K.C.M.G., of Government House, Lagos, West Africa; and Mr. Sydney Wachter, F.R.C.S., of Dane John, Canterbury, were elected Fellows of the Society.

The President announced the deaths of Prof. C. C. Babington, the last but one of the original members of the Society, and Prof. C. V. Riley, one of the ten Honorary Fellows of the Society, and commented upon their scientific work.

Mr. W. F. H. Blandford spoke at some length on the valuable services rendered by the late Prof. Riley to the cause of Economic Entomology, and referred to the enormous number of papers and memoirs on the subject which he had published.

Mr. F. C. Adams exhibited (1) a series of nineteen *Merodon equestris*, containing several varieties, showing their resemblance to wild bees of the family Apidæ, and made a few remarks on mimicry; (2) specimens of *Leptomorphus walkeri*, Curt., taken in the New Forest in September last; (3) *Melanostoma hyalinatum*, Fln. (male and female), from a series of eighteen also taken in the New Forest in the latter part of August; and (4) a specimen of *Spilomyia speciosa*, Rossi, from the New Forest.

Mr. Euock exhibited, and made remarks on, specimens of the mature sexes, and the nest of *Atypus piceus*, the British Trap-door Spider; specimens of *Andrena atriceps*, and males of *A. fulva*.

Mr. Tutt exhibited a long series of *Erebia nerine*, captured in the Tyrol, and read notes on the species.

Lord Walsingham exhibited the types and paratypes of *Pseudodoxia limulus* (Rghfr.), together with the larval cases and a preserved larva. In 1889 Herr Rogenhofer gave the name *Fumea? limulus* to the case and its contents, and Mr. McLachlan agreed from the evidence then adduced that the insect was lepidopterous rather than trichopterous.

Mr. C. J. Gahan exhibited, for Mr. Turner, an imago and some larval forms of *Ledra aurita*, Linn.

Mr. G. C. Griffiths exhibited, and read notes on, hybrids between *Platysamia cecropia* (male) and *P. gloveri* (female); between *P. cecropia* (male) and *P. ceanotha* (female); and between *Actias luna* (male) and *A. selene* (female).

Lord Walsingham read a supplementary note on *Grapholitha*, Hb.

Dr. A. G. Butler communicated a paper entitled "Notes on Seasonal Dimorphism in certain African Butterflies."—H. Goss, *Hon. Secretary*.

November 6th.—The Rt. Hon. LORD WALSHINGHAM, F.R.S., Vice-President, in the chair.

Mr. Cecil W. Barker, and Lieut. H. G. R. Beavan, R.N., were elected Fellows of the Society.

Lord Walsingham announced the death of Mons. E. L. Ragonot, President of the Entomological Society of France, and, since 1887, a Foreign Fellow of the Entomological Society of London, whose loss would be felt by entomologists all over the world.

The Secretary read a letter from Mr. Waterhouse, calling attention to the prospectus of a Monograph by Mr. Ernest Green on the *Coccidæ* of Ceylon.

Mr. Stevens exhibited two larvæ, supposed to be those of a species of *Anobium*, which had been damaging oil paintings in his possession; also two specimens of a luminous species of *Pyrophorus*, which he had received alive from the West Indies.

Mr. Adkin exhibited a portion of a collection of Lepidoptera made in Hoy, Orkney, in 1895, including *Agrotis vestigialis*, *A. tritici*, and *A. cursoria*, not previously recorded from Orkney. Mr. Barrett, Mr. McLachlan, and the Chairman made some remarks on the collection.

Mr. Tutt exhibited a series of *Emydia cribrum* var. *candida*, which he had bred from eggs obtained from a specimen caught by Mr. Merrifield in May, 1895, in Northern Italy. He stated that being unable to obtain *Calluna vulgaris*, the ordinary food-plant, he had tried the larvæ with knot grass (*Polygonum aviculare*), and had no difficulty in rearing them.

The Rev. Canon Fowler exhibited, on behalf of Prof. Poulton, living specimens of *Diaperhomena femorata* bred from eggs received from Prof. Titchener, of Cornell University, New York. The young larvæ had emerged from the eggs in July and August and fed on lime. Several pairs had arrived at maturity, and were feeding in cases in the Oxford Museum.

The Rev. J. H. Hocking exhibited a specimen of *Xylina zinckenii*, taken by him at sugar on the trunk of an oak tree at Copdock, near Ipswich, on Sept. 30th. It had apparently only recently emerged from the chrysalis. He also exhibited two specimens of *Xanthia ocellaris* taken at

the same time. Mr. Barrett referred to the few recorded captures of *X. zinckenii* in this country.

Mr. R. W. Lloyd exhibited male and female specimens of *Amara alpina* from Garvell, Perthshire.

Colonel Swinhoe stated that he had, during the past summer, captured four specimens of *Pieris daplidice* at Deal. They were worn and had probably been blown over from France. Mr. Tutt had collected at Deal for many years, but had never met with *Pieris daplidice* there.

Mr. Tutt read a paper, communicated by Prof. A. R. Grote, entitled "Notes on the genus *Cidaria*."

Dr. T. A. Chapman read a paper entitled "Notes on Pupæ: *Orneodes*, *Epermenia*, *Chrysocorys*, and *Pterophorus*." Lord Walsingham, Mr. Blandford, and Mr. Tutt took part in the discussion which ensued.—H. Goss and W. W. FOWLER, *Hon. Secretaries*.

NOTICES OF NEW BOOKS.

Sport on the Pamirs and the Turkistan Steppes. By Major C. S. CUMBERLAND. With Frontispiece and Map. 8vo, pp. i—x, 1—278. London: Blackwood & Sons. 1895.

In this very interesting volume we have an account of an expedition which the author, in 1889, planned and carried out from India into Kashmir, Chinese Turkestan, the Pamirs, and Asia Minor. At that time comparatively little was known of the particular regions visited by him, and not much interest was taken in them; but subsequent Russian claims and expeditions to our frontiers beyond Gilgit brought these countries more prominently under notice. The author having travelled over a greater area than that described by other explorers, and having frequently left the main caravan routes to hunt over mountains not generally visited, he very wisely, as we think, decided to publish the results of his experience. A good route map shows the course of his travels, and the book abounds with incident attractive alike to naturalists and sportsmen, to say nothing of the valuable details which are given concerning the physical geography of the countries explored. Major Cumberland's chief ambition, it would seem, was to find the *Ovis Poli* in its native haunts, and obtain with his own rifle some typical heads and horns of this magnificent wild sheep, which has been named in honour of Marco Polo. His description of the wild snow-clad

regions in which it is to be found, often at an elevation of 15,000 to 18,000 feet, and of his numerous successful and unsuccessful stalks, is most thrilling; and his observations on the appearance and habits of the animal as viewed by him in a state of nature brings vividly before the reader the scene of his stirring adventures.

To naturalists his remarks upon *Ovis Karelini* (which under some misapprehension he styles *Ovis Carolini*), are instructive, since they tend to prove that although considered by some who have never seen it alive to be specifically distinct from *Ovis Poli*, it is at most only a lowland variety of that animal. On this point he writes:—

“I could not see the slightest difference in this *Ovis* to that of the Pamirs. No doubt it is found at a much lower altitude, as this steppe (the Tian Shan range) was barely 7000 feet above the sea; and it is quite possible that in the summer there might be a slight difference in the colour and length of the hair; but otherwise the two appear to be identical.”

This confirms the opinion of Mr. Blanford, who does not consider them distinct. After measuring and comparing a series of eleven skulls, he arrived at the conclusion that the alleged differences in the curvature of the horns are merely individual, and that a complete transition can be traced between the extreme modifications. It is highly probable that the so-called *Ovis Heinsi*, also from the same region, has no better claim to specific distinction.

Major Cumberland's remarks upon the wild Camels seen by him while camped at Bashkiok, on the edge of the great Gobi Steppe, recall to mind the account given of these animals by the Russian traveller Prejevalski:—

“At Bashkiok,” he says, “a cavalcade approached with two bullocks laden with something the nature of which I could not discern, but which, on coming nearer, proved to be portions of a Camel, the head just as it had been cut off, and some huge joints of meat. I was much interested, and asked the shikari where he had got it. He said that the Camels came to a place on the edge of the great desert of Gobi, about twenty-five miles off, to drink water and graze on a certain kind of grass that grew there; in his time he had killed several of them there. This seemed an unusual opportunity, and I told him I should like to shoot a specimen. He replied it was very unlikely we should get another, for now that the snow lay about, they went away to the heart of the desert, and did not return to drink at the

pools until it had all disappeared, as the snow sufficed for their wants. However, we might try, and failing my getting one, I could take this head and skin.*

“I tried some camel-steak for dinner, but found it very tough.

“The specimen the shikari had brought back was a full-grown female, and, judging by her teeth, pretty old. She must have been a very handsome beast, and in size much the same as the tame species. The head was beautifully shaped, and showed high breeding—very broad across the forehead, with a tapering muzzle. In colour the hair was a bluish grey, rather short, but close and fine, with an undergrowth of *pushm*; on the head it was so fine as to be more like fur. The bumps, of which there two, were small, and the animal altogether quite a different species from the ordinary Bactrian Camel used in the country, and bred in the hills” (p. 171).

In Kashmir the author had some very varied sport. In an expedition to Pangi, where he was first in the field, crossing over the Chini Pass—now forbidden as dangerous—he shot ten Ibex, eight Bears, and seven Musk Deer. From there he went to Zanskar, to try for Burrel (*Ovis nahura*), but saw no heads worth trying for; so proceeded to Leh, whence, after twelve days' march, he reached the Kobrang Valley, where traces of Yak (*Bos grunniens*), were found, and two of these animals were shot, one of them a very fine bull. Moving back to Kiam, in Chang Chenmo, he shot a couple of Antelopes, after some difficult stalking on the open grass plain—presumably *Gazella picticaudata*—and crossing over the Marsemik Pass, came across a herd of Burrel, one of which he secured. Two days having been spent unsuccessfully in pursuit of a herd of *Ovis ammon*, he returned to Kashmir, to plan a fresh excursion up the Rupel Valley, west of Nanga Parbat, into Chilas, in search of Markhor. Great was his joy on discovering a herd of these fine wild goats, and greater still was his satisfaction when after a successful stalk he shot three of them. The horns “resembled the Kajinag heads as to twist, and were not in the least like the Astor heads.” See the figures in Blanford's ‘Fauna of British India,’ Mammalia, pp. 506, 507.

Between Yarkand and Aked Major Cumberland had an opportunity of seeing a flight at the Jeran Antelope with a trained Eagle, and thus describes the incident:—

* This the author did, and it was subsequently exhibited on his behalf in London, at a meeting of the Zoological Society, May 17th, 1892,

“ The morning broke clear and fine, the mist and clouds having rolled off, and when I looked out the most lovely view greeted my eyes of the Tian Shan range, towering aloft full 24,000 ft., the immense height being doubly emphasised by the whiteness of the surrounding country, glistening with freshly fallen snow. The Beg had promised to come early and bring the Shikari with him, but he had been sent for in the night by the Dotai, to answer for the life of a man who had been found dead in the snow. However, later in the day, the Yulbeggie of the district appeared, saying he had been sent by the Beg to do my business, and that being something of a Shikari himself, he would take me to the best places for game. Accordingly we started for Khotan Kama, where he lived, about twenty miles away. On the way he suggested a hunt for Jeran with a trained Eagle which he had with him, but we found none. Then he proposed, after our arrival, to have a deer-drive in the forest ; but after trotting me about here, there, and everywhere, without any result, I came to the conclusion he merely wanted to detain me at his village, so told him I could waste no more time.

“ After Khotan Khama the country was quite wild, without any signs of cultivation or habitation. The junction of the Aksu and Khotan rivers with the Yarkand river occurs here, and from this point change their names for that of the river Tarim, which runs nearly due east until it empties itself into Lobnor. Near Khotan Kama a ferry crosses the Tarim and connects the road from Khotan to Aksu, which is a good deal used by the caravans carrying rice from one town to the other.

“ For the twenty-four miles of jungle through which we tramped my shikari kept his Eagle on his wrist, but it was not until we got to our camping-ground, when he went off by himself to have a last look round, that he had any success, returning with a doe Jeran Antelope. I was anxious to see the Eagle work, and as I could see nothing of a stag, went off with the Yulbeggie in the afternoon to try for another Jeran. I was mooning along, thinking of something else, when all of a sudden the Yulbeggie started off as hard as he could gallop across the maidan. I followed suit, and soon made out a doe Jeran in the distance. It stood and looked at us in amazement, and then cantered off, not very fast, while we still continued our headlong career, every now and then floundering on to our noses over a tussock of grass, or into a hole hidden by the snow, until we got about a hundred yards from our game, which only then realised the situation and extended its stride. The shikari now hurled the Eagle, which he had unhooked and held clasped to his breast during the run, at the Jeran. The Eagle, instead of rising like a Falcon and swooping at its prey, flapped along with its great wings close to the ground ; and although it seemed to fly very slowly, gradually caught up the Jeran, which was impeded in its course by the high grass, and at last grabbed it by the rump with its strong talons. It regularly dragged the deer down,

and held on for some time, the little gazelle kicking out like mad. We still galloped on, and I wondered what the finish would be. The shikari, when he got up to them, without drawing rein, threw himself off his pony and grabbed the deer by the hind leg, just as it had kicked itself free, and pulling out his knife, cut its throat. It was a most exciting chase, and I enjoyed the gallop immensely. On another occasion the Eagle, after it was flown, did not see its quarry, and, after a vague flight, lit on the ground and began to scream; and the next time, when it was more successful, we were too long in coming up, and the deer had shaken it off, going on seemingly none the worse, while the Eagle, which was now on the ground, remained there screaming like a fool, without attempting to get on the wing again to follow its game."

Here we must take leave of the traveller, and close a volume which, after a recent surfeit of books on African big game, has seemed to us refreshingly attractive.

Birds from Moidart and Elsewhere. Drawn from Nature by Mrs.

HUGH BLACKBURN. Small 4to, pp. 192. Edinburgh :
David Douglas. 1895.

THE rapidity with which books on Natural History are issued from the press at the present day, though hard upon reviewers, is in one sense a good sign. It argues not merely a steady sale for such works, profitable, we may hope, to all concerned in their production, but a healthy improvement in public taste. It indicates a desire, on the part of some readers, at least, for what is natural and true and beautiful, in preference to the sensational fiction which of late years has exercised so baneful an influence.

This is as it should be, although we are far from saying that all the books now written on Natural History are needed. More than half of them, it may be said, have no permanent value; they teach us nothing new; while in many cases the illustrations from an art point of view are deplorable, and from their inaccuracy too often misleading.

A work of art to be successful depends not merely upon originality of conception and perfect execution, but also upon truth in design. From this point of view it matters little whether the ablest craftsman has been employed to engrave the artist's lines if those lines are faulty; while their reproduction by "process," or photography, as a rule only emphasises the errors

of conception. Much, therefore, is expected of the artist, and the success of his illustrations must largely depend upon the method of his work. So long as he is content to learn from Nature,—to study her beautiful outlines, her infinite variety of form, her sober harmonies and glorious contrasts of colour, transcribing what she teaches with fidelity and patience,—so long will he continue to approach perfection in his particular branch of art. Unfortunately other influences combine to mar his efforts, and to frustrate good intentions. Nothing is more detrimental to art, more calculated to pervert talent, than what may be called “the hurry of the age,” the rapidity with which work is expected to be conceived and executed. A young artist, not already prepared with careful studies for what is wanted, may not have time to repair at once to the fountain source of inspiration. He must be content, alas! to rely upon the work of others, which he has to take upon trust for lack of sufficient experience to judge of its merits; to call in the aid of the photographer or the taxidermist; or to evolve something from his own “inner consciousness,” with no certain light to guide him. To the true artist not one of these methods will commend itself.

We have been led to these reflections on turning over the pages of Mrs. Blackburn’s sketches in the volume now under notice, which shows us clearly what an advantage it is for science-teaching when an artist is in a position to furnish faithful transcripts from Nature, instead of resorting for illustrations to any of the second-hand expedients above referred to. In saying this we must not be understood to give unqualified praise to all Mrs. Blackburn’s productions. Her volume contains eighty-seven lithographic plates of birds, from original sketches made by her on or near the coast of Argyllshire, where she has long resided; but candour compels us to say that they are not all of equal merit. In many, perhaps most of them, she has been very successful in catching the characteristic attitude which so often distinguishes a species amongst its fellows, and enables an observer to identify it at a distance when too far off to perceive its colour. There is no mistaking her young Kestrels and Peregrines. The Redwing and Song Thrush, which to many people seem so much alike, are cleverly differentiated. The old and young Cuckoos are faithfully delineated. The Spotted Flycatcher feeding its fledgling, the Blue Tit on the larch, and the

swimming Guillemot, with half-closed wings, on the point of diving, strike one as being all very true to nature. The letter-press which accompanies each plate, though often brief, is generally to the point, and often embodies some little fact worth noting. Mrs. Blackburn has lived long enough in Moidart to have observed some curious changes in the avifauna of the district. For example, Thrushes are much more numerous now, at Roshven, than they used to be, probably owing to the increase of cultivation and extension of garden ground. Forty years ago there were no Starlings in the neighbourhood. At first they began to appear at intervals, resting temporarily upon the islands; now a good many stay all the year round, and live in the dovecot with the Pigeons. When the author first came to reside in the district (1856) Sparrows were unknown there, now they are common; while the Yellowhammer, once more plentiful, has of late years decreased in numbers. The Brambling or Mountain Finch, although figured from a caged specimen, has not been detected in Moidart, and the Goldfinch has been observed only once. "It used to be common in the wild parts of Kirkcudbrightshire when there was less cultivation and fewer plantations." A curious habit of the Starling is noticed which we do not remember to have seen elsewhere recorded. A bird of this species was observed to run about on the gravel and insert its beak under loose stones, when by opening it wide it would, after the manner of a Turnstone, raise a pebble, and search beneath it for worms and insects. Respecting the habits of the Hooded Crow, she remarks:—"I have more than once observed these birds eating the berries of the mountain ash off the trees growing near the sea-shore, where there was apparently abundance of more congenial food." Their taste for these berries does not seem to be generally known.

Another observation that is new to us refers to the partiality evinced by the Wood Pigeon (*Columba palumbus*) for the flowers of the horse-chestnut. In the south of Scotland these birds are numerous; and Mrs. Blackburn has heard a tradition there to the effect that "they used in old times to build their nests on the ground; but their young having been so often destroyed by passing cattle, they took to nesting on trees. From that safe altitude they now shout to their former enemies in triumphant defiance, 'Coo-coo, come noo, come noo!'" This recalls to mind

what has been observed in the island of Samoa concerning the *Didunculus* or Little Dodo.*

A converse divergence of habit has been noted in the Jackdaw. Mrs. Blackburn says :—"I have seen their nests in the island of Inch Murrin, in Loch Lomond, among the roots of old oak-trees, some of them quite low down in the ground, others above, with great quantities of sticks both above and below."

The Red Grouse, as is well known, lives almost entirely upon heather, but will feed also in the oat-fields when these are situated on the edge of the moor. The food of the Black Grouse is very different. These birds feed largely on the buds of the bog myrtle; Mrs. Blackburn has found their crops quite full of them, emitting a strong aromatic scent when opened. In winter she has found them full of alder catkins. Like the Red Grouse, however, they are also fond of frequenting the oat-fields. Some young ones which Mrs. Blackburn once captured in the heather were kept in confinement for some days, and thrived upon green peas until they were liberated.

The Partridge, we are told (p. 125), is "not a native of Moidart," and Mrs. Blackburn's experience, in an attempt to introduce it there, is rather curious. She says :—

"We hatched some Partridge eggs in the incubator and tried to rear them, but without success. They seemed to thrive at first, and took their food well, but dropped off daily, and were all dead in a fortnight from no apparent cause. We then got four pairs of full-grown birds. They arrived during frost in winter, so we had to keep them enclosed for a time till thaw came, and fed them on fresh cabbage and grain. We let them out two at a time, to let them get accustomed to the place, for fear they should fly away together if they were all set at liberty at once. They remained near for some time, coming back for the food laid out for them, and sometimes feeding with the chickens or joining the Pheasants. They very soon took to feeding on the sea-shore, among the cast up sea-weed, and finding "hoppers" and other marine delicacies, showing rather a remarkable taste for inland-bred birds imported to London from Hungary. In due time they nested, and hatched small broods, but they all disappeared in the course of the year, probably having become the prey of Sparrowhawks, or escaped cottage cats, of which there are more than enough here."

* See the observations on a change of habit in the *Didunculus*, by the Rev. J. S. Whitmee, quoted in an article on "Rare Birds now living in the Zoological Society's Gardens," 'The Field,' December 26th, 1874.

Perhaps the most interesting of all Mrs. Blackburn's sketches is that which she gives of the young Cuckoo ejecting from the nest the young of its foster-parent, a Meadow Pipit. The story is not new, for she published it many years ago, and had the satisfaction thereby of confirming the earlier statements of Jenner and Montagu, which had been doubted and even rejected as incredible by so good an observer as Charles Waterton. Her observations on the subject have been accepted and quoted by other naturalists,* and have since been fully confirmed by the late John Hancock from personal experience in the garden of his friend Hewitson at Oatlands, in Surrey,† a fact which Mrs. Blackburn might well have noted in her new volume.

We have not found in the letterpress to this volume much to provoke dissent, but a few slips here and there may be noted. For example, it is a mistake to suppose (p. 6) that the Little Auk (*Mergulus alle*) breeds in Shetland; nor is it quite accurate to state (as on p. 185) that "Herring Gulls and other *Laridæ* do not assume the adult plumage of white and grey for a year at least." The bird, to which some of the older writers have given the name "Wagel," is not, as Mrs. Blackburn supposes, the Herring Gull, but a Skua of some kind, as is evident from the description given of its habits, and referred to by herself under the head of Skua (p. 187).

It will be seen from the foregoing remarks that Mrs. Blackburn is not only a gifted artist, but has also the instincts of a true naturalist; and if the merit of her publication lies chiefly in her characteristic sketches of birds, its value is enhanced by the interesting notes which she has appended from her observation of their haunts and habits. It would be well, as we have already hinted, if other artists who furnish illustrations for books on natural history were to follow her example more closely, and appeal oftener to Nature for inspiration than we find to be the case.

* See Gould, 'Introduction to the Birds of Great Britain' (p. 91); Harting, 'Summer Migrants' (p. 239); Newton, in 'Yarrell's British Birds' (ed. 4, vol. ii. pp. 396, 397); and 'Dictionary of Birds' (p. 120).

† See 'Zoologist,' 1886, p. 203.

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NOTES ON THE SEAL AND WHALE FISHERY, 1895.

By THOMAS SOUTHWELL, F.Z.S.

THE severe financial crisis through which our colony of Newfoundland passed in the winter of 1894-5 caused the important harvest of the Seal Fishery to be looked forward to with unusual anxiety, and it was hoped that a successful voyage would, to some extent, alleviate the distress which had weighed so heavily upon all classes, and rendered that memorable winter the blackest in the colonial history. To this end some special regulations were passed, and the steamers which sailed on March 9th (the 10th being Sunday), were allowed to extend their voyage to May 10th instead of April 20th (the usual closing day), and second trips were permitted. The result, as will be seen, was most satisfactory from a commercial point of view, and highly beneficial to all concerned.

Of the twenty steamers which prosecuted the fishery in the past season, seventeen turned their attention to the East Coast, and three to the Gulf of St. Lawrence. During the entire winter westerly winds prevailed, and the ice was off the land; the Seals were struck by the first section of the fleet on March 14th, some sixty miles eastward of Belle Isle, and about eleven of the steamers did well, the other six being beset with ice near Funk Island, and eventually they came off badly. The 'Aurora' was the first to get amongst the Seals, and returned to St. John's on March 26th with 29,916 pelts. On May 8th the same vessel returned from a second trip, with another catch of 3896, making

33,812 Seals. Capt. Jackman stated that on his second trip he discovered a patch of ice, on which a large body of Harp Seals had whelped, and had apparently not been disturbed; this was about sixty miles N.E. of the southern patch, which had proved so productive earlier in the season. In the Gulf of St. Lawrence the success early in the season was only partial, owing to the prevalence of westerly winds keeping the ice packed on the Newfoundland coast; but here the extension of time stood them in good stead. Capt. W. Bartlett, of the 'Panther,' had a somewhat novel experience in this respect; he got a few old and young Hoods in the spring, but husbanded his coals, determining to stay out as long as possible, and was rewarded by getting several thousand old Harp Seals, about the end of April or beginning of May, between Prince Edward's Island and Picton, where he found them quite plentiful; and, in his experience (it being good sealing ground), they remain about there every year till the ice melts. This year there was not a great deal of ice, but as a rule the steamers find it too heavy to get so far into the Gulf. Had Capt. Bartlett been compelled to discontinue work on April 20th, he would not have got any old Seals to speak of. Mr. Thorburn tells me that he never remembers any steamer before this year getting any quantity of old Seals (*i.e.* old and Bedlamer Harp Seals) in the Gulf. Referring to the old Hoods, he says they leave the Gulf and East coast between April 15th and 20th, going down to Cape Harrison on the Labrador coast; and out of ten or fifteen thousand old Seals taken at the end of April or beginning of May, there will not be ten Hoods; they seem to disappear all at once.

The twenty steamers which left the Newfoundland ports captured 270,058 Seals; these were fairly evenly distributed, the average of the whole twenty vessels being 13,500. Six steamers captured over 15,000 each, the 'Terra Nova,' the only Dundee vessel present, taking the lead with 33,886, followed by the 'Aurora' 33,812, 'Neptune' 32,308, 'Wolf' 30,292, 'Ranger' 19,022, and 'Algerine' 18,594; five others had more than 10,000 each, and the remaining nine varied from 516 to 7462. In addition to the 270,000 here referred to, some 30,000 others were captured, making a probable total of 300,000.

The net value of the produce brought in by the steamers, at the time of landing, was estimated at about £77,824; but about a month later the value of skins suddenly advanced very considerably,

in sympathy with the advance in leather, and further large sums were made by those who manufactured them, much to the advantage of the colonists.

The Greenland sealing in 1895 has been a failure, both as regards the young and old sealing. The Scotch vessels took no part in it (the only Seals brought home being 4500 from the station in Cumberland Gulf by the 'Alert'), and the fourteen Norwegians appear to have secured about one cargo between them. I have no precise figures with regard to the catch, but it is evident they are now paying the penalty of their imprudence in times past; the extended close time so strenuously advocated by Capt. David Gray, and to which the Norwegians would not consent, had it been adopted, would, in all probability, have staved off the inevitable result for some time; but nothing short of entire relief from molestation for a lengthy period could have saved the Greenland pack from eventual extermination. In 1860, twenty-one British ships captured 67,876 Seals in the Greenland seas; in 1895, the British vessels have altogether deserted the fishery, and the fourteen Norwegians had to be content with something like the odd thousands.

There were no British vessels in pursuit of Bottle-nose Whales, but the Norwegians are reported to have been fairly successful in this branch of the industry.

The season of 1895 is again marked by the absence of any Peterhead vessel in the Arctic Seas; a fleet of seven steamers left Dundee, two of which, the 'Active' and the 'Polar Star,' went to Greenland, the remainder to Davis Straits.

The 'Polar Star' left Dundee on April 9th, and Lerwick on the 15th, reaching the whaling grounds about the end of the month. The frost was very severe, and for several days she was frozen up; but on May 19th five Whales were seen, and one struck, which, after running out twenty-five lines, was lost, three of the boats making their way back to the ship with very great difficulty. The same misfortune occurred on June 1st through a line breaking, but both these fish, as will be seen, were accounted for by her colleague the 'Active.' On June 6th she took her first Whale, a fair-sized one, with 10 ft. 6 in. bone. Bad weather then set in, and she was driven off the whaling ground; but early in July she succeeded in capturing a second Whale, about equal in size to the first, the two yielding 32 tons of oil and 30 cwt.

of bone. On August 19th the 'Polar Star' bore up for home, arriving at Dundee, all well, on the 28th.

The 'Active' had a very successful voyage, capturing nine Whales, an unheard-of number for Greenland of late years. She left Dundee on April 10th, and Lerwick on the 15th; favoured by wind and weather, the land of Spitzbergen was made on the eleventh day after leaving Lerwick, and Whales were almost immediately sighted, but, owing to severe frost and gales, little could be done in the way of capture; fortune however was with them, and two good Whales were killed unusually early in the season. Other Whales were met with early in May, and on the 20th, a large Whale was harpooned in a heavy gale of wind which lasted three days, and after a struggle for fourteen hours, and a loss of fifteen lines from fouling in the ice, it was killed. The next Whale gave them very little trouble: it was one of those previously mentioned as lost by the 'Polar Star,' and was found to be floating dead. On June 6th a large Whale was struck, and the harpoon drew; but fortune again favoured them, for a second one which had been harpooned by the 'Polar Star' and lost, was picked up. Both these Whales, having once been "loose," were the property of the finder, although in each case the harpoon of the 'Polar Star' was found in them. Three others were taken in the same vicinity, making eight Whales killed before the middle of June. It was not until July 26th that the ninth and last Whale was killed, and, after continuing the search until August 21st, the 'Active' departed for home, arriving at Dundee on the 31st, with a living Polar Bear as passenger. The nine Whales yielded 81 tons of oil and 85 cwt. of bone. The success of the Greenland fishery seems to be due to the condition of the ice, and the favourable position of the south-east pack.

The accounts from Davis Straits are unanimous as to the failure of the fishery there being due to the great quantity of ice which afforded abundant cover to the Whales, very few of which were seen and only three captured. The ice never cleared out, and not a single Whale was seen in the fall. Some of the vessels had great difficulty in extricating themselves at the close of the season. Of the five Dundee ships in the Davis Straits fishery, two only were successful in taking Black Whales; two others had 715 and 709 White Whales respectively; and the 'Terra Nova,' which, however, as before mentioned, had been very successful at the Newfoundland

sealing, brought home only three White Whales and seven Walrus. In Dexterity Bay, the mate of the 'Terra Nova,' when on shore with a shooting party, discovered the remains of some twenty or thirty Esquimaux. The skeletons were of various sizes, and the bones much bleached, showing that they had been exposed a considerable time. To all appearance the remains of the men had been placed apart from those of the women and children; beside the former were placed their fishing and hunting gear, while near the children lay their toys and miniature weapons. The sailors left this desolate burying-place as they found it.

The 'Eclipse' killed her two Whales off Coutts's Inlet, and had not another chance; the 'Nova Zembla' also killed her single Whale in the same month of July. In Elwin Bay, White Whales were as usual plentiful, and it was there that the 'Balæna' and the 'Esquimaux' made the captures before alluded to. The 'Alert' brought home from Cumberland Gulf, in addition to the Seals already mentioned, the produce of three Black Whales, consisting of 20 tons of oil and 30 cwt. of bone.

The total produce of the Whale fishery was 17 Black Whales, 1436 White Whales, and 16 Walrus; these yielded 349 tons of oil (about 178 tons of which was White Whale oil), and $9\frac{1}{4}$ tons of bone. The oil may be valued at £17 per ton, or £5933; and the bone at £2000 per ton (£2500, I am informed, is now being asked by holders), or a sum of £18,025. The total produce being £23,958, against a total of £27,452 in the season of 1894.

In the 'Board of Trade Journal' for November last (vol. xix. p. 586) are some particulars of a fishery for Whales in the Bay of Islands, New Zealand, culled from a report published by the Chief Inspector of Factories, at Wellington, New Zealand, in the 'Journal of the Department of Labour.' This industry is carried on at Whangamumu, a small harbour on the south side of Cape Brett, where it was commenced in 1891. The Whales pass in large numbers between the months of May and August going north, and again between October and December returning south. They pass close in shore, and are taken in nets made of strong rope, iron rings taking the place of the knots in the usual netting; they are 50 fathoms long, divided into 10 fathom sections, with a mesh of 6 feet. The Whales become entangled in the nets, and are killed by lances in the usual way. The produce is oil and

manure. The Whales taken are said to be "Humpbacks." A second station has been established within a few miles, and the combined produce has "so far" amounted to 17 Whales, but it is not clear what period of time is covered by the expression "so far." Except that the fishery, at present, is from the shore, the treatment of the produce seems to be similar to that pursued by the Norwegians off the Finmarken Coast.

I have, as on former occasions, to thank Mr. David Bruce and Mr. R. Kinnes, of Dundee; and Mr. Michael Thorburn, of St. John's, Newfoundland, for their kindness in supplying me with information.

NOTES ON THE ORNITHOLOGY OF NORTHAMPTONSHIRE AND NEIGHBOURHOOD.

BY THE RIGHT HON. LORD LILFORD, F.L.S.

I CONTINUE my notes from the end of 1894 (Zool. 1895, p. 56):—

JANUARY, 1895.

3rd. I received from Mr. Mitchell, station-master at Ditchford, L.N.W.R., a living cock Sparrow of the blackest Cockney type, that had been caught a few days previously near the station. After one or two baths this bird regained the normal appearance of his kind, and I record the occurrence as the only one of the sort that has come to my knowledge in our county. It is difficult to understand why this fictitious melanism should be confined to a solitary individual.

4th. Three Golden Plovers were killed by one of our gamekeepers from a flock that he computed at 180, by far the largest congregation of this species of which I have heard for many years in this neighbourhood.

5th. Mr. G. Bazeley, of Northampton, under this date, informed me that a Puffin was killed by a pike-fisher on the Nen at Leathe's mill, near Ecton, on 2nd inst.

6th. Mr. Walter Stopford informed me that he noticed a flock of ten Common Gulls near Tichmarsh on 1st inst.

7th. My falconer reported two male Peregrines chasing each other and "toying" over and about the house at Lilford for some minutes.

11th. Very severe frost. The falconer reports a large number of Mallard, two Pintails, three Teal, and three Pochards on the river below Lilford, and hundreds of starving Fieldfares about the meadow-fences; also an adult male and two female or young Smews; the latter birds were seen again in the same locality on 12th inst. by my informant.

15th. A cold thaw. The falconer shot at a Tufted Duck high in air close behind the house at Lilford, just "tipped" her in the wing, and brought her down otherwise uninjured to my fowl-pond, where she found many of her own and other allied species. Three Mute Swans paid a visit to this pond to-day, and seem disposed to remain with us. Three Canada Geese were seen on our river near Lilford.

16th. I received a young Snow Bunting, "in the flesh," from Mr. G. Bazeley, of Northampton, with the information that it was caught in a meadow near that town a few days previously.

19th. I had a letter from Mr. John Crisp, of Warmington, informing me that he had recently got very close to three *wild* (?) Swans on the river near that place; he also tells me of having observed some Grey Wagtails taking small fishes from the gravelly shallows near Elton mill, and devouring them upon the dry bank of the river close at hand. Mr. Crisp also mentions that he only just managed to save the life of a Kingfisher by running up and driving off a Sparrowhawk from a bush into which it had "put" the former bird.

20th. Lord Henry Grosvenor told me that he flushed a Bittern four times in the garden at Bulwick on Dec. 14th ult.

21st. Our river in full flood. The decoy-man told me of some 300 Mallard in the flooded meadows; and that he had about 260 of these birds and ten Teal on the decoy on 18th inst., when the water was already too high for a "drive." He tells of seeing six Tufted Ducks on the river on 15th inst. and seventeen Geese on 19th. He came up to see me again in the evening to report that a big Otter had got into the decoy-enclosure; this readily accounts for the fowl getting out of it.

24th. I received a Little Auk in the flesh from Rev. Henry H. Slater, of Thornhaugh Rectory. This bird was picked up at Wansford Bridge on 22nd inst. Another caught and brought into a cottage at Wadenhoe by a cat was also sent to me; and I received a third from Brigstock without any particulars of capture.

25th. Mr. G. Bazeley, of Northampton, writing under date of yesterday, informed me that a female Waxwing was killed at Brington on 22nd inst, and had been sent to him for preservation.

26th. One of our gamekeepers brought to me the remains of a Little Auk found this morning near Lilford Wood; the head and neck of this bird had been eaten by some beast or bird of carnivorous disposition.

27th. Very severe frost, our flooded meadows were covered with thick ice, and a good many Mallard were sitting thereon.

29th. Nineteen degrees of frost, the Thrush family suffering very severely. Immense numbers of Redwings reported to me.

30th. Mr. W. Tomalin informed me that another Little Auk was picked up at Brington on 25th inst., and was sent to Mr. W. Bazeley, of Northampton, for preservation. My son reported two "very big" Gulls seen by him on Tichmarsh Manor, near Molesworth.

31st. Mr. John Crisp told me of having picked up a starved Kingfisher near Warmington, and that some 500 Mallard and Wigeon were frequenting the river in that neighbourhood.

FEBRUARY.

1st. Mr. Frederick Hodgson told me that he recently saw a large flock of Snow Buntings near Aldwinckle.

2nd. A very clean specimen of Little Auk was recently picked up dead near Tichmarsh, and sent in flesh to me by the Rev. F. M. Stopford, to whom it was brought by the finder. Mr. H. Field, of Kettering, wrote informing me that a Little Auk was brought to him yesterday, for preservation, from Geddington, and that his brother had received a Waxwing recently shot near Kettering. Mr. J. Crisp brought me a Little Auk in flesh that was picked up yesterday near Elton. Mr. G. Bazeley sent me a very dull-coloured female Waxwing, stuffed, with the information that he had received it from Burton Latimer on 29th ult.

3rd. My tame Ravens commenced to build in the site from which a brood of four was hatched out last year (see my notes for April 30th, 1894), but the female parent of said brood died not long after the young were taken, and I am not certain about the sex of her successor, which I received with her, from a nest in Andalusia some years ago.

5th. I was given to understand that the three Mute Swans

that frequent our home-ponds (see Jan. 15th ult., *antea*) are wanderers from Lamport, and belong to Sir Charles Isham. Mr. Walter Stopford, who took a stroll in pursuit of wildfowl along our river and brooks between Thrapston and Aldwinckle, brought in three Teal out of six seen, five Tufted Ducks from a bunch of ten, and one Snipe of four seen. He reported many Mallard sitting upon the ice, two Pochards at which he failed to get a shot, and some forty Wood Pigeons busily engaged upon some "greens" in the Aldwinckle allotments. Twenty-two degrees of frost and heavy snow-showers in late afternoon.

6th. Twenty-five degrees of frost. Amongst the birds that come to feed on the scraps thrown out for them on our upper terrace in the flower-garden I to-day noticed one that at first sight, in profile, I took to be a Ring Ouzel, but soon discovered to be a male Blackbird with a broad white half-collar on the right side of neck and a few white feathers about left side of head. This bird was taken alive and uninjured in the afternoon, and transferred to the aviary. Our wild-fowlers brought in three Mallard, two Wigeon, one Pochard, one Tufted Duck, and one Snipe, and report many more up the river, but the whole valley disturbed by skaters. Twenty-nine degrees of frost registered at midnight in our kitchen-garden.

7th. I received a very fine male Waxwing, stuffed, from Mr. G. Bazeley, with the information that it had been killed near Daventry with a catapult about the 2nd inst.

8th. Our garden barometer stood at zero at daybreak, but does not register below that point. Three Coots (rare birds with us of late years) were disporting themselves with many Waterhens on a trickle of half-frozen water below Lilford Locks. Our gunners brought in five Mallard, one Wigeon, and a Snipe.

9th. Twenty-seven degrees of frost. I received as a present from Mr. G. Bazeley a perfectly black female Bullfinch, caught, as the donor informs me, in August last, at Duston, near Northampton. The gunners brought in two Snipes, a Wigeon, and a Goldeneye, and tell of seeing a Water Rail, the only one as yet reported to me this season.

11th. The frost diminishes, only eleven degrees registered. The Lamport Swans (see 5th inst., *antea*) were caught up and sent back to their owner, but I hear of three more of the same species between Thrapston and Aldwinckle to-day.

12th. The frost resumed its severity, 25 degrees were registered before daylight this morning. Stock Doves evidently pairing and very clamorous.

13th. Sky Larks coming into the kitchen-garden at Aldwinckle, in large numbers: 23 degrees of frost.

15th. Our gunners killed five Mallard and a Wigeon up the river, and report the three Swans (see 11th inst., *supra*) as hanging about the Aldwinckle meadows.

16th. I received from Mr. G. Bazeley an immature Red-throated Diver in flesh, killed yesterday close to Northampton. Two Bramblings in flesh received from the station-master at Ditchford, L.N.W.R., with an enquiry as to what they are.

21st. I received a female Scaup alive from the Borough Fen decoy, near Peakirk.

23rd. My son reported a large flock of Stock Doves on Pilton, with a Peregrine in close attendance upon them. Hedgesparrows in full song.

25th. Several large Gulls flying over Lilford, and very noisy.

27th. My son reported a single Peewit, the first seen for many weeks in the neighbourhood, on a meadow below Lilford.

28th. I saw from my up-stairs window an adult Mute Swan on the river below our stone bridge. I note this, because none of these birds are kept within a considerable distance of our house. Twenty Golden Plovers were seen below Lilford, and small flocks of Peewits in our upper meadows.

MARCH.

2nd. The crops of several Wood Pigeons killed yesterday and to-day were fully and almost exclusively crammed with leaves of the Lesser Celandine.

6th. The falconer tells me that he heard the jarring of Little Spotted Woodpecker about ten days ago for the first time this year; also that the Song Thrushes have been in full song for some days past. Mr. W. Bazeley, writing yesterday, tells me that he has a Little Owl, shot near Northampton, in his hands for preservation; he cautiously avoids giving me the name of the murderer of this bird, who, if the bird was killed since 1st inst., is liable to a penalty of £1.

8th. A Whimbrel was seen and heard to-day, and on 11th inst., near our decoy, by the decoy-man, who is perfectly acquainted

with this bird as distinct from the Curlew. This is a very unusual time for the appearance of the Whimbrel in our district. I hear of large numbers of Siskins in the alders near the river.

15th. The Ruffs in the aviary are beginning to resume their "shows."

16th. Eight Whoopers were seen flying about Lilford by my nephew, the falconer, and others.

17th. The Whoopers above mentioned were seen upon the river below Lilford, and subsequently on wing, by my two sisters and niece, two of our guests, and a great many others, some of whom reported the flock as consisting of nine birds. I received from the Rev. W. Hopkinson, of Sutton Grange, near Wansford, a female Ringed Plover in flesh, killed near Castor a day or two ago. This species is by no means very uncommon at the seasons of migration in our valley; but this is the first freshly-killed specimen that I have handled for at least thirty years.

18th. A very clean specimen of an adult Greyhen was shot upon the manor of Wigsthorpe this afternoon, and brought to me. The shooter did not recognise the bird till he picked it up. I am only acquainted with one previous occurrence of Blackgame in Northamptonshire (see Zool. 1851, p. 3278).

19th. The crop of a Wood Pigeon shot and examined to-day contained forty-six horse-beans; another, killed on the following day, had a good handful of field-peas and a few elm-buds in the receptacle just mentioned.

20th. A Stock Dove sits upon two eggs in a hollow ash in our deer-park.

25th. Lord Huntly, writing yesterday, informed me that he received a male Garganey alive a few days ago from the Borough Fen decoy, where it was taken on 18th inst.

26th. A Water Rail seen at the decoy.

28th. Fifteen Wigeon seen upon the river below Lilford. Many nests of Song Thrush and one or two of Blackbird, containing eggs, have been reported to me during the last ten days.

APRIL.

2nd. Peewits' eggs brought in for the first time this year.

5th. One of our gamekeepers tells me that, while searching for Peewits' eggs on Achurch meadows, he saw two Curlews, three Snipes, and four Golden Plovers; one of these last, as he declares,

fairly "mobbed" him, after the manner of a breeding Peewit; but, from information that will be found further on, I am inclined to think that he is mistaken in his identification of these four birds.

10th. The gamekeeper above mentioned says that his four Golden Plovers are still haunting the same locality, and have "black breasts."

11th. Another gamekeeper, well acquainted with Golden Plovers in their breeding haunts, went at my request to the locality above mentioned, and confirms the report of his colleague, adding that he saw a bird that he believes to have been a Ruff.

12th. I heard from the Duke of Buccleuch's head gamekeeper, at Boughton, that while beating Boughton Wood for rabbits, on 9th inst., they flushed a Woodcock that disappeared behind a rise in one of the broad "ridings." On going to look for this bird they found that it had been caught, killed, and partially eaten by a Sparrowhawk, which flew reluctantly from her "quarry."

17th. Mr. John Crisp sent me a fine adult Lesser Black-backed Gull in flesh, killed yesterday at Elton. The Rev. Edward Moore told me that a Partridge had laid eggs in a domestic Duck's nest containing three of the rightful owner's, in the Rectory gardens at Benefield.

18th. Mr. F. Hodgson reported seeing several Redshanks, apparently breeding, on Achurch meadow. I strongly suspect that, in spite of the "black breasts" alluded to above, these are the "Golden Plovers" of my previous informant.

19th. Two Woodcocks were reported to me as seen to-day in our woods, and are the last of which I had any information before October. One of our gamekeepers reported having to-day seen four birds about a bend of the river near Achurch—known as "Starnel Corner"—that must have been either Little or immature Black Terns.

20th. My brother-in-law, who went to look after the supposed Golden Plovers in Achurch meadow, saw three Redshanks, but no Golden Plovers (see 11th inst., *supra*). Miss F. Wickham wrote to me telling of several Redshanks evidently nesting upon Perry Herne (a rushy meadow below Oundle, regularly frequented by these birds during the summer), and adds that she saw a considerable flock of Fieldfares, and saw and heard a Snipe "drumming" in the same locality to-day.

28th. Mr. John Crisp told me that twenty-four Wigeon and

one Teal were still lingering on the river near Elton, and that a few Fieldfares were still thereabouts.

MAY.

2nd. A large diving bird, reported to me by Mr. F. Hodgson, and one of the gamekeepers, as seen on the river near Achurch, could only be Great Crested Grebe.

4th. Whilst out with the Bucks Otter hounds to-day, I saw three Redshanks in Achurch meadow; these birds flew around at a great height when disturbed by the hounds, and were very clamorous, evidently having eggs or young in the meadow-grass.

6th. The falconer reported finding a nest of the Common Heron ready for eggs in a small spinney on Braunsea Brook, near Aldwinckle.

20th. On revisiting the Herons' nest above mentioned to-day, the falconer found that it had evidently been robbed by some human thief. I have little doubt that the cause of a pair of Herons' selection of this spot for building was the destruction of many of the nest-bearing trees in the Heronry at Milton, by the disastrous hurricane of March 24th ult.

27th. A nest of Common Flycatcher, containing three eggs, and built in a cylindrical cement-tin, about three parts full, was brought in to me. The tin in question was on a shelf in a temporary shed, constantly occupied by masons employed in repairs to our stone-work about the house, damaged by the hurricane of March 24th ult. The Flycatchers eventually took off a brood of four young birds in safety, in spite of having had their nest continually brought out of the shed for exhibition. I was out with the Otter Hounds again to-day, and found the three Redshanks still about Achurch meadow, in a frantic state of excitement, but the grass was too long and strong to allow of a search for the young birds that were certainly not far off. This is the first proof positive that I ever had of the breeding of Redshanks upon my own property in this county. Our meadows seem to be unusually full of Corncrakes.

JUNE.

8th. A pair of Great Tits have a brood of young in a large circular leathern Indian bottle, with very small orifice, suspended at about $3\frac{1}{2}$ feet from the ground, in a cedar in our flower-garden; a brood of Redstarts were hatched out in this bottle last year.

12th—19th. I was informed of three or four nests of Little Owl, with eggs and young, in our immediate neighbourhood.

21st. Mr. H. Wickham told me that a Red-legged Partridge was sitting upon her eggs in a nest in the ivy upon the wall of Barnwell Castle.

24th. The falconer told me of a pure white Chaffinch, constantly seen about our pleasure-grounds by himself and others; I had a glimpse of this bird to-day, and have frequently heard of it since, till within about a fortnight ago,—December 26th.

JULY.

4th. I was assured that several pairs of Hawfinches were breeding in the tall lime trees near Drayton House. This species has been remarkably scarce about Lilford this year. Two pairs of Bank Martins have nests in the old stone facing of a bank on the side of a sunken road between the house and farm-buildings at Lilford. This is the first time that I have heard of a nest of this species nearer to us than the colony in the gravel-pits at Aldwincle, about three miles off.

8th. I received alive from Mr. W. Allen, of Raunds, a small foreign Finch, that I cannot identify. The donor informed me that it was taken in a garden at Raunds, in August, 1893, by means of a trap-cage.

11th—12th. I noticed a very unusual congregation, some nineteen or twenty Common Sandpipers haunting the river's sides close to Lilford.

14th. I was informed of the shooting of a White Swallow at Maidwell on 1st inst.

15th. Two Hobbies were reported by the decoy-man as hawking over the meadows near our decoy. This is the only record of this species that has as yet reached me this summer.

22nd. Three Common Sandpipers were taken at the decoy, and placed in our aviary.

26th. A Green Sandpiper was seen at the Park ponds.

AUGUST.

5th. A very unusual number of Swifts hawking over the river near Lilford.

14th. Young Pied Woodpeckers are very noisy in the high trees near the boat-house, and on the bridge-island. Two broods

at least, of this species must have "come off," very near the house at Lilford.

15th. Tawny Owls have been for many days past, and still are, hooting vigorously from daylight to dark, but are comparatively silent during the dark hours. Grey Wagtail seen for the first time this season.

30th. Dr. T. Walker, of Peterborough, reported having recently seen a White Swallow between that town and Whittlesea.

31st. First large flock of Peewits of the season, seen by me near Barnwell Mill.

SEPTEMBER.

2nd. Mr. John Cordeaux informed me by letter that on this day he saw some young Red-backed Shrikes at Welford, in this county, that could not have left the nest more than a day or two ago.

6th. A very young Common Redpoll taken at Pilton. I only record this as I am not aware that a nest of this species has ever been found nearer to Lilford than the neighbourhood of Stamford.

9th. My son reported large Gulls passing over Pilton to the southward. The decoy man reported ten Teal, first of the season, on the decoy.

15th. A quantity of Thrustles at work at the Irish yew berries in the terrace garden. These birds have been, comparatively speaking, scarce here throughout the summer, and I believe that those seen by me, as above mentioned, were travellers; at all events, on the following day, at the same time, and under precisely the same conditions of weather, I could not see one of these birds in the garden during the five or six hours that I was sitting there. Mr. W. Tomalin informed me that the last Swifts were seen at Northampton on the 22nd ult.

18th. Mr. G. M. Edmonds informed me that a Golden Oriole was seen in his garden at Oundle to-day, by an "unimpeachable witness."

19th. One of our gamekeepers saw a flock of Geese passing over Tichmarsh about a week ago. A Quail was killed by Mr. W. Tomalin, in the parish of Hackleton.

30th. The falconer reported the first Redwings of the season seen close to Lilford.

OCTOBER.

6th. A White Starling is often seen about a meadow near

Lilford. The White Chaffinch, previously mentioned, is still haunting our pleasure grounds.

7th. I saw the first Fieldfares of the season flying over the house at Lilford.

12th. First report for the season of Grey Crow near Lilford.

13th. My nephew reports myriads of Wood Pigeons in our home plantations.

17th. First report of Woodcocks for the season: one shot upon the Aldwinckle manor; another killed by telegraph wires on the L. & N. W. Railway, near Wigsthorpe.

18th. Three Wigeon, the first of the season on our decoy.

24th. I received from Mr. W. Tomalin, a Quail in the flesh, picked up, as he informed me, under telegraph wires in St. Giles's Square, Northampton, yesterday; he also announced that another of these birds had been shot recently at Hackleton.

26th. The falconer reports a considerable passage of Sky Larks to the south-west, along our river's side.

30th. Capt. F. A. Irby told me of seeing thousands of Fieldfares about a spinney close to Aldwinckle. The decoy-man tells of a solitary Golden Plover seen to-day; the first of the season.

NOVEMBER.

6th. A Water Rail, the first of the season, seen at the decoy.

14th. The falconer killed a very fine pair of Wigeon, from a bunch of five, on one of our home-ponds.

15th. I received from Mr. H. Beauford, of Sudborough, a very clean specimen of the Forked-tailed Petrel in the flesh, that was picked up at Lyveden, on 13th inst.

16th. I heard from Lady Knightley that, on September 15th ult., she saw a large Hawk in her garden at Fawsley, with a small bird in its talons; her belief that this Hawk was a male Hen Harrier is almost positively proved by the description that she was good enough to send to me.

21st. A Whimbrel was identified by the decoy-man near Thrapston.

22. A Jack Snipe killed near Wadenhoe: this is the first occurrence that has come to my knowledge this season in our neighbourhood, and nearly two months later than the average date of first appearance here; but Snipes are exceptionally scarce hereabouts this year.

25th. Mr. H. Beauford sent me a Little Owl in flesh, that was caught by a dog near Sudborough on 23rd inst. Mr. W. Bazeley reported that he had recently received several Short-eared Owls from various parts of the county for preservation; and on 29th inst. sent me a good specimen of this species that was killed by telegraph wires at Hardingstone, near Northampton.

30th. The falconer tells me that a good many Mallard, Teal, and Wigeon come in at evening "flight"-time to a small pond in our pleasure-grounds. The Mallard are, no doubt, attracted by the exceptionally heavy crop of acorns fallen from a tree in the enclosure, but, unless it be for company's sake, I cannot tell what is the attraction for the other species. Twenty-seven Golden Plovers were observed by several members of our shooting party on Aldwinckle.

DECEMBER.

3rd. I received a fine adult male Gadwall, and a Tufted Duck, alive, from the Borough Fen decoy. It is remarkable that, although the Gadwall has occurred upon our decoy here on several occasions, the proprietor of the other decoy did not recognise the bird sent to me, and enquired of me if it was an "American Wigeon!" Two Wild Geese were seen in the meadows below Lilford on the 2nd, and reported to me to-day.

9th. Vast numbers of Wood Pigeons are coming to our plantations and pleasure-grounds for the acorns, of which there are hardly any in the neighbourhood except in these places. Many of these Pigeons are deficient in their wing feathers, some of which are not more than a quarter grown, and still partially "in quill;" others of these birds are affected with tumours about their heads and the roots of their bills; these conditions are prevalent in both old and young birds.

12th—20th. I received many reports of Peregrines seen in the neighbourhood of Lilford.

31st. The Rev. F. M. Stopford reports a very large number of Bramblings about a fence on Aldwinckle Manor yesterday.

I do not trouble you with a record of vernal arrivals on this occasion, as they by no means assuredly indicate the actual earliest dates of appearance; but I may mention that the Wood Warbler was very much more common than usual in our neighbourhood; and that the first nest of this species that I have

known of in Lilford for many years, was destroyed before it was quite finished, by the trampling of the Otter hounds on our Bridge Island in May. The Hobby was very seldom seen or heard of. Our other vernal migrants were, I think, in about their usual numbers, but there was a marked diminution in our breeding Starlings, Blackbirds, Thrustles, and Mistletoe Thrushes.

I regret that, owing to my negligence about writing to Mr. H. H. Slater, I did not receive his notes from Thornhaugh till I had sent in my own for 1895; I therefore add them here. As will be seen, they have the merit of being personal observations, whilst mine, alas! are for the most part, of necessity, second-hand reports.

Jan. 5th. Snow and frost; many birds are availing themselves of the shelter of my garden. Four Hawfinches feeding on the ground under a yew-tree (which had borne a very abundant crop of berries) upon the hard seeds which the other birds had dropped. A flock of Redpolls in the grass-field by the brook. *Turdidæ* strongly in evidence; enormous numbers of Fieldfares; many Blackbirds and common Thrushes; Redwings apparently not numerous. A Dormouse brought to me from the Bedford Purlieus.

8th. Bedford Purlieus. Still wintry. I counted nineteen Squirrels in about an hour, all on larches, feeding upon the cones, which I think they prefer to anything. I find that they are very fond of the green bark of spindle-tree (*Euonymus*), and peel the twigs entirely. I thought that Rabbits and Mice must have assisted them, but the height above ground excluded the former, and the teeth-marks the latter. The woodmen here tell me that this is a usual occurrence.

22nd. A Little Auk caught alive on Wansford Bridge by F. Percival. I begged it, and sent it to Lilford.

23rd. One Woodcock yesterday, and four to-day, while shooting the Purlieus; presumably on their north-eastward journey.

Feb. 5th to 13th. Astonishing temperatures, registered in my garden, in an open sheltered place, three feet above ground.

February	5th	(night of)	+	0.5°	Fahr.
„	6th	„	-	1°	„
„	7th	„	-	2.5°	„
„	8th	„	-	1°	„
„	9th	„		0°	„
„	12th	„		0°	„
„	13th	„	-	1°	„

16th. Two more Little Auks reported. One shot near Alwalton (which Capt. Vipan got—I skinned it for him); the other at Whitewater.

March 24th. A frightful wind, lasting for about an hour and a half; its worst fury, fortunately, for only half an hour. It injured my trees dreadfully, and tore up by the roots the largest *Platanus occidentalis* I had ever seen. And the poor rooks! We counted sixty-three nests on Friday; this evening only seventeen were left. Some of the sitting birds stuck to their nests till the trees or branches reached the ground. One we found pinned to the ground by a branch, but not much the worse. Four uninjured eggs were picked up! Some which were broken contained well-feathered young.

28th. A Blackbird's nest with three eggs. A Chiffchaff, trying to sing.

April 8th. Many Chiffchaffs. Two Willow Wrens singing.

9th. A bright sunny day, yet a small Bat was flying about,—evidently, by his sharp turns, feeding busily—in the full sunshine all the afternoon in my garden.

12th. A Redstart (male) picked up by one of my boys.

13th. Swallows reported at Wansford, probably Sand Martins.

15th. Sand and House Martins on the river at Wansford; no Swallows.

17th. Swallows.

18th. Capt. Vipan and I were beating shallows for moths at the Bedford Purlieus, and heard several Grasshopper Warblers singing.

19th. Tree Pipits, which have evidently been here some days, as they are quite settled down. Cuckoo.

20th. Nightingale singing.

24th. Corncrake noisy.

May 1st. Remembering that I saw Meadow Pipits on Sutton Heath in the breeding season last year, I and the children went

there to-day, and found four Titlarks' nests, one with four eggs. Not hitherto found breeding in this county, I believe.

4th. Lesser Whitethroat building in my garden. A Jay's nest with three eggs. Not a single Wood Wren to be heard anywhere about here this year. Since the growing up of the under-wood in three or four of our woods they seem to have left the neighbourhood. We shot the first young Rooks. There are more Nightingales, I think, than usual.

May 26th to Aug. 16th. (Absent).

Aug. 16th. My man tells me that the Hawfinches have been more numerous in the garden, and more tiresome, than in any previous year we have been here.

17th. A Nuthatch in my garden. I have seen a few at times in the Bedford Purlieus, but none in my garden, and have often wondered why.

19th. Capt. Vipan tells me that there have been fewer Nightjars than usual in the Purlieus, and that the Grasshopper Warblers, which we found common on their first arrival, got scarce in breeding-time; it seems difficult to understand why. This bird escapes attention more than most others because of its shyness, and perhaps because few are acquainted with its note; in some cases I have found people sceptical as to its being the note of a bird at all. But I have found it in all parts of the county, though less abundant towards the south-west.

26th. I received from Irchester a common Sandpiper, shot on migration near Chester House. I have seen a good many in the Nen Valley, both in spring and autumn, but do not recollect having handled one in the county.

28th. I know of three Wood Pigeons' nests with eggs. Two are in the Purlieus; one in the chuchyard near my house, to which my attention was directed by seeing the bird carrying sticks.

Sept. 6. A Chiffchaff in song in my garden. We see the Nuthatches every day here now.

6th to 13th. The above Chiffchaff, or another like him, stayed on the premises, and sang on every fine day. On the 10th a Willow Wren also singing. On the 11th both Chiffchaff and Willow Wren sang, and, to my surprise, a Garden Warbler also (at which I had a good look) was singing for a short time.

20th. Chiffchaff again.

21st. House Martins seen, with many Swallows.

24th. Ray's Wagtail; very late. In the western part of this county this bird is more abundant than in any part of England where I have been. Taking Wellingborough as a centre, a morning's walk in the breeding season before the females are sitting, would probably show a careful observer half a dozen pairs at least. In the autumn they leave the neighbourhood of water and resort to turnip-fields on higher ground, where, for the first fortnight in September, large numbers are to be found, as many as forty together. After this they get scarcer, and the present date is as late as I have seen them.

25th. A Goldfinch's nest—a second brood, no doubt—fledged. The nest was at the top of the Norway maple overhanging my alpine rockery. I heard the parent birds much excited over the event, and one fledgling fell dead on the rockery.

26th. Some *Phylloscopi* in the garden amongst the shrubs, but they were obstinately silent, and I could not identify them. They were very green in tint. Swallows many: one young House Martin among them. A lot of Gulls, high in air (like *Larus fuscus*) working to the south-west.

Oct. 2nd. A turnip-field near Elton swarming with Meadow Pipts and common Buntings.

12th. Bedford Purliens. Saw a female Redstart on the Wood Farms. I ought to have shot it, as it was very likely *R. tithys* (it was *not* a Bluethroat). But I had only No. 5 shot. Fieldfares for the first time; the last I saw were at their nests at Tromsö. A large flock of Peewits.

17th. Swallows (three), near Wansford Station.

23rd. Going to Peterborough in the train, I caught sight of a large bird of prey mobbed by hundreds of Rooks. It was too far off to do more than guess at the species; but as I noticed that the wing-spread was about four times that of the Rooks, it was probably a Sea Eagle. I saw a Hooded Crow for the first time this autumn.

Nov. 22nd. Eight or nine Snipe in a turnip-field. I got one, but I don't think any one else saw them.

ON SHELL-COLORATION IN BRITISH EXTRA-MARINE MOLLUSCA.

By ARTHUR E. BOYCOTT.

A GOOD deal of somewhat acrimonious discussion went on some years ago in one of our scientific monthlies* with regard to the original colouring of British Land and Freshwater Mollusca. There were represented there, and elsewhere, two views: first, that "*Helix cantiana, cartusiana, &c.*, were once banded species;" † this view was held notably by J. W. Taylor and C. Ashford; secondly, to J. W. Williams there seemed "scarcely any foundation for such a supposition." The chief reasons which induced the latter authority to hold the views he expressed seem to have been (1) that the primitive embryo shell is colourless: (2) that the nucleus in banded species is usually colourless; (3) that freshwater forms are usually unicolorous, and these have been subjected to less change of environment. ‡

In the following remarks I may be able to suggest that both views are, in a way, correct; the difference perhaps lies only in what is understood by the term "once." The meaning of such a phrase as "original ancestors" may, and possibly has, led to much confusion. With regard to the prototype of the large group of Mollusca, or indeed of the Gastropoda only, the argument would be somewhat complicated. On this question evidence could only exist in a very hazy form, and any conclusion arrived at would be but dubious. But, judging from the general aspects of the question, it would seem probable that the first molluscan shell was horn-coloured, colourless, or white. For it would appear obvious that the mollusc would first get the trick of secreting a shell, and afterwards the trick of elaborating it for some useful purpose. Whether it were white, or transparent and colourless, would probably depend chiefly on the molecular condition of the

* 'Science Gossip,' vol. xxvi. p. 178 (J. W. Williams); *ibid.* p. 233 (S. Pace); *ibid.* p. 241 (S. C. Fryer); *ibid.* p. 274 (J. W. Williams); vol. xxvii. p. 73 (J. W. Williams); *ibid.* p. 121 (W. M. Webb). A bibliography of the subject is given by J. W. Williams in vol. xxvi. p. 44.

† "Valedictory Address," in 'Journal of Conch.,' April, 1888.

‡ 'Land and Freshwater Shells,' 1889, p. 19.

calcium carbonate, or other salt of which it might be composed. But "original ancestors" may mean something a good deal more recent than this hypothetical animal, all traces of which in any definite form have long since disappeared. The meaning which may reasonably be given to it is those chronologically most distant molluscans that had organisations from which the various Gastropodous or Lamellibranchiate (for to these two groups, for obvious reasons, the question is confined) forms at present in existence have more or less immediately been derived.

There is now, I assume, no doubt that the extra-marine mollusca have been derived from marine forms by gradual adaptation to terrestrial or freshwater life. The freshwater forms have passed through an estuarine, brackish-water life, while the land species have been derived (1) from sea forms migrating direct across the littoral, (2) from those which have already taken to a freshwater or estuarine habit.*

The shells of marine Gastropoda are on the whole far more brightly coloured than freshwater forms; and at the same time are much thicker in substance. This latter enables them to withstand better the greater battering about to which they are subjected by the rough water in which they live, and, assisted by the coloration, to escape their enemies more easily. One would expect to find that marine mollusca would well illustrate cryptic coloration, for their enemies are very numerous and they are practically dead if once seen. As C. A. Westerlund† quaintly remarks, they are not remarkable for celerity of movement, and hence the chief thing in catching them is to find them. But, as a fact, very few cases of protective coloration have been recorded. One or two are given by Prof. Poulton‡ where corals are imitated; and a figure of a striped *Purpura lapillus* taken on striped rocks by Mr. A. H. Cooke.§ If, however, we could see with fishes' eyes, we should probably find here, as in other cases, that protective colours are far commoner than we suppose.

* Further, certain land forms may take to an aquatic life. *Limnaea truncatula*, e. g. (really more a terrestrial than an aquatic species) looks as if it were migrating one way or the other; either following allied forms into the water or leading them on to land.

† 'Fundamenta Malacologica,' 1892, p. 17.

‡ 'Colours of Animals,' 1890, pp. 70—71.

§ 'Cambridge Nat. Hist. vol. iii. p. 90, fig. 35 (2).

But when we reach the tranquil waters of our ponds, we find the characteristic genera,* *Limnæa* and *Physa*, have monochromatic horn-coloured shells, of a comparatively thin substance. Their apertures too are, as a rule, large in comparison with the whole shell, and they are in the habit of protruding a considerable portion of their bodies as they move about. All this points to a safer life than marine mollusca lead. In the sea there are almost innumerable enemies devouring any mollusca they can find. Gwyn Jeffreys† enumerates a long list of destructive animals, from the cod to star-fishes; and mentions that the number of *Turtonia minuta* in the stomach of a small mullet from Lough Larne was estimated by Hyndman at 35,000. In fresh water their enemies are far fewer; cod and the rest of the large fish are replaced chiefly by the trout which occurs in few such ponds as *Limnæa* likes. Gwyn Jeffreys‡ records a case where a specimen of *L. peregrina burnetti* was found in the stomach of a gillaroo trout (*Salmo stomachicus*) from Ireland;§ and I have heard of several shells being found in trout from the Lugg. The lobster, which readily breaks open even a whelk,|| is replaced by *Astacus*, at once less numerous and less powerful; though it will, however, eat molluscs, shells and all.¶ Among other enemies are sticklebacks, birds (especially ducks), frogs, &c., but the number of mollusca destroyed annually by all these must be far less, both absolutely and relatively, than in the sea.

I have for some time been inclined to think that the shell of *Limnæa* is degenerate, and that this degeneracy has arisen from its quieter organic surroundings.** Of course, the physical conditions of animal life are far more severe in fresh water than in the sea. Organisms are subjected to the drying up of ponds, con-

* These may, however, occur in the sea; *cf.*, *e.g.* K. Semper, 'Animal Life,' 1890, p. 145.

† 'British Conchology,' vol. i. p. lix; *cf.* A. H. Cooke, *op. cit.* chap. iii.

‡ R. Rimmer, 'Land and Freshwater Shells,' 1880, p. 59.

§ Prof. Seeley considers that the muscular thickenings of the walls of the stomach characteristic of this species ("local race"), have arisen from its feeding on *Limnaea*, *Aucylus*, &c. 'Freshwater Fishes of Europe,' 1886, p. 280.

|| Gwyn Jeffreys, *op. cit.*, *loc. cit.*

¶ Huxley, 'Crayfish,' 1884, p. 9.

** Darwin ('Descent,' ed. vi. p. 83) makes a similar remark, but draws a somewhat different conclusion.

siderable and sudden variation of temperature, consequent on shallow water, and to the action of torrents. This generally leads to important modifications: free-swimming forms are lost, *e.g.* in *Anodonta* and *Astacus*, where the *Nauplius* and *Zoea* stages are entirely slurred over; and in *Hydra* we find the medusiform person reduced to a mere gonadial excrescence on the hydriform person. Indeed, Prof. Sollas remarks,* “As *Spongilla*, however, is a fresh-water form, anomalies in its development might almost be expected.” But the colouring of the shell cannot depend so much on its physical, inorganic, as on its organic surroundings. The only differences, which, I imagine, are thus produced, are in the ground colour *e.g.* of “*Planorbis*” *corneus*, living in ferruginous waters. Mr. E. W. Bowell assures me that here the reddish colouring is found in the prismatic layer, not merely as a superficial coating.

It is very interesting to note, that of the five genera of more brightly coloured British fresh-water mollusca, four are closely connected with the sea. *Neritina* is found in fresh water, brackish water, and salt water (and on land); *Dreissena* is closely allied to *Mytilus*, and was undoubtedly recently a marine form, a fact which is strongly attested by its still possessing the free-swimming larva, which in *Unio*, &c., has been so largely modified; † *Unio* and *Anodonta* are nearly allied to sea forms. *Paludina* alone offers considerable difficulties: its affinities with any recent marine form are by no means obvious, and there seems good evidence to show that the “elaborately coloured ‡ forms arose from simple and unornamented” ones.§ We have then here to suppose that for some purpose not very clear (probably cryptic), || this genus has been modified since its habitation in fresh water, which has lasted for some time, Cretaceous onwards. The allied British genera, *Bythinia* and *Valvata*, have the usual horn-coloured shell, which also exists, somewhat strangely, in the brackish-water genus *Hydrobia*.

* Article “Sponges,” ‘Encyclopædia Britannica.’ Reprint, 1891, p. 52.

† Korschelt, Sitzungsber. Naturf. Berlin. 1891, p. 131.

‡ I do not think though that the colours in England ever reached Da Costa’s brown with red transverse stripes. See ‘British Conchology,’ 1779, t. vi. fig. 2.

§ A. R. Wallace, “Darwinism,” 1889, p. 381: ‘Nature,’ xiv. p. 275.

|| The green and brown stripes may resemble water-weeds on a reddish or brown mud.

There are several small points which seem to indicate a more elaborate ancestral shell to some of our species : for instance, the embryo hairs on *Paludina vivipara*,* and *Planorbis corneus*,† the occasional reversion to a banded form of *Limnæa peregra*‡ and *Bullirus hypnorum*. Among the land forms, I fancy the peripheral band and embryonic hairs which occur in *Fruticicola rufescens*, *F. cantiana*, &c., have the same significance.

It is possible that *Limnæa* may be adventitiously protected by the thick growth of weed§ which so often covers the shell.

To turn to terrestrial forms : here we find two great main divisions of coloration—(A) oligochromatic approaching polychromatic, as in *Tachea*, &c. ; (B) monochromatic, the prevailing form.

Of the former class two explanations are possible : (1) They have retained the pigmented shells which were of use to them in the sea. But this is rendered improbable because (α) the colours which were of use to them in their marine habitat would probably be useless|| on land ; and (β) the colours would hardly have remained the same while their internal organisation was undergoing such extensive modifications. (2) They have acquired their colours, the migrating species having been either coloured or uncoloured. This view I think is alone tenable.

The monochromatic species (if descended from coloured forms) have become so for the same reason as *Limnæa* ; the life they lead is distinctly quiet and retired. The brightly coloured species all live a more exposed life (as one might expect) than the dull ones. Genera like *Hyalinia* live under stones, among dead leaves, &c., and by no means court a bright light. Bright places, too, are generally too dry for them.

The two groups may likewise be distinguished, I think, by their hibernation. Group A is characteristic of a warmer climate than group B, which is essentially boreal. *Tachea* and *Cryptom-*

* J. S. Kingsley ('Riverside Natural History,' vol. i. p. 341, fig. 432) figures a *half-grown* specimen, with bands and rows of upright spines ; in error apparently.

† For a figure, see J. W. Taylor's 'Monograph British Land and Fresh-water Shells,' vol. i. p. 74.

‡ This may be pathological : J. W. Taylor, *op. cit.* i. p. 102.

§ Cf. Poulton, *op. cit.* p. 77.

|| Of course the colours may be at present useless, but this appears improbable.

phalus, e.g. hibernate very rigidly through a winter however mild; while *Hyalinia*, *Fruticicola rufescens* and *hispida*, and especially *Vitrina* (to give a few examples only), keep fairly lively all through the winter.*

Certain species (*Buliminus obscurus*, e.g., and "*Helix*" *obtecta*, from Madeira), though monochromatic, have been supposed in their younger stage to practice concealment by coating their shells with small particles of dirt; but doubt has recently been thrown on this idea, and the coating may well be accidental.

Among the coloured species, one group may easily be separated off: the black and white shells of *Xerophila* and *Cochlicella*. This form is one essentially frequenting dry heaths, &c. S. S. Pearce thinks that some forms of this group (*X. caperata*, var. *ornata*) may be sematic, and warn the sheep, which frequent its habitat, that it is not very palatable;† but there used to be an idea that South-down mutton owed its delicate flavour to this strange diet.‡ However, taking into consideration the fact that nearly all desert shells show a tendency towards leucochroism, I am inclined to attribute their pale, opaque coloration to the fact, that they are hence more able to withstand the great changes of temperature to which their open habits must expose them.§ Indeed, Bouchard-Chantereaux states that *X. virgata* never hibernates, and does not seem to mind the cold; and it must be remembered that extensive, dry areas, if very hot in the daytime, at night are extremely cold.|| I suspect that *Xerophila* may be, in part, cryptically coloured. It is my experience, at any rate, that however much the collector knows the shape, size, and colour of the species he is looking for, or however plentiful they may be, till he catches sight of one, the ground looks quite fruitless; when one

* R. Rimmer, *op. cit.* pp. 96, 131; A. H. Cooke, *op. cit.* p. 24. Quite recently, after two very sharp frosts, and while there was ice on all the ponds, I found *H. nitidula*, *Patula rotundata*, and *F. hispida* in abundance, crawling freely on the under surface of a large stone tilted up against a shed on a very exposed hill.

† 'Journal of Conchology,' vi. p. 123; 'Cambridge Nat. Hist.' iii. p. 89.

‡ Borlase seems to be the originator of this statement, *cf.* Harting, 'Rambles in Search of Shells,' pp. 75, 76.—Ed.

§ See Poulton, *op. cit.* pp. 16, 17.

|| I have seen *X. caperata* crawling over moss when snow was quite thick on the ground.

is seen, one finds out how numerous they are. This applies chiefly to *X. ericetorum (itala)*; *X. virgata* is easier to see. I have noticed near Oxford that this latter species is very fond of sitting exposed on the most prickly thistles in the neighbourhood.

With regard to the remaining bright species in the British fauna: *C. aspersus* more or less harmonises with old walls, &c. *Arianta arbustorum* and *T. nemoralis* and *hortensis* are more difficult to understand. F. E. Beddard* says the colour of *Tachea* must be either cryptic or epigamic, and very naturally objects to regarding them as sexual in hermaphrodite animals. Eimer and C. Darwin† also agree that sexual selection has not modified Mollusca.

With regard to the colours of *T. nemoralis*, Eimer,‡ quoting Leydig, says the amount of moisture in the air has considerable effect, and adduces in support of his view the various colours found in the Rhine Valley, the colour apparently growing darker as the sea is approached. I have looked about for further evidence, but am unable to find anything; nor do I think the amount of moisture can have very much influence. If it has, I imagine it may be because in humid atmospheres the night and day temperatures are more nearly equal, and that therefore a darker colour can do no harm in the respect of warmth, and may help in concealing the animal.

It is very hard for us to see here how the ordinary colours of *Tachea* can be cryptic, and to our eyes they certainly are not. It would appear, too, that they are not so to Thrushes, Blackbirds, &c., which kill considerable numbers. They can hardly be sematic, as the birds are evidently fond of them, for "thrushes' stones," though more obvious in winter, when other food is scarce, may frequently be seen in summer, when worms and suchlike are abundant.

W. H. Dall§ has suggested that the striped shells of, e.g., *T. hortensis lutea*, B.F. 12345, are cryptic among the stripes of green and dry grass, &c., on the banks they frequent. I cannot see it myself.

A good deal has been said about the effects of food on the colour, but experiments seem to give such varying and conflict-

* 'Animal Coloration,' 1892, p. 56. † 'Descent,' ed. 1871, vol. i. p. 326.

‡ 'Organic Evolution,' p. 137, quoted by F. E. Beddard, *op. cit.*, p. 56.

§ Quoted by J. W. Taylor, *op. cit.*, vol. i. p. 95.

ing results that very little can be deduced from the observations made.* Perhaps it is the fact, not the nature, of the sudden change which makes the difference.

Generally speaking, one thing is obvious, that it is those species which live most freely exposed to light which chiefly develop pigment. This is in accordance with the general rule, and, plainly, in the dark, sematic, cryptic, or epigamic colours, would be of small service.

Under certain circumstances a monochromatic shell can adapt itself by cryptic, isochromatic coloration. Thus a case of albinism in *Pupa cylindracea* on a white wall has been recorded.†

Simroth ‡ suggests that the bands have something to do with the large superficial blood-vessels,§ and there is a good deal of evidence which rather attracts one towards this view.

Prof. Semper || gives a few very interesting cases of pseud-aposematic coloration among land-snails from the Philippine Islands, but this appears to be very rare, so far as our observations have at present gone.

Finally, we may say that the whole matter is wrapped in considerable obscurity, and, at any rate at present, it seems impossible to formulate any theory which will cover all cases. Personally, I fancy that the colours of *Tachea* (and of *Xerophila* partly) are cryptic, or are trying to be so. It is only by very careful observations and accumulation of large masses of material that such questions can be made out satisfactorily. To return to the beginning again, I only hope that in these disconnected jottings I have made it clear that Mr. J. W. Williams's idea may be right, if a very ancient prototype is discussed (and his embryological reason would naturally only apply to this), while the opposite view may turn out to be correct if more recent forms are under consideration.

Since writing the above, I have seen an interesting paper by Mr. W. M. Webb,¶ in which he shows that *Clausilia* in Britain is

* See *ibid.* i. pp. 91, foll.

† J. W. Taylor, *op. cit.* i. p. 92.

‡ See *ibid.* i. p. 96.

§ Cf. the views of Alfred Taylor, 'Coloration in Animals,' 1886.

|| *Op. cit.* pp. 393, foll.

¶ "Protective Coloration in British Clausilias," in 'Science Gossip,' n. s. vol. ii. No. 21, 227.

cryptically coloured with reference to such botanical remains as shrivelled bud-scales, &c. I cannot, however, regard this as a very good case, for *Clausilia* is by no means always found in the situations indicated.

SOME NOTES ON THE RED-BACKED SHRIKE
(*LANIUS COLLURIO*).

BY O. V. APLIN, F.L.S.

FOUR or five years ago, while engaged in collecting evidence of the distribution of the Red-backed Shrike in these Islands,* various items of information relating to the plumage and habits of this bird came into my hands, and at the same time my attention was turned to some points relating thereto. The facts I then collected were carefully noted down, but were put on one side, partly because I was just going abroad, and partly in the hope that I should be able to add to them at some future time. However, other things ornithological have occupied me, and when I came across the little bundle of notes the other day, I thought that the best way to draw attention to the subject, and get further light thrown upon it, would be to bring them under the notice of ornithologists just as they were.

The ordinary dress of the female Red-backed Shrike is described as having the whole of the upper surface of the head and body reddish brown; wings like those of the male, but the rufous margins narrower; tail-feathers above brown, tinged with red, the outer edges of the web of each outside tail-feather dull white; under surface of body and sides greyish white, crossed with greyish brown semilunar lines ('Yarrell,' 4th edit.). The young males are said to be like adult females, but to have the darker semilunar marks on the back as well as on the breast. Mr. Howard Saunders writes ('Manual of British Birds') that the female ordinarily has the upper parts and tail russet-brown, with faint crescentic bars on the mantle; and I may add that I have known the female breeding while still showing fairly conspicuous semilunar lines on the upper parts. A bird very much in this stage of plumage is figured in Morris's plate (1851 edition). The dark crescentic lines in this specimen are to be seen on the crown of the head, as well as on the upper

* Trans. Norfolk and Norwich Nat. Soc. vol. v. p. 286.

parts of the body, but that instances are on record of the assumption of a plumage similar to that of the male. The same author describes the young bird as whiter on the forehead, duller and less rufous brown on the upper parts, and more barred both above and below. The young Shrikes in early August appear, at a little distance, in life, considerably paler than the female. Meyer ('Illustrations of British Birds,' 8vo, 1842, vol. i.) describes the female as ferruginous brown on the upper parts, tinged on nape and rump with ash-grey; and the young of the year to "nearly resemble the female, but some of the feathers on the rump have a narrow dark border." He figures, in his beautiful plate of this species (No. 43, upper figure), a very curious bird. The crown is grey, strongly washed with brown, and closely marked with clearly defined semilunar dark lines; mantle light rufous brown, differing not much from that of the adult male; rump grey, marked with a few semilunar dark lines; under parts marked with dark lines rather closely. I believe Meyer always drew and coloured his figures from specimens, and he lived where these Shrikes were common; but what stage of plumage his bird was in it is hard to say. It might be an old female in the dress described by some as assuming the plumage of the male, if it were not for the marking on the crown of the head. Can it be a male over the first moult? I am rather inclined to think that Meyer must have exaggerated the clearness and abundance of the semilunar dark markings. Jenyns and others refer to a shade of grey on the head or nape, and rump of females, and Dr. Sharpe ('Handbook of British Birds') says that "the grey of the head" of the female is "duller and washed with brown." Seebohm wrote that the female usually differs considerably from the male; the whole of the upper parts reddish brown; wings similar in colour to those of the male, but rufous margins paler and not so broad. He says nothing of crescentic marks on the upper parts. The cases in which the female is found "very, if not exactly similar in plumage to that worn by the cock" are, in the 4th edition of 'Yarrell,' suggested to be cases of "sexual dimorphism." The case of the female shot by Blyth and stated by him to be "partly in the male plumage; but the ovaries were perfect and contained eggs; and it was in company with a partner of the other sex," is referred to in 'Yarrell'; and to the foregoing account Blyth added that he

had "reason to believe that this was a young individual, that is to say, a bird of the preceding year." This belief of Blyth is, in the work before alluded to, said to show that the assumption of some writers that it was only the very old hen of this Shrike which acquires the cock's plumage, could not explain the fact. But Blyth merely had reason to believe his one specimen was a bird of the previous year; we have not the grounds for his belief, and it would be difficult to be certain of the fact in the case of a breeding bird in an almost unknown stage of plumage. Unfortunately, there is a great dearth of detailed descriptions of the plumage of these so-called female Shrikes assuming the plumage of the male. I have, personally, only met with one example of a female in a dress approaching that of the male, and the character of its plumage (especially the whiteness of the under parts and the clearness of the markings) gave me the impression that it was a very old bird. It was shot in Oxfordshire, in the second week in July, 1890, and was in company of an ordinary male at the time. The following is the description of this specimen:—Crown ash-grey, tinged strongly with brown; nape ash-grey; above the eye a white streak; ear coverts dark brown. Mantle and wing coverts warm brown. Rump and tail coverts grey tinged with brown, and with faint traces of dark marks at the end of some of the tail coverts. Tail dark brown, outside feathers edged and tipped with white. Chin, throat, sides of neck and breast and belly and under tail coverts dim white, marked on breast, sides of neck, and flanks with clearly defined dark crescentic lines; throat marked slightly; belly, under tail coverts, and chin unmarked. There are no signs of crescentic marks on the head, back, or rump. These marks, when present, are always a sign of immaturity.

The question is, whether this (or something very like it) is not really the normal, fully adult plumage of the female. That female Shrikes breed in the plain warm brown dress, referred to in this paper, is no proof that the latter is the ordinary dress of the adult; for Kestrels commonly breed before they attain the blue tail (barred with black) of the old female. In June, 1891, I saw in Switzerland another female Shrike with the colouring of the upper parts approaching that of the male. This was in the valley of the Engelberger Aa, near the Lake of Lucerne, where the Red-backed Shrike is common. It was one of a pair which

seemed to have a nest in some thick bushes, and I had a very close view of them both through my glasses. This female had the crown, nape, and rump brownish grey, and the mouth warm brown. I saw (*inter alia*) another female the same day, which appeared to be plain brown above, and seemed to be an unusually pale-coloured bird, but I did not get very close to it. From the descriptions of Meyer, Jenyns, &c., and from the specimens mentioned, it is clear that plain reddish brown, with or without dark crescentic lines, cannot be considered as the normal colouring of the upper parts of the fully adult female Red-backed Shrike in breeding plumage. And I would suggest the possibility of the birds hitherto referred to as assuming the plumage of the male, being merely old examples in the dress of the fully adult female.

The fact that only a small number of female Red-backed Shrikes have been found in what has been regarded as extraordinarily bright plumage, is not in any degree repugnant to this theory. The adult female Woodchat Shrike is sometimes described as very similar to the male; but more usually as being generally duller in colour; and I have several times seen pairs sitting together on a bush, the female of which was a much duller bird than the male, and had the reddish chestnut of the head and nape both duller and considerably paler.

The only doubt which has arisen in my mind as to the propriety of advancing the above suggestion, has its origin in the fact that I have been unable to find a description of the *under* parts of the birds said to be assuming the male dress. I cannot find out whether these birds had the under parts marked with crescentic dark marks (invariably the case in females in my experience), or had them unmarked, and washed with pale red, like ordinary adult males. If the latter is the case, of course my little theory falls to the ground.

In any case it seems to me that the subject of the plumage of female Red-backed Shrikes is by no means thoroughly understood at present, and it is chiefly with a wish to find out more about it that these remarks have been penned.

I have not seen it stated in any work on British Birds that the nesting dress of the male of this species is different from that of the female. Through the kindness of Mr. F. Coburn, of Birmingham, I was able to satisfy myself that it is so. The following is a description of two birds taken in a trap-cage in a

garden at Northfield on August 14th, 1891, which he was good enough to send for my inspection. The colours of the soft parts were taken down by Mr. Coburn himself.

Male. Crown, nape, ear-coverts, and rump brownish ash-grey, changing to brown on the mantle, and light rufous-brown on the wing and upper tail-coverts; all the feathers marked more or less with subterminal blackish lines and having pale edges, either buff or ashy; the lines semilunar and clear on the mantle and upper tail-coverts. Primaries and secondaries dark hair-brown, the latter with clean-cut buff edges to outer web and tip; the tertials with the clean-cut edging, and, inside it, a dark line. Tail hair-brown, all the feathers tipped with dull black and white in succession; in the outer pair these lines are carried round to the webs, and in the next pair partly so. Under parts dull white, marked very slightly on throat and across upper breast, and strongly on sides of throat and neck and flanks, with more or less semicircular dark lines. The head and nape have a grey appearance, and shade into the warm colour of the back; over the eye is a very indistinct line of buffy white, marked with dark specks.

Female. Crown light rufous-brown, feathers with subterminal blackish band. From the beak over eye an irregular line of buffy white, broadest immediately behind the eye. Nape greyer and less distinctly lined, hardly at all, in fact, and some of the feathers unlined. Ear-coverts rufous-brown marked with dull black. Mantle and wing-coverts warm rufous-brown, the feathers with broad subterminal lines of black, and some of them shading to buff on edge on lower back and greater coverts. Rump greyer, marked the same. Upper tail-coverts warm rufous-brown, with a speck or two of black on a few feathers. Tail hair-brown; central feathers warmly tinged rufous, outer pair edged with black on inner web (extending round part) and then with white all round; second pair similar at tip, third and fourth indistinctly so. Under parts dirty white, sides of neck and flanks marked with more or less indistinct and irregular blackish subterminal lines. A buffy tinge on upper breast and signs of dark markings almost wanting. Very little lined on under parts, and actually *less* than in the male of the same age.

This is Mr. Coburn's description of the soft parts. Tarsus and toes slaty drab with a tinge of blue, at joint of tibia and

tarsus distinct cobalt-blue. The legs and toes would probably be blue whilst the nestlings were very young. Nails umber-brown. The bill has the upper mandible blackish umber, shaded round margin with pale horn-white; lower mandible obscure horn-white, faintly shaded at end with blackish umber. Gape and inside of bill flesh-white, with a tinge of lemon-yellow at ends. Irides apparently very dark hazel. Eyelids umber-black.

Mr. Coburn was good enough to send me the bodies immediately they were skinned, with labels attached, and the mounted specimens with corresponding labels a few days later; and I am responsible for the identification of the sexes on the understanding that the labelling was correct. That this was so, there is, of course, no reason to doubt.

My correspondent Mr. G. W. Bradshaw sent me, for identification, a strange egg which had been found in a nest of the Red-backed Shrike (containing also three eggs of the usual grey type), taken at Burwash, Sussex, on May 18th, 1891. It proved, as I expected, to be an egg of the Cuckoo, and was smaller than the Shrike's eggs. The Red-backed Shrike is included in Mr. E. Bidwell's list of birds in whose nests the Cuckoo occasionally deposits her eggs, and it is marked as having been so selected in Great Britain; but perhaps this additional instance may be worth recording.

NOTES AND QUERIES.

MAMMALIA.

White Stoats in Mild Winters.—During the past month I had brought to me a Stoat which was nearly pure white, with the exception of the top of the head and neck, and a very thin line down the middle of the back. Seeing that the change from the summer to the winter dress is due not to any casting of the fur, but to an actual change of colour in the fur itself, generally admitted to be due to the action of severe cold, the question naturally arises why the animal should adopt its winter coat during such a very mild season as the present, and I suppose that the answer is, that the phenomenon of change has become to a certain extent hereditary, irrespective of cold; though, so far as my experience goes, white Stoats are more plentiful in severe winters than in mild ones.—OXLEY GRABHAM (Flaxton, York).

Long-tailed Field Mouse of the Outer Hebrides.—Referring to Mr. W. E. de Winton's remarks respecting this mouse (Zool. 1895, pp. 446, 447), and his neglect to compare his specimens with the one already recorded and at the British Museum, it would be of interest if he, or Mr. Oldfield Thomas, would kindly do so, and forward the particulars for publication in 'The Zoologist.' Should my description be somewhat inaccurate, it is excusable, for the specimen was sent to the Editor upon my return to St. Kilda, with a request to have its description brought before the readers of this Journal, and was afterwards described by me from memory only, and without any comparison ever having been made with the ordinary type. It is hardly worth while to mention the difficulty of obtaining further specimens from St. Kilda, having sent out spirits for preservation of specimens, a supply of arsenical soap having been left on the island, but all to no purpose; and until I am able to pay another visit, or others interested in the subject can spend a few days at least on those lonely rocks, little more than we know at present is likely to be published. This Mouse, I think, is by no means numerous there.—J. STEELE ELLIOTT (Dixon's Green, Dudley).

Hedgehogs in Winter.—Bell, in the second edition of his 'British Quadrupeds' (p. 109), remarks that the "hybernation of the Hedgehog is, perhaps, as complete as that of any animal inhabiting this country. . . . It lays up no store for the winter, but retires to its warm soft nest of moss and leaves, and, rolling itself up into a compact ball, passes the dreary season in a state of dreamless slumber, undisturbed by the violence of the tempest, and only rendered still more profoundly torpid by the bitterest frost," and, as a rule, in my experience this is quite true, for I once had, for three or four years, a score of Hedgehogs in a large walled-in garden; and, whether the winter was mild or severe, they never moved when once they had taken up their winter quarters, which were always in the manure covering a strawberry-bed, and in that laid at the roots of a large patch of lavender; but, *audi alteram partem*, a year or two ago, some unfamiliar footprints being seen in the snow, they were tracked to a thick hedgerow, and from a mass of dead leaves *Erinaceus europæus* was unearthed in quite a lively condition; and in January I knew of a fine old Hedgehog which periodically issued forth from its lair in the bottom of a thick fence, the grass leading to the same being all trodden down, and a regular track made. Sometimes from home, and at others cosily rolled up in the middle of its domicile; but I am afraid it must have resented my visits and taken up other quarters, for it is now missing.—OXLEY GRABHAM (Flaxton, York).

BIRDS.

The Dispersal of Acorns by Rooks.—In an extract from the Report of the U. S. Department of Agriculture, given under the above heading

on p. 20 of 'The Zoologist' for January last, the following passage occurs:—" . . . it has been shown that the vitality of such seeds is not impaired by the partial digestion to which they are subjected." May I ask, in connection with the above, whether there is any truth in the statement, which I have seen in print elsewhere, to the effect that the germination of such seeds (holly, *e.g.*) as naturally lie dormant a year is accelerated a twelvemonth by passing through the bodies of birds?—M. C. H. BIRD (Brunstead Rectory, Norwich).

Roosting Habits of the House Sparrow.—Between Eltham and Sidcup, Kent, are some birch-thickets in which Pheasants are preserved. House Sparrows come from all directions to sleep in these places. They begin to arrive at about 2.30, and, until after four o'clock, they are continually coming, in small parties of rarely more than thirty birds, flying high and fast, and seemingly from some distance. On December 29th last I watched from 3.30 till 3.50—twenty minutes—and counted 453 Sparrows, besides a few Greenfinches, descending into a small area some thirty yards square, in one thicket. On another day, while walking 300 yards, I saw 153 Sparrows descend at the same place. They roost in small groups of from thirty to sixty birds, in the upper branches of the birches, many of them being in full view from the road, and all of them directly exposed to any rain that may fall during the night. In winter Sparrows ordinarily sleep either in their nesting-places in walls, or ricks, ivied trees, hedges, &c. I do not know of any British bird smaller than a Starling which ever selects so exposed a dormitory as that above mentioned. In the same district, also, Sparrows sometimes build in elms and other large trees, many of their nests being placed far out on the branches, domed, and strong enough to withstand the winter; but they are not occupied at that season.—CHARLES A. WITCHELL (Sidcup, Kent).

Nesting of the Goldcrest.—I am sorry that in jotting down a casual remark, *currente calamo* (Zool. 1895, p. 448), I should have seemed to discount the interest of Mr. Davenport's note on this subject (Zool. p. 21); for nothing was further removed from my purpose than to undervalue the original observations of so good a field-naturalist. Contrariwise, I am looking forward with anticipation of pleasure to Mr. Davenport's forthcoming book, which I feel sure will receive a hearty welcome from all ornithologists.—H. A. MACPHERSON (Carlisle).

Hybrid Crows.—Some years ago I mentioned, in 'The Birds of Cumberland,' two mounted specimens which combined the characteristics of the so-called Hooded and Carrion Crows. I had recently an opportunity of purchasing one of these birds on the death of its owner, a man named Barnes, who shot it in Wastwater. It has the ash-coloured breast and collar of the so-called Hooded Crow, but the belly and the entire back are

pure black. I mention this because I cannot recall having met with examples of the so-called crosses of the two forms or species in any public museum in this country, although the Natural History Museum at South Kensington contains Mr. Seebohm's series of the eastern form of the Carrion Crow in much variety. It is quite possible that cross-bred birds are exhibited in one or other of the provincial museums, but I have at present no note of the fact.—H. A. MACPHERSON (Carlisle).

The Effect of Thunder on Pheasants.—The effect of thunder, or the firing of cannon, on Pheasants has often struck me as very curious: either of these sounds setting the cock birds off crowing as if in defiance. At a place between five and six miles distant from the garrison town of Colchester, I have heard Pheasants close to me echoing each report of the artillery practising there; and have on many occasions noticed the same thing elsewhere. The crowing sounds more like the answer to a challenge than the expression of fear.—G. T. ROPE (Blaxhall, Suffolk).

[This observation is not new. If we mistake not, Gilbert White remarked a century ago that the Pheasants in his neighbourhood crowed when big guns were fired at Portsmouth and the wind was blowing from that direction. Charles Waterton also, in his 'Essays on Natural History,' (first series, 1837), makes the following remarks on the subject;—"The Pheasant crows at all seasons on retiring to roost. It repeats this call often during the night, and again at early dawn; and frequently in the daytime, on the appearance of an enemy, or at the report of a gun, or during a thunder-storm."—ED.]

Great Black-backed Gull in London.—On Feb. 4th inst. I observed three mature specimens of this Gull flying along the Embankment near Blackfriars Bridge. With the exception of one or two of the secondaries of one of the birds being missing—possibly due to an early moult—they were a fine-looking trio. As this bird has been described as rare in London, and the Editor has not included it in his note on "Sea Gulls in London," in 'The Zoologist' for March, 1895 (p. 109), this note may prove interesting. I see that in 'Nature Notes' for February of this year, at page 33, Mr. A. Holte Macpherson mentions his observation of an adult bird of this species flying over the Thames opposite the Temple Gardens on Nov. 5th, 1895.—JOHN H. TEESDALE (St. Margaret's, West Dulwich).

[Apparently our correspondent has not referred to what has been published of this species in 'The Birds of Middlesex' (p. 263), where it is stated that it may often be seen towards the mouth of the Thames, and occasionally strays up the river to a considerable distance. One was killed as high up as Putney during a frost; and, further inland, examples have been seen and shot at Kingsbury Reservoir. The changes of plumage noticed in a tame bird of this species, kept under observation for two and a half years, are described in the same volume.—ED.]

FISHES.

Scorpcena dactyloptera at Lowestoft.—I am indebted to Mr. A. Patterson for the opportunity of examining a second specimen of this fish, which was taken off Lowestoft on Dec. 10th, 1895. It was eight inches in length, the former example, captured off Yarmouth on April 29th, 1894, as reported in 'The Zoologist,' 1894, p. 430, measured $5\frac{3}{4}$ inches only.—THOMAS SOUTHWELL (Norwich).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

January 16th, 1896. — Mr. C. B. CLARKE, F.R.S., President, in the chair.

Messrs. O. V. Aplin and William Cole were elected Fellows of the Society.

On behalf of Mr. G. H. Adcock, F.L.S., of Geelong, Victoria, Mr. A. B. Rendle, F.L.S., exhibited and made remarks upon some photographs of *Hakea grammatophylla*, F. Muell., a little-known species of the Proteaceæ, of local distribution in South Australia.

Mr. G. F. Scott Elliot exhibited specimens of bark-cloth from Uganda, and the shores of Lake Tanganika, and gave an account of the mode of its preparation from the bark-cloth fig, and of the fleshy Euphorbias and Acacias of British East Africa, illustrating his remarks with lantern-slides from photographs taken by himself. Mr. Elliot remarked that the native cloth manufactured on the shores of the Tanganika was made on the same sort of rough loom which he had seen employed near Sierra Leone, and as the Tanganika is, ethnologically and botanically, part of the west coast, that it was interesting to find that the methods employed in countries so far apart were so similar in detail. A discussion followed in which Messrs. Rendle, E. M. Holmes, T. Christy, and W. Carruthers took part.

On behalf of Mr. W. R. Ogilvie Grant, Mr. Harting exhibited some land-shells, and eggs and skins of two rare Petrels from the Salvage Islands, lying between the Canaries and Madeira. These islands were stated to be of volcanic origin, faced with steep rocks from 100 ft. to 300 ft. in height, and covered with loose sandy soil, the vegetation consisting chiefly of the wild tomato, *Lycopersicum esculentum*, the ice-plant, *Mesembryanthemum crystallinum*, *Asparagus scoparius*, and *Cistanche lutea*. Amongst the shells collected were *Helix ustulata* (peculiar to the Salvage Islands), *H. pisana*, *H. macandrewi*, *H. polymorpha*, *Rumina decollata*, *Littorina striata*,

Cerithium rupestre, and *Nassa conspersa*. *Helix paupercula* was said to furnish the chief food of the Tarantula spider, *Lycosa maderiana*, and entire shells of *Helix pisana* had been found in the stomach of a Kestrel hawk shot on one of the islands. The Petrels exhibited with their eggs were *Pelagodroma marina* and *Oceanodroma cryptoleucura*, which were found nesting in burrows, after the manner of the Shearwater, *Puffinus kuhli*, of which great numbers were also breeding there. Mr. Howard Saunders offered some critical remarks on these birds, referring chiefly to what was known of their geographical distribution.

Mr. George Murray exhibited full-grown complete specimens of some giant Laminarians from the Pacific, *Nereocystis*, *Egredia*, and *Macrocystis*, and some very fine specimens of *Postelsia*, collected by Mr. W. E. Shaw on the coast of California. He made some remarks on the distribution of Californian *Laminariæ*, and illustrated some points in the structure of their reproductive organs.

A paper was then read by Prof. T. Rupert Jones and Mr. Frederick Chapman on the relations of the Fistulose *Polymorphinæ* and the *Ramulinæ*, with the view of showing the existing evidence for or against the suggestion that several specimens referred to the latter of these two subfamilies may really belong to the former. With this object the authors enumerated, firstly, all the known examples of *Polymorphinæ* having fistulose, tubulose, and racemose outgrowths, and, secondly, all the *Ramulinæ* known, whether published or not, figures for comparison being supplied and supplemented by lantern-slides. Sixty-nine figures of the former and forty-four types or species of the latter were shown on the screen. The most interesting feature in *Ramulina* was said to be the Polymorphine character of the initial chambers in some good specimens of *R. grimaldii* and *R. cervicornis*, and an approach to Polymorphine structure in the swollen bifurcations in other species. Just as Milioline beginnings in *Articulina*, and Nodosarian in *Fronicularia*, &c., do not deprive these of their independent standing as genera among Foraminifera, so *Ramulina* is distinct from *Polymorphina*. Other features and characters were also referred to, giving the genus a substantial position among the hyaline or perforate Foraminifera. In some respects this paper may be regarded as supplemental to the monograph on *Polymorphina* by Messrs. Brady, Parker and Jones, Trans. Linn. Soc. vol. xxvii. (1870).

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THE NORWICH MUSEUM.

By J. H. GURNEY, F.L.S., F.Z.S.

WITH the sanction of the Museum Committee, Messrs. Jarrold and Sons have just published an Official Handbook of nearly two hundred pages, with illustrations, as a Guide to the Norwich Castle Museum. The greater portion of it has been written by Mr. Thomas Southwell, than whom no one could have been found better qualified for the task.

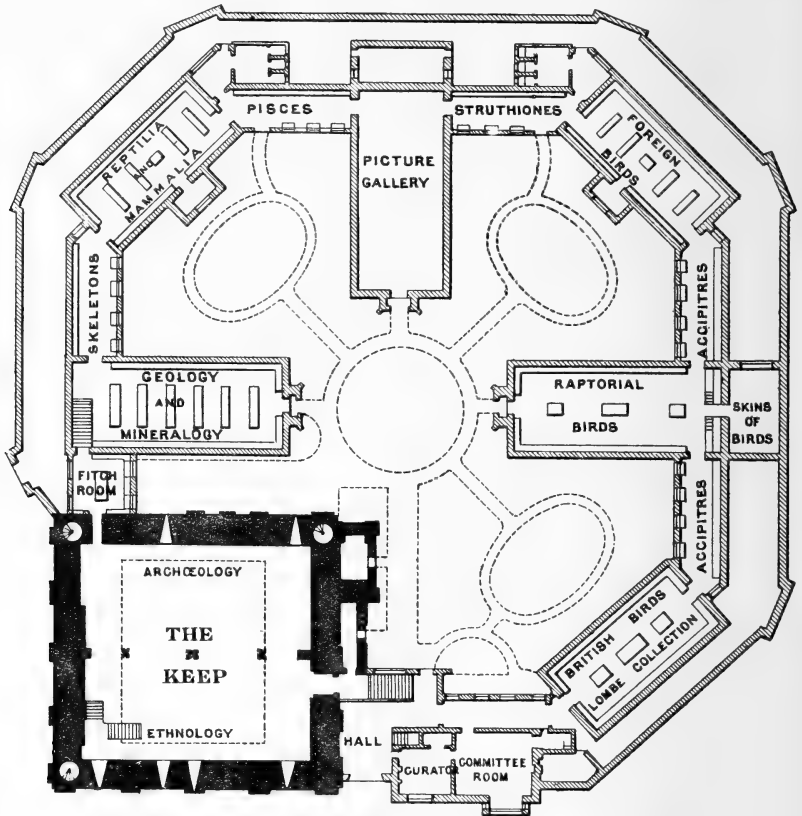
The History of the Museum.—The originator and first President of the Norwich Museum was Sir J. E. Smith, the friend of Linnæus, and founder of the Linnean Society; and great indeed would be the surprise of that distinguished man if he could now arise and see the present state of the collections in their new home.

The Museum in its present form is the outcome of Sir James Smith's zeal* for a cause, and Mr. Southwell's book forms an admirable Guide to it. This will serve me as a peg for a few general remarks, which I hope may induce some of your readers to come and view our famous Norfolk Fossils and rare collection of Birds of Prey.

The present Museum, which is vastly more commodious than the old one in St. Andrew's Street, was completed and opened to the public on Oct. 26th, 1895. It consists of an ancient Norman keep, called "The Castle," and six spacious modern buildings,

* Associated with Smith, however, were several other distinguished men.

which, with the corridors between them, accommodate the British Birds, the Raptorial Birds, the Foreign Birds (not raptorial), the Picture Gallery, the Mammals, and Fishes, as well as the fine geological collection formed principally by the late Mr. John Gunn. These have been arranged pretty nearly in accordance with the scheme submitted by Mr. P. L. Selater to the Trustees in 1891, and have been more than once inspected and generally approved



PLAN OF NORWICH CASTLE AND MUSEUM.

by Sir William Flower, our leading authority on museums. There is also a Muniment Room, in which are preserved municipal documents which go back to the year 1240; and, as will be seen from the accompanying plan, a good committee-room, where the Norwich naturalists meet once a month during seven months of the year for scientific discussion, and to read papers.

The collections, which are the property of the Corporation of Norwich, are still under the watchful care of Mr. James Reeve, who has had the charge of them for about forty-five years, and are open to the public on four days in the week free of charge. The first room which we enter is that devoted to—

The British Birds.—The gem of the British collection is a very perfect specimen of the Great Auk (*Alca impennis*), which formerly belonged to Mr. Lombe; and hardly less interesting is the central case of seven Great Bustards, together with one egg, all native specimens of the old Norfolk race, with the history of each attached. These particulars may be found in Stevenson's 'Birds of Norfolk.' An inconspicuous little bird in Case VII. may not attract the visitor, though Mr. Southwell makes allusion to it, but is nevertheless of considerable importance, since it is the first British example recognised of Savi's Warbler (*Locustella luscinioides*); and not far off are three others, the quartette being worth, according to the price at which the last one changed hands, fifty-two guineas! My late father had two of these birds in the flesh. The first British Buffle-headed Duck and the first British example of Steller's Duck are in separate cases, as they deserve to be, and are in excellent preservation, considering that they have both been stuffed for sixty-six years. A King Duck (*Somateria spectabilis*), shot at Hunstanton in 1888, and presented by Mr. Southwell, to whose exertions the Museum is further indebted for securing the unique Caspian Plover (*Ægialitis asiatica*), stands near them; and a superb old male of the Red-crested Pochard, killed on Horsey Broad, is probably the best example of this species ever killed in England. The Red-crested Pochard is one of the nineteen British species which were first obtained in Norfolk. A remarkably fine Squacco Heron, in nuptial plumage, from Surlingham Broad, is well worthy of attention. This and the Crane, Sabine's Gull (from Breydon Broad), two white-winged Crossbills, and a Broad-billed Sandpiper (also from Breydon), belonged to the late Henry Stevenson, whose fine local collection the city of Norwich ought never to have allowed to be dispersed. It would occupy too much space to enumerate all the choice Norfolk-killed rarities in this Museum, most of which have at one time or another been reported in 'The Zoologist'; but among them are also the following:—

Caspian Tern (old and young).
 Roseate Tern (from Lord Lilford).
 Red-breasted Snipe (Horsey Broad).
 Black Stork (bought at Rising's sale for eleven guineas).
 Buff-breasted Sandpiper (the second British example).
 White's Thrush (Hickling).
 Roller (caught at sea).
 Alpine Swift (Buckenham).
 Richard's Pipit (from Lord Lilford).
 Little Bustard (two specimens).
 Greenland Falcon (Cromer).
 Red-footed Falcon (two).
 Green-backed Porphyrio.
 Fine case of Norfolk Ruffs.
 Bee Eater.

Several white and piebald varieties on the shelves may be noticed of such birds as the Woodcock, Red-backed Shrike, Snipe, Nightjar, Buzzard, Kestrel, Jay, Brambling, and Pheasant; but perhaps the most striking varieties are a slate-coloured Moorhen, with feathers of hair-like texture, and a beautifully pied Long-eared Owl, shot at Burgh, and presented by Mr. C. J. Lucas—albinism in Owls being of very rare occurrence.

In the British Room, though not "British-killed," is a family group of Waxwings, male, female, and nestling, with the nest, all collected by Mr. John Wolley in Finnish Lapland in 1856, when he discovered for the first time the long-sought nesting-place of this beautiful wanderer. This famous oologist was in the habit of sending yearly most of the birds obtained by himself or his agents in Lapland to the Museum at Norwich, where they will ever be objects of special interest to those who are possessors of eggs collected by him, as being in some cases the very birds which laid them. The Oological Collection (excepting the Raptorial Eggs) and the rest of the Nests are in the first and second corridors, and, *inter alia*, comprise locally taken and neatly preserved nests of the Ruff (J. A. Cole), Gadwall (Col. Butler), Hawfinch, Long-tailed Tit, &c., and a nest of the Crossbill taken by John Hancock in Ross-shire.

The Diurnal Birds of Prey.—The collection of Raptorial Birds is, as Mr. Southwell truly observes, a lasting memorial of the energy and acquaintance with this branch of Ornithology pos-

essed by my late father, which has afforded pleasure even to those who are not professed naturalists. Many of the specimens have been described at one time or another in 'The Ibis,' and some are types of new species; while others have a value of their own as being the originals of Wolf's beautiful figures. Only a few of the many mentioned by Mr. Southwell can be here noticed. Case I. contains the Secretary Birds; Case II. the Vultures. In Case III. is a fine group of Californian Vultures, *Pseudogryphus californianus*, with nestling, skeleton, and egg, procured at the same time as the pair in the British Museum; a moribund species, already so rare that when a skin comes into the market it is advertised with the Great Auk and Labrador Duck! Ridgway calls it the peer of the Condor, and it is greatly to be regretted that its destruction by poison is found necessary by stock-owners, for there are now very few left. Another noble species probably marked for extinction, in Europe at least, is the Lämmergeyer, of which there is a fine series of sixteen from different localities, including the valley of Magna near Nice, Sardinia, Bagnères de Bigorre (Philippe), Constantine (Dr. L. Burvey), Erzeroom (with white scapular patches, perhaps incipient albinism), Landom, Himalaya (Major Horsburgh), Tagalang Pass, Ladakh (Capt. Adair), and Lamalmon, Abyssinia. Mr. Southwell reminds us of the well-known story told by Pliny—how one of these birds, mistaking the bald head of the poet Æschylus for a stone, dropped a tortoise from on high, and caused the death of the poet.

The finest of all the Sea Eagles, the deep-billed Kamtschatka Sea Eagle, *Thalassaëtus pelagicus*, is represented by four mounted skins and a nestling; but the more recently described *T. branickii*, which is black all over except the tail, is still a desideratum in the Museum. Passing over the cosmopolitan Ospreys, we come to Anderson's Pern; an abnormal Buzzard, with a small beak and a big mouth, from Africa, which created some excitement thirty years ago, and was named by my father *Stringonyx andersoni* (Trans. Zool. Soc. 1865, p. 117, pl. xxix.), a generic appellation which proved to have been anticipated by *Machærhamphus*, Westerman, conferred on an allied species in the Australian region.

Three or four melanistic examples of Montagu's Harrier, *Circus cinerascens*, which has the same curious tendency to melanism as the Skua Gulls, are of interest, more particularly to

British ornithologists. A finely-preserved *Buteo galapagensis*, collected by Dr. George Bauer, is worth a few minutes' comparison with the representative array of eleven specimens of *Buteo swainsoni*; while a very pale *B. krideri*, shot and presented by Mr. Arthur Stark, should by no means be passed over. *Haliæetus vociferoides*, Des Murs, is another addition since my father's death, and so likewise is *Leucopternis semiplumbea*, obtained by Mr. George Cherrie, of Chicago, of which a fairly good picture is given at page 47 of 'The Guide.'

Mr. Southwell very properly bestows a word of praise to the taxidermic skill displayed in the case of *Buteo solitarius*, the small Buzzard of the Sandwich Islands, the subject of my father's last memoir ('Aves Hawaiienses,' 1893, part v.). Equally creditable to the late Mr. Roberts, who for many years mounted specimens for the Museum, is the group of *Gypsoictinia melano-sternon*, the acquisition of which, through Mr. K. H. Bennett, was a source of gratification at the time. A full description of the nestling in this group is given in 'The Ibis' (1886, p. 458), and we also have the eggs.

Our white variety of the Sea Eagle (*Haliæetus albicilla*), singular for its rarity, though not unique, obtained many years ago in Ireland, was painted from the life by H. L. Meyer in his 'British Birds,' where he remarks:—"No painting can fitly represent the delicate and beautiful colour of this bird. When its feathers are ruffled, as may be frequently observed, at the pleasure of the creature, a delicate azure blue tint is seen to pervade the basal part of the feathers, which, appearing through the whole transparent texture, imparts to its plumage the singular tint it displays" ('Brit. Birds,' i. p. 14). As it has been stuffed for more than fifty years, it is not surprising that "the delicate azure blue" is no longer perceptible.

As special rarities also may be noticed the Long-tailed West African Goshawk, *Urotriorchis macrurus*, nearly as rare as when first described by Dr. Hartlaub in 1855; *Tinnunculus alopec*, the Fox-coloured Kestrel from the Red Sea, lately received in exchange from the Museum at Florence; *Accipiter rufotibialis*, from Kina Balu, Borneo; *Microhierax melanoleucus*, from China, collected by Mr. C. B. Rickett; *Baza bismarcki*, from New Britain (cf. 'Ibis,' 1893, p. 339); and *B. sumatrensis*, from Burma (T. A. Hauxwell).

The latest addition of all is an Australian *Hieracidea orientalis*, from Mr. R. J. Ussher, which is worth alluding to because it is said to have been shot at Dunmore, Co. Waterford, last March. If so, it was probably brought over by sailors and escaped. *Hieracidea*—which partakes of the nature of a Falcon and a Buzzard, having the beak of the former and the legs of the latter—has been sometimes kept in confinement at the Regent's Park Gardens.

The Nocturnal Birds of Prey.—The Owls, noiseless in flight and keen of sight, as Mr. Southwell says, having eyes peculiarly adapted to their nocturnal habits, are located upstairs, and are reached by a staircase leading from the entrance to the Skin Cabinets. As the eye wanders along the shelves, one of the first to attract notice is the beautifully pencilled and mottled *Pseudoptynx gurneyi* (Tweeddale), in which the colours of brown and grey blend like the tints upon an old forest tree. The genus *Pseudoptynx*, Kaup, was adopted by my father for three species, to which a fourth has since been added, viz. the recently described *P. doerriesi*. *P. blakistoni* and *P. doerriesi* are associated with the name of the late Henry Seebohm, the latter, indeed, being the last species which that active and ardent ornithologist lived to describe. Our handsome specimen of *P. blakistoni*, a male in the second year, was taken in the island of Yesso. Beside it stands a skeleton of a bird from the same nest, which afterwards died at the Zoological Society's Gardens.

The next to claim attention is the noble African genus *Scotopelia*, and of *Scotopelia peli* the Museum is fortunate in having two examples, one from Dr. Livingstone, and one from Colonel O'Connor. The latter specimen of this bird was brought to England alive, and lived for a long time in a cage in my father's garden, where it twice sat for its portrait by Wolf, whose skill is especially shown in his delineation of raptorial birds. The type of Ussher's Owl stands on a table in the centre of the room, with the large *Huhua shelleyi*, presented by Dr. Sharpe, and other rarities under shades, e.g. *Sceloglaux albifacies*, from New Zealand, brought home in 1895 by Sir Francis Boileau, of which there is another specimen in the gallery. Two examples of the Madagascar Bay Owl, *Heliodilus soumagnei*, procured by Mr. J. Wills, and the Sooty Owls of New Guinea and Australia, complete this series. Among additions made since my father's death, special

mention may be made of *Scops sibtuensis*, a second specimen of *S. luciaë*, *Ninox ochracea*, from Tonkean in Celebes (very rare), and *N. spilonotus*, from the Philippines, described and presented by Mr. D. Worcester.

The series of Owls closes with *Photodilus*. There are altogether 197 species in the Norwich Museum, and of diurnal birds of prey there are 404 out of a possible 472, leaving 68 to be procured, for which the Museum Committee appeals to travellers and naturalists who are inclined to help in this direction. Desiderata lists in both groups may be had on application.

In several of the Cases are placed printed cards showing the geographical distribution by means of small maps of the world, with the inhabited area coloured red, most instructive to those who wish to know to what part of the earth's surface any given genus belongs. The Short-eared Owl, for instance, is shown to be almost cosmopolitan, except in the Australian region; while the Great Harpy Eagle is only found in Central America, and in the northern portion of South America.

Exotic Birds.—Apart from the series of rapacious birds, the foreign collection is not very extensive, and will at present hardly bear comparison with the series in other large Museums; but nevertheless Mr. Southwell profitably devotes thirty-eight pages of 'The Guide' to this section, illustrating his remarks with portraits of the Bower Bird, Flamingo, and Apteryx. The sixth order, the *Psittaci*, seems to be the best represented of any, viz. by six of the "Kakapo," or Owl Parrot of New Zealand (*Stringops habroptilus*), in one case, presented by Mr. Haldinsein, and three of the sheep-killing Kea, *Nestor notabilis* (about to partake of a dead lamb) in another—a cleverly mounted group. But most of all worth looking at is the modest little shade, beneath which is the extinct Phillip Island Parrot, *N. productus*, whose range at no time extended beyond this one little Australasian island, said to be but five miles in circumference. There are few narratives in the early volumes of 'The Zoologist' more curious than that of the man who shot the last *Nestor productus* on Phillip Island (Zool. 1854, p. 4298), communicated to my father in a letter from Mr. Strange, of Sydney.

In 1892 a notable donation of eighty-six bird-skins, referable to fifty-nine species, collected during the exploring expedition of H.M.S. 'Challenger,' principally from Kerguelen Island,

Australia, and Southern Ocean, were presented by the Lords Commissioners of Her Majesty's Treasury, through Mr. T. Digby Pigott, C.B. A few only of these have at present been mounted, the remainder being preserved amongst the skins, where they are to be seen on application. Mention may also be made of three fine Emus, and the White-billed Diver (*Colymbus adamsi*), recently obtained in Norway by Col. Feilden, a species which one of your correspondents, I observe, has just added to the Norfolk list (Zool. 1896, p. 14) on the strength of a specimen preserved in the Booth Collection at Brighton.

There are several good skeletons of birds, and in the Keep a large table-case of feather capes and tippets worn by the South Sea islanders and other natives, some of them from South Africa, presented by the Baroness Berners.

The Mammalia.—Amongst the more interesting objects here are a pair of Himalayan Bears, a large West African Chacma Monkey, a splendid Moufflon from Cyprus (presented by Sir Henry Bulwer), various interesting beasts from Lord Hastings's Collection and the Trustees of the National Museum at Melbourne, a three-months'-old Lion cub (bred in Bostock's menagerie), and the skull of *Phoca hispida*, captured on the Norfolk coast, and bought by my father in Norwich fish-market. There are several others which Mr. Southwell mentions, including the Beavers, which, when liberated in Sotterley Park, "made themselves quite at home, felling trees to construct a dam after their manner," and the gnawed tree-stool in the Museum is their work. In one corridor a number of skeletons will be found, and among them Mr. Southwell enumerates—Lioness (two), Polar Bear (Capt. Manby), Leopard, Camel, Zebra, and Fallow Deer; also two very large and perfect tusks of the African Elephant, and an enormous head of the same in the Geological Room.

The addition of some life-size models of Cetaceans, accurately painted after nature, would add very much to the attractions in this department; good models, such as they have in the British Museum, being even better, for museum purposes, than the creatures themselves; but unfortunately want of room is already a serious consideration.

The Ichthyological Collection.—The collection of Fishes is a pretty good one, comprising a fine Maigre (taken at Sheringham in 1841), Spanish, Pomeranian (Cossey), and Ray's Bream (Yar-

mouth), Deal Fish (from T. J. Mann, Oct. 1879), large Opah, Wolf Fish, Long Rough Dab (A. Patterson), "double Turbot" (A. P.), and head of Sword Fish. In spirits, following Mr. Southwell's enumeration, are *Cottus grælandicus* and *C. scorpius* (A. Patterson), from Yarmouth, and the rare Rose Perch* (*Scorpena dactyloptera*); while, since Mr. Southwell's account was written, the Earl of Orford has presented a Florida Tarpon, or Silver King, which weighed 140 lbs., with the rod and line with which he caught it.

The Picture Gallery does not contain much of interest to naturalists, and the Hall, devoted to Geology, hardly calls for notice in the pages of 'The Zoologist.' But one can scarcely pass, without reflecting on ages gone by, one enormous fossil tusk, nearly 10 ft. long, from Cromer, supposed to have belonged to a Mammoth Elephant 16 or 17 ft. high, and an immense humerus, which for size might have belonged to the same animal.

The cabinets of Insects, rearranged by Mr. C. G. Barrett, with additions by Lord Walsingham, are very good. The Hymenopterous Insects are all the gift of Mr. Bridgman. The Lombe-Taylor Collection of Shells was noted in its day. Finally there is the giant Galapagos Island Tortoise, presented to the Museum alive in 1843, when it was no rarity; and a well-arranged Herbarium, with supplementary collections formed by Sir J. E. Smith and Sir James Paget.

THE RABBIT-PLAGUE IN AUSTRALIA.

NOTHING lately has been heard of the Rabbit-plague in Australia, and, to judge by the enquiries which continue to reach us, it appears that there are many who would be glad to learn how this matter now stands.

The attention of our readers has been already directed to the subject on several previous occasions.

In 'The Zoologist' for 1888 (pp. 321-328) we gave an account of the original introduction of the Rabbit, in 1860, in the western district of Victoria, for the purpose of sport, and its subsequent spread to other parts of the country, resulting in an enormous increase of numbers during the succeeding twenty

* See Zool. p. 79.

years, and incalculable damage to sheep-farms and crops. We remarked that during the years 1884, 1885, 1886, the Government had expended in the extirpation of Rabbits in Victoria about £30,000, chiefly by poisoning with phosphorized oats and wheat, arsenic in bran and chaff, and bisulphide of carbon, and by paying 3d. a dozen on all skins or scalps of Rabbits produced to the agents. In this way, at least 157,000 dozen were brought in (equal to 1,884,000 scalps and skins) and paid for in two years.

In New South Wales the sum voted by Parliament in 1886 for the destruction of Rabbits was £74,000, and in South Australia £30,000. The area infested in Victoria was stated to be about 20,000,000 acres, more or less; and the estimated loss during ten years incurred by the destruction and abandonment of sheep-runs, consequent loss of wool, skins, and other profits arising from this source, was set down by Mr. Morgan, the United States Consul-General at Melbourne, Victoria, at something like £3,000,000 sterling.

It was under these circumstances that the Government of New South Wales was induced, in August, 1887, to offer a reward of £25,000 for a satisfactory method of destroying Rabbits wholesale, provided the method were new and effective, and at the same time perfectly harmless to domestic animals. It was this offer which induced M. Pasteur to make the experiments which we have already described (*Zool.* 1888, pp. 326–327), and eventually to claim the reward, if allowed to apply his method in his own way, through a properly instructed agent.

We need not here refer to the Rabbit-pest in New Zealand, as to which we have already furnished statistics (*Zool.* 1888, p. 325), and a report on the remedial methods adopted in that country (*Zool.* 1889, pp. 323–334). Our concern at present is only with the question whether M. Pasteur's method was ever adopted and carried out in Australia; if so, with what measure of success; if not, why not.

We believe it to be a fact that M. Pasteur, having satisfied himself by experiment in a Rabbit warren near Rheims that he could produce a fatal epidemic amongst Rabbits by inoculating them with so-called "chicken cholera" (which he communicated by cultivating the microbes producing it and introducing them amongst the vegetable food given to the Rabbits), announced to the Government of New South Wales that he was ready and

willing to prove the efficacy of his discovery by actual application of the method in that colony.

With that object, his son-in-law, M. Valery Radot, with a skilled assistant, set out for Sydney "with large supplies of the choleraic microbe," and would have proceeded to carry out their object had they been permitted to do so by the colonial Government. At the last moment it would seem that a reaction set in. Those who had hailed with satisfaction the announcement that a remedy for the Rabbit-plague was at hand, now paused to consider whether, after all, the proposed cure might not prove worse than the disease. The result of the deliberation was that the experiment was not permitted to be carried out, and M. Pasteur's assistants had to return home without the expected reward, though we presume, of course, that all their expenses were paid by the Government on whose behalf they had undertaken the voyage.

We have been asked to state why M. Pasteur's proposed remedy for the Rabbit-plague was not adopted and applied in Australia. The fact appears to be that on the eve of the arrival of his assistants at Sydney, certain resident members of the medical profession, feeling it incumbent upon them to examine into the matter carefully before committing themselves to an opinion which they were asked or expected to express, arrived at a conclusion adverse to the adoption of M. Pasteur's proposed experiment. Amongst those who strongly opposed the project was Dr. H. C. Wigg, who, in a paper read before the Royal Society of Victoria, in March, 1888, stated the principal objections to the scheme.

As his views may be taken to be those of others besides himself, and as they undoubtedly embody some serious objections, it may be well to quote them here, for the benefit of our readers, who will then be in possession of the whole story; for hitherto, as some of them have pointed out, they have been furnished only with statistics relating to the introduction of the Rabbit in the Colonies, the damage caused by such unwise introduction, the cost incurred by the Government in attempts to stamp out the plague, and the nature of the remedy proposed by M. Pasteur.

In opposing the scheme, Dr. Wigg wrote as follows* :—

* Proc. Roy. Soc. Victoria, 1889, pp. 28-33.

“The loss, and even desolation, caused in many parts of this country by the excessive multiplication of Rabbits, and the great reward of £25,000 offered by New South Wales for their extirpation, have induced many efforts to discover a cure for the plague.

“Of these the most important has been that of M. Pasteur; but his proposed remedy is so uncertain, and at the same time contains such elements of danger, that I have thought it right, as a matter of urgency, to direct the attention of the Royal Society to the subject.

“He has discovered that a certain virulent epidemic disease, found in France and parts of the Continent, and called the ‘fowl cholera,’ can be easily communicated to Rabbits, and with fatal effect. The poison of this disease he intends to scatter broadcast throughout the colonies, hoping in this manner to destroy the Rabbits everywhere.

“It is this scheme, the prospects of its success, and the grave risks attending it, that we have to consider.

“His plan is to obtain the microbe, which is the effective cause of the disease; to cultivate it in properly prepared infusions, until he has multiplied each single particle of the poison into hundreds of millions, and then to spread it over the ground, or over food prepared for the Rabbits. The microbe is a living being, extremely minute, and found in the blood of diseased animals; and it is supposed that there is a special one for each form of disease. There is much difficulty in saying whether it is vegetable or animal.

“It is now nearly forty years since microbes were first noticed by Davaine, but their real importance as factors in disease was not recognised thoroughly until 1877, when the celebrated paper of MM. Pasteur and Joubert was read before the Academy of Sciences.

“These gentlemen selected anthrax, a disease affecting men and cattle, called in the first case ‘malignant pustule,’ and in the second ‘splenic fever,’ and showed that in the blood myriads of these little organisms were found, either as slender waving rods, or minute oval spores, or as curled filaments; and also proved that the poison, if it existed in these, could be cultivated out of the body to an indefinite extent, without losing any of its infectious virulence. The method was this:—A neutralised decoction of yeast in water was strained and heated so that all

germs in it were destroyed, and a drop of the diseased blood was then placed in it. After a day or two it was full of the microbic growth, and a single drop let fall into a fresh quantity of yeast-water produced a second crop, and so on. Of course the latter cultivations give the microbe free from any foreign matter, and it is from these that its form is best studied. Over fifty successive cultivations of the anthrax microbe have been made, and the last one was as virulent as the first. I spoke of the spores of the microbe. While the active form is very sensitive to degrees of heat (the typhoid microbe being very inactive at low temperatures, and the anthrax microbe inactive at high ones), the spores, the seeds as one might call them, which form when the protoplasm of the active plant is drying up, can endure the greatest heat and cold, and could be swept in dust-storms from one end of the colony to another, carrying disease and death for thousands of miles.

“This should be borne in mind when we consider the proposal to carry on the experiments ‘safely’ here within walled paddocks. We might as well build a post and rail fence to keep out the cholera, or attempt to enclose smallpox within open wire network. Even an island would not secure safety, for the germs might be blown across, or be carried on a boat, or on the clothes and hair of the experimenters. This is one of the great dangers—once admitted, the disease is practically uncontrollable.

“There is another point that I will ask you to bear in mind, as upon it hinges all the value of the experiments held on Sheep that we have received by a recent mail, and which are to prove that they could not be attacked by the disease. I quote the words of M. Valery Radot, M. Pasteur’s son-in-law, and his recognised organ:—‘Easily inoculable and fatal to the Ox, the Sheep, the Rabbit, and the Guinea-pig, splenic fever is very rare in the Dog and Pig. These must be inoculated several times before they contract the disease, and even then it is not always possible to produce it.’ He proceeds to state that fowls never take it, but that if they are artificially chilled they do take it easily—(the logic is not mine)—and it proves exceedingly fatal to them. Now all this simply shows that, under varying circumstances of temperature, and of intensity of the contagion, the microbe affects different animals, *including those rarely susceptible, and those supposed to be never susceptible to its influence.*

“Now for the Rheims experiments, to which so much importance has been attached. A walled-in vineyard of nineteen acres (eight hectares) was greatly infested with Rabbits, and when they had multiplied so much that there was not sufficient herbage left to keep them from starvation, the amiable old lady to whom the place belonged had them fed each day with hay and dry clover. After some time, however, even she found that it was too much, and called in M. Pasteur, who saturated the food with his cholera-poisoned broth, and in two or three days there were hardly any of them left. That is, that famished Rabbits within an enclosure and accustomed to artificial food, one day find that food poisoned, and die accordingly, a result that might safely have been predicted even by non-scientific people; and that is all. One reason why this experiment was not dangerous and, indeed, probably why it was allowed to be performed at all: it was not done in summer, and still less in the fierce heat and far-sweeping dust storms of our plains; it was done in the depth of a French winter, and amid falling snow.

“Again, he inoculates one or more Sheep, and allows others to be in the fields with the poisoned Rabbits, and says they cannot take it because they did not become infected then; but this, too, was done in the depth of winter; and all know how much the action of zymotic poisons is affected by season and temperature.

“Information has been withheld as to what Birds it attacks, and whether we may expect to lose our domestic poultry of every kind. It is, however, pretty certain that we shall lose our native insectivorous Birds, and with them the only restraint we possess over Locusts and Grasshoppers, which, no longer checked as they are now, might become a plague far worse than the Rabbits. But it will naturally be said, If such things happen here, how is it that they do not occur in France? The answer to this question is twofold. In the first place, whenever a new disease falls upon virgin soil adapted to its growth it extends with singular rapidity and virulence, and that whether the disease be in man, as smallpox, or in the earth, as thistles and brambles. After a time, however, and often after the most frightful ravages, the disease appears to have consumed either the whole or a very large portion of the special material required for its growth, and then either disappears altogether, or is confined within moderate bounds. A most striking example of this is within the memory of all. In 1874 King

Thakombau left Fiji to pay a visit to the Governor of New South Wales at Sydney, on the occasion of his cession of his realm to the British Crown. While there he contracted measles, a disease entirely unknown in Fiji; and unfortunately returning home before he was free from the microbes, these minute particles spread to his immediate attendants, and grew and multiplied in them, till at last the disease swept like a storm over the islands, and no fewer than 40,000 people out of that small population died from its effects. After four or five months the epidemic ceased in its virulent character, and now measles there is scarcely more severe than in Europe.

“In the same way, I am informed that the growth of the briar-rose in Tasmania, which at one time threatened such great mischief to that colony, is now far more easily controlled than at first; and that thistles in Victoria—partly, no doubt, through the special legislation, but partly also from the exhaustion of certain ingredients in the soil—are becoming greatly restricted in area. Now in France the plants, the animals, the diseases have, for thousands of years, been adapting themselves to each other, and, if I might use a rather far-fetched simile, they have established a *modus vivendi*.

“Here we have new birds, new animals, a virgin soil, and new climate conditions. Who can tell what results will occur when these are brought into contact with a new choleraic disease? Next, besides the fact that in France the choleraic microbe is on a worn-out soil,—worn out for its own purposes, I mean,—we must remember that the frosts and snows and rains of the long winter there are unfavourable to the extension of the microbe, while in that country of small farms, where every range of trees, every growing field, acts as a filter, the conditions are totally dissimilar to those on our vast sweeps of plain, ‘growing weather’ all through the winter, and dust-winds raking the country straight down from the Rabbit-infected fields to the fertile districts of the coast. Is there, then, any certainty as to what would be the result of the introduction here of this poison? There is no certainty. Microbes of some of the most malignant diseases are sterile in certain countries; thus, although typhus fever is endemic in England and Ireland, we have never had one case in Australia—it seems as if it could not live out here; and the poison of the yellow fever of America dies out rapidly in England.

So it may be with the chicken-cholera in the colonies; but that is only a remote chance, and—no one knows.

“Lastly, is there any reason why we should endanger our flocks, our green crops, the whole prosperity of the country, at a word from M. Pasteur? He is a man who has done brilliant scientific work, especially in the diseases of silk-worms, the diseases of wine, and the investigation of zymotic disease, but who has the intensely French passion of pushing great ideas farther than they will go.

“A few brief references to his last great work, the cure of hydrophobia, will illustrate my meaning, and at the same time give us a salutary caution as to believing too much of what we are vaguely and grandiloquently told about his successes. He attenuates the virus of mad dogs by passing it through the systems of a rabbit and a monkey, and then injects with modified cultures, usually from the monkey’s brain, into men and dogs as a protective and curative measure. For a year or two all went on well, and one enthusiastic writer even declared that he had ‘built’ (upon mad dogs) the ‘eternal temple of his fame.’ Centres for mad-dog vaccination were established at Vienna, Buda-Pesth, and half-a-dozen other towns; and in March, 1886, we find from the ‘Lancet’ that 350 cases had been treated by M. Pasteur, and that but one death had occurred, and that in a case recognised as very serious from the beginning. On 15th May we find that three persons more have died from one set alone. On 12th June another is dead; on 21st August a boy is dead; on 28th August three more boys, two French and one English; on 4th September a patient dies; on 13th November another, and so on. Then at the end of December the statistics of the Pasteur Institute for the previous fourteen months are published, and we find that 31 of the patients are dead; but it is conclusively proved to us in the report by figures (which cannot lie) that during this period M. Pasteur had saved the lives of 163 of his patients. This was a truly great result, and would have excited much admiration, had not Professor Peter, of the Hôpital Necker, pointed out from the vital statistics that the average mortality for the whole of France before the discovery of the infallible cure was 30 per annum. And to obtain this result, thousands of men and women, many never bitten by rabid animals at all, have been inoculated with the virus and are scattered all through France.

“The poison intended for us is now on the ocean, and scarcely a fortnight’s sail from our shores. Two of M. Pasteur’s assistants are on board the ‘Cuzco’ with large supplies of the choleraic microbe, and perhaps even the germs of other diseases as well. The opinion I offer to you, and which I hope that you as the leading scientific body in Victoria will confirm, is that our Government should immediately take steps to make not only the introduction but the use of these things highly penal. It seems to me that in trifling with such diseases we should be rushing blindly towards a precipice, and what lies in the darkness beyond it no man living can say.”

Whether it was this report which decided the Government of New South Wales to prohibit the proposed experiment by M. Pasteur’s representatives in the colony we are not informed; but there can be little doubt that it threw considerable weight into the scale of the oppositionists. At any rate the experiment was not made, and the principal sufferers by the depredations of Rabbits in Australia were left to seek some other and (as the oppositionists would say) less risky remedy than that of M. Pasteur.

What we should now like to know is, What is the present *status* of the Rabbit at the Antipodes after all these vicissitudes of fortune?

NOTES AND QUERIES.

MAMMALIA.

Hedgehogs in Winter.—With reference to Mr. Grabham’s note (p. 76), I may state that I once in winter observed for some minutes an old Hedgehog searching about among some dead leaves, which were partly covered with snow some days old, and this during a prolonged spell of frost. The leaves were in a slight hollow ten yards from a hedge. From this I infer that the Hedgehog does not hibernate.—CHARLES A. WITCHELL (Eltham, Kent).

Bank Vole in Jersey.—During a brief stay at St. Helier, Jersey, on January 2nd, I caught a couple of what appear to be perfectly typical examples of the Bank Vole, *Evotomys glareolus*. I do not know if this species has been previously recorded from Jersey or the Channel Islands.—G. E. H. BARRETT-HAMILTON (Savoy Mansions, W.C.).

BIRDS.

Can Woodpeckers see in the dark?—My reason for asking this question is as follows:—Some time ago I found a nest of the Green Woodpecker, *Picus viridis*, the hole being bored in the trunk of a large ash tree, about 15 ft. from the ground. After tapping the tree with a hammer to ascertain the situation of the nest, I decided to cut a circular hole with a chisel about 1 ft. below the entrance, and a very tedious operation I found it, as I had to cut through nearly seven inches of very hard dry wood before I reached the nest, which, to my great disappointment, contained only one solitary fresh egg. Deeming it advisable to take it, as in all probability the bird would forsake the nest, I removed it very carefully, and substituted a newly-laid Thrush's egg, on the chance of the bird returning and laying to it, closing up the hole I had made with a $3\frac{1}{2}$ -inch bung, filling up the crevices with stiff clay, and rubbing some brown wood-dust over the outside to make it look as natural as possible. On returning a few days later, I tapped the tree with my stick, and was much pleased to see the Woodpecker's head appear cautiously at the mouth of the hole, when on seeing me she flew away: upon which I reascended the tree, removed the bung, and to my surprise found four more fresh eggs. Now comes the point of my question, for, instead of laying to the Thrush's egg, I found that the bird had cast it out of the nest and deposited it at the far end of the passage I had cut, close to the bung; in fact, so close that had I not removed the bung very carefully it would have fallen to the ground. Now what I do not understand is, how the bird knew that it was not its own egg. The hole was only just large enough, as usual, for the bird to squeeze in, and therefore, when once it had entered and filled up the passage, the nest must have been in total darkness; and, unless it could see in the dark, it is difficult to imagine how it detected the fraud, for the two eggs being about the same size and shape would, I should have thought, have been quite indistinguishable to a bird of that family in the dark. Of course the texture of the shells is slightly different, but surely a bird would not be able to detect that either in the dark. I have found the plan of boring a hole opposite the nest and closing it with a bung to answer admirably in the case of most birds that nest in the holes of trees, and adopted it often when I was in India with great success, especially with Barbets, Parroquets, Tits, &c. (*vide* Oates' edition of 'Nests and Eggs of Indian Birds,' vol. ii. p. 326, under the head of *Cyanops viridis*, the Lesser Green Barbet).—
E. A. BUTLER (Brettenham Park, Ipswich).

Early Nesting of Herons.—Owing to the unusual mildness of the present winter, Herons commenced breeding very early, indeed earlier this season than I can ever remember. By Jan. 15th I observed them haunting their old nesting-places, and the unearthly sounds proceeding from them

both day and night while about the trees indicated that pairing had commenced. By Feb. 1st several pairs had eggs, while others were only building. There are three separate colonies here, in three small woods a few hundred yards apart, separated by pasture and tillage fields (the birds building chiefly on firs, though occasionally on sycamores), and one nest by itself on a sycamore in a grove close to a garden not forty yards from a cottage, where we had excellent opportunities for observing the birds during their building operations. It is strange that this pair of Herons should have selected a site so close to a house, while they had numerous trees to build on in more secluded groves. The temperature in January was very mild, the maximum for the month being 48° , the minimum $37\frac{1}{2}^{\circ}$.—ROBERT WARREN (Moyview, Ballina).

[For a note on the early nesting of Herons, see Young, Zool. 1884, p. 191.—ED.]

Herony near Beckley, Sussex.—Unfortunately, the well-known herony at Great Sowden's Wood, Brede, can no longer be described as "one of the largest in England" (Borrer, 'Birds of Sussex,' p. 312; see also Yarrell, 'British Birds,' 4th ed. vol. iv. p. 167; and Rowley, Orn. Misc. vol. iii. p. 65, where will be found two pictures of this herony), inasmuch as this year it is entirely deserted, not a single pair having returned to breed. In 1840, 400 nests might be counted, while twenty years later scarcely 200 remained (*vide* letter from owner, Mr. E. Frewin, to Dr. Arnold, 'Sussex Archæological Collections,' vol. xxvii. p. 114). During the last few years the numbers have steadily decreased, a consequence, I believe, of the erosion of some of the timber. It is, however, with no little gratification that I am able to report that the birds have established a settlement in Alder Shaw, the property of Capt. Pennifather. Alder Shaw is an oak wood of eight acres, situated north-east of the Sowden wood, and near the village of Beckley. On March 1st the owner and I counted seventeen nests, fifteen of which were at the time occupied, the birds presumably performing the duty of incubation. The Herons arrived unusually early this year, *viz.* on Jan. 28th, which is quite three weeks earlier than last year. The settlement (of which this is, I believe, the first notice appearing in print) was commenced in 1892, when three pairs migrated from Great Sowden's Wood. By 1895 this number was increased to fourteen, and I am told that at least a hundred young were safely reared. The nests are placed in the tops of oaks, at a height of thirty to forty feet. Happily, Capt. Pennifather takes great interest in the colony. My friend Mr. Thomas Parkin informs me that it is likely that some of the Herons have migrated to Iden Wood, near Rye. If this surmise be correct, an old herony is revisited, for "Edward I. had one in his manor of Iden, which he reserved to the crown, when, in 1297, he granted that manor to Robert Panlyn, one of the barons of Winchelsea, for

life" (Sussex Archæol. Coll. xvii. p. 122).—W. RUSKIN BUTTERFIELD (St. Leonards-on-Sea).

Red-throated Pipit in Sussex.—I have lately added to my collection an adult male example of the Red-throated Pipit, *Anthus cervinus*, which I procured through Mr. Bristow, of St. Leonards, near which place it was shot on Nov. 13th last. As Dr. Bowdler Sharpe, in his recently published volume on the Birds of Great Britain in Allen's 'Naturalists' Library,' discards the doubtful specimen from Unst in the collection of the late Frederick Bond, the present specimen may be regarded as the third authentic instance on record for Great Britain. As this is a bird which, in its winter dress, might be easily passed over as a Meadow Pipit, *Anthus pratensis*, it may be of interest to point out its distinguishing characters. It is much paler in colour than *pratensis*. There is a well-defined pale streak over the eye; the wing-coverts are broadly margined with pale buff, which forms two bars; the outer tail-feathers are conspicuously white; the dark markings to the centre of the feathers on the back are very bold, and the legs and toes dirty white. A bird which has been mounted since November last might when quite fresh have had the legs tinged with flesh-colour. Looked at separately, it resembles *A. pratensis*, but placed among a few of these birds its distinguishing features are readily observable. Indeed I feel sure that, in the field, I could single out one among a flock of *A. pratensis* without the aid of a field-glass. This specimen has been inspected by Prof. Newton and Dr. Bowdler Sharpe, who are both satisfied as to its correct identification. I may here state that, during my recent visit to the west coast of Ireland, I shot on Achill Island a specimen of *A. pratensis* with a distinctly rufous throat. It was a male and in rather worn plumage. All the Meadow Pipits I saw there struck me as being rather paler in general coloration than those I am accustomed to see in my own neighbourhood.—F. COBURN (7, Holloway Head, Birmingham).

Eider Duck in Gloucestershire.—It may perhaps be worthy of record that on Feb. 12th two Eider-ducks, both males in perfect plumage, were shot on the small reservoir at Witcombe, which lies in a hollow below the Cotswolds, about five miles S.E. of Gloucester. The condition of their feet and feathers is strong evidence that they had not escaped from confinement, their crops also contained nothing but a few small sea-shells. Probably their presence at such a considerable distance from the sea is to be accounted for by their having travelled northwards up the Severn estuary, and thus become bewildered when they found themselves losing touch of the sea; but their occurrence at all so far south in a winter so singularly mild seems remarkable. The birds are now being preserved by Mr. White, of this town, and will be placed in the Cheltenham College Museum.—FRANCIS J. CADE (Thirlestaine Villa, Cheltenham).

[On referring to Witchell's 'Fauna of Gloucestershire,' 1892, we find no mention of the Eider-duck as a visitor to that county.—ED.]

Shoveller in Somersetshire.—A fishmonger in Bath showed me a pair of young Shovellers, *Anas clypeata*, male and female, which had been shot near Keynsham about the beginning of January last. As I have never heard of these birds having been shot near this locality before, the fact may be worth recording.—C. B. HORSBRUGH (4, Richmond Hill, Bath).

[In Cecil Smith's 'Birds of Somersetshire' (p. 477), the Shoveller is mentioned as "a rather rare occasional visitor to the county, making its appearance generally in the winter and early spring."—ED.]

Abnormal Nesting of the Willow Wren.—I have seen mentioned in 'The Field' and elsewhere that the Willow Warbler sometimes, though rarely, nests in ivy on old walls. As the nesting-season of 1896 will soon be with us, I should like to put before readers of 'The Zoologist' a strange instance of this, which took place during my nest-hunting experience. Some years ago, in 1884, I think, I was shown a nest of the Willow Wren in a position such as I have indicated, in the ivy mantling the ruins of an old church. The nest was inside the building. The eggs, of which five were laid, were very brightly spotted. A similar nest was built, in exactly the same place, in May-June, 1893, but none, so far as I know, in the intervening years. Is it not rather strange that these birds should have come back to their old nesting-place after an interval of nine years, assuming that they were the same pair, the truth of which, however, I had no means of certifying? The eggs in the latter case were very ordinary specimens of the Willow Wren, so that there is practically little doubt as to the identity of the birds. In connection with this I would like to mention another strange nesting-place of the Willow Warbler, which came under my notice in 1884. Two of the nests of this species were built in the upper part of a hawthorn hedge. That they were nests of the Willow Wren is the only conclusion I can come to, for I do not think we have the Chiffchaff or the Wood Wren in the district to which my notes refer—on the north shore of the Solway; and the nearest nesting-place of the Grasshopper Warbler to this particular spot is in the woods along Kirkcudbright Bay, some miles off. In any case it is a very unlikely situation for the Grasshopper Warbler. The nests were not at a great distance from each other, domed; and the eggs were lightly spotted with reddish yellow. The hedge was beside a wood frequented by a few Willow Wrens; at the root of the hedge a rabbit-warren; the place a probable haunt of Weasels. It is just possible that this last consideration had something to do with the situation chosen.—J. W. PAYNE (Edinburgh).

Hybrid Linnet and Siskin.—At a meeting of the Linnean Society, held at Burlington House on Feb. 28th, Mr. John Young exhibited a mounted specimen of a hybrid between a Siskin, *Carduelis spinus*, and

Linnet, *Linota cannabina*, of which he believed no example had been recorded. The bird in question had been reared by Mr. George Davis, of St. Aldate Street, Gloucester, who stated that the male parent was the Siskin, and that previous to nesting, the birds had been kept together in the same cage for six months. The case, of course, would have been more remarkable had the hybrid been met with in the wild state.—ED.

Variation of Habit in the Blue Titmouse.—Early in February last, near New Eltham, and about 8 a.m., I noticed two Blue Tits, *Parus cæruleus*, flying from tree to tree along the road in the direction of my walk. The leading bird, which appeared to be a male, frequently uttered call-notes; the other, which I presumed to be a female, was comparatively silent. The leading bird, after flying for a little distance in the usual jerky manner of the species, would suddenly extend his wings and hold them motionless, so that he might be said to soar along, in which position the upward curving of the long feathers was clearly visible. Sometimes he travelled in this way for only a few feet, sometimes for as much as ten yards. Once when he was sailing along a male House Sparrow flew at him, and made three or four attempts to peck him in the air; but the Tit with much agility avoided the attack, and he then perched in a chestnut tree, closely followed by the Sparrow; but the latter, though not more than a foot distant from the Tit, took no further notice of him. On the following morning, near the same place, I saw two Blue Tits, and one of them came from a position about half-way up an elm-tree, and descended in a graceful swoop on motionless wings to a lamp-post on the other side of the road. On no other occasion have I seen any Titmouse exhibit this peculiar gliding flight, which in this case was presumably intended for the purpose of display; but if such behaviour is likely to incite the attacks of other species, it probably will never become prevalent in the Tit. It is, of course, with some other birds habitual.—CHARLES A. WITCHELL (Eltham, Kent).

Red-backed Shrike: Correction of Errors.—As I was unfortunately unable to revise the proof of my article on the Red-backed Shrike (p. 70), I should be much obliged if readers of 'The Zoologist' would make the following corrections in it:—A passage at the bottom of p. 70, beginning with the words "and I may add," and ending at the top of p. 71 with "parts of the body," should have formed a foot-note. This passage should therefore now be enclosed in square brackets. On p. 73, line 3, *for* mouth *read* mantle. Same page, line 37, *for* nesting *read* nestling. On p. 74, line 14, *for* to the webs *read* both webs.—O. V. APLIN (Bloxham, Oxou).

FISHES.

Tunny Fish in the Solway Firth.—The appearance of a Tunny (*Orcynus thynnus*) of considerable size in the Solway Firth is perhaps deserving of notice in 'The Zoologist.' The fish in question was stranded

among the numerous sandbanks of the Firth, near Silloth, on Feb. 24th. Its arrival was at once reported to me, and I had the pleasure of examining it early on the following day. It proved to be a male fish, full of milt. The total length was considerably less than some that have been taken at different times on other parts of the coast. Nevertheless, the fish measured 7 ft. 9 in. in total length, its greatest girth being 5 ft. 2 in. It weighed 28 stone, and was in splendid condition. The entire fish, all but the skin and viscera, was eaten, being distributed, to all who cared to try it, in the town of Penrith, whither it was taken for preservation. The flesh was found to be as rich as salmon. Many who tasted it compared it to veal. The stomach only contained five partly digested vertebræ of some other species of fish.—H. A. MACPHERSON (Carlisle).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

Feb. 6th.—Mr. C. B. CLARKE, F.R.S., President, in the chair.

The Rev. E. Woodruffe-Peacock, and Mr. William Cole were admitted, and Messrs. J. Backhouse, Gilbert Christy, and I. Richards were elected Fellows of the Society.

Sir W. H. Flower, K.C.B., F.R.S., presented to the Society, on behalf of the subscribers, a portrait of Mr. William Carruthers, F.R.S., ex-President of the Linnean Society, painted by Mr. J. Hay. On the motion of Mr. J. G. Baker, F.R.S., it was resolved that the portrait be accepted, and that a cordial vote of thanks to the donors be recorded.

Prof. C. Stewart exhibited a series of dissections of skulls, illustrating the development of air-cavities. The skull of a Herring carefully dissected to show the relations of the ampullæ of the pneumatocyst to the cranial bones; of a Crocodile, to show those of the extra-tympanic cavity and siphonium; of a Rook, to show the limitations and relationships of the vesicular and other strata of the cranial roof; and of a Chinchilla and a *Phascolarctus*, to illustrate the variations and development of the "bullæ" and of its associated structures, were the chief objects shown. Prof. Stewart expressed himself favourable to the belief that the parts mentioned in the Herring are functional for acoustic purposes. In this he was supported by Prof. Howes, who referred in detail to the arrangements occurring in *Hyodon* and *Mormyrus* as substantiating this conclusion.

On behalf of Mr. B. G. Cormack, Dr. D. H. Scott gave the substance of a paper on Polystelic Roots of certain Palms. He remarked that with scarcely any exception roots show one normal vascular bundle or stele. The author, utilizing material from Ceylon, found that in *Areca catechu*, Linn., *Cocos nucifera*, Linn., and a species of *Verschaffeltia*, the young roots agree

with this condition, but on examining older and thicker portions of the same roots he found many steles present. After discussing the origin of this, the author considered the change to be primary, not secondary, and suggested that these roots might serve as props to the stem. The paper was criticised by Mr. George Murray and Prof. Trail, Dr. Scott replying to objections.

Mr. R. Morton Middleton then read a paper on a remarkable use of Ants in Asia Minor, communicated by Mr. Miltiades Issigonis, of Smyrna. It was stated that the Greek barber-surgeons of the Levant employed a large species of ant for the purpose of holding together the edges of an incised wound. The ant, held with a forceps, opens its mandibles wide, and being then permitted to seize the edges of the cut, which are held together for the purpose, as soon as a firm grip is obtained the head is severed from the body. Mr. Issigonis had seen natives with wounds in course of healing, with the assistance of seven or eight ant's heads. The species of ant referred to was a large-headed *Camponotus*, not unlike one found in India. Mr. Middleton recalled the fact that a similar observation concerning an ant in Brazil had been recorded many years ago by Mr. Mocquers, of Rouen (Ann. Soc. Entom. France, 2 ser. ii. lxxvii), as quoted by Sir John Lubbock in his work on 'Ants, Bees, and Wasps'; but the observation, strange to say, had not been confirmed either by Bates or Wallace during their travels in South America. Dr. John Lowe pointed out that in this operation apparently no attention was paid to the usual antiseptic precautions, which are regarded as indispensable in modern surgery. Sir William Flower considered the observation of much interest from an ethnological point of view, as showing the independent existence of the same custom in countries so far apart as Brazil and Asia Minor.

Feb. 20th.—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Messrs. O. V. Aplin, Gilbert Christy, and W. O. Stenteford were admitted Fellows of the Society.

Mr. Clement Reid exhibited a collection of Acorns planted by Rooks, and made remarks upon the agency of these and other birds in the dispersal of seeds. A discussion followed, in which the President and Messrs. Cole, Druery, Harting, and Kirby took part.

Mr. Bernard Arnold exhibited and made remarks upon an abnormal growth of *Dactylis glomerata*, Linn., gathered at Shorne, near Gravesend, followed by remarks from Messrs. B. Daydon Jackson and H. Groves.

Mr. W. H. Lang exhibited under the microscope Prothalli of several varieties of *Nephrodium Filix-mas*. These illustrated the apogamous production of the sporophyte which has been described in this species by De Bary and Kny. Dr. D. H. Scott and Mr. C. T. Druery took part in the discussion which followed.

On behalf of Mr. John Young, there was exhibited an unprecedented

case of hybridism between *Carduelis spinus* and *Linota cannabina*, the former being the male parent. Some remarks were made on the subject by Mr. Harting, who took occasion to exhibit, on behalf of Captain M. Murphy, another hybrid, viz. one between Blackgrouse and Pheasant, which had been shot near Buinessan, Mull, in the month of January last.

On behalf of Mr. E. J. Lowe, a paper was read by Mr. Druery, in which details were given regarding the culture of divided and re-divided *Prothalli* of *Scolopendrium vulgare*.

ZOOLOGICAL SOCIETY.

February 4th, 1896.—Dr. A. GÜNTHER, F.R.S., V.-P., in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of January, 1896, and called special attention to a young male Manatee from the Rio Purus, Amazons, and to two young King Penguins in down plumage from Macquarie Island, New Zealand, acquired by purchase.

Mr. G. A. Boulenger read a report on the second portion of the Reptiles and Batrachians collected by Dr. A. Donaldson Smith during his recent expedition to Lake Rudolph, the first portion having been already described. In the present report forty-two species of Reptiles and five of Batrachians were catalogued—of which two Lizards were described as new, under the names *Agama smithi* and *A. lionotus*.

Dr. A. Günther read a report on the collection of Fishes made by Dr. Donaldson Smith during his expedition to Lake Rudolph. From Lakes Rudolph and Stephanie examples of eight species had been obtained. Of these five were found in the Nile basin, and were mostly of wide distribution in Africa; while one (*Distichodus rudolphi*) was new to science. Two other species were also described as new, and named *Clarias smithi* and *Synodontis smithi*, after their discoverer.

Mr. Martin Jacoby offered some remarks on the system of coloration and punctuation in the Beetles of the genus *Calligrapha* of the family *Chrysomelidæ*. He showed that in this genus the colour and punctuation of the elytra seemed to be dependent on each other, so that the markings, no matter what their shape might be, were always surrounded by a row of the punctures.

Mr. F. E. Beddard read a paper on the oblique septa in Birds, in which he pointed out a new character of Passerine Birds. A second paper by Mr. Beddard contained a note upon the syrinx and the ambiens muscle of an African Stork, *Dissura episcopus*, and comprised some remarks upon the classification of the Herodiones.

Mr. R. Lydekker communicated a note on the mode of progression of the Sea-Otter.

A paper by Dr. St. George Mivart contained a description of the hyoid

bones of *Nestor meridionalis* and *Nanodes discolor*. As the presence of a parahyal arch had as yet only been met with in the *Loriidæ*, it was interesting to find whether it was present in the other brush-tongued forms, *Nestor* and *Nanodes*. In the specimen of *Nestor* examined, such an arch did exist, and the location of the *Nestoridæ* next to *Loriidæ* was so far justified. In two specimens of *Nanodes*, however, the two processes did not form an arch, and thus its removal from the *Loriidæ* was also justified.

February 18th.—Prof. G. B. HOWES, F.L.S., F.Z.S., in the chair.

A report was read, drawn up by Mr. A. Thomson, the Society's Head-keeper, on the insects bred in the Insect-house during the season of 1895. Examples of nine species of Lepidoptera were stated to have been exhibited for the first time in 1895.

A communication was read from Dr. A. G. Butler on the Butterflies obtained in Arabia and Somaliland by Capt. Nurse and Col. Yerbury in 1894–98.

A communication was read from Lord Walsingham and Mr. G. F. Hampson, on the Moths collected at Aden and Somaliland by the same naturalists and by other collectors.

Mr. F. E. Beddard communicated (on behalf of Miss Marion Newbigin) a paper dealing with the metallic colours of Humming-birds and Sun-birds. It had been held that these peculiarly coloured feathers played some special part in the economy of the bird, for they could not be of much use for flight owing to the disconnected barbules. The author combated this view, pointing out in the first place that the statement of fact did not apply to all Humming-birds, in the metallic feathers of which the barbules were often connected by ciliæ. It was urged in the next place that the very perfection of the flight of Humming-birds led to correlated variations in feather-structure productive of their especially brilliant metallic tints. The difficulty of the plain-coloured Swifts—possibly near allies of the Humming-birds—was met by the suggestion that the latter have fewer enemies, and had therefore had greater scope of possible colour-variation.

Mr. C. W. Andrews read a note on a skull of *Orycteropus gaudryi*, an extinct species of Ant-bear from the Lower Pliocene deposits of Samos, originally discovered and described by Dr. C. J. Forsyth-Major. Except in size, and in some slight differences in the cranial bones and teeth, which were pointed out in the paper, the extinct form closely resembled *Orycteropus athiopicus* from East Africa. The former range of *Orycteropus* was much greater than its present distribution, for its remains had been found so far east as Maragha in Persia, and the fauna with which it is associated both there and in Samos extended from Spain probably to Southern China. It seemed, therefore, that though the genus was now exclusively Æthiopian, it might have had a northern origin, and have spread into Africa along with the rest of the Pliocene fauna.

Mr. F. E. Beddard read a paper upon the anatomy of the Scissor-bill (*Rhynchops*), in which the structure of the viscera and muscles of this bird was described. The muscular anatomy was found to differ from that of the Gulls, Skuas, and Terns, and was held amply to justify its separation as a distinct subfamily, *Rhynchopinæ*.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

Feb. 5th.—Prof. RAPHAEL MELDOLA, F.R.S., President, in the chair.

Dr. D. Sharp, F.R.S., Mr. Roland Trimen, F.R.S., and Mr. Walter F. H. Blandford were nominated Vice-Presidents for the session 1896–97.

The Rev. John Hocking, M.A., and Mr. J. C. Moberley, M.A., were elected Fellows of the Society.

Mr. Waterhouse exhibited pupæ and portions of pupæ of a silk-moth, *Antheræa mylitta*, selected from some scores of specimens, which he had opened to see if they showed stages of development agreeing with the examples given by Dr. Spuler, and the results confirmed Dr. Spuler's researches. Some specimens showed the tracheæ, the median vein having two branches, very rarely emitting a third branch in the direction of the radial; other specimens had faint indications of the veins and of the discoidal spot of the imago. Even at this very early stage, the vein branching from the subcostal to unite with the upper radial, and the short branch uniting the second median with the third median veins were distinctly traceable, no tracheæ being yet visible in these branches.

Mr. E. E. Green remarked that in the *Trans. Ent. Soc.* 1881, p. 601, there was a short paper by the late Prof. Westwood, describing a curious little insect from Ceylon under the name of *Dyscritina longisetosa*. Prof. Westwood believed his typical specimens to be immature. Mr. Green now exhibited what he supposed to be a later stage of the same species, though it differed in some particulars from Westwood's description and figure—notably in the proportions of the caudal appendages. Prof. Westwood had pointed out the affinities of *Dyscritina* with the *Forficulidæ*. This was apparent in the specimen under consideration. Putting aside the nature of the caudal appendages, the insect was essentially an earwig. The specimen exhibited was taken in the Punduloya district of Ceylon, at an elevation of about 4000 feet. Mr. Green said he had more than once seen this insect under loose pieces of bark and in crevices of rocks, and had always been struck by its likeness to an earwig, both in appearance and habits.

Mr. O. E. Janson exhibited a Goliath beetle, from the Upper Congo, which he believed to be the male of *Goliathus russus*, described from a unique female example in the Berlin Museum.

Mr. Blandford referred to the case of the eye of a boy affected with inflammation caused by the hairs of the larvæ of *Lasiocampa rubi*; the

attack recurred after an interval of nineteen weeks, and in several continental cases this recurrence of the attack had been found to take place, and in some cases permanent injury to the eye had followed. Mr. Blandford discussed the various kinds of hairs on several caterpillars, certain species having hairs of two kinds, one kind being barbed, and thus having the power to work into the skin. He said that the urticating property of the hairs appeared to be mechanical: there was no evidence of any poison-glands. Mr. Lawford said he had had some difficulty in discovering hairs in the lid, and he thought that the symptoms in the case in question were not to be explained by mechanical irritation alone due to the presence of hairs in the tissues. The subject was a new one to him, and he had looked up all the medical literature bearing on it.

Dr. F. A. Dixey read a paper entitled "On the Relation of Mimetic Patterns to the Original Form." The paper was illustrated by a number of coloured diagrams. Prof. Poulton expressed his gratification that the Hope Collection under his charge had afforded material for the work. He thought the result of the paper was to give support to the theories of Fritz Müller rather than to those of Bates.

Dr. Sharp contributed a paper on "The Rhynchophorous Coleoptera of Japan. Part IV."—H. GOSS & W. W. FOWLER, *Hon. Secretaries*.

Feb. 19th.—Prof. RAPHAEL MELDOLA, F.R.S., President, in the chair.

Messrs. T. Hudson Beare, William J. Kaye, and Charles H. Dolby-Tyler, were elected Fellows of the Society.

Dr. D. Sharp exhibited preparations of *Dytiscus latissimus* and *Cybister roeselii*, to show the so-called secondary wing, noticed by Meinert. He stated that this structure is only a part of the elytron, to which it is extensively attached, and he considered that it corresponded with the angle at the base of the wing seen in so many insects that fold their front wing against the body. This structure afforded no support to the view that the elytra of beetles correspond with the tegulæ of Hymenoptera rather than with the front wings. He also exhibited specimens of Neuroptera, and pointed out that this secondary wing agreed in position and structure with a small lobe on the front wing of Raphidia.

Mr. C. G. Barrett exhibited, for Dr. H. G. Knaggs, cells of *Retinia resinana* formed of resin but lined with wax. A portion of the cell had been removed and the resin dissolved away with spirit, leaving a slight film of wax (*cf.* Ent. Mo. Mag. 1895, pp. 251, 252). Mr. Tutt stated that a secretion of wax had been detected by Dr. Chapman in *Parnassius apollo*. Prof. Meldola suggested that, as Dr. Knaggs had shown how to separate the resin from the wax, it would be of interest to make a chemical investigation of the latter, since a sufficient supply of this material could be easily obtained. No insect-wax, with the exception of that of the bee, had been submitted to investigation by chemists.

Mr. Gahan exhibited drawings of the dorsal segments of the abdomen of *Dyscritina longisetosa*, formerly described by Prof. Westwood in *Trans. Ent. Soc.* 1881, a specimen of which was shown by Mr. E. E. Green at the last meeting of the Society. He regretted that no drawing showing the ventral surface had yet been prepared.

Mr. B. A. Bower exhibited specimens of *Argyresthia atmoriella*, Banks, taken in Kent in June, 1894, a recent addition to British Lepidoptera.

Mr. E. E. Green read notes on the habits of the Indian Ant, *Æcophylla smaragdina*, Fabr. He believed that Mr. H. N. Ridley, of the Singapore Museum, had made some remarks on this ant and its supposed habit of using its own larvæ as web-spinners in the formation of its nest, but though he had not been able to find anything on the subject in the 'Proceedings,' he was now able to produce corroborative evidence from an independent source. The facts were noted by his friend Mr. W. D. Holland, of Balangoda, Ceylon, a most careful observer. Mr. Green exhibited the specimens referred to by Mr. Holland, and pointed out that the larvæ were still tightly grasped by the jaws of the ants, and he thought it probable that other web-spinning ants utilized their larvæ in the same way. Mr. Hampson said he could confirm this statement.

Mr. G. F. Scott-Elliot read a paper entitled "Notes on Flower-haunting Diptera." The author pointed out that some of the higher types of Diptera appeared to prefer red and blue flowers, and oftener visited the complicated types of plants than the smaller Hymenoptera. He also alluded to the effect of insect visitors in isolating particular individuals. Prof. Meldola expressed himself as much interested in the paper, and stated that although he was aware, from the writings of Herman Müller and others, that Diptera played an important part in the fertilization of flowers, he was unaware of the great importance which these insects possessed for the function of pollination until he heard Mr. Scott-Elliot's paper. He also called attention to the urgent need of a Manual of British Diptera. Mr. Roland Trimen mentioned that in South Africa some species of *Orchidaceæ* were fertilized by Diptera. Dr. Sharp referred to Prof. Plateau's opinion that neither the colour nor the form of the flower played any part in attracting insects. Mr. McLachlan remarked that the flowers of *Scrophularia* possessed a great attraction for wasps. Lord Walsingham enquired whether any observation had been made as to the Diptera which visited differently coloured flowers of the same species, such as Petunias.

Mr. Tutt read a paper, by Prof. A. Radcliffe-Grote, entitled "On the Nomenclature of the *Geometridæ*." A discussion on the rules of nomenclature followed, in which Lord Walsingham, Prof. Meldola, Mr. Hampson, and Herr Jacoby took part.—H. Goss, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

A Breath from the Veldt. By JOHN GUILLE MILLAIS, Author of 'Game Birds and Shooting Sketches.' With Illustrations by the Author, and Frontispiece by Sir J. E. MILLAIS, R.A. 4to, pp. i-x; 1-236. London: Henry Sotheran & Co. 1895.

THE former volume on Game-birds by this author was reviewed in 'The Zoologist' for 1894 (pp. 354-358). It dealt exclusively with the Grouse family, and the field of observation was Scotland, chiefly Perthshire. In the handsome quarto now before us the scenery is of a very different character. Mr. Millais takes us into South Africa,—Beaufort, Karroo, Colesberg, and part of the Orange Free State,—where we are introduced to many of the characteristic animals, chiefly big game, which delight the heart of the hunter and naturalist.

Mr. Millais possesses this advantage over his contemporaries who have written of African sport and travel,—he is not dependent upon an artist who has never seen what he attempts to draw, but is able to furnish his own illustrations made upon the spot. This undoubtedly is a very great advantage, especially in the case of those wild animals whose portraits hitherto have been taken from museum specimens "with all faults." It is comparatively easy, of course, to correct faulty outlines, and to depict an animal in repose; but the difficulty is to convey an accurate idea of its natural appearance when in motion. Capt. Swayne has attempted something of the sort in his excellent book on Somaliland, which was reviewed in this Journal only last year (pp. 315-318); but his attempt fell short of perfection for want of that artistic training which has served Mr. Millais in such good stead. In this respect Mr. Millais has made a new departure, and he has succeeded in graphically reproducing a series of outlines instantaneously photographed in his mind's eye, and at once transferred to paper, which are as striking as they are novel to all but those who, like himself, have seen what he depicts. This may be said to be the chief feature of his work; but it is not the only feature. His descriptions in the text bear the stamp of close observation, and the details which he gives of the habits of many South African mammals and birds supply gaps in the published accounts of previous writers which will be very acceptable to naturalists.

Here is a description of the Great Karroo, a vast uncultivated plain, stretching away in all directions as far as the eye can reach, except only towards the west, where frowns the sombre range of the Nieuveldt mountains:—

“The whole expanse presented to the eye shows only a great plain of cracked mud, and stunted bushes about a foot high. But presently one discovers that these stunted bushes are, in fact, the favourite sustenance of Springbuck. . . . In the scattered bushlands, too, on the verge of this district, live the graceful Koodoos, along with their enemies the Lion and the Leopard; and, though to-day but a remnant remains of countless herds, there is still plenty of attraction for the naturalist and sportsman.

“Numerous troops of Springbuck may be met with; a Steimbuck may here and there be seen; also the Silver and Long-eared Jackals; whilst hundreds of Meercats burrow in the ground or live in the holes of the Aardvark. Even to-day the Cheetah, or Hunting Leopard, follows the herds of the Springbuck like a shadow; whilst in the adjoining mountains the Leopard devotes his attention mainly to the scattered troops of Vaal and Roi Rhebuck, Baboons, and Klipspringers.

“The birds of this portion of South Africa are, however, more interesting and numerous than the mammals. In small parties the graceful Stanley Crane stalks along the bare ground in search of locusts, its exquisite French-grey colouring contrasting strongly with the brown earth; and at sunset its hoarse trump may be heard as the flocks wing their flight to some solitary spot far in the heart of the desert, where they can pass the night without fear of disturbance. Moving in a string across the sky, they give the last touch to a scene of splendour such as only the Karroo can show.

“Here on the plains may be seen that most interesting creature the Secretary-bird, plodding along in his thoroughly business-like manner,—a large raptorial bird, slate and white as to colour, and quite unique in all his movements as he walks about in search of food. . . . As to his alleged snake-killing exploits, I think he is a bit of a fraud. No doubt he does occasionally kill these reptiles, but the true poisonous snakes are rare in the open lands of the Colony, Free State, and Lower Transvaal, where these birds are mostly found, and where their depredations are known to be very great amongst the young of

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FIG. 1.— DEAD GIRAFFE (see p. 161).

Khoorhans (Bustards) and Francolins. . . . To the eye his flight is exceedingly fine, resembling the grand movements of an Eagle. Curiously enough, however, his evolutions in the air are exceedingly weak. He has no staying power, and in many instances has been captured by greyhounds, which, after keeping the bird continually on the wing for some time, are able to run it down when finally forced to alight from sheer fatigue, and no longer able to rise again.

“Over the surface of the great sun-baked flats continually float Eagles, Hawks, and Harriers in great variety. On its dams of water are found the Egyptian Goose, the Cape Shoveller, the Pochard, several species of Plovers and little waders; whilst in the early morning the Namaqua Sandgrouse come to the margins in large numbers to drink in company with Pigeons, and that most exquisite little creature the Dwarf Dove. . . . But perhaps the most characteristic birds of this part of the country are the Koorhans, or Bustards, pre-eminently associated with South Africa, for they are everywhere *en evidence*, cheering with their wild goose-like notes the heart of the sportsman who is stranded in the wilderness; for they supply a want, in the shape of food, which in their absence would be keenly felt.”

This description conveys a very good idea of the author's style, and of the nature of the country in which his observations were chiefly made.

The following remarks on the variation in the size of Antelopes in different parts of Africa are worth repeating:—

“The Antelope attains to the finest size and head in the vicinity of Kilimanjaro in north-east Africa, and the smallest in Nyassaland. . . . Possibly the very best heads of Pallah killed on the southern bank of the Limpopo may compare favourably with those of Masailand, but as a rule they are far inferior, and I fancy every year sees a deterioration in the horns of the southern form. . . . This increase in size of heads of the Pallah in their extreme northward range is very remarkable, for, as a rule, both in Southern and Central Africa, the tendency of the animal is to become smaller both in body and horn as higher latitudes are reached. The difference is hardly noticeable in the fine Roan and Sable Antelopes, but in the case of the Koodoo, the Reedbuck, the Bushbuck, the Springbuck, the Eland, the Waterbuck, and the Gemsbuck, it is certainly most marked. Taken

on an average, the heads of Koodoo bulls killed in the Transvaal, and at one time in the old colony, are certainly finer than those of the same species in Mashonaland, whilst the horns of individuals killed in the latter country surpass those of Somaliland and Abyssinia. The Reedbuck of the Transvaal is far finer than any found northwards in West Africa, as is also the Waterbuck. The Gemsbuck and the Eland grow finer in the Kalahari than in other parts of Africa, while the Springbuck of the Kalahari, Ovampoland and the Transvaal are small by comparison with those of the Karroo in Cape Colony. The Pallah, therefore, after dwindling away to almost a dwarf in Nyassaland, seems to have

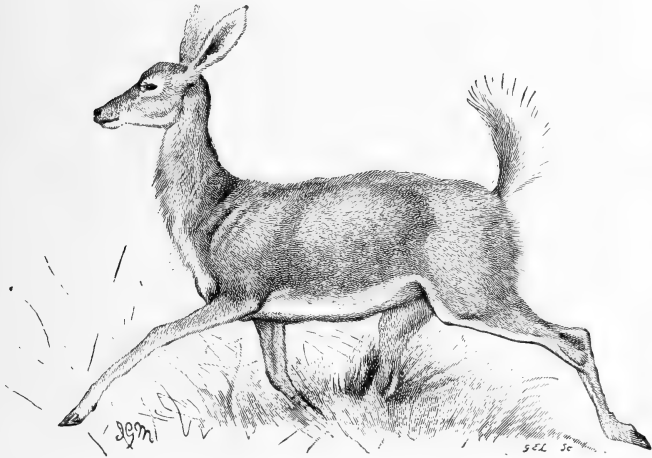


FIG. 2.—A ROI RHEBUCK.

gained double strength in his East African home, becoming a much finer animal than his South-African congener. This is the more curious, as the Koodoo, whose food and general requirements are almost exactly similar, shows no difference but the general northward deterioration."

In regard to the illustrations, many of them, as we have already hinted, are strikingly original in their treatment.

Through the courtesy of the publishers, Messrs. Sotheran, we are enabled to reproduce a few of the smaller pictures; for some of the more characteristic, which might have been selected, are too large for an octavo page. Taking them in the order in which they are to be found in the book, we give first a portrait,

from a photograph, of a dead Giraffe, with Dutch hunters, showing very admirably the relative proportions of man and beast.

The Roi Rhebuck moving off (p. 195), and the Wounded Black Wildebeest (p. 228), are spirited drawings of wild animals in motion. The attitude of a Bustard, hovering when disturbed



FIG. 3.—A WOUNDED WILDEBEEST.

(p. 229), is curious, and is perhaps not confined to the White-quilled Black Koorhan, of which a larger figure is given on page 39; and the evening "play" of the Bush Koorhan (figured on page 58) is described by Mr. Millais as one of the most extraordinary aerial feats he has ever seen. Every evening, he says, as the sun approaches the horizon, the Bush Koorhan rises

from the grass, and mounting perpendicularly into the air, at a height of from 100 to 200 feet, it closes its wings and drops



many individuals of that
 white raised. But found
 white & brown in the air
 J. N. Oliphant & River ZAR.
 Sept 1073

FIG. 4.—BLACK BUSTARD.

head first to earth, only opening the wings to break its fall when within a few feet of the ground.

The last illustration shows the difference in the face-markings of the Blesbuck and the Bontebuck. Vast herds of the former once roamed throughout the Orange Free State, Southern Transvaal, and Southern Bechuanaland; but now their numbers are confined to such troops as are preserved by the Boers north

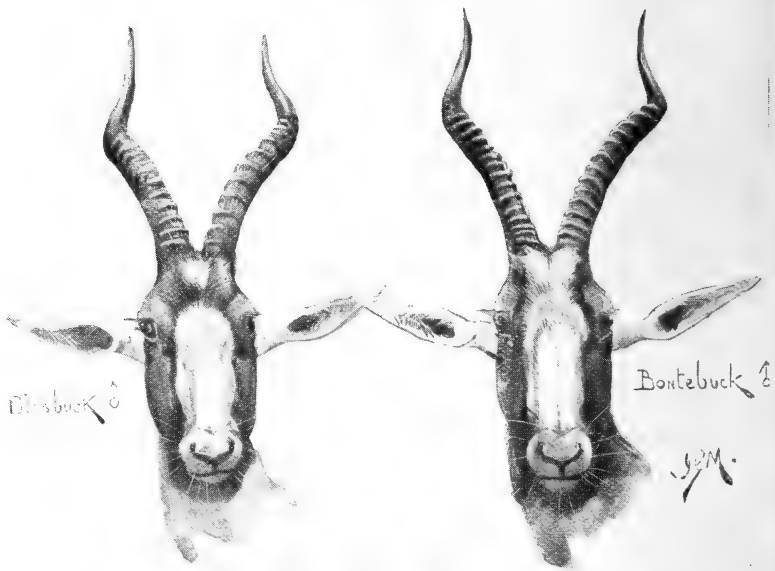


FIG. 5.—HEAD OF BLESBUCK AND BONTBUCK.

and south of the Vaal River. The Blesbuck and the Bontebuck (which stands about 3 ft. 4 in.) are commonly included in the family of Gazelles, but in the opinion of Mr. Millais are more nearly allied to the Hartebeests. Like other gregarious animals, they are extremely shy, especially when the grass is short; so they are by no means easy to shoot. Contrary to the received

opinion, Mr. Millais considers the Blesbuck a fleetier animal than the Springbuck, and says that no dogs could overtake the former, while the latter was often coursed and killed. A Blesbuck's pace is a rolling, somewhat heavy canter, resembling the action of a Hartebeest, and when running up wind it frequently moves like a Springbuck (with its head close to the ground like a hound on scent); but if pressed, it can upon occasion show great speed and energy.

In the foregoing remarks and extracts we have given but a faint indication of the amount of interesting matter which is contained in this volume.

It is just one of those books in which a hunter will delight on account of the pleasant memories it will recall, and which a naturalist will treasure for the careful descriptions and spirited portraits of wild animals which are given by one who has seen and studied them in their native haunts.

Supplement to 'The Birds of Devon.' By W. S. M. D'URBAN and MURRAY A. MATHEW. 8vo, 32 pp. London: Porter. 1895.

THE volume to which this is a supplement was reviewed in 'The Zoologist' for 1892 (pp. 438—441). It must be satisfactory to the authors to find that their labours have been so much appreciated as to justify the publication of a second edition. Those who already possess the first may avail themselves of the additional matter incorporated in the second, by securing this Supplement, in which the name of every species preceding the fresh observations upon it is followed by a reference to the page of the former work in which it is mentioned. By this plan it is easy to ascertain the author's views respecting any given species up to November, 1895, the date of the Preface to the Supplement. We note, *inter alia*, that since 1892 they have been able to increase the list of species nesting in the county. For example, the Reed Warbler, formerly considered to be only an occasional and rare visitor, proves to be a regular summer migrant in large numbers to Slapton Ley and other meres; the Tree Sparrow has been found to be resident at Kingsbridge in South Devon, receiving accessions to its numbers in autumn; the nest of the Short-eared Owl has been found at Braunton; and there are species of Ducks to be added to those that are known to nest at

Slapton Ley, which had been omitted for lack of information from that particular locality. We are not surprised to learn that the Pochard and Shoveller occasionally rear their broods in the vicinity of that attractive sheet of water, but are scarcely prepared to accept the author's view that the presence of young Wigeon there in August indicates their having been hatched in that neighbourhood. Wigeon are amongst the earliest of winter visitors to make their appearance in the South of England. In Sussex we have long been accustomed to see small flocks in September, and larger flocks as the autumn advanced. There is nothing improbable, therefore, in the assumption that Wigeon observed in Devonshire in August may well have been hatched two months earlier in Caithness, Ross, or Sutherland, or even in Lapland or Iceland, for the flight of this Duck is very rapid, and it is not long in acquiring sufficient power of wing for migration.

We are also somewhat sceptical about the supposed nesting of the Red-necked Grebe in Devonshire; for although this bird is resident in the south of Norway, and breeds not uncommonly in Denmark, and some parts of Northern Germany, it has never yet been recognised but as a winter visitor to the British Islands.

The Ruddy Sheldrake, again, is a bird which we think is very doubtfully to be included as a genuine immigrant to this country. It is so frequently imported and turned out with other ornamental water-fowl, and recovers the use of clipped wings, that in all probability the birds of this species which have been shot from time to time in an apparently wild state have in reality made their escape from the places where they have been introduced.

Messrs. D'Urban and Mathew give a list of twenty-two species (nine of them American) which have occurred in Cornwall and the Scilly Islands, but which have not yet been observed in Devonshire. Amongst these we note, with some surprise, the Ortolan, Baillon's Crake, and Roseate Tern; for we should have supposed that with so many good ornithologists in this county, all these birds would have been detected ere this as periodical visitors to the county. Their discovery probably is only a matter of time.

This 'Supplement' to the 'Birds of Devon' is well posted up to date, and includes, amongst additions to the county list, one (namely, the American Yellow-billed Cuckoo) recorded in 'The Zoologist' for 1895, p. 376.

THE ZOOLOGIST

No. 232.—April, 1896.

BIRD LIFE IN EASTERN ALGERIA.

By O. V. APLIN, F.L.S.

WHEN living for a few weeks, in May and June, 1895, in the western part of Tunis, a little to the south of the Khomair country, on the borders of Algeria, I occasionally crossed the frontier of the latter country; and I propose to give in this paper some account of the birds I used to meet with there. That in casual and infrequent visits of this kind, of merely a few hours' duration each, I should only meet with the most usual and ordinary birds—and should overlook some of these even—goes without saying. And yet many of the species which I did encounter are so interesting to the members of that growing class of British field-ornithologists (“hedgerow naturalists” an old friend calls them) to which I try to belong, that I feel hardly any apology is needed for laying these notes before the readers of ‘The Zoologist.’

The valley of the Medjerdáh (the Roman Bagrađa) at the point, and above where, the river crosses the frontier, has narrowed very considerably in the last mile or two of its upward course. The traveller proceeding in that direction has left the broad plain-like valley, with its wide, rich corn-lands, and its woods of wild olive, intersected by many a tributary stream or little river. The hills have closed in rapidly, and it is only here and there that one finds a tiny patch of corn at the foot of the hills, or on some little terrace higher up, both probably edged and encroached upon, more or less, by the sarib thorn, or other

spiny shrubs, from whose clutches only "gabardine" escapes unscathed. Nor are there in these few miles of Algerian territory which I used to visit more than one or two Arab douars of the smallest dimensions, with scanty prickly-pear gardens; for that part of the valley is sparsely populated in comparison with that lower down. For the most part the hills rise sharply on each bank of the river (some spurs of the Atlas in sight reaching to about 2500 and 3000 ft.), their rocky or stony sides thickly covered with rosemary, gum cistus, cytissus, and thorny shrubs, and in parts with a taller growth of wild olive, batoum (*Pistacia terebinthus* ?), &c. Still higher are some fair grassy pastures, studded in places with a few wild olives, hawthorns, dwarf shrubby batoums, &c.; or covered with the blackened stems of shrubs, victims of a great forest fire which raged for miles on both sides of the valley in the previous year. This higher bare ground is interspersed with stretches still covered with rosemary, cytissus, cistus, &c., and with naked stony or rocky ground. To the highest parts of the hills just here I never climbed. At the foot of the hills the banks of the river in places are overgrown with the lovely pink oleander, tamarisk, wild olive, myrtle, and other shrubs. The oleander and tamarisk grow also on little islands formed in its bed by the river dividing. The river has a rapid fall, and still, glassy lagoons are less frequent than rippling shallows, and tumbling, rushing rapids. The bed of the river is stony and full of boulders, and the stream is sometimes interrupted by lumps of rock; the banks are chiefly rocky, and at this season the water seldom quite touched them, leaving usually a border of water-worn pebbles or some mud.

This is the sort of country in which my walks lay, but I should add that the hill-sides on the south bank (to which I confined my steps) are almost, if not quite, devoid of permanent water, though the heavy thunderstorms which occasionally occur, and send the river down in flood, wear out many a torrent-course in their dry and stony sides. During the course of my stay in the district I paid a short visit to a place at the head of the valley on very high ground, but as the country there (and its birds) presented some difference to that treated of now, I shall refer to it separately in the latter part of this paper.

I cannot refrain from mentioning here a very curious plant, which was quite a feature in the landscape foreground. It is

perhaps the bluest plant in the world, at least I cannot imagine a bluer one. It is an angular plant, six inches or a foot high, with short, stiff, narrow leaves in whorls of three, developed into spines. With the exception of the cluster of tiny inconspicuous flowers inside the whorl, the whole plant is of a dark dull sky-blue, perhaps a dark cobalt—a really fine colour, though peculiar. A patch of these plants often colours a bit of the hillside as blue as a patch of bluebells in an English wood.

I saw comparatively few birds of prey. The Lesser Kestrel (*Falco cenchris*) was perhaps the most common species, but I saw also its larger relative *F. tinnunculus*. Egyptian vultures (*Neophron percnopterus*), adults in clear white dress with black wings, were not an uncommon sight. They look very fine soaring in the deep, but brilliant blue sky, their wings held straight out and level, rather like a Shearwater's. Once I remember seeing a great fulvous-brown Griffon Vulture (*Gyps fulvus*). The Black Kite (*Milvus migrans*) I saw, but it likes rather to hunt near the Arab douars, for the Arabs keep a lot of fowls. I have only twice seen our Kite (*M. ictinus*) in these islands, and only once in recent years, so perhaps I am not a fair judge; but it seemed to me that the Black Kite is hardly so grand-looking a bird.

Buzzards I never saw actually in Algeria, though I once saw a pair (*Buteo desertorum*?) wheeling over the hills just across the frontier.

Among the warblers the most conspicuous was the Rufous Warbler (*Aëdon galactodes*), which was numerous, the dry-bushed hillsides suiting the bird admirably. It is a bold bird, and conspicuous both in manners and colouring. It is easy to watch it in the breeding season, for if you sit down and wait anywhere near the home of a pair, they will come to see what you are about, and keep you under observation. It flits with an easy flight on to some outside or topmost twig, and then on to another, and so on. Its motions are rather curious; the long, broad tail is gently jerked (if one may use such an expression) upwards, and slightly spread (the action is peculiar and very graceful) while the wings are drooped. When on the ground the Rufous Warbler hops like a Nightingale, but puts its tail up, sometimes nearly erect like a Wren's; its body is held in rather an upright position also. You often see it on the ground. To sing, it loves to mount to a fairly high perch, and I have often seen it sitting

on a tall prickly-pear. Its song is loud, sweet, and rather twittering, somewhat Robin-like, and delivered in Thrush-like jerks, some of the notes being fairly full and rich. Perhaps one might syllable it "chitty witty chee tree tee wee." When the Rufous Warbler flies it spreads its tail a little, and displays the black and white markings at the tip. Indeed, on all occasions it is fond of making play and show with its large and distinctly marked tail.

Three species of the Leaf Warblers of the genus *Hippolais* were to be seen. *H. icterina* was found in the bushes near the river, and a little way up the hillside. It has a soft low call-note, "ti-op." Its song is flowing, but not good. It might be written "wardy whichy chyo chyo" over and over again; but there are considerable variations of this, and other notes are interspersed; now and then, however, it reminds one of the song of a river warbler. The song of *H. polyglotta*, which was more usually heard at a slightly higher level, is vastly superior; it is varied and occasionally has some fine rich clear notes. Perhaps the bird deserves its name. It sings, like the last-named species, in an exposed position, from the top of a bush, or an outside twig. The song, while it is slightly acrocephaline in character, is delivered in the leisurely manner of a Reed Warbler, but is more flowing, and quite different from that of the latter bird. It is very sweet and a good deal varied. The bird begins its song with a note several times repeated. This varies. It is one of these four:—A soft but clear "whit-way-ee" (a slight emphasis on the middle syllable); a rather harsh Sedge Warbler's note; a sharp bright note; or a sweet and plaintive "wit wee-eee" (the emphasis on the last syllable). Then it goes off into the running song, a varied, rather rapid warble, with some clear, sharp or sweet notes interspersed. The alarm notes are a sharp short "tit," and a harsh rattling "kurr." *H. pallida* is a very different bird so far as habits go, and has been, perhaps not altogether wrongly, generically separated from the others by some authors. It is far more of a river warbler. It was fairly common on the banks of the Medjerdáh, where these are clothed with thick bushes, for it frequents only the immediate vicinity of water, and haunts especially the thick covert of the tamarisks. It is a skulking bird, and does not sing mounted on an exposed twig; it is continually on the move, and sings from the thickest

parts of the bushes, often in those parts which overhang the water. Its song is very inferior, and much more acrocephaline in character than those of its relations before mentioned. It is loud and harsh: "tyuck tyuck tuck tuck char a wichy char wichy char," a few lower-toned, jerky notes are occasionally interspersed. Sometimes "Tac tac tah tarh tarh tac tarh" expresses the song.

I have described the songs of these three species of *Hypolais* rather fully, partly because I am unable to understand the extravagant praise bestowed by some authors (quoted in the 4th edition of 'Yarrell') upon the song of *H. icterina*. Rennie is said to be loud in praise of the rich intonation and multitudinous variety of its notes. More extraordinary still is Hewitson's opinion, that its carol was the sweetest he had ever heard, equalling, if not surpassing, that of the Nightingale. Baron de Selys-Longchamps (I still quote from 'Yarrell') credits it with the power and habit of imitating various other birds. Seebohm, who knew the bird well, gives rather a different account of its singing powers. He writes (Hist. Brit. Birds, vol. i. p. 382), "Its song is by no means specially melodious. It has great power, wonderful variety, and considerable compass, but is singularly deficient in melody." To my mind, the best bit of description he gives relates to the bird when he first made its acquaintance at Valkenswaard, when it "screamed and warbled and chuckled and sang voluminously." I quote a few more of his remarks: "The song is somewhat harsh, but very varied, although he repeats every combination of notes two or three times over in rapid succession, like a Song Thrush." . . . "Perhaps, on the whole, the song of the common Tree Warbler comes nearest to that of the Marsh Warbler, but often it reminds you strongly of the song of the Sedge Warbler. At other times you may trace a fancied resemblance to the chirping of the Sparrow, the scolding of the Whitethroat, or the scream of a Swift; but all rattled off at such a rate one after the other, and repeated so often, that it arrests the attention at once." . . . "in spite of its wonderful variety I think the song is original, and can see no reason for supposing the bird to be more of a mocking-bird than the Song Thrush or Nightingale." Perhaps the examples of *H. icterina* I found spending the breeding season in Africa were less imbued with spirit and energy than

those which go further north in spring—it is quite possible. At all events I formed a poor opinion of the song of this species. I look forward to hearing it elsewhere. As I have remarked before, the song of *H. polyglotta* is to my mind vastly superior. There is one more remark of Seebohm's which is worth quoting, viz. "If he were a common bird, one might say he screamed, or even shrieked."

The Whitethroat (*Sylvia rufa*) was common, and so was the pretty restless Sardinian Warbler (*S. melanocephala*), which has a running song, whitethroatish, but better than the Whitethroat's song, being rather less harsh and more continuous. One of this bird's alarm notes is sharp, harsh, and loud—"ticket ticket ticket"; another is a kind of "kurr."

That fine bird, the Orphean Warbler (*S. orphea*) was scarce. It has a loud, bold, Thrush-like song, "yoke-a-toy yoke-a-toy yoke-a-toy" (or toy-tay toy-tay toy-tay)—the three notes are always repeated three times—preceded by some rich warbling notes (not heard at a distance, and less soft and rich than those of the Garden Warbler); then the song goes off into "wih-it-toy wih-it-toy toy-tay toy-tay toy-tay too-tee too-tee too-tee." In mellow richness it approaches the Blackbird's; it is varied altogether, and not always regular, or nearly so. When I first heard it I was reminded, more than of anything else, of the sweet lively song of the Ochre-headed Greenlet (*Cycorhis ochrocephala*), which I used to hear in the riverside "montes" of Uruguay. The alarm-note of the Orphean Warbler is a harsh "chadzz."

Nightingales (*Daulias luscinia*) were in numbers, and in very fine rich song in May and early June. You could hear them pouring out their songs under the blaze of a mid-day African sun.

The Wren (*Troglodytes parvulus*) was not uncommon on the bushed hillsides; and the Blackbird (*Turdus merula*) fairly common.

Once or twice I caught sight of a Golden Oriole (*Oriolus galbula*), or heard its loud, clear, rapid "tlit-a-wee" or "tlit-a-vee-o."

The Dusky Bulbul (*Pycnonotus barbatus*) also I met with, but only very rarely. It has a fine lively and rich song of a few notes only, "tit wot wot tit tit."

That curious, strikingly coloured little bird, neither quite Redstart nor quite Bushchat, called Moussier's Redstart (*Ruti-*

cilla moussieri), was not very uncommon on the bushed hillsides, where it perches on a twig or a rock indiscriminately. Its alarm-notes are curious—a clear “zip zip zip” or “zeep,” and a low grating “p’zir” or “pzare.”

I did not identify a Wheatear, but probably both *Saxicola stapazina* and *S. aurita* occur; one or the other I saw.

The only Titmouse was the dark blue representative of our Blue Tit (*Parus ultramarinus*), which is not uncommon, and rather fond of prickly-pear gardens.

The Woodchat (*Lanius rufus*) was rather common, and of course very conspicuous, whether perched on a bush or in flight, when it looks as much pied as a Magpie. It is less Shrike-like in general mien than other species of the genus with which I am acquainted, and sits in rather a dumpy position, its stout thick form contributing to this appearance. When a pair of Woodchats are sitting on a bush together in the breeding season, the male does a good deal of courting, frequently bowing to the female. The chestnut of the female’s head is usually of a much lighter tint than that of the male. The latter sings regularly; he has a really proper song—a rather quick chatter, harsh certainly, but with three variations, and tolerably continuously delivered, though it comes out in jerks. The Woodchat sings a good deal as it sits on a bush close to the female, bowing repeatedly to her at intervals. Besides its song, the Woodchat has some other notes, *e.g.* “hek hek hek,” and “tchay tchay tchay.”

Neither the Calandra nor the Short-toed Lark—birds of the plains chiefly—seem to come so far up the valley, but the Crested Lark is found in small numbers at the foot of and a little way up the hills. It is not the ordinary form of *Alauda cristata*, but a darker form, referred by Mr. Whitaker to *A. cristata thecklae*, Sharpe (‘Ibis,’ 1895, p. 99). The song of the Crested Lark is not continuous when the bird is circling round in the air. The bird sings chiefly hanging in the air with beating wings, and almost without changing its place; then it moves a bit and sings again. The song is lower and more leisurely than the Sky Lark’s; the individual notes are perhaps on the whole better, being more mellow, but the song is less varied. This Lark will also sing when perched on a bush or a stone. Invariably after alighting (it perches on a bush quite as often as on the ground) it utters its

call-note (it is also sometimes uttered by the bird as it flies), which is a peculiarly sweet "kay see sweet weet" or "sweet-a-weet." The Crested Lark also has a low croaking note—"quirk"—uttered when it is frequently alarmed.

The Swallow (*Hirundo rustica*) was fairly common.

I think the most abundant bird in the valley was the Goldfinch (*Carduelis elegans*); even in the height of the breeding season, dozens could be seen together, feeding among the great beds of thistles, or washing in the shallow water, and often presenting a sight to delight the heart of a naturalist. These African birds are rather small and dark, yet brilliant; the yellow is very bright, the black intense, and the red a fine deep crimson; they are unlike our small dusky resident race, on the one hand, and the large light-coloured birds which visit us for the breeding season, on the other.

The Serin (*Serinus hortulanus*) I do not remember actually seeing in this part of the valley, but it is doubtless to be found, in small numbers only, as it prefers taller shrubs or trees.

The Linnet (*Linota cannabina*) I used to see on the hillsides, and the Greenfinch (*Ligurinus aurantiiventris*), a brighter bird than ours, with a similar song, in the olive thickets. There, too, and by the river, the handsome Algerian Chaffinch (*Fringilla spodiogena*) was found commonly. Its alarm-note is "twick," not "twink," like that of our bird, *i. e.* not so metallic or ringing; the "whit," too, is a little different; the ordinary note is slightly harsh and Sparrow-like. Its song, perhaps, is "cheese cheese chideriderede," differing from that of our bird in the first part. But as it is well known that the song of *F. caelebs* varies a little in different localities, perhaps not much importance attaches to this modification.

There being little corn, and few douars, the Spanish Sparrow (*Passer hispaniolensis*) was not often seen, though I know this bird will take up its abode in a wood if there are big batoum trees, with holes, in it, not too distant from the corn-patches.

The Rock Sparrow (*Petronia stulta*) also I very seldom saw, for there did not happen to be a rocky precipice, such as this bird loves to haunt in the breeding season, within the limits of my walks. The Rock Sparrow's call-note somewhat resembles that of the Greenfinch, but is more squeaky.

Next to the Goldfinch, the Corn Bunting (*Emberiza miliaria*) was the most numerous bird in the district.

Swifts (*Cypselus apus*) were often to be seen high in the air, or over the river, and once I watched some Alpine Swifts (*C. melba*) flying quite low down. Few things in bird-life are grander than the marvellous, dashing, rushing flight of this great Swift, and one is lost in wonder at the sudden way in which it can check its flight, turn to one side, or up or down, and change its direction; one moment it seems to be dashing in the face of the observer, who hears the sharp sound of cut air, and the next, before he can turn, the Swift is gliding smoothly over the river far away.

I sometimes saw a Roller (*Coracias garrula*) perched on the telegraph wire by the railway, or twisting about like a Lapwing, or executing some other strange tumble in the air, to the tune of harsh croaking cries; I think they bred in some of the high earth-banks in the neighbourhood.

More numerous were the lovely Bee-eaters (*Merops apiaster*), the "Chasseurs d'Afrique" of the French, the flash of whose plumage in the sun is something to be seen. They breed in the gorges. I can always recall one scene in which the Bee-eater figures. I was sitting on a rock in a very pretty spot at a slight bend in the river, with tamarisks, pink oleanders, &c., growing among the boulders; the banks above were well shrubbed. Just above where I sat a broad glassy pool was dotted with two or three projecting rocks; beyond this were green and shrubbed slopes, and then a double-headed mountain. Below, the river broke in two, and fell through a rocky and boulder-strewn bed, making noisy rapids. A Kingfisher (rare) sped by, and two Bee-eaters were hawking for insects over the pool and dipping in the water, returning after each graceful flight to perch on some bushes on the bank. The Bee-eater's call-note is "whrip" or "whrrrep" (two or three syllables run together). The alarm-note is a louder, clearer "hrrip." The bird has a sailing flight with outstretched wings. It sits in a somewhat upright position, head, body, and tail all in line. It often perches thus, to dash out at intervals for an insect, and return to the same perch.

The Hoopoe's (*Upupa epops*) "hoop hoop hoop," "hoop hoop," sounded sometimes from high up the slopes; when this bird

alights after a flight, and is a little alarmed, it erects its crest and bows; in flight it is a most conspicuously pied bird. It is the "Tebib" of the Arabs, and has (or its skin has) supposed virtues of a medicinal or magical kind; it is much the same with these people.

Rock Doves (*Columba livia*) might be seen flying overhead sometimes, but I did not notice any breeding haunt in that bit of Algeria. The Turtle Dove (*Turtur communis*) was quite common, and occasionally I used to come across a Barbary Partridge (*Caccabis petrosa*). The ordinary call-note of this bird has a considerable resemblance to that of our Red-legged Partridge, as might be expected, and may be expressed as "chuck chuck chukor." The alarm-note when the bird is flushed is "chuckow," the emphasis being laid on the last syllable, which is drawn out; an old cock, when alarmed, makes a great noise. The former note more properly is that of winter. In the breeding season, as is the case with *Caccabis rufa* also, it is modified, and becomes "tucka tucka shack shack." But *Caccabis petrosa* has, in addition, at this season, an extraordinary long-drawn note, which, after listening to it for some time, I put down in my note-book as "h'kwaia"; this strange sound sometimes precedes the ordinary call. The Barbary Partridge is truly a most beautiful bird, its pretty colours being set off by a coral-red beak and orange eyelids.

On May 25th I went (in search of a little bracing air) for a couple of days to Souk Ahras, about two hours by rail (or 60 kilometres) from the frontier, and at the head of the valley. The valley, along which the railway winds with some wonderfully sharp curves, is very lovely. At that date the oleanders were in their glory, and many of the olives, &c., were festooned with trailing white roses; conspicuous among many showy flowers was a tall pink valerian. Some of the mountains beneath which we passed were of considerable height, with oak-scrub at the top—a sure sign here of high elevation. I saw a Roller and a buff-backed Wheatear, either *Saxicola stupazina* or *S. aurita*. We rose throughout the journey, and after Oued Mougras the valley had become much shallower, and rather wider in proportion; here were some corn-patches, the barley nearly ripe; but the ground was always bushy close to the river. At Sidi Bader the little station-house was thickly clustered with the nests of the House

Martin (*Chelidon urbica*), a bird with a strong affection for Europeans, and their stone houses and eaved roofs. The country about there is very European in appearance. We saw corn-fields, and red-tiled station-houses, with gardens full of our flowers and vegetables, and a few vines perhaps; the usual grove of eucalyptus trees having nothing of Africa about it, at all events. The cows, as usual, were just like coarsely-bred Jerseys. But suddenly you see some white-burnoused Arabs, or bare-legged brown children, the girls in the universal blue cotton, and the boys in ragged dirty-white, and red *chachias*; a string of camels, or a white-domed marabout's tomb rising up among the corn, and the illusion vanishes. After Tarja the line rises more rapidly. Many of the little hills (the soil of which is very red) are clothed with vineyards, and there are extensive European gardens. We passed among little wooded hills with some Aleppo pines (*Pinus halepensis*), through several short tunnels, and then left the main valley, and in a few minutes arrived at Souk Ahras, a thoroughly French town, where much and good wine is made, the soil and climate being suitable.

Souk Ahras is 2067 ft. above the sea. The air felt delightfully fresh, and the climate is said to be temperate and very healthy. From the distinctly European appearance, and peaceful aspect of this agricultural neighbourhood, one found it difficult to realise that only five and twenty years earlier the Arabs here rose in revolt, and, after burning the farms and killing the colonists, attacked the town. But a shocking massacre occurred at no great distance ten years later. It is curious to notice how some towns are given up to a particular species of Swallow or Swift. This place (said to be the birth-place of St. Augustine) is in the possession of the House Martin. The Hôtel de Ville (which I took at first for a church, from the fact that a wedding party were just emerging from it) held a great many nests, stuck in clusters at the corners of the little pilasters, under the eaves, and in the corners of the windows. There were swarms of the birds in the air about the building. The next morning, from observations made from my bedroom window, I found that the ruling Sparrow was *Passer domesticus*, with grey crown and typical chestnut back. Either it has ousted *P. hispaniolensis*—the common Sparrow of the country—or the latter never took possession of this new and strange kind of town. *P. domesticus* was

perhaps introduced by the French, and perhaps introduction is partly responsible for the plague of Sparrows in Algeria and Tunis, about which I read in 'La Dépêche Tunisienne.'* Whatever he is at home, the House Sparrow has certainly proved to be a curse wherever he has been taken abroad.

The next morning I walked down a small winding valley, and reached the Medjerdáh, there merely a mountain stream, and a very pretty one. The smaller valley was vine-clad at first, and then bushed with the usual shrubs, a cytisus and the broom being still in bloom; the considerable elevation of the country was further shown by the presence of scrub-oak, an ash and an elm, both small, and low Aleppo pines in plenty. Some vines had got astray, and festooned the small trees by the stream and river, showing what a beautiful plant it may be when it escapes from the formality of the vineyard. Nightingales were abundant, and still in full song; a pair were hopping and pecking about on a bit of bare mud at the edge of the river, their tails up like a Robin's. The Cuckoo (*Cuculus canorus*) and the Hoopoe were both calling. The Cuckoo evidently breeds here, and I was pleased to hear its note among the many less familiar songs, for I knew I should be too late to hear it in England, where they were enjoying an early season and a real summer. Serins, and the very abundant Goldfinches, were singing. The Serin often sings on the wing. The song is a rapid sibilant trill. Besides the ordinary call-note, the Serin has another, *viz.* "chitty titty weee," the last note ascending at the end. The Corn Bunting was very numerous. Woodchats were common, as were Linnets, Greenfinches (*Ligurinus aurantiiventris*), Sardinian Warblers, Whitethroats, Blackbirds, Ultramarine Titmice, Rufous Warblers, Algerian Chaffinches, Swallows, and Martins. Both *Hypolais*

* I am perhaps wrong in assuming that *Passer domesticus* was introduced by man. 'Yarrell' (4th edit.) says, "It is common, though not universally distributed, in Algeria." Loche, in his 'Catalogue des Mammifères et des Oiseaux observés en Algérie,' published in 1858, gives its habitat as "les trois provinces de l'Algérie." Seebohm says that *P. hispaniolensis* is found in Spain, Algeria, Nubia, and Egypt, together with *P. domesticus*, the latter being chiefly confined to the towns. Yet I cannot help thinking there are some facts to be observed about the distribution of the House Sparrow which point to its probable absence from the country before its settlement by Europeans.

polyglotta and *H. pallida* were in song, the latter, of course, only down by the river; and I noticed the Wren, a Kingfisher, Spotted Flycatchers, and the Blackcap (*Sylvia atricapilla*), a bird I never saw lower down the Medjerdáh valley. Near the town I had seen House Sparrows as well as Spanish Sparrows, the latter being the more numerous in the gardens of the scattered out-lying houses. Some of these gardens were just then very gay with scarlet or vermilion pomegranate flowers. I heard one or two Cirl Buntings (*Emberiza cirrus*) singing, and watched a fine old male at close quarters while it perched on a low Aleppo pine; it was a very brightly-coloured specimen, and quite a striking bird. In a few minutes the female settled beside him.

May 27th broke with some regular Welsh weather—thin drifting rain and a chilly air (a great change to me just then), but this gave way to fine weather, with a strong cold wind, about 8 a.m. I walked by a good road up to the higher ground above the town, winding among vineyards at first, and then through wide open pasture and corn-fields. It was a lovely country, with green flowery pastures, corn, and vineyards, red-roofed farm-houses, and fruit-trees. Beyond were bushed hills, and other higher, barer ones, green or varied with grey rock, and bushed in places. The air was most invigorating, and the place must be exceedingly healthy. Quails (*Coturnix communis*) were calling from the corn and grass. Goldfinches were flocked, and I saw as many as thirty in a “charm.” Sky Larks (*Alauda arvensis*)—another bird not found lower down the valley—were singing, and Crested Larks also; and I noticed some Tawny Pipits (*Anthus campestris*) among the vines. The Tawny Pipit seems to me a quieter, more sedate, and silent bird than any other species of the genus *Anthus* with which I am acquainted. I saw no birds of particular interest on my return journey down the valley.

THE EVOLUTION OF BIRD-SONG.

BY CHARLES A. WITCHELL.

IN July and August, 1890, I published in 'The Zoologist' two articles on the Evolution of Bird-Song. They were the result of a considerable amount of patient observation; and, although they contained many surmises of a more or less valueless character, they also included many statements founded on fact and embodying hitherto unknown (or misstated) records of the construction of songs, and of racial similarities of voice. I should like to defend these articles from hasty criticism. Mr. Warde Fowler, in his 'Summer Studies on Birds and Books,' in the course of two pages (55-57), adverts (seemingly in some haste) "to a theory, lately propounded in 'The Zoologist,' which would explain all songs as imitations, either of the utterances of other birds, or of inarticulate sounds which are constantly obtruded on the bird's ear. The writer of these articles has made a most painstaking analysis of many of the best-known songs; his perseverance is admirable," &c. Then why not do him the justice to quote him without misleading error? What I wrote was that "the call-note, being more or less the result of imitation, would be influenced by other sounds familiar to the bird;" and that is a perfectly justifiable surmise, supported by the observations of Daines Barrington and other authors. I further described how several species construct songs by uttering their call-notes many times in succession (and how many birds repeat certain notes many times in succession) in their songs. I believe I was the first writer to call attention to this fact. Mr. Fowler writes of the songs of Buntings (*op. cit.* p. 157):—"They consist of a quick succession of notes, varying slightly in tone and pitch with different species, and possibly developed from a primitive sound indicating invitation or alarm." Exactly: it was to this theme that I called attention in 'The Zoologist' (1890, pp. 238-9) in the article on "Bird-Song and its Scientific Value," which Mr. Fowler read with so much interest and appreciation!

He further "quotes" as follows:—"He suggests, for example, that the Song Thrush began by imitating the sound made when a snail-shell is being broken against a stone; from this humble beginning, used perhaps as an invitation to others to come and feast on snails, it has gradually developed its splendid song."

I wrote, however, as follows:—"In the course of time persistent sounds might, in consequence of the involuntary or voluntary imitateness of a bird, modify its call-note. . . . It is also possible that certain call-notes may have been intentionally modified to a resemblance of the sounds made in obtaining food, and for the purpose of suggesting those sounds to other birds." I then instanced the behaviour of the barn-door cock—which bird, when calling his hen, pretends to be picking food—as "warranting the suggestion" (this was obviously a mere surmise); "but often there is certainly, from whatever cause arising, great similarity between the call-notes of birds and the sounds which are occasioned by their obtaining food or eating it." Among other instances I mentioned, ". . . the Blackbird and Thrush, which at times make a clicking sound that is the foundation of the reiterated alarm-notes of the former bird. This is an imitation of" (I should have written "is similar to") "the 'clicking' sound produced when a snail is broken against a stone." Let me here add that unless a person has cracked a snail within an inch or two of his ear he is not able to form an idea of the loudness of the sounds which a bird hears when it performs the same operation. I did not state that the Thrush developed its song from this cry, but alluded to it as the third best British mimic with which I was acquainted (Zool. 1890, p. 242).

Mr. Fowler proceeds:—"The Swallow's note resembles the sound made by the breaking of the wing-cases of beetles." I wrote:—"The Swallow's call-note 'clit' reminds one of the breaking of the wing-case of a small beetle." The word "note" by itself might be interpreted "song," in which case the expression would be obviously inaccurate.

Mr. Fowler continues the sentence: "the harsh tones of the Rails suggest the crushing of the tender shells on which they partly subsist." This is the only phrase, so far, quoted without error of meaning. He then humorously misquotes me by remarking that the Corncrake "took a fancy to imitate the noise made by a cow in browsing." Should any reader consider this funny, I trust he will defer his conclusion until on some still night he has been near a cow which is browsing rank grass. Then, and then only, will he be able to judge whether my comparison was a fair one:—"The 'crake' of the Landrail is in time and tone closely like the noise made by the grazing of a cow."

I never stated that the Corncrake had any desire to imitate the sound; I merely mentioned the similarity of the two sounds as noteworthy.

Mr. Fowler again misquotes me when writing:—"The Starling's 'whining' sounds are like the noise made when a bird pulls a large worm out of the ground." What I wrote was this:—"In the song of the Starling are some 'whirring' sounds (generally uttered near the beginning of a phrase) which resemble the noise made in pulling a large worm from his hole." There is some distinction between "whining" and "whirring," as applied to a bird's song; but I am now glad to hear from Mr. Fowler that the misspelling was due to a printer's error. Mr. Fowler does not say whether he tried to bring his ear near enough to the struggling worm to hear what noise it actually produces.

He continues:—"The Robin's song is like the gurgling of water, says Mr. Witchell." This is not quite accurate. I wrote:—"The song of the Redbreast seems to be, in its general character, an imitation of the gurgling of water: in summer the bird is very often near water." The latter clause is quoted in inverted commas thus:—"The Robin is frequently found near water." The music of the Robin is describable as a sort of trickling music, in general character not unlike the sweetest murmurs of a small stream.

He thus sums up:—"Surely it is hopeless to try to discover the ultimate origin of individual songs. It is little or no good to publish mere guesses which cannot possibly recommend themselves to the judgment of cautious inquirers." Yet he himself revels in the mimicry which he has observed, though that indicates, if anything can, the origin of the songs of individual birds. He adds:—"It would be more possible, and on the whole more useful, to examine a single group of closely-allied songs, with the object of finding in them some common ancestral element—an archetypal song, the character of which has survived throughout the genus, while particular species have been gradually modifying it. As song is without doubt a valuable specific character, it might surely be worth while to trace its relation, as well as that of plumage and structure, to the generic characters of the whole group. Take, for example, the songs of the Buntings," &c.

Now it appears to me that Mr. Fowler might here have mentioned my articles, knowing that I was the first person who had written on this theme; that I had traced "family-voices"

in the *Corvidæ*, Thrushes, Warblers, Doves, and other rasorial birds. Yet he has made no allusion to it, but has expressed his suggestion as though it had been original.

Since the above was written I have heard from Mr. Fowler that he did not think he had ever before seen my second paper on "The Evolution of Bird-Song" ('Zoologist,' August, 1890); and he kindly offers to expunge the above criticism from his book, but I have expressed the hope that if his opinions are unchanged he will allow it to remain.

ON A WILD LIVING MOUSE OF THE *MUS MUSCULUS* GROUP IN PORTUGAL.

BY OLDFIELD THOMAS, F.Z.S.

IN England and other parts of Northern and Western Europe the House Mouse, *Mus musculus*, is the only member of its group as yet known to occur, and, as we are all aware, this lives solely in or near the haunts of man, while there is no genuine wild species corresponding to it, and it cannot therefore properly be considered a member of the really indigenous fauna. But in many parts of Asia, in Arabia, and in N. Africa, there are found mice belonging to the same group, but living independently of man, and evidently truly indigenous animals. These, notably in N. Africa, are commonly much paler than our House Mouse, and have white or whitish bellies, while in our familiar pest this part is very constantly of a dull smoky colour.

While trapping small mammals in Portugal, I have found two forms of the group inhabiting the country: one our typical northern animal, smoky-bellied and house-haunting; and a second, found away in woods and open gardens, which appears to be the Portuguese representative of the N. African white-bellied mice, and to be quite distinct from the introduced and domesticated form.

This second animal is distinguished from the other by its whitish or pale buff belly, well defined from the darker colour of the upper parts, by its whitish feet, and also by its much shorter tail.

This latter character the following measurements will show :—

TYPICAL *Mus musculus*.

Head and body	84	81	74	mm.
Tail . . .	82	81	73	mm.

WILD FORM.

Head and body	77	77	77	76	78	mm.
Tail . . .	65	61	62	62	57	mm.

Nearly a score of the wild form have been trapped, and of these not one has shown the slightest tendency towards intergradation with the true *Mus musculus*, while their constancy in colour and proportions has been very noticeable. In fact, no one who had seen them in the flesh could doubt their essential distinctness from that animal.

This being the case, it is evident that in the Wild Mouse we have to do with a genuine indigenous species, occurring side by side, but not mixing with the introduced form. It is therefore a new addition to the fauna of Portugal, and its non-recognition hitherto has been, of course, due to its resemblance and close relationship to the introduced *Mus musculus*. Like the Mongoose and the Genet, it forms part of the N. African element in the Portuguese fauna, but whether, like the last-named, it penetrates into S. France, or like the former is confined to the Peninsula, still remains to be determined. Visitors to Pau, Biarritz and other southern places might occupy themselves pleasantly and advantageously by measuring and skinning any mice that could be trapped there in order to clear up this interesting point.

What the name of this wild form should be must unfortunately remain doubtful for the present. Several such mice have been described from N. Africa, among others *Mus spretus*, Lataste, and *M. algirus*, Loche; while further east similar forms have been called *Mus bactrianus*, Blyth, and the exact relationships of all these to each other and to the Portuguese animal must be better understood than at present before the proper names for them can be settled. Another mouse of the same group is that discovered on the Salvage Islands by Messrs. Grant and Baring, to which also I have not as yet ventured to assign any definite name.

All these forms of the *Mus musculus* group will, it is true, be probably only looked upon as geographical subspecies of the

parent form; but that does not make it less interesting to find out exactly their distribution and relationships to each other.

At both the two places in Portugal where I have trapped (Cintra and Estoril) I have succeeded in obtaining both forms, and at each place the white-bellied one was found only in the woods and gardens, where it competes with the ubiquitous *Mus sylvaticus*, abundant, as usual, everywhere. Like its domesticated relative, it is rather more cautious than other wild mice, and one seldom catches a second specimen on the same spot whence a first has been obtained, which is far from being the case with *Mus sylvaticus*.

Inhabiting the same places as *Mus sylvaticus*, it is difficult to determine whether it makes burrows for itself or only trespasses in the runs of that animal; but on the whole I am inclined to believe the latter is the case, and that in the absence of suitable ready-made burrows it takes refuge in runs among logs and stones, or in holes under the roots of trees.

THE FAUNA OF THE OUTER HEBRIDES.

BY RADCLYFFE WALTERS.

It has occurred to me that a few notes on the birds and beasts which chiefly interest the sportsman, as observed during six years' tenancy of a shooting in Lewis, may to some extent supplement the observations recorded in Messrs. Harvie-Brown and Buckley's 'Fauna of the Outer Hebrides.'

The Galson shootings, being situated at the extreme north of the island, must often be the first resting-place of birds on their southward migration, and though a skilled naturalist with the same opportunities would no doubt have ascertained many interesting facts which escaped my notice, I offer my notes as being at all events, as far as they go, the result of actual observation.

I propose to take 'The Fauna of the Outer Hebrides' as my text-book, and only to record such observations as are at variance with, or supplementary to, its statements. The references are in all cases to the pages of that book.

COMMON HARE (p. 38).—I only saw this three times, once in 1890, and twice in 1895; possibly the same Hare was seen twice

in 1895, as the first was not shot, and the second was killed only two or three days afterwards within a mile or two of the same place. They are said to have been much more common before the Ground Game Act, as they frequented the cultivated ground, where they could be easily killed by the crofters.

BLUE HARE (p. 39).—Much more abundant in 1895 than in any previous year; forty-four were killed, exactly double the average of the five previous years. The increase was noticed in the early spring, and was attributed to their having been driven down by the severe winter from the higher hills in the south of the island.

RABBIT (p. 39).—Found all over the moor, and abundant in suitable places on the coast. Many are of various colours, particularly black and white, owing, it is said, to a previous tenant of the sheep-farm having turned down some tame ones.

CHOUGH (p. 69).—A specimen of this bird was shot in Stornoway Harbour on September 13th, 1895, by Mr. D. Mackenzie, who is frequently quoted by Messrs. Harvie-Brown and Buckley; in the previous autumn he saw a bird which he believes to have been a Chough.

HOODED CROW (p. 70).—The keeper's experience agrees with Messrs. Harvie-Brown and Buckley's suggestion that the Hooded Crow finds enough food on the sea-shore without interfering to any great extent with the nests of other birds; it does not often go far from the coast.

ROOK (p. 71).—Mr. Mackenzie tells me that an extraordinary flight of Rooks, probably 5000 or 6000, visited Lewis about October, 1893, as noted by him in 'The Field' at the time. About 300 remained during the next summer, but did not breed; in 1895 they nested for the first time (no doubt in the Castle grounds at Stornoway), and are now building again.

RAVEN (p. 71).—Nests regularly in the cliffs on the north-east coast. The keepers of Galson and Gress make a combined raid upon their nests every spring. Undoubtedly visits us in large numbers from the mainland. Very destructive in nesting season of 1893. On arriving at Galson early in September, 1894, I found that the keeper had a row of about twenty, recently killed, laid out for my inspection.

SNOWY OWL (p. 77).—One was shot by our party on August 25th, 1890. In 1893 several appeared during the nesting season,

and were very destructive, taking the hen Grouse at the water-side when they left their nests for their evening drink. The bright hot weather caused them to hide themselves in the day-time, instead of being, as they are in dull weather, very conspicuous objects on the hill-side; but the keeper killed several, certainly four or five, and I think Mr. Mackenzie has two of them stuffed.

PEREGRINE FALCON (p. 88).—Nests are taken in most years by the keepers on the cliffs on the north-east coast.

GANNET (p. 94).—Invariably seen travelling, singly or in small companies, along the coast, which runs about south-west and north-east, in a north-easterly direction. At all hours of the day, from 9 or 10 a.m. till late in the afternoon, I have seen this movement, and conclude that, as they are said to frequent Rona, which lies about forty miles to the north-west of the Butt, they go out to sea in a south-westerly direction in the morning, and strike the coast on the return journey.

BEAN GOOSE (p. 99).—I remember identifying a bird of this species, shot by our party, but not knowing of the uncertainty as regards its occurrence, I made no note of particulars.

WHITE-FRONTED GOOSE (p. 99).—Often seen, and one or two shot, but not so common as the Greylag. I should say regular in its occurrence.

MALLARD (p. 102).—Certainly common in autumn, but, with all the other wildfowl, very uncertain in its appearance in winter, and driven away by very hard or very stormy weather.

TEAL (p. 103).—Common, and more frequently shot than any other wildfowl; the game-book shows a total for the six seasons of 342 wildfowl, of which 174 were Teal. I have no doubt as to their breeding there, but, not knowing that there was any question about it, did not collect any evidence on this point.

PINTAIL (p. 104).—I shot one out of a flock of four on October 1st, 1894.

SCAUP (pp. 105 and 249).—One, out of four, was shot on October 18th, 1895. Never seen before by the keeper, who has been twenty-seven years on the place.

GOLDEN EYE (p. 106).—A few generally seen in the late autumn. One killed on October 22nd, 1892; two on October 6th, 1893; these had evidently only just arrived, and were so tired that we had to fire at them to drive them, off a loch on

which they were just out of shot, over a gun lying up for them. One drake, in very good plumage, killed on October 21st, 1893.

GOOSANDER (pp. 110 and 249).—A young male, just assuming full plumage, shot on October 26th, 1895, while fishing in a burn, and with four or five small trout in its gullet. This was at the end of a week of very bad weather; northerly winds, with rain, hail, and snow every day. Apparently the first specimen actually obtained in the Outer Hebrides. The bird has been preserved.

SAND GROUSE (pp. 114 and 254).—Two or three of the flock mentioned on p. 254 were shot by the keeper; one, set up by him, is now in the lodge.

GROUSE (p. 118).—Young broods, too small to shoot, occasionally found in October; I have a note of this happening on September 27th, 1895. I once found a covey dusting themselves in the road near the lodge after 7 p.m. on September 29th.

COOT (pp. 123 and 253).—Only frequents one loch.

LAPWING (p. 125).—Only found in the immediate neighbourhood of the same loch.

RUFF (pp. 134 and 254).—One shot on September 6th, 1892; a Reeve on September 6th, 1893, and another Reeve on September 8th, 1894. These dates seem to point to a great regularity in the autumn migration. As far as I know, the birds were alone in each instance; probably but few select a route so far to the westward.

OWLS.—I have notes of a "Barn Owl" having been killed on August 29th, 1891, and a "Brown Owl" on September 2nd, 1893; but I did not see them, and do not know their species.

If I may venture on a criticism on the excellent work which I have taken as my text-book, I should like to ask why it is adorned with a frontispiece depicting animals which are unknown in the Outer Hebrides, such as the Fox, the Badger, and the Wild Cat?

NOTES AND QUERIES.

MAMMALIA.

Mus rattus at Great Yarmouth.—Mr. A. Patterson has sent me several typical specimens of *Mus rattus* from Great Yarmouth, where he informs me they have suddenly become very abundant. They appear to be restricted to a portion only of the town, but show an inclination to increase their radius. Mr. Patterson is of opinion that this species has never been absent from Yarmouth within his recollection, but if so, it appears strange that it should only recently have attracted attention; it seems more likely that it is a recent importation by grain ships, and that having fallen into suitable quarters, it has increased in numbers very rapidly, as is the manner of all the members of the genus; this seems the more probable from the circumstance that the last example sent me was not *Mus rattus*, but the closely-allied race *Mus alexandrinus*. Mr. Patterson has also sent specimens to Mr. Eagle-Clarke and Mr. Barrett-Hamilton.—T. SOUTHWELL (Norwich).

CETACEA.

Dolphin in the Thames at Chiswick.—I have been viewing a Dolphin which was taken in the Thames here on April 10th. It is a female, measuring over eleven feet from the snout over the back to the tail. The back is black, shaded off on the lower parts of the animal to white. Its captors called the creature a Porpoise, but the shape of the jaws, which form a snout, prove it to be a Dolphin, probably *Delphinus delphis*.—ALFRED SICH (Burlington Lane, Chiswick).

[The Porpoise has the head rounded, with no distinct beak. In the Dolphin the beak is as long as the brain-case or longer. The Porpoise has only from twenty to twenty-six teeth in each jaw, while the Dolphin has double that number. As regards dimensions, an adult Porpoise generally measures from four to five feet in length, an adult Dolphin about a couple of feet longer. Eleven feet, as above mentioned, seems to us an extraordinary length. Perhaps it is the Bottle-nosed Dolphin, *Delphinus tursio*.—ED.]

BIRDS.

Snow Buntings at the Mouth of the Thames.—On March 14th I saw four Snow Buntings (*Plectrophanes nivalis*) on the cliff between Southend and Shoeburyness. Is not this late for these birds to remain here, particularly after so mild a winter? I was walking with a young Canadian, who is undergoing a course of instruction in gunnery at Shoeburyness, and on my asking him if he recognised the bird, he replied that it appeared to resemble their "snow bird." I have several times this winter been "fighting" on the east end of Canvey Island, and there, on

and about the broken bank and on the grassy foreshore, I have invariably met with Snow Buntings; and it was worthy of remark that, with one notable exception, they showed very little white in their plumage.—HENRY SHARP (Southend-on-Sea).

Effect of Thunder on Pheasants.—Referring to Mr. Rope's note on this subject (p. 78), a loud report seems to have the same effect on Peacocks as on Pheasants. On the afternoon of March 7th, as I was walking through Kensington Gardens, there was a sound of firing in the distance; each report was answered by the shouts of the Peacocks. I have on previous occasions noticed that a similar result is produced by the sound of fog signals.—A. HOLTE MACPHERSON (51, Gloucester Terrace, Hyde Park).

Ross's Gull.—On June 1st, 1888, lat. $78^{\circ} 47' N.$, long. $3^{\circ} 6' E.$, we were steaming north through ice. At the mast head all the forenoon, and while there, a Ross's Gull passed close to the ship, accompanied by a Snow-bird. The Gull had a pink breast and belly. The wings were also pink underneath. It had the appearance of a Hawk coming towards us, and when going away looked like a Tern. It was the only bird of this species I had seen during forty-eight voyages to the Greenland seas.—DAVID GRAY (Peterhead).

Hen and Marsh Harrier in Sussex.—Mr. Bristow, of this town, has just afforded me an opportunity of seeing a specimen each of *Circus cyaneus* and *C. aruginosus*, shot in this neighbourhood and brought to him for preservation. The former was shot on Feb. 22nd, and weighed 19 oz.; the latter on March 3rd, and weighed 21 oz., both birds being immature females. The late Mr. A. E. Knox considered the Hen Harrier to be "by far the most generally distributed of the Harriers" in Sussex ('Ornithological Rambles in Sussex,' ed. i. p. 88). Mr. Borrer now accords this position to Montagu's Harrier ('Birds of Sussex,' p. 26, where, strangely enough, he wrongly imputes to Knox the same opinion). This author, in stating that "Montagu's Harrier" is most frequently met with, was comparing it with the Marsh Harrier, and not with the Hen Harrier, as may be seen (*op. cit.* p. 90). So also the information from the 'Ornithological Rambles' appearing in Mr. Borrer's work under the Hen Harrier, would appear to be intended by its author to apply to Montagu's Harrier. It will be remembered that Lord Lilford reported a specimen of the Hen Harrier from Sussex in March of last year (Zool. 1895, p. 189).—W. RUSKIN BUTTERFIELD (St. Leonard's).

Rookery destroyed by Crows.—We have in this village a small rookery of some thirty nests, nineteen of which are in a single sycamore in the Rectory garden. On March 30th, towards sunset, a pair of Crows attacked the sycamore, and the next morning its inhabitants had vanished.

They seem to have "gone for" the Rooks' eggs, and Mr. O. V. Aplin and I found fragments of shells under the tree when we visited it two or three days later. They hung about the village for several days, and have only at last been driven away by unsuccessful attempts to shoot them. Before they left us these rascally pirates had completed their work by ransacking the nests that had escaped their first attack; and now we have not a single pair of Rooks left in our settlement. All the familiar cawing of a spring day is hushed; and the same fate will doubtless overtake other rookeries if the brigands long escape the gun. Why could not the Rooks combine to defend themselves?—W. WARDE FOWLER (Kingham, Chipping Norton).

The Southward Flight of a Crane in Autumn.—In the recently published work by Rudolf Slatin Pasha, Colonel in the Egyptian Army, entitled 'Fire and Sword in the Sudan: a Personal Narrative of fighting and serving the Dervishes, 1879–1895,' translated by Major F. R. Wingate, C.B., Director of Military Intelligence, Egyptian Army, the following curious story is told (pp. 497–498), concerning the capture of a Crane in the Sudan which had been liberated with a message attached to it in a cartridge-case from Ascania Nova, Taurida, in Southern Russia. The incident suggests the route taken by these birds when quitting the South of Europe for their winter quarters in Africa. Slatin Pasha thus relates it:—"One day, in the month of December, 1892, when I had just left the Khalifa's door to take a short rest, one of the Mulazemin summoned me to the Khalifa's presence. I found him in the reception-room, surrounded by his Kadis, and the threats and reprimands which I had received on the occasion of Taib Haj Ali's calumny were still fresh in my mind. I was therefore considerably dismayed when the Khalifa, without returning my salute, ordered me to take my seat among the judges. 'Take this thing,' said he, after a short pause, and in a very severe tone, 'and see what it contains.' I at once arose and took in both hands the object he gave me, and then sat down again. It consisted of a brass ring of about four centimetres in diameter, attached to which was a small metal case about the size and shape of a revolver-cartridge. An attempt had been made to open it, and I could plainly see that it contained a paper. This was indeed an anxious moment for me. Could it be a letter from my relations, or from the Egyptian Government; and had the messenger who brought it been captured? Whilst I was engaged in opening the case with the knife that had been given to me, I turned over in my mind how I should act and what I should say; and, as good luck would have it, I had not on this occasion to have recourse to dissimulation. Pulling out two small papers and opening them, I found inscribed on them, in minute but legible handwriting, in German, French, English, and Russian languages, the following:—

'This Crane has been bred and brought up on my estate at Ascania Nova, in the Province of Taurida, in South Russia. Whoever catches or

kills this bird is requested to communicate with me and inform me where it occurred.—(Signed) F. R. FALZ FEIN ; September, 1892.'

"I now raised my head, which hitherto I had kept closely bent down, and the Khalifa asked, 'Well, what do the papers contain?' 'Sire,' I replied, 'this case must have been fastened to the neck of a bird which has been killed. Its owner, who lives in Europe, has requested that anyone who finds the bird should let him know where it was caught or killed.' 'You have spoken the truth,' said the Khalifa, in a somewhat more amiable tone; 'the bird was killed by a Shaigi near Dongola, and the cartridge-case was found attached to its neck. He took it to the Emir Yunes, whose secretary was unable to decipher the writing of the Christian, and he therefore forwarded it to me. Tell me now what is written on the paper.' I translated the message word for word, and at the Khalifa's command also tried to describe the geographical position of the country from which the bird had come, and the distance it had travelled before it was killed. 'This is one of the many devilries of these unbelievers,' he said at last, 'who waste their time in such useless nonsense. A Mohammedan would never have attempted to do such a thing.' He then ordered me to hand over the case to his secretary, and signed me to withdraw; but I managed to take one more hurried glance at the paper,— 'Ascania Nova, Taurida, South Russia,' I repeated over and over again, to imprint it on my memory. The Mulazemin at the door anxiously awaited my return; and when I came out from the presence of my tyrannical master with a placid countenance they seemed greatly pleased. On my way to my house I continued to repeat to myself the name of the writer and his residence, and determined that, should Providence ever grant me my freedom, I should not fail to let him know what had happened to his bird." This story found its way into print last autumn through the Cairo correspondent of 'The Times,' whose very brief narration of it was quoted in 'The Zoologist' for October last (p. 382). A comparison of his version with that now given reveals certain discrepancies; but we may take it that the authorized version is that which appears in the volume now before us, and which has been translated by Major Wingate from the original notes of Slatin Pasha himself.

BATRACHIA.

Acclimatisation of *Rana esculenta* in Yorkshire.—On March 11th I received seventeen specimens of the continental Edible Frog. Twenty-five had originally been forwarded to me, but three died on the way, and five had disappeared, owing possibly to the attentions of the Custom-House officers. I have turned them into a certain suitable pond, and trust that they will increase and multiply. A few years ago I brought eight or nine of them over from Germany with me, and let them loose in a large walled-in garden. For four years they turned up regularly every spring; but after

that I saw them no more, so in all probability they were gathered to their fathers. They never spawned while I had them, owing I presume to the fact that there was no water for them, and I never knew for certain where they took up their winter quarters; but I had strong suspicions that a large heap of manure afforded them the warmth and shelter they required. I also turned down at the same time about half-a-dozen green Tree Frogs, *Hyla arborea*, and they lived for two years to my knowledge, generally frequenting in the summer a tall thick privet-hedge. I have never found *Rana esculenta* wild in the British Isles. It is a fine handsome frog, and I do not think any objection can be raised to its attempted introduction, as might well be the case with other more injurious species. It can certainly make itself heard, but unless sufficiently close to a house to disturb the repose of the inmates, its croaking, to my mind, is an additional charm to the various sounds to be heard on a warm summer's evening.—OXLEY GRABHAM (Flaxton, York).

Newts in Denbighshire.—On April 5th, during a short holiday spent in Denbighshire, Mr. T. A. Coward and I came across the Palmated Newt, *Lophinus palmatus*, in a small pond in some slate-quarries on the moors near Nantglyn. In spite of a careful search, we found only one mature example, a male; but we captured several immature specimens $1\frac{1}{2}$ in. in length, which still retained their tufted branchiæ. These were, presumably, individuals born late in the summer of 1895 which had been unable to complete their metamorphosis before the approach of winter. On the 6th we found the two commoner species (*Triton cristatus* and *Lophinus punctatus*) in a pond near Trefuant station.—CHARLES OLDHAM (Romiley).

Palmated Newt in Radnorshire and Breconshire.—During a few days' stay in the Elan Valley, near Rhayader, in April, I found the Palmated Newt frequenting various ponds and water-holes in that district.—J. STEELE ELLIOTT (Dixon's Green, Dudley).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

March 5th, 1896. — Mr. W. PERCY SLADEN, Vice-President, in the chair.

Mr. Ivor Richards was admitted, and Mr. S. H. Bickham was elected a Fellow of the Society.

On behalf of Capt. J. Marriott, Mr. Harting exhibited an antler of the Burmese Deer, *Cervus eldi*, and described a singular condition in another example which for eight years had continued to exude a blood-coloured liquid from a puncture on the under surface of the brow-tine. Prof. Stewart, to

whom some of the substance had been submitted for examination, had found no blood-corpuscles therein, and considered it to be grease in a semi-fluid condition, the nature of the colouring-matter being as yet undetermined. Mr. Druce thought the substance exuded might be the excretion of the larvæ of some insect feeding upon the internal surface of the horn, and suggested the examination of a section, if possible.

Mr. Harting exhibited a drawing from life of a Klipspringer Antelope, *Oreotragus saltator*, lately received (for the first time in this country) at the Zoological Society's Gardens. He directed attention to the singular position of the hoofs and the enlarged condition of the fetlocks, suggestive of injury during capture. It was difficult to believe (as alleged) that this was the normal condition of the animal, so very dissimilar to that of other species allied to it.

Mr. Thomas Christy exhibited several cases of Butterflies collected by Mr. Horace Billington in Old Calabar, on which remarks were made by Messrs. W. F. Kirby and H. Druce.

Mr. B. D. Jackson, in directing attention to an English translation by Mr. J. Lucas of that portion of Pehr Kalm's 'Travels' which relates to England, remarked that few persons were aware that Kalm, a pupil of Linnæus, had in 1748 spent six months in this country and had diligently noted the plants which he met with. Thus he had recorded no less than sixty plants for Hertfordshire alone, deriving some of his information from an examination of the contents of two haystacks in that county,—in this way anticipating by more than a century one of the methods employed by Sir John Lawes and Sir J. H. Gilbert, and by Prof. Fream.

On behalf of Prof. Gustav Gilson, of Louvain, two papers entitled "Studies in Insect Morphology" were communicated by Prof. Howes. In the first of these—"On Segmentally Disposed Thoracic Glands in the larvæ of *Trichoptera*"—the author found that in *Limnophilus flavicornis* the prothoracic prominence gives exit to an underlying tubular gland. In *Phryganea grandis* each thoracic sternum gives exit to a glandular apparatus of the same category, the prothorax alone developing a prominence. Passing on to a consideration of the glands themselves, it was shown that in *Phryganea* they are slightly monilated branching tubes of a paired nature, which unite in the middle line. They are found to bear a cuticular lining, and to secrete an "oily" fluid which Dr. Hanseval had found, on analysis, to be identical with the secretion of the maxillary glands of *Cossus*. The author gave reasons for regarding these glands as inherited structures, preserved under the tubiculous habit, and not as organs newly acquired in correlation with that. In discussing the homology of the glands, he instituted comparisons with the "Bauchdrüse" of certain non-tubiculous caterpillars and the "salivary glands" of *Peripatus*; and concluded that they are nephridial rather than coxal, pointing out that by their discovery

representatives of segmentally disposed glandular organs may be said to occur throughout the length of the Hexapodan body. In the discussion which followed, Mr. A. R. Hammond referred to the saccular reservoir on the ventral surface of the prothorax of the larva of the Puss Moth, *Cerura vinula*, from which an acid fluid is said to be ejected; also to the large pear-shaped glandular cells which underlie the integument of the thoracic segments in the larva of *Dicranota bimaculata*, as described by Prof. Miall (Trans. Entom. Soc. 1893, p. 235). The function of these cells appeared to be the secretion of an oily fluid.

In the second paper by Prof. Gilson and M. J. Sadones—"On the Larval Gills of *Odonata*"—the authors described in each branchial lamella of *Libellula depressa* three conical processes which are functional in preventing adherence of the lamella to its fellows, and in maintaining full exposure to the surrounding medium. The authors showed that the tracheal ramifications are looped tubules running parallel with the surface of the gill, which at all points lie embedded in a subcuticular protoplasmic syncytium. Stress was laid upon the fact that the in- and out-going tracheal tubules are related to one and the same branchial main tracheal trunk, and that the air within the gill does not circulate regularly through the tracheal system. Turning to physiological considerations, it was pointed out that gaseous interchange between the contents of the gill-laminæ and the surrounding medium must of necessity take place through the living protoplasm of the lamellar syncytium; and, on consideration of the fact that the death of an epithelium is known to profoundly alter the osmotic properties of the tissue which it composes, the conclusion was drawn that absorption of oxygen must here involve something more than a mere physical process. Attention was then directed to the existence of a "præ-rectal vesicle" from which there depend into the lumen of the guts a couple of epitheloid disks. It was suggested that this structure, together with a similarly differentiated epithelium lying about the bases of the gills, might be possibly concerned in the removal of carbonic anhydride. The authors accordingly discriminated between the air-vascular (tracheal) system, as concerned in the absorption and dissemination of oxygen, and the blood-vascular as concerned in nutrition and the removal of waste. In the discussion which followed, Mr. A. R. Hammond expressed his satisfaction at finding that the authors' observations on the gills of *Odonata* confirmed to some extent his own views as to the syncytial condition of the hypodermis in aquatic larvæ. In the larvæ of the red-blooded species of *Chironomus* this condition appeared to be most strikingly exemplified.

March 19th.—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Messrs. James Backhouse and Spencer H. Bickham were admitted, and Messrs. J. H. Leigh and Edward Step were elected Fellows of the Society.

Mr. Thomas Christy drew attention to the fact that the Anniversary

Meeting of the Society would fall this year on Whit-Monday. The President, in reply, remarked that the matter had not escaped the attention of the Officers, and stated what was proposed to be done.

Mr. Clement Reid exhibited fruits of *Naias marina* from a peaty deposit below mean-tide level in the new Docks at Barry, S. Wales. In Britain it had only been found living at a single locality in Norfolk, but in a fossil condition it had been obtained in the pre-glacial forest-bed at Cromer. A discussion followed in which Messrs. A. B. Rendle, H. Groves, and A. W. Bennett took part, and it was suggested that the living plant might be looked for in South Wales, where, being inconspicuous, it might have been hitherto overlooked.

Mr. Clement Reid also exhibited some wood forwarded by Mr. H. N. Ridley from the jungle near Singapore. It appeared to have been eaten into a honeycombed mass of peculiar character, and was found only in wet places, but always above ground, the entire tree rotting. Neither Mr. Ridley nor Mr. Reid had seen anything like it in England; and the latter, while suggesting that the small lenticular unconnected cavities in the wood were probably caused by insects or their larvæ, thought they were unlike the work of either Beetles or White Ants. Some critical remarks were offered by Dr. Haviland.

A paper was read by Dr. Otto Stapf "On the Structure of the Female Flowers and Fruit of *Sararanga*, Hemsley." The materials utilized consisted of female flowers and fruits of *Sararanga sinuosa*, Hemsley (Journ. Linn. Soc. vol. xxx. p. 216, t. 11), which had been collected by the officers of H.M.S. 'Penang' in New Georgia, Solomon Islands, and were in excellent preservation. There were also photographs and a description, taken upon the spot, of the tree, about 60 ft. high, shortly branched at the top, with terminal, nodding, white-flowered, very compound, and gigantic panicles, the leaves being like those of an ordinary screw-pine. On this paper some critical remarks were offered by Mr. Rendle.

On behalf of Mr. G. S. West, a paper was read by Prof. Howes on two little-known Opisthoglyphous Snakes. The author had examined and compared, in respect of the structure of the buccal glands and teeth, specimens of the grooved and the non-grooved varieties of *Erythrolamprus æsculapii*, as recorded by Dr. Günther (Biologia Centr.-Amer. part cxxi. p. 166), and he proved that the latter were rightly referred to the species.

April 2nd.—Mr. J. G. BAKER, F.R.S., Vice-President, in the chair.

Mr. J. W. Cornwall was elected a Fellow of the Society.

On behalf of Dr. F. Arnold, of Munich, the Secretary exhibited several photographs of typical Lichens, received in continuation of a series which has been for some time past in course of issue by that well-known lichenologist.

Mr. M. F. Woodward exhibited a very young example of the Spiny Ant-eater, *Echidna aculeata*, taken from the mammary pouch of the parent at Newcastle, Western Australia, by Mr. H. B. Woodward, Curator of the Perth Museum. It was intermediate in size between the two stages described by Prof. Parker, but showed no trace of the calcaneal spur characteristic of the male, nor any trace of the mammary pouch peculiar to the female. He called attention to the flattened and beak-like character of the snout, and the vestiges of the "egg-breaker," and to the disposition of the spine papillæ. For the purpose of comparison, Mr. Woodward exhibited also the heads of *Ornithorhynchus* and *Echidna*, and a male and female mammary fœtus of *Perameles*.

A paper was read by Mr. C. H. Wright, "On the genus *Stemona*, Lour.," one of the few monocotyledonous genera whose flowers are constructed on a tetramerous type, and remarkable for the diversity of its vegetative characters, while its floral structure varies within comparatively narrow limits. In habit the plants of this genus are generally climbers, but *S. sessilifolia*, Miq., and *S. erecta*, C. H. Wright, are exceptions. Of the twelve species enumerated by Mr. Wright as concentrated in Eastern Asia, two of them extend to North Australia.

Lieut.-Col. C. T. Bingham, in a paper on some Exotic Fossorial Hymenoptera in the British Museum (communicated on his behalf by Mr. W. F. Kirby), enumerated thirty-four species, of which no fewer than thirty were previously undescribed. The discovery of many of them was due to the researches of the author, who had spent twelve years collecting in Sikhim, Burma, and Tenasserim. In the arrangement of the *Pompilidæ*, a confessedly difficult group of Fossorea, he had adopted the classification proposed by Prof. Kohl of Vienna, but he was of opinion that a thoroughly satisfactory classification had yet to be devised. A new genus, *Paragenia*, was proposed for an insect, described originally from Borneo, which he had found also in Burma and Tenasserim, possessing the characters of both *Agenia* and *Macromeris*, resembling the former in neuration and in habits, and the latter in the conspicuous development of the coxæ and femora, especially in the male.

The President then gave a descriptive account of the Khasia Hills from personal experience, dwelling on their geological formation, the extraordinary rainfall of the district (120 inches in five days), and the chief characteristic features of the flora and fauna. His remarks were illustrated by a number of lantern-slides, several of which had been prepared from photographs taken by himself, and others from sketches made by Sir Joseph Hooker. Some additional remarks were made by Col. Sir Henry Collett, K.C.B., from experience gained during two years' residence while commanding the British forces in that part of India.

ZOOLOGICAL SOCIETY OF LONDON.

March 3rd, 1896.—Sir W. H. FLOWER, K.C.B., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of February, 1896, and called special attention to a young Klipspringer Antelope, *Oreotragus saltator*, presented by Commander Alfred Paget, R.N.

Mr. G. E. H. Barrett-Hamilton exhibited two skeletons and other bones of the Lemming, *Myodes lemmus*, obtained by Dr. H. Gadow from caves in South Portugal, a discovery which increased our knowledge of its distribution in past times. At present the Norway Lemming is only to be found in Norway and Lapland, its southern range extending to about $58\frac{1}{2}^{\circ}$ N. lat.; but its remains have been met with in England, and at Quedlinburg, in Saxony. Mr. Hamilton's remarks were supplemented by Dr. Gadow, who gave an account of the caves in Southern Portugal, in which he had found these Lemmings' bones along with those of other animals.

Mr. Sclater opened a discussion on the Rules of Zoological Nomenclature by reading a paper on the Divergences between the Rules for naming Animals of the German Zoological Society and the Stricklandian Code usually followed by British naturalists. After giving some details of the plan proposed by the German Zoological Society for a new work on the Animal Kingdom to be called 'Das Tierreich,' and to contain an account of all the species of recent animals hitherto described (estimated to be at least 386,000 in number), Mr. Sclater shortly recapitulated the Rules which were intended to be used in the preparation of this important work. The main divergences from the Stricklandian Code were pointed out to be three in number:—(1) The permission to use the same generic names in zoology and botany; (2) the use of "tautonyms," that is, the same generic and specific name for a species in certain cases; and (3) the adoption of the tenth edition of the 'Systema Naturæ' instead of the twelfth as the commencement of binary nomenclature. The advantages of, and objections to, these alterations of the Stricklandian Code were discussed, and other minor points of nomenclature were touched upon, amongst which was the use of trinomials, which Mr. Sclater approved of as designations for subspecies. A communication was read from Graf Hans von Berlepsch, expressing his regret at not being present on this occasion, and giving his opinion on the three points specially discussed. After some remarks by the Chairman, Mr. E. Hartert spoke in defence of the German Rules, and was followed by Prof. Lankester, Mr. H. J. Elwes, Dr. Sharp, Mr. Blanford, Mr. H. O. Forbes, and Mr. Kirby.

A communication was read from Graf Hans v. Berlepsch and M. J. Stolzmann on the ornithological researches of M. J. Kalinowski in Central

Peru. The collections made in the years 1890-93 had been transmitted to the Branicky Museum of Warsaw, and contained examples of 295 species and subspecies, of which an account was given in the present paper. Five species and twenty-two subspecies were described as new.

Dr. David Sharp, on behalf of the Committee for investigating the flora and fauna of the West India Islands, communicated a paper on West Indian terrestrial Isopod Crustaceans prepared by M. Adrien Dollfus.

March 17th.—Prof. G. B. HOWES, F.L.S., F.Z.S., in the chair.

Mr. Sclater called the attention of the meeting to the prospectus of the great work of the German Zoological Society, to be called 'Das Tierreich,' spoken of at the last meeting, and gave some particulars as to the mode in which the plan was intended to be carried out. He also called attention to the appointment of a Committee on Zoological Nomenclature at the International Zoological Congress held at Leyden last year.

A communication was read from Lieut.-Col. C. T. Bingham, containing a contribution to the knowledge of the hymenopterous fauna of Ceylon. The paper was founded mainly on the collections made in that island by Col. Yerbury, R.A., and Mr. E. E. Green, and dealt only with the Monotrochous Hymenoptera, of which 335 species were recorded. Of these seven were now described as new. The author observed that this number was far less than what must actually occur in an island with so varied a climate and flora. Most of the species, as was to be expected, likewise occurred in India.

A communication was read from Mr. Edward T. Browne on British Hydroids and Medusæ. This paper contained descriptions of the early stages, and notes on twenty species of Medusæ, of which examples had been collected at Plymouth, and in Valencia Harbour on the west coast of Ireland. It also contained a revision of the synonyms of the species and an account of their distribution. Notes on the hydroids connected with some of the species were added.

Mr. A. Smith Woodward read a paper on some extinct fishes of the Teleostean family *Gonorhynchidæ*. He described a new specimen of *Notogoneus osculus* from the Eocene (Green River Shales) of Wyoming, U.S.A., confirming Cope's determination of this fish as a member of the family *Gonorhynchidæ*. He also pointed out that the so-called *Sphenolepis squamosseus* and *S. cwieri*, imperfectly described by Agassiz from the Eocene of France, are generally identical with *Notogoneus*. In proof of this identification, he gave an account of new specimens in the British Museum. The *Gonorhynchidæ* were thus shown to have comprised fresh-water fishes in the early Tertiary period both in Europe and North America.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

March 4th.—W. F. H. BLANDFORD, M.A., F.Z.S., V.P., in the chair. Mr. P. Marshall, of Canterbury College, Lincoln, N.Z., was elected a Fellow.

Mr. P. H. Grimshaw exhibited specimens of *Cephenomyia rufibarbis*, Meigen, a new British Bot-fly parasitic on the Red Deer in Scotland.

Mr. C. G. Barrett exhibited, for Mr. Porritt, a black variety of *Polia flavicincta*, taken at sugar in his garden at Huddersfield; a variety of *Cosmia trapezina* with a blue-black central band; and a variety of *Mania typica* with pinkish white central markings, bred by Mr. Turnstall, of Huddersfield.

Mr. A. H. Jones exhibited specimens of the following butterflies, captured at Coomassie by Major Henry P. Northcott during the recent expedition, viz. *Papilio zenobia*, *Elymnias bammakoo*, *Limnas alcippus*, *Romaleosoma gausape* (var.), *Catuna cænobita*, *Terias sengalensis*, and *Neptis nemetes*.

Sir John T. D. Llewelyn, Bart., M.P., exhibited specimens of a small species of Diptera which he believed to be parasitic on *Trochilium sphegiforme*, as he had bred a number from that species. *T. sphegiforme*, although one of the most local moths in this country, had occurred last year at Dolau Cothy, Carmarthenshire, in such numbers in the larval state as almost to destroy the whole of the alders growing there. Mr. G. H. Verrall said that the insects belonged to a species of *Phora*, possibly *Phora rufipes*, practically omnivorous, but not considered to be truly parasitic.

Mr. Hampson exhibited an exotic species of Locust which Lord Walsingham had found in his conservatory at Merton Hall, Norfolk, where no exotic plants had been imported for some years.

Dr. Sharp exhibited specimens of the pupæ of *Micropteryx* (probably *semipurpurella*), and drawings to illustrate their structure. Mr. McLachlan said that so long ago as 1865 he had suggested the close affinity of *Micropteryx* to the Trichoptera; the opinion then formed had since been much strengthened, but he was not disposed to admit co-ordinal relationship.

Mr. McLachlan exhibited a singular instance of monstrosity in a Dragon-fly. The insect was a male of *Hetarina occisa*, Hag., from Venezuela. On the left side were three wings, two mesothoracic and the other metathoracic; on the right side only one wing, the metathoracic. The supplementary wing on the left side was inserted almost immediately beneath the ordinary wing; it was normal in form and neuration, but the red pigment at the base (fully developed in all the other wings) was not evident, the wing in this respect being similar to those of highly immature examples of the same species.

Mr. E. E. Green exhibited a larva of an homopterous insect—one of the

Cicadinæ—from Ceylon, having what appeared to be a head at its caudal extremity. He pointed out that the larva had caudal appendages which might be mistaken for hairy antennæ, and pigment spots resembling eyes on the antepenultimate segment of the body. The insect walked either backwards or forwards, and when first seen looked like a beetle of some kind, the caudal extremity representing the head.

Mons. Louis Péringuey contributed a paper entitled "Descriptions of New Species of South African Coleoptera, chiefly from Zambesia."

Dr. Sharp read a paper, by Professor Williston, "On the Diptera of St. Vincent, West Indies. Part I."

March 18th.—Prof. RAPHAEL MELDOLA, F.R.S., President, in the chair.

Mr. T. A. Gerald Strickland was elected a Fellow.

Mr. C. G. Barrett exhibited drawings of varieties of British Lepidoptera in the collection of Mr. S. J. Capper, of Huyton Park, Liverpool. They comprised 389 figures, representing 139 species, of which 33 were butterflies and 50 moths. Herr Jacoby enquired whether any record had been kept of the localities in which these varieties had been caught, or of the conditions under which they had been bred. Mr. Barrett in reply stated that none of the varieties exhibited had been obtained by breeding under artificial conditions for the purposes of experiment, but they were all natural varieties.

Mr. J. J. Walker, R.N., exhibited a specimen of *Procas armillatus*, taken on Durland Hill, near Chatham.

Herr Jacoby exhibited a specimen of *Loxoprosopus ceramboides*, Guér., from Brazil.

Mr. E. E. Green exhibited the eggs of some species of *Locustidæ* extracted from the stem of a young cinchona tree at Punduloya, Ceylon. The species of the parent insect was undetermined; it was possibly either a *Cymatomea* or a *Cyrtophyllus*, both of which possess large sabre-shaped ovipositors. A slit half inch deep and more than two inches long had been cut into the hard wood, in which the eggs had been symmetrically deposited, edge to edge, with the coloured part inwards. The greater part of each egg was of fine texture and coloured green; but at the extremity from which the young insect would make its exit the egg shell was soft, pliant, and beautifully reticulated. The row of flattened green eggs lying side by side resemble an acacia leaf, but as they are concealed within the stem the resemblance was apparently without motive. It seemed curious that as the eggs were embedded they should be brightly coloured.

Mr. Green read a short paper entitled "Notes on *Dyscritina longisetosa*, Westw." He remarked that drawings of the species had been exhibited by him at a recent meeting of the Society. Dr. Sharp could not agree with Mr. Green in regarding it as belonging to the *Forficulidæ*. He

thought further specimens for examination were required before attempting to determine its position, which was at present doubtful.

Mr. W. F. H. Blandford communicated a paper entitled "Descriptions of New Oriental *Scolytidæ*."

April 1st.—Prof. MELDOLA, F.R.S., President, in the chair.

Mr. Luke Bishop and Mr. Robert Nesham were elected Fellows of the Society.

Mr. Champion exhibited, on behalf of Mr. Blatch, specimens of *Quedius riparius*, Kellner, captured in February last on the banks of running streams at Porlock, Somerset. The insect was an interesting and unexpected addition to the British list, and the second recent novelty from the west country, the other being *Ochthebius lejolisi*, Muls. and Rey, found at Ilfracombe in June last by Mr. Bennett. Mr. Waterhouse had seen specimens of the *Quedius* from Wales and Scotland.

Mr. Champion also exhibited a small collection of Coleoptera made by Mr. O. V. Aplin in Southern Tunis during various expeditions inland from Gabes. The collection included some interesting *Tenebrionidæ* of the genera *Pimelia* and *Adesmia*. Mr. Aplin noticed specimens of these insects impaled by Shrikes. Dr. Sharp, Mr. R. Trimen, and Mr. McLachlan made some remarks on the subject of the impalement of insects by birds.

Mr. Goss exhibited, for Mr. Cameron, an apterous male of *Mutilla contracta*, taken by Mr. Rothney at Barrackpore, India. The specimen was stated to be the first recorded instance in this species of a wingless male, and was also abnormal in having the thorax incised laterally.

Dr. Sharp called attention to the fact that at a recent meeting of the Society (March 20th, 1895, see Proc. 1895, p. x) a specimen of a supposed dimorphic form of one of the species of *Dytiscus* was examined, and Prof. Stewart enquired whether any anatomical examination had been made of the sexual organs. Dr. Sharp said that in 'Comptes Rendus Soc. Bordeaux,' 1894, there was an account of the examination of the sexual organs of the supposed second form of *D. marginalis* by M. Peytoureau, who came to the conclusion that it was really a distinct species, which he called *D. herberti*.

Prof. Poulton exhibited examples of the type labels now in use in the Hope Collection at Oxford, and illustrated their employment by projecting on the screen, by the lantern, a photograph of the Westwood types of African *Eusemia*, described in Oates' 'Matabele Land' (Lond., 1881). He said that such labels, having been once set up in type, could be reproduced in electrotype very cheaply and efficiently. Black ink was considered better than red on account of its greater permanence. Mr. Verrall was of opinion that no species should be described from a single type, but from many specimens, and he wished every so-called "type" could be destroyed as soon as a species had been described from it. He knew of cases in

which a "species" had been described from a single female specimen in bad condition. Mr. Blandford explained the system of labelling types in the Brussels Museum. Dr. Sharp, Prof. Meldola, Mr. McLachlan, and Prof. Poulton continued the discussion.

Mr. Blandford exhibited a series of lantern-slides showing the uses to which photography could be put in entomological illustration. The photographs shown included various *Saturniida*, *Vanessida*, species of *Mamestra*, *Tipula*, *Ophion*, *Carabus*, *Lucanus*, *Sitones*, &c., as well as one or two examples of insect-injury, and a view in Windsor Park showing oaks defoliated by *Tortrix viridana*.

Prof. Poulton read a paper "On the Courtship of certain European *Acriididæ*," from observations made in exceedingly favourable weather at the end of August and beginning of September last. He was much indebted to Mr. F. J. H. Jenkinson, of Cambridge, and Mr. F. V. Dickens for many independent observations and valuable confirmation. The observations were almost all made in the neighbourhood of the Weisshorn Hotel, high above Vissoye, in the Val d'Anniviers. Dr. Sharp had been kind enough to name the species referred to in the paper.

Mr. G. F. Hampson read a paper "On the Classification of three Subfamilies of Moths of the Family *Pyralinæ*: the *Epipaschiinæ*, *Endotricinæ*, and *Pyralinæ*."—H. Goss, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

Hunting in Many Lands. The Book of the Boone and Crockett Club. Editors, THEODORE ROOSEVELT, GEORGE BIRD GRINNELL. 8vo, pp. 448, with sixteen illustrations. New York: Forest and Stream Publishing Company. Agent for Great Britain: David Douglas, Edinburgh.

To the members of the Boone and Crockett Club is due the credit of having secured, by Act of the New York Legislature, the incorporation of the New York Zoological Society, as well as an Act to protect the Yellowstone National Park, and to punish crimes and offences within its area, where, it may be remembered, such wanton slaughter of Bison took place in March, 1894. When it is stated that this so-called "Park" includes nearly 5600 square miles, some idea may be formed of its importance as a game reserve. The Act of Congress referred to is printed in the present volume, and the descriptive account by Capt.

Anderson, which precedes it, is most interesting. A very curious, well nigh incredible, fact is mentioned with regard to the Bears, Grizzly and Black, in the Yellowstone National Park. It is said that the preservation of the game there has unexpectedly resulted in turning a great many Bears into scavengers for the hotels within the park limits. Their tameness and familiarity are astonishing, and they act more like hogs than beasts of prey. Accordingly naturalists have now a chance of studying their character from an entirely new standpoint, and under entirely new conditions. Never before has such an opportunity presented itself.

With regard to the other chapters in this book, it may be remembered that in 1893 the same editors issued a volume on Big Game Hunting in America. Their second volume, now before us, deals with the pursuit of Big Game in many parts of the world beyond the American Continent, including Russia, Mongolia, Thibet, India, and East Africa. A chapter on Wolf-hunting in Russia, by Lieut. H. T. Allen, of Washington, with a portrait of the "Barzoi," or Wolf-hound, employed in that country, is particularly interesting.

In another chapter Col. Roger D. Williams, of Lexington, Ky., describes Wolf-coursing in Montana and Wyoming (where the Wolves are stronger and fiercer than those found further south) as one of the most thrilling and exciting sports to be enjoyed.

These pages, although primarily more attractive to sportsmen than to naturalists, are not without interest to the latter, by reason of the measurements and weights which are given of the wild animals described. Thus, in the chapter by Col. Roger Williams just mentioned, we are told that the American Wolf, while not so tall or leggy as the European Wolf, is more compact, with heavier head, coarser muzzle, and smaller ears, and perhaps a little heavier in weight, standing from 29 to 36 inches at the shoulder, and weighing from 85 to 125 lbs. Col. Williams adds that the American Wolf is, when run down to a death finish, a much more formidable foe for dogs than his European relative; and he arrived at this conclusion, he says, after hunting with high-priced hounds that had won medals in Russia for Wolf-killing, but which demonstrated their utter inability even to hold American Wolves.

Perhaps the most valuable chapter in this volume is that entitled "Head Measurements of the Trophies at the Madison Square Garden Sportmen's Exhibition" (pp. 424-432). In this will be found some very useful statistics, compiled by three members of the Boone and Crockett Club (Messrs. Roosevelt, Grinnell, and Rogers), including tabulated measurements of Bison, Bighorn, Musk Ox, White Goat, Prongbuck, Wapiti, Mule Deer, White-tailed Deer, Moose, and Cariboo. These measurements are compared with those given in the English Catalogue of Trophies in the American Exhibition in London, 1887, and also with those in Ward's Book of Horn Measurements, 1892, a high compliment being paid to the English Committee who prepared the Catalogue of 1887, and who may be said to have laid the foundation for a collection of reliable and trustworthy statistics relating to the Big Game of America, as interesting to sportsmen as it is useful to zoologists.

This volume then is not to be regarded as embodying merely a sensational account of the doings of American sportsmen, for while many of the chapters are not devoid of thrilling adventure, they contain much useful information derived from the personal observation of experienced hunters.

A Naturalist in Mid Africa: a Journey to the Mountains of the Moon and Tanganyika. By G. F. SCOTT ELLIOTT, M.A., F.L.S. 8vo, pp. i—xvi, 1—413. With numerous illustrations and maps. London: Innes & Co. 1896.

WHEN the author of this interesting volume returned, rather more than a year ago, from his adventurous ascent of Mount Ruwenzori, and exploration of the country to the north of the Albert Edward Nyanza, he read papers at the Geographical, Linnean, and Zoological Societies, in which he gave a more or less abridged narrative of his travels, and some account of the flora and fauna of the country which he explored. In the interval which has since elapsed it would seem that he has been busily employed in the preparation of the volume now before us, which embodies a full and complete account of his arduous journey, and of the scientific results attained, so far at least as the materials collected by him have been worked out (*cf.* Appendix, p. 387).

His expedition seems to have been planned chiefly with the object of determining the question of botanical areas around the shores of the Victoria Nyanza, Lake Tanganyka, and other parts of Equatorial Africa. Starting from Mombasa, he journeyed north-west to the head of the Victoria Nyanza, passing along the northern shore of that lake, and round its north-west end to Kitangule, then across the north-eastern extremity of the Albert Edward Nyanza to Mt. Ruwenzori, which lies between that lake and the more northern Albert Nyanza. After completing the exploration of that mountain, he turned southward to the head of Lake Tanganyka, and proceeding then by water, traversed the entire length of that lake and Lake Nyassa, when, crossing the Shiré highlands and the Zambesi valley, he found himself once more at the sea at Chindi, some 1300 miles south of Mombasa. As the zoological results of this expedition have been already briefly made known to our readers (*Zool.* 1895, pp. 154, 238), we need not do more than call attention to the publication of the present volume, in which more detailed information may now be found.

It may be observed that both the Sunbirds mentioned at pp. 98, 99, were originally described from Kilimanjaro; and *Nectarinia johnstoni* was found by Mr. Gregory on Mount Kenia (*cf.* 'Ibis,' 1896, p. 290).

We learn from the Appendix (p. 387) that the collection of mammals obtained by the author has been entrusted for determination to Mr. Oldfield Thomas, of the Natural History Museum, and it is not unlikely that some of them may prove to be new and undescribed.

Dr. Günther has already described several new Reptiles and Batrachians collected on this expedition (*Ann. Mag. Nat. Hist.* June, 1895), and in a list of more than one hundred different species of insects enumerated by Dr. A. G. Butler (*Proc. Zool. Soc.* 1895) about a dozen are stated to be new.

It is to botanical science, however, that Mr. Scott Elliott, as on former explorations in Africa, has made the most valuable contributions, and his book, therefore, appeals more directly to botanists. Nevertheless zoologists will find in its pages a good deal of information illustrative of the fauna of a most interesting and still little-known region of Central Africa.

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ON THE REPORTED OCCURRENCE OF THE GOLD-VENTED
THRUSH AND SPOTTED EAGLE OWL IN IRELAND.

BY RICHARD J. USSHER.

IN his "Handbook of the Birds of Great Britain," published in Allen's 'Naturalists' Library,' Mr. Sharpe writes (vol. i. p. 318):—"A specimen of a *Pycnonotus* is said to have been shot near Waterford in January, 1838, by Dr. R. Burkitt, and skinned by him. It turns out to be the Bulbul of South Africa, *P. capensis*. . . . There is not the slightest probability of the bird having migrated from the Cape to Ireland, and the supposition that it might have been an escaped specimen might have been entertained but for the fact that an Eagle Owl, shot in Ireland by the same gentleman, turned out to be another South African species, viz. *Bubo maculosus*. There seems, therefore, to be some mistake connected with the occurrence of these African species in Ireland, and the birds had better be dropped out of the British list altogether." I can well understand the propriety of excluding from our avifauna a species that may have escaped from confinement, and has only occurred once; but as to the facts of both these birds having been shot near Waterford I wish to remove all misconception.

My valued friend Dr. Burkitt died on July 3rd, 1893, at the age of eighty-six. Previously to 1830 he began to collect and preserve native birds, and continued to do so for more than fifty years in Waterford, and subsequently at Belmullet. Little or no interest was taken in his pursuits by his fellow-townsmen. He

never saw a museum in his life, nor possessed a modern handbook of British birds until 1890. Yet he pursued Ornithology devotedly and untiringly, and was one of the local authorities so often quoted by William Thompson. No one could know him without recognizing the simplicity of his character, his keen sensitiveness in matters of honour, and absence of mercenary motives. I have before me his ornithological papers and his MS. collecting-book, with data of birds preserved by him from 1830 to 1891, from the Robin and Blackbird to the Great Auk! In this book he entered many particulars, even the preservative and stuffing material used. He would let no one examine this book in his lifetime, keeping it merely as a private record. I find in it this entry:—"10th Jan. 1838, I obtained a specimen of the Gold-vented Thrush, *Pycnonotus chrysorhæus*, shot at Mount Beresford within 4 miles of Waterford."

Dr. Burkitt described to me how he had found this bird amongst a lot of Blackbirds in possession of a lad who had shot them, as recorded by Thompson. Among his letters is a copy he made of the following, written to Mr. Yarrell:—

"Waterford, April 22, 1843.

"Dear Sir,—I trust you will not deem a perfect stranger in addressing you on this subject presumptuous, especially as I sent a notice of the enclosed, with a sketch, to Mr. Ball, of Dublin, to forward to Mr. Thompson for his opinion, some months ago, and have been advised, as Mr. Thompson was in London, to forward the specimen to your care, in order that you might both inspect it. It has puzzled my friends here not a little, being totally unknown to us all. Should Mr. Thompson not be in London, perhaps you would have the kindness to open the packet, as the bird may be worthy of inspection, though much mutilated. The history I gave Mr. Thompson several months ago, and regret to say that I neglected at the time I obtained it (Jan. 1838) to ascertain its sex, deeming it a variety of the immature or female Waxwing (a bird I have never seen), and, being much hurried at the time, merely skinned it, and, some months after, foolishly stuffed it, instead of leaving it as it was, never dreaming it would require as now to go on its travels.

"I am, &c.,

R. BURKITT, M.B.

"William Yarrell, Esq.,

Secretary to the Zoological Society, London."

Dr. Burkitt generously gave this bird (as well as his specimens of the Hawk Owl and the Great Auk) to Trinity College Museum. In a note in which he vehemently deplores the subsequent disappearance of the *Pycnonotus* from that Museum, he states, "it was poisoned with arsenical soap, so was safe from insects." The coloured sketch mentioned above was inspected by Prof. Newton in 1871, and is now in the Science and Art Museum, Dublin.

Dr. Burkitt's collecting-book contains an entry of the Spotted Eagle Owl as "Hawk Owl? Preservative, arsenic. Tow. Jan. 27, 1851. John Dobbyn, Esq., Woodlds. Shot near Belle Lake. This is not at all like Short-eared Owl, being twice size and much darker." The label on the specimen runs thus:—" *Strix bubo?* Linn., nondescript, or is it Eagle Owl? Shot near Belle Lake, Co. Waterford, Jan. 1851. Presented by John Dobbyn, Esq., of Woodlands. Marked this Owl formerly as *Strix ulula*, or Hawk Owl. R. B. 1862." The words "nondescript, or is it" having been written in different ink, apparently at a different time.

In his copy of Thompson's work, Dr. Burkitt interleaved this notice regarding it:—"The Spotted Owl, *Bubo maculosus*, Vieillot. A specimen of this bird was presented to me by the late John Dobbyn, Esq., and skinned, stuffed, and mounted by me Jan. 27th, 1851. It was placed among my native birds, where it lay upwards of thirty years unnoticed, till Mr. Richard Ussher, of Cappagh, discovered it there, and first brought it into notice, having been marked by me when mounted as a 'Hawk Owl' or Eagle Owl? (doubtfully), shot near Belle Lake, Co. Waterford, Jan. 1851. Not being able to find any description of this bird in any of my books of native birds, it was then forgotten, and neglected, till Mr. Ussher on inspecting my collection of native birds called my attention particularly to it in 1881, and requested me to send it, with some two other birds, to Mr. A. G. More, of the Natural History Department of the Science and Art Museum, Dublin, for inspection and decision as to its species, in 1882. Mr. More, understanding that it was my intention to leave Waterford for a distant part of Ireland, and that I was willing therefore to part with my collection of Irish birds, appeared anxious to purchase this and the other birds which I had sent him for the Dublin collection. This, of course, I would not listen to, being anxious to dispose of all together did I find a purchaser. However, a short time afterwards, some doubts having apparently arisen

amongst the London ornithologists as to the fact of this Owl being shot in Ireland, and as I wished to dispose of my native birds by sale, it struck me that Mr. Ussher, being practically the discoverer of this bird, was the person entitled to it," &c.

Accordingly Dr. Burkitt most kindly sent me the bird, and I presented it to the Science and Art Museum, Dublin.

When presenting this Owl to me in Sept. 1882, Dr. Burkitt wrote:—"Happening unfortunately at the time it came into my possession to be very fully occupied, I took but scant notice of this bird, merely inserting the locality of capture, the donor (now several years dead), skinning, preserving, mounting, and placing it amongst my Irish birds as you discovered it. This bird when presented to me, Jan. 27th, 1851, was apparently some days dead, and struck me at the time as having been a good deal handled (by its numerous examiners after Mr. Dobbyn had shot it), but was brought to me in the flesh. Mr. Dobbyn stated it had been shot in Belle Lake plantations. No doubt this bird may very possibly have been an escape from one of the numerous vessels passing up the Suir to Waterford."

On Dec. 8th, 1882, Dr. Burkitt, again writing to me about the Owl, in reply to my further enquiries, said:—"I am positive poor Mr. Dobbyn never intended to play me any practical joke or trick of any kind, and firmly believe that he shot the bird himself. The idea or suggestion that the bird was 'obtained through a dealer'! is, to say the least of it, to my mind perfectly ridiculous and far-fetched, when it came to me *in the flesh!* and requires no further comment. . . . I still adhere to the idea that it may have been an escaped bird. . . . I can not imagine the bird died in confinement, for its claws, legs and whole plumage, though much tossed, had not any appearance of a caged bird."

Dr. Burkitt failed to sell his collection in its entirety, and afterwards presented to the Science and Art Museum, Dublin, his Baillon's Crake, and on my visiting him at Belmullet he gave me an undetermined Warbler taken there marked "Whitethroat?" which proved to be the Barred Warbler, and is now in the same museum; and he gave the bulk of his collection in Waterford to his brother Archdeacon Burkitt. Thus the history of his collecting during sixty years was marked by many acts of disinterested generosity. To my knowledge he never sold a single bird. Persons who approached him with offers to buy this and

that specimen excited his intense displeasure. It is not a matter of indifference to Ornithology to state these personal facts, for his collecting-book and specimens illustrate the avifauna of the South-east of Ireland, affected as it is by the Pembroke and Wexford migration route, and the leading estuaries of Waterford Harbour and Tramore Bay. For instances of Owls accompanying a vessel for four hundred miles and alighting on the rigging, see Thompson, 'Birds of Ireland,' vol. i. p. 104.

THE EVOLUTION OF BIRD-SONG.

BY W. WARDE FOWLER, M.A.

IN the last number of 'The Zoologist' Mr. Witchell complains that I misrepresented him in my 'Summer Studies of Birds and Books,' published last year, while he was absent from England. I have now re-perused his original paper very carefully, and also the Supplement to it, of which he has been good enough to send me a separate copy, and I am glad to take this opportunity of freely acknowledging that he has good grounds for complaint in at least two particulars.

(1). I find that, as Mr. Witchell states, the Thrush is not one of those birds whose *song* is attributed by him to a humble origin, *e. g.* (as I stated his view), the cracking of a snail-shell. He does not seem to explain the song of the bird otherwise than as a series of imitations of other birds: it is only the "occasional clicking sound" which he compares to the breaking of the shell, and he does not in this instance deduce the song from a habit of repetition of sounds of this kind, as he does in some other cases. I much regret this misapprehension, and will see that it is corrected in any future edition of my book. It arose, I imagine, from the general tendency of Mr. Witchell's argument, which is stated by him as applicable to song in general, without mention of exceptions, in his concluding paragraph (Zool. 1890, p. 246).

(2). When I suggested that it would be interesting to study the songs of some group of birds, with a view to the discovery of an archetypal character common to all its members, I was not aware that Mr. Witchell had added a short supplement to his paper, in which he had written that "the similar cries of certain nearly-allied species seem generic," &c., and had illustrated this

point by several examples. By some accident I had missed this supplement; and some expressions of mine (pp. 156, 157), which seem to upbraid Mr. Witchell for not doing what he had actually done, are unfair to him, and shall certainly be expunged on the first opportunity. I need hardly say that it never occurred to me that I was making an original observation and claiming precedence for it; for the idea was one that must have occurred to many who are familiar with the songs of birds, though it has never, so far as I know, been worked out scientifically.

On the other points of which he complains I hardly think I have seriously misrepresented Mr. Witchell, unless to criticise be necessarily also to misrepresent. For example, when I wrote that in his view the Cornerake "took a fancy to imitate the noise made by a cow in browsing," I think I was justified; for the whole tendency of his remarks (Zool. 1890, p. 239) suggests not merely similarity but imitation, and they conclude with the words, "Many birds *reproduce* less persistent sounds, which will be subsequently mentioned." This certainly implies that the examples just given are examples of *reproduction* of such sounds by birds, and not merely casual resemblances which Mr. Witchell is noting down for what they may be worth. But perhaps this is one of those "surmises of a more or less valueless character," to which Mr. Witchell alludes on p. 134 of the last number. If so, I think he will allow that it is a little difficult for a critic to separate these from others to which he attributes more weight.

But I am unwilling to enter into a controversy with Mr. Witchell on points like these at present, for I understand that he is about to publish a work in which the whole subject will be dealt with afresh; and I have also had a friendly correspondence with him, the pleasant impression of which might possibly be obliterated if we were to take up arms in public. My only object in this note is to do him all the justice in my power by stating how far, in my opinion, I misrepresented his statements, and to express my regret. In other particulars I am sure he will allow that he laid himself open to criticism; and except in the points to which I have alluded, I do not think he has any real cause to resent it.

ON A NEW BRITISH PETREL.

By BOYD ALEXANDER.

AN example of *Oceanodroma cryptoleucura*, which proved on dissection to be a female, was picked up on the beach close to Littlestone, a small village six miles north of Dungeness, on December 5th last, at a time when strong north-westerly gales were prevalent. It was taken the next day to Mr. Bristow, the taxidermist, at St. Leonards, and there I saw it in the flesh. It was in poor condition, and clearly in appearance a storm-beaten victim.

This specimen was subsequently exhibited by Mr. Howard Saunders at a meeting of the British Ornithologists' Club, on April 15th, and the fact that it was found on the English coast will be of interest to ornithologists, not only because it adds a fresh species to the British *Procellariidæ*, but also on account of the recent discovery by Mr. Ogilvie Grant of the breeding of this species in the Canary seas, where it had been previously confounded with Leach's Fork-tailed Petrel (see 'The Zoologist,' 1895, p. 413). It may be well to give here a *resumé* of the range of *O. cryptoleucura*:—It is found in the South Atlantic, and inhabits the Sandwich Islands and St. Helena, while the most northern breeding point at present known is the Salvage Group. In the above places, therefore, it appears to be the representative form of Leach's Petrel (*O. leucorroha*). Although the latter species has occurred as far south as the Canaries, it can only be regarded in the same light as when found off the English coasts and off some of those of Eastern Europe—a mere straggler, though not an uncommon one.

On the other hand, when the lately increased straggling distribution of *O. leucorroha* is considered, it seems not unlikely that *O. cryptoleucura* will before long be met with quite as often as its close relative; in fact, it is not out of the question to suppose that cases may have occurred prior to the one here mentioned, but where proper identification has not been exercised.

The knowledge of ornithology possessed by a local taxidermist does not, as a rule, extend much beyond the pale of those species which have passed at different times through his hands, while some which require a close examination to be identified (and

often are not carefully examined) may be seen so seldom by him that the distinctive characters of each are not kept clear in his mind. Hence it is evident how a mistake may be made. No fault of his, since in a bird-productive district he is a busy man, and has little time to acquire more than a superficial knowledge of the subject.

O. cryptoleucura is slightly smaller in size than Leach's Petrel, and possesses three distinct characteristics. I cannot do better than quote the descriptions of these species as given by Mr. Ogilvie Grant in his interesting paper on the birds of the Salvage Islands:—" *O. cryptoleucura* has the tail nearly square, the outer feathers being only slightly longer than the middle pair, the basal part of the outer feathers is white, and the upper tail-coverts are white, tipped with black. *O. leucorrhoea* has the tail deeply forked, the outer feathers being longer than the middle pair and dark to the base, while the upper tail-coverts are uniform white, not tipped with black."

ORNITHOLOGICAL NOTES FROM NORFOLK FOR 1895.

BY J. H. GURNEY, F.Z.S.

My register of Norfolk birds for the year 1895 contains entries concerning three rarities—the Broad-billed Sandpipers, the Black-winged Stilt, and Sabine's Gull, but is chiefly remarkable by the extraordinary number noticed of castaway Little Auks, which were still more plentiful further north. In fact, we in Norfolk only saw the tail end of the invaders. It is singular that up to 1862 Mr. Stevenson had booked not a single occurrence of this erratic little sea-bird in January (the month of this great invasion), and in 1890 Mr. Southwell, to whom I am as usual indebted for much assistance, could only mention one. The autumn of 1895 was certainly rather remarkable for the number of Skuas of different species which occurred from Salthouse westwards, and ten Fulmar Petrels is an unusual number to have been noted in twelve months. A corresponding abundance of Skuas was noted by Mr. Cordeaux in the Humber district.

JANUARY, 1895.

Prevailing wind N., as registered by Mr. A. W. Preston.

1st. Snow and frost. Great Northern Diver on a stall at Yarmouth (A. Patterson), and two Little Auks, of which more hereafter.

5th. Glaucous Gull in Yarmouth market (A. Patterson), and about the same date two more taken on the beach there (W. Lowne).

7th. Four or five young Glaucous Gulls appeared at Blakeney, where they were immediately recognised, and in a few days three of them had found their way to Mr. Pashley's, with four Kittiwakes (rather uncommon in winter), and a male and female Goosander. At the same time hundreds of Golden Plover were seen between Salthouse and Wells, and were abundant enough to be bought of the gunners for fourpence apiece (E. Ramm). Green Plovers were also very numerous around Breydon Broad, and Mr. Patterson believes they were fattening on the dead worms which were lying in the marshes by myriads, having been killed by an extraordinary high tide. The marshes were black and white with Plovers, and the oldest inhabitant had never seen so many (A. Patterson).

13th. Thirty White-fronted Geese were seen on Holkam Marsh (A. Napier).

14th. A Corncrake, which had missed its migration, and a three-legged Snipe were taken to Mr. R. Clarke, of Snettisham, who noticed that the former had at some time had a damaged wing, which, however, had quite healed. The supplementary leg in the Snipe springs from the tarsal joint, I understand, as in the malformed Gull's leg figured in 'The Zoologist,' 1869, p. 1685; on this subject see article "Monstrosities" in 'The Dictionary of Birds,' p. 587. I have not seen the Snipe, which must be a singular deformity.

15th. Picked up two Fulmar Petrels on the shore, one of them fresh enough to skin, a Puffin, and some Razorbills. This Puffin, like two others in the flesh, had a highly-coloured beak, though small, having probably shed its sheath in August. A small flock of Tufted Ducks were on Salthouse Broad, long reclaimed, but again under water, and allowed us to get two of their number; and the same day, Mr. Ramm tells me, a Black

Guillemot was shot there, which we had not seen, but which some more fortunate gunner secured.

19th. Four Wood Larks, a bird generally driven by snow to the coast, were watched by Mr. Patterson on the same "denes" where six had been shot a month previously, possibly the remains of the same flock, and a few days afterwards I saw two more, which had been sent to Mr. J. Cole to be stuffed, from near Yarmouth; and Mr. E. Saunders also had a pair. Shore Larks were more numerous than usual this month, and throughout the winter in the two or three spots which they regularly frequent. The great abundance of Bramblings inland during the hard weather was remarked on by several correspondents. Eight dozen were caught by a bird-catcher on the Caistor Road (Patterson). In the Humber district of Lincolnshire a corresponding abundance of Bramblings, Shore Larks, Golden Plovers, and Glaucous Gulls was noted by Mr. Cordeaux about the same time,—a usual coincidence, but always interesting.

26th. Lesser Spotted Woodpecker at Colney (W. Andrew).

29th. A white Woodcock was shot at Fishley by Mr. Read. A feather forwarded shows faint markings, which extended all over the plumage.

30th. Two Waxwings near Lynn (F. Wilson). Another about the same time was sent to Norwich, indicating only a small migration this year.

The gales of January had an altogether unprecedented effect on one well-known Arctic species, the Little Auk, or Rotche, sprinkling these dapper little sea-birds broadcast over all that portion of the north of Norfolk which is nearest to the coast. So far as I can make out, the greatest number were picked up between the 10th and 27th of January. On the 21st, the poor half-starved little voyagers were to be seen in small flocks passing along the north coast of Norfolk, flying a few yards above the sea, near enough to the beach for Mr. E. Ramm, who was on the look-out, to estimate that one flock contained a hundred. The greatest number of Little Auks were undoubtedly picked up, or otherwise obtained, between Kings Lynn and Cley, where Mr. Ramm was stationed, and especially was this the case in the vicinity of Snettisham, Wells, and Blakeney. Most of the castaways at Blakeney, Cley, and Salthouse were taken to Mr. Pashley, the local taxidermist, but being ill at the time he only

stuffed thirty; while Mr. Dack, of Holt, mounted thirty-five. Mr. Clarke, of Snettisham, set up forty-one; and the three Norwich bird-stuffers eighty-four, sent in from various parts of the county. Besides these, other naturalists and amateurs stuffed eighty-three; two were sent to the Zoological Gardens by Colonel Feilden and Mr. Lestrangle; and some others, picked up at or near Holkam, were taken to the Earl of Leicester, and not preserved. I think I cannot be over the mark in estimating birds thrown away and skeletons found on the beach at twenty, which gives a total of 295. Very few of these Little Auks were in full winter plumage, and one from Cromer had the sides and lower part of the neck nearly black. From Yorkshire, Mr. W. J. Clarke, of Scarborough, wrote that he had conclusively proved a large preponderance of females by dissection; and all the earlier ones sent to Mr. Gunn, and dissected in his absence by his son, were females except one, and the later comers nearly all males. The same separation of the sexes was noticed by Mr. Roberts and by Mr. Robert Clarke.

FEBRUARY.

Prevailing wind N.E.

2nd. Five or six Glaucous Gulls were seen at Cley by Mr. T. Gunn, two of which were shot, with a Fulmar. About this time, Mr. Patterson reported Cuttlefish bones washed up along the beach for miles, and that one or two enterprising men gathered these chalky interiors in sacks to sell to our Canary-breeders, who hereabouts are rather a numerous fraternity. (See Zool. 1889, p. 15.)

9th. A Shag, *Phalacrocorax cristatus*, was shot at Snettisham (R. Clarke).

11th. A Yarmouth bird-catcher named Cubitt, taking advantage of the protracted frost, caught fifty-three starving Gulls in a clap-net, and brought them all alive to Mr. Patterson, viz. forty-one Black-headed Gulls, eleven Common Gulls, and one Lesser Black-backed Gull.

16th. A cat or a Tawny Owl killed and partly eat one of my pinioned Garganeys, and frightened one of the above-mentioned Gulls into the water, where it froze to death, and was found in the morning a veritable feathered iceberg!

20th. Slavonian Grebe and several Whooper Swans were seen or shot at Cley (H. N. Pashley).

22nd. Eared Grebe and Whooper at Cley (Pashley).

27th. Two Slavonian Grebes, Cormorant, and Purple Sandpiper at Cley.

28th. Received from a gunner at Cley two of the darkest-bellied Brent Geese I have ever seen, but with the white neck-patches widely separated in front as well as behind, showing that they could not be *Bernicla nigricans*. It is a mistake to suppose that the dark- and light-bellied races—if they be races—do not sometimes associate.

MARCH.

Prevailing wind S.W.

March 11th was the first real spring day, succeeding a total eclipse the night before. The great lake at Fritton, which had been frozen for many weeks, thawed rapidly, and immediately the appearance of a number of Great Crested Grebes was reported.

Then came several days of beautiful spring weather, and Robins began to nest, which did not prepare us for what was to follow.

24th. A hurricane, the most destructive ever known to timber in Norfolk, though lasting only from 2.30 to 4 p.m.; but in that short time this county lost about a quarter of a million trees, mostly *Coniferæ*, the prostrate silver firs, their heads all pointing to the east, being counted by thousands on scores of estates. Many Pheasants were buried alive, and Rooks, already nesting, were whipped to the ground with a few Wood Pigeons, but I did not see them. A great many trees were upset at Scoulton, where the Gulls had already assembled, but fortunately none grow on the part of the "hearth" where they breed, now limited to about an acre. In 1871, Stevenson says, the Gulls' nests extended over nearly fifty acres, and that as many eggs were taken in a day as were gathered during the whole of the present season (about 2000); not that this diminution was due in any way to the hurricane, which will be long remembered as being the greatest we have had since 1860.

31st. A Grey-headed Wagtail was taken on a smack off Yarmouth (B. Dye).

APRIL.

Prevailing wind S.W.

1st. A Black Guillemot was killed near Cley (Pashley).

26th. Two Kentish Plovers were shot at Yarmouth (B. Dye).

MAY.

Prevailing wind E. and N.

5th. Twelve Spoonbills visited Breydon tidal Broad, where Chambers, the watcher employed by the Breydon Wild Birds' Protection Society, guarded them splendidly, and they all passed on unscathed. A single one was seen a few days later (Patterson). In the seventeenth century, Spoonbills nested a little higher up the river within only about three miles of Breydon, and it seems not too much to hope that with protection they might be induced to breed again.

8th. As further evidence of the good which has been done, Mr. Patterson saw and counted in one walk ninety-nine Bar-tailed Godwits, twenty-seven Wigeon, fourteen Turnstones, forty-two Black Terns, and eight Sandpipers. The Black Terns, which were resting all together on a mud-flat in company with Gulls, flew up in a very erratic manner, screaming noisily, and shortly afterwards mounted high in the air, flying N.N.E.: perhaps the Zuider Zee was their next halting-place, or Naarden Meer.

9th. Nine Black Terns were seen sitting on a rail overhanging a pond at Snettisham (R. Clarke).

15th. A Kestrel's nest was found in a wheat-stack at Horningtoft about a foot into the roof, underneath the eaves (Davey).

29th. Two Fulmar Petrels were picked up on the shore at Cley (Pashley), but they may have been dead some time, for I have known one to lie on the beach two months or more before the sea disintegrated its carcass; and the skeleton of one of the January Little Auks was reported as still sticking in a bush in August.

A Marsh Harrier and a Scaup Duck were noted this month at Swaffham (Gunn); and some Crossbills at Rollesby and Belton. Three of the last-named were caught in a Pheasant enclosure at Somerton (W. Lowne).

JUNE.

Prevailing wind N.E.

8th. Caught a Squirrel in the act of eating a young Starling, to the indignation of its parents and several other birds. Jays also kill a great many nestlings.

19th. A pair of Black Terns at Scoulton contemplating the

“hearth,” or Gull-island, than which a more suitable nesting-place could not be found, entertained us greatly while we “punted” round it.

A pure white Cuckoo, with pink eyes, nearly full-grown, was sent from near Stratton to Mr. Roberts, of Norwich, at the end of the month,—a real albino, and a beautiful bird. Young Hawfinches were reported from Stoke, Swardeston, Thorpe, Feltwell, and Colney, where there was a nest of four, and two were brought up by hand.

JULY.

Prevailing wind S.W.

5th. A Scoter was shot or picked up off Blakeney: I have seen a flock later than this.

17th. A pair of Sandwich Terns at Blakeney, one with a fish in its beak, flying as if it was going to feed a young one somewhere (Pinchin).

27th. Three Green Sandpipers appeared at Northrepps (R. H. G.), after heavy rain.

AUGUST.

Prevailing wind W.

1st. A Golden Oriole still in song was reported to be at Framingham Earl (S. Bligh).

2nd. Several Black Terns at Hickling (M. C. Bird).

3rd. Four Wood Sandpipers were brought into Yarmouth (W. Lowne), shot somewhere in the neighbourhood.

7th. A number of adult Arctic Terns and two flocks of Black Terns were seen at Cley (E. Ramm).

13th. Two Broad-billed Sandpipers on the Blakeney “beach-way” were seen by three or four observers, and one was shot. This was taken to Mr. H. N. Pashley, who mounted the bird for the Caistor (private) Museum. This is the first time it has occurred at Cley, but four or five have been taken at Breydon, where this species was first recognised as British in 1836. It is as rare in Heligoland (Gatke) as it is in England.

14th. A Manx Shearwater, not quite adult, was killed at Cley (E. Connop), and another about the same time at Wells. A Temminck’s Stint was shot by Pinchin; and three young Montagu’s Harriers, in richest bay plumage, doubtless bred on Kelling Heath, were sent to Mr. Pashley, who found young

chickens about ten days old in all of them. A day or two afterwards Mr. Pashley and Mr. Dack each received another, which completed the slaughter of the family party! perhaps necessary, though it is impossible not to regret it from a naturalist's point of view.

16th. A Dotterel was shot at Yarmouth (E. C. Saunders).

20th. A young Buffon's Skua, with a dark breast and a very small beak, was shot in Blakeney Harbour by Mr. Robert Gurney.

23rd. A Shearwater, several Black Terns, five Richardson's Skuas, one Buffon's Skua, and three Sandwich Terns, were seen or shot at Cley (R. Gurney); and about this time some Green Sandpipers.

31st. Some Green Sandpipers at Fritton (N. Buxton).

SEPTEMBER.

Prevailing wind S.E.

4th. Counted sixteen Great Crested Grebes from Mr. Buxton's boat-staithe on Fritton Lake, but as we could not see half the lake, it is safe to estimate that there were at least thirty-five. On rowing to the end several more appeared, two-thirds of them young ones, and one or two being little more than half-grown were yet able to keep up with their parents. I did not see more than two young in general, which looks as if the marauding Pike had had his share, and in some cases there was only one; they are strictly protected from gunners.

6th. Two Buffon's and two Richardson's (Arctic) Skuas, all young birds, paid the usual penalty at Cley (Pashley); and the same day a very good immature Buffon's Skua, now in Mr. Robert Gurney's collection, was shot at Rockland.

7th. A Spoonbill at Burgh Castle (W. Sharman).

10th. Some Pied Flycatchers were seen on the coast by Mr. Gunn.

12th. Some Skuas were seen near Cley by Mr. Gunn. A Manx Shearwater was shot at Hunstanton (C. Whitty), and another off Cley.

13th. A flock of about sixteen Sandwich Terns was seen at Cley by Mr. T. E. Gunn; and a young Buffon's Skua killed.

15th. First Pink-footed Geese appeared at Holkam (Lord Leicester).

- 19th. Storm Petrel was seen at Blakeney Bar (F. D. Power).
 21st. Three young Richardson's Skuas at Cley (Pashley).
 22nd. A Rough-legged Buzzard at Castle Rising (R. Clarke).
 24th. A Peregrine Falcon at Holkam (Lord Leicester).
 25th. About four hundred Mallard, forty Teal, four Wigeon, forty Coots, and fifty Canada Geese, were counted on the lake at Holkam. A Solitary Snipe at Burgh (E. C. Saunders); and a number of Pied Flycatchers at Cley (F. D. Power). About this date seven hundred and seventy-four Partridges were killed at Feltwell by three guns, one of the biggest scores ever made in one day in this county, but it was a very good season. Tame Pheasants also did very well; but as an instance of the dangers run by such birds, I may relate that two stray dogs killed forty-two and twenty-two fowls in two nights, supposed at first to be the work of a fox, but the dogs came again, and paid the penalty of the law.

OCTOBER.

- Prevailing wind W.
 2nd. A Woodcock was shot at Threxton (J. Tingey).
 4th. A Pomatorhine Skua was shot at Cley (A. Sapsworth).
 5th and 6th. A Spoonbill was seen at Morston by Mr. Sapsworth; also a Pied Flycatcher, Buffon's Skua, Velvet Scoter, and a large number of Gannets in the same neighbourhood.
 8th. Two Stilts were seen on Wolferton Marsh by Mr. Charles Plowright and T. Petch.
 12th. A Black-winged Stilt, a young female with some black feathers coming on the upper wing-coverts, the only indication of any change, was shot on Castleacre Common (T. M. Hudson, Zool. 1895, p. 434). This species has not turned up in Norfolk, except in one unconfirmed anonymous instance ('St. James' Gazette,' Jan., 1889), since 1875, when, as in the present case, a pair appeared. A young Norfolk Plover, about two-thirds grown, was shot on the east bank at Salthouse (Pashley).
 16th. A Rough-legged Buzzard near Cley (Pashley).
 17th. Buffon's Skua, an immature male, was shot at Yarmouth (E. C. Saunders); and a Guillemot was picked up at Dunton, inland (E. Dowell).
 18th. Enormous migration of *Corvidæ*, Hooded Crows principally, and many Jackdaws at Cley (Dr. George Power).
 19th. A Norfolk Plover near Cley (Pashley).

21st. Two Long-tailed Ducks at Cley; and a Peregrine.

22nd. A Fulmar, a Storm Petrel, and a Sabine's Gull at Wells (Colonel Feilden); the wind at the time was blowing strong from the north-east. This is the fifth Sabine's Gull recorded for Norfolk; all immature, and all taken in October. Although it came in with the gale, it was probably moving against the wind on the 21st, which was then variable in the morning, and light from the westward in the evening (Meteorological Office Returns). At the same time another Fulmar, two Grey Phalaropes, two Pomatorhine Skuas, and a Ringed Guillemot, were taken between Wells and Salthouse, and were received by Mr. Pashley for preservation; and Dr. Power shot a Glaucous Gull.

24th. A young Long-tailed Duck was picked up on the shore at Overstrand.

26th. A number of dead *Corvidæ* were noticed; and a Fulmar was washed up on the shore (Dr. George Power). About this time Mr. Ramm found some birds washed up, including a Shore Lark, two Chaffinches, and some Rooks.

NOVEMBER.

Prevailing wind S.W.

1st. A female Great Skua was shot on the beach at Snettisham (R. Clarke).

2nd. Two Fulmars were picked up on Holme beach by Mr. Plowright, making the unusual total of nine for twelve months. About this time several Wood Pigeons appeared which had shed their flight feathers and not replaced them, and in some cases to such an extent was the wing divested of its quills that the birds could not fly at all. The same inability of locomotion was noticed in several other parts of England ('Field,' pp. 833, 902, 946).

24th. Seven Swans flew over Norwich, very high, going south-east against the wind (Dr. Wheeler).

DECEMBER.

Prevailing wind W.

8th. A Black Redstart was seen at the foot of a mud-cliff at the mouth of the Ouse (C. Plowright).

13th. A young Long-tailed Duck was shot at Barton (Gunn).

14th. A yellow or dun-coloured Starling at Hingham (E. Roberts).

16th. A Long-tailed Duck was shot at Cley, and two Mergansers (Pashley); and a few days later three more Mergansers. A Pink-footed Goose with yellow legs was taken to Mr. Pashley while fresh. Mr. Saunders says the Bean and Pink-footed Geese have been known to hybridize in confinement, and doubtless they sometimes cross in a wild state. M. Suchetet mentions several hybrid Geese ('Oiseaux Hybrides,' p. 738).

23rd. A cinnamon-coloured Yellowhammer at Yarmouth (Patterson).

24th. A Little Gull was caught alive during a gale at Lowestoft (H. Bunn).

26th. A Black-throated Diver was shot at Cley (Pashley).

28th. A Waxwing at Filby (Lowne).

ON WILD FORMS OR SUB-SPECIES OF *MUS MUSCULUS*.

By G. E. H. BARRETT-HAMILTON.

I WAS much interested in reading the remarks of Mr. Oldfield Thomas (pp. 137-139), "On a Wild Living Mouse of the *Mus musculus* group in Portugal," as last spring, while in Morocco, I met with a white-bellied form of *Mus musculus*, which occurred both about Tangier and also at Scharff-el-Akab, three or four hours' journey southwards. I have four specimens of this mouse, all males, in my collection, and their dimensions are as follows:—

Length of head and body	.	.	83	80	81	80	mm.
„ tail	.	.	57	59	53	56	„
„ hind foot	.	.	17	17	16	16	„

After carefully reading M. Fernand Lataste's description of his *Mus spretus*,* I am of opinion that my mice belong to this species, although the line of demarcation between the colours of the upper and under sides is more distinct in mine than it was in his specimen, and although I cannot find that "sa première molaire supérieure présente un talon supplémentaire antérieur." Since, however, Lataste based his species on a single specimen (a female containing $4 + 5 = 9$ young, and with the mammæ as in *Mus musculus*), from "l'Oued Magra, entre M'sila et Barika, au nord du

* "Note sur les Souris d'Algérie et description d'une espèce nouvelle (*Mus spretus*)." Actes Soc. Linn. Bordeaux, tom. xxxvii. (1883).

chott du Hodna, Hauts-Plateaux Algériens," I think it very possible that these slight differences in colour are merely due to individual peculiarities, and that the extra "talon" of the first upper molar of M. Lataste's specimen will not be found in other examples. At all events I prefer to identify my specimens with his *Mus spretus* than to make a new species or subspecies of them, and I think my views gain support from an examination of a considerable number of specimens of *Mus musculus*-like animals from various localities now in the British Museum collection. These specimens are very puzzling, for the extreme forms, though at first sight very distinct, intergrade in a wonderful manner. They, however, seem to bear out Mr. Thomas's suggestion that we have in many parts of Europe, as well as in N. Africa, Arabia, and Asia, two forms of the *Mus musculus* group which differ from each other in coloration, one of which is to be found in houses, and the other in the fields and open country. Whether there exist more than one of these wild forms is as yet a doubtful question, but the following forms have received names, and perhaps it would be well to retain them as subspecies of *Mus musculus*, for the present at least. Possibly in the future one or more of them may have to be suppressed, but more specimens are needed before the matter can be thoroughly worked out.

(I.) *Mus musculus bactrianus*,* Blyth, 1846.—This mouse has a wide distribution in Africa and Asia, and appears to be the common house mouse of Southern Persia and the neighbouring regions.† It has the upper parts fallow-red and the under parts yellow or white. M. Lataste has shown that it cannot be distinguished from *Mus musculus* proper, except in colour, and it resembles very closely *Mus musculus flavescens*.

(II.) *Mus musculus flavescens*,‡ Fischer, 1872, which has a

* J. A. S. B. xv. 1846, p. 140; and xxxii. p. 347. Blyth also ultimately united with this species his *E. gerbillinus*, from the Punjab (*vide* J. A. S. B. xxii. p. 410), and *M. theobaldi*, from Kashmir (*vide* J. A. S. B. xxii. p. 583.)

† *Vide* Blanford's 'Zoology of Eastern Persia,' vol. ii. pp. 56, 57, where this mouse is figured.

‡ Fischer, "Das Verfärben einer Hausmaus, *Mus musculus*, var. *flavescens*" (*Zool. Gart.* xiii. 1872, pp. 223-224). Fischer's specimen was from Berlin, but he was evidently unaware that the name *flavescens* had been previously bestowed by Elliot (*Madr. Journ. Lit. Sci.* x. p. 214, 1839) on a variety of *Mus alexandrinus*, or *rattus*, and by Waterhouse (*P. Z. S.* 1837, p. 19) on a mouse from Chili. A similar form, or variety, is evidently alluded

reddish brown upper and a light yellow under side. According to Lataste it occurs in Mid-France, Spain, Italy, and the Mediterranean Isles; but there are specimens in the British Museum from Western Hungary that I can only refer to this form, while others from the same lot resemble very closely my Tangier specimens. Examples of this most probably intergrade with those of the preceding form.

(III.) *Mus musculus spretus*, Lataste (*op. cit.* 1883), to which form probably belong my Tangier specimens, as well as Messrs. Grant and Baring's mice from the Salvage Isles (Zool. 1895, p. 409). Unless the extra "talon" of the first upper molar can be shown to be constant, I should be inclined to allow *Mus spretus* only subspecific rank, since it certainly appears to intergrade with Hungarian specimens in the British Museum. Messrs. Grant and Baring's specimens vary somewhat in the distinctness of the line of demarcation between the upper and under sides, and some of them in this respect come very close to Lataste's description. A very large specimen sent to the British Museum from Corsica by Col. J. W. Yerbury resembles these; while one from Malta, presented by Lord Lilford, is more like what I imagine the typical *flavescens* to be.

The following are the dimensions of some of Messrs. Grant and Baring's specimens:—

	♂	♂	♀	♂	♀	♀	♀	
Head and body	78	85	83	87	80	90	85	mm.
Tail	74	87	85	84	86	89	89	„
Hind-foot	17	18.5	17.5	18	18	18.5	17	„

The specimens differ from my Tangier mice and also from M. Lataste's description of *Mus spretus* in the larger size of the tail. There are also very interesting forms or varieties in the British Museum collection from Asia Minor, Quang-tung, and even from

to by the description: "Mus cauda longa mediuscula, corpore cinereo-fusco, abdomine subalbescente" (Linn. Mus. Ad. Frid. i. p. 9), and "Mus domesticus minor, cauda longa subnuda, corpore fusco-cinerascente, abdomine albicante" (Brown, Jour. p. 484); also by De Selys-Longchamps, in his 'Faune Belge' (1842), p. 32, as the var. *d. rousâtre*. What the true name of this form or subspecies may be I am not prepared to state here; but it seems that Fischer's name will not stand. Possibly the proper name would be *Mus musculus brevirostris* of Waterhouse, who described *Mus brevirostris* (Proc. Zool. Soc. 1837, p. 19), and afterwards stated that it was a variety of *Mus musculus* ('Voyage of the Beagle,' p. 38).

America, whose presence only serves to complicate the whole matter.

The above are the names which have at various times been given to the more distinct races or subspecies of *Mus musculus*. But although the extreme forms are quite distinct in each case, they are so connected with each other by a series of gradations, that I very much doubt if they can stand as species, especially if Lataste's dental distinction for his *Mus spretus* turn out to be, as I suspect, a merely individual peculiarity. Hence I have here given them merely subspecific rank, a course which, I think, gets rid of the difficulty.

Of other species which have been described by various authors, *Mus algirus*, Pomel,* 1856, has been identified by M. Lataste with *Mus sylvaticus*, Linnæus; *Mus algirus*,† Loche (non Pomel), 1867, with *Mus musculus bactrianus*, Blyth (or some very similar variety); *Mus chamæropsis*,‡ Levailant, with *Gerbillus campestris*, and *Mus reboudi*,§ Loche, with *Mus musculus bactrianus*.

Mus poschiavinus,|| Fatio, 1869, is a black form of *M. musculus*, which was found commonly in a tobacco manufactory at Poschiavo, in the Canton Grisons, where it fed on tobacco. There remain four very doubtful species, viz. *Mus gilvus*,¶ *M. trizonus*, *M. spicilegus*, and *M. arundinaceus*, which were described by C. Chyzer in 1882, from MSS. left at his death by Dr. Petenyi. The work being in Hungarian is almost a closed book to me, but so far as I can make out from the Latin "notæ specificæ" and the dimensions of the specimens as given by the author, it is possible that the first two will be found to be synonyms of *Mus sylvaticus*, while *M. spicilegus* is probably a form of *M. musculus* possibly identical with *M. musculus flavescens*, and *M. arundinaceus* seems to have been described from a large example of *M. minutus*.

* Compt. Rend. Acad. Sci. 1856, p. 654.

† Cat. Mamm. et Ois. observés en Algérie, p. 25, et Expl. Sci. de l'Algérie, p. 115, 1867.

‡ Explor. Sci. de l'Algérie, 1867, pl. 5, fig. 1.

§ Expl. Sci. de Algérie, Mamm., p. 116.

|| Faune Suisse p. 207, pl. 7.

¶ 'Reliquiæ Petenyianæ: Termes-Fuzetek, N. (1881), p. 91, 1882.

THE PROTECTION OF BEAVERS ON THE RHÔNE.

BY M. GALIEN MINGAUD.*

AMONGST the wild animals which inhabit France at the present day, there are few more interesting than the Beaver. This rodent, harassed as it is on all sides by man, who makes war against it without remorse, is on the point of disappearing from the French fauna, and will soon be no more than a memory of the past, unless some energetic measures are speedily taken to avert its extinction.

For many years a price was set upon its head by the Syndicate of the *digues* of the Rhône at Beaucaire-on-Sea by the Little Rhône. This reward, however, amounting to fifteen francs, has been abolished at the pressing instigation of Professor Valery Mayet. This is the first step to success, but it is not sufficient.

It was supposed that the *digues* constructed on the banks of the Rhône in Camargue, to protect the new plantations of the vine and to prevent their submersion, were perforated by the Beavers in the formation of their burrows, and that their solidity in time of flood was thereby impaired.

As a matter of fact, these *digues*, protected at their base by rocks, are not easily assailed by Beavers. They form their burrows not in the banks, but elsewhere, often far away from water, and frequently on the banks of the Rhône, in the *ségonneaux*, that is to say, on the low grounds, marshy and uncultivated, which protect the *digues* from the tide, and where willows and poplars grow spontaneously.

The Beaver is especially located in the part of the Petit Rhône comprised between Fourgues and Sylvéreal (Isle of Camargue). There are some, also, in the Rhône between Avignon and the Port-Saint-Louis-du-Rhône; and they are to be found also in a tributary of that river, the Gardon. The Beaver ascends this river as far as Pont-du-Gard, which is about eight kilometres from its outlet in the Rhône near Comps.

During the year 1895 I noted, in the case of the Gardon, seven captures of this rodent, four of which passed through my own hands. As to the delta of the Rhône, I have not been able to get any precise information. Since the beginning of the year,

* Translated from the 'Revue Scientifique,' 4th April, 1896, p. 443.

to my knowledge, three adult Beavers were killed: one in the Rhône, near Avignon, on January 20th; another in the Gardon, at Montfrin, on February 10th; and the last at the same place on March 22nd.

In common with other naturalists, I would raise my feeble voice on behalf of the French Beavers, and implore the authorities to take energetic measures in order to retard as much as possible the extinction of this animal.

I take the liberty of pointing out some of the steps which our able ministers should be requested to take with one accord in order to protect the lives of the last Beavers of the Camargue, or at least to retard their destruction. Their friendly aid would greatly benefit in so interesting a cause:—

(1) The Ministers of the Interior should be asked to add a special clause to the game laws applicable only to the departments of the Gard and the mouths of the Rhône where the Beavers are located, and prohibit for some years the killing of these animals. They have always been hunted out of season, and the authorities have shut their eyes to it, under the impression (according to the report of those who kill them for profit) that they are very destructive animals.

(2) The Minister of Public Instruction should be asked to protect a unique species of mammal and one of the most interesting in our fauna, to be preserved by administrative measures, in the same way as we preserve our megalithic and historic monuments.

(3) The Minister of Public Works, from this special point of view, should have a watch set on the banks of the Gardon and of the Rhône by ordinary river keepers. In this way one might form a cantonment of these curious animals, and at the same time ensure their not committing any serious depredations outside the valueless land which, so to say, would be given up to them.

I am not unmindful of the many difficulties to be overcome in enlisting scientific interest to bring about the increase of the last French Beavers, and in dispelling the preconceived notion of such riparian owners as imagine that they have reason to complain of their depredations. I would appeal also to all naturalists and to all scientific societies to induce the authorities to interest themselves in this matter.

At the beginning of the present century Beavers were not

rare in certain rivers of Central Europe. At the present day they are only found in Russia, in Germany, and in Austria, and there, far from proscribing these animals, the respective Governments have passed stringent laws in their favour. Those who destroy them are heavily fined. These industrious rodents of inoffensive habits are not considered destructive on the banks of the Dnieper, and its tributary the Pripet, the Volga, the Petchora, the Vistula, the Oder, the Elbe and its tributary the Mulde, and the Danube.*

French Beavers are now so scarce that it seems to me very desirable to prepare a map of the region of the Lower Rhône, indicating the places which they inhabit on the Gardon and in Camargue, before the end of the present century, in order to have a record as complete as possible of those which still exist, and to localize their haunts. This would form a fitting supplement to the memoir by Professor Valéry Mayet on "The Beaver of the Rhône" ('Compte Rendu des Séances du Congrès International de Zoologie,' Paris, 1889, p. 58), and to some notes which I published on the same subject in the 'Bulletin de la Société d'Étude des Sciences Naturelles de Nîmes' (1889, p. xxiv; 1894, p. 42 et p. 130; 1895, p. xxxiv, lxix et 100).

ORDERS MADE BY THE HOME SECRETARY FOR THE PROTECTION OF BIRDS AND THEIR EGGS.

SINCE the passing of the Wild Birds Protection Amendment Act of 1894, a great many applications have been made by County Councils to the Home Secretary, and the Secretary of State for Scotland, for orders prohibiting the killing of birds or taking of eggs either within the county or within certain specified areas.

The result is that between thirty and forty orders are now in force in different parts of the country, differing in various ways as regards close time and species protected, and causing (as we foretold it would do) no end of confusion and uncertainty as to the precise state of the law in any given locality.

So far as we can learn at present, the following orders are in force :—

* A more detailed account of the distribution of the Beaver in Europe will be found in 'The Zoologist,' 1886, pp. 273-280.

ABERDEENSHIRE.—The taking or destroying eggs of the following birds is prohibited throughout the entire county of Aberdeen for a period of one year, from Sept. 1, 1895, *viz.*: peregrine, kestrel, merlin, long-eared owl, short-eared owl, barn owl, tawny owl, nightjar, goat-sucker, or fern owl; black-headed gull, herring gull, kittiwake, common gull, common plover, lark, crossbill. The taking of eggs of the lapwing is prohibited throughout the entire county of Aberdeen in the year 1896, after April 15 in the said year. The Wild Birds Protection Act, 1880, now applies within the county of Aberdeen to the following birds, as if they had been included in the schedule to that Act, *viz.*: peregrine, kestrel, merlin, and crossbill.

ANGLESEA.—All birds are protected from March 1 to Oct. 1, except curlew, diver, dunbird, eider duck, lapwing, mallard, peewit, plover, pochard, shoveller, snipe, teal, wigeon, wild duck, and woodcock (the close time for these being March 1 to July 31).

ARGYLLSHIRE.—The taking or destroying of the eggs of the following wild birds is prohibited in the islands of Islay, Colonsay, Coll, and Tiree, for a period of one year from Oct. 1, 1895, *viz.*: wild duck, teal, eider duck, merganser, snipe, dunlin, grebe, lapwing, tern (all kinds), Richardson's skua, pochard, tufted duck, and chough. And the Act of 1880 applies within the islands of Islay, Colonsay, Coll, and Tiree to the tufted duck, as if that species had originally been included in the schedule to that Act.

BEDFORDSHIRE.—By an order dated February 17, 1896, the time during which the taking or killing of wild birds is prohibited in this county has been varied so as to extend from March 1 to August 12, and as regards the kingfisher the time is further extended so as to be from February 1 to August 31.

BERWICKSHIRE.—By an order dated June, 1895, the taking or destroying the eggs of the following species of wild birds is prohibited throughout the entire county of Berwick for one year from July 1, *viz.*: dipper or water-ouzel, redstart, stonechat, lark, peregrine falcon, barn owl, long-eared owl, tawny owl, goldfinch, bullfinch, redpoll, siskin, wagtail, kingfisher, snipe, ringed plover, common tern, teal, great spotted woodpecker, cuckoo, dunlin, redbreast, heron, rock pipit, sandpiper, mistle thrush, wren, coal tit, blue tit, and long-tailed tit, and by the same order the following among the above wild birds are, in addition, to have the protection of the Wild Birds Protection Act of 1880, as if they had been included in the schedule to that Act, *viz.*: the dipper or water-ouzel, redstart, stonechat, peregrine falcon, bullfinch, redpoll, siskin, wagtail, redbreast, heron, rock pipit, mistle thrush, wren, coal tit, blue tit, and long-tailed tit.

CAMBRIDGESHIRE.—By an order dated Sept. 23, 1895, the taking or destroying of wild birds' eggs within that part of the

county of Cambridge known as Wicken Sedge Fen is prohibited for a period of three years from Sept. 7, 1895.

CHESHIRE.—By an order dated July 10, 1895, and in force throughout the whole county of Chester—I. The close time fixed by the Act of 1880 is extended so as to be from March 1 to Aug. 12 in each year. II. The Act of 1880 will now apply within the county of Chester to the kestrel and heron, as if those species were originally included in the schedule to that Act. III. The taking or destroying eggs of the owl, bittern, kingfisher, kestrel, heron, sheldrake, dunlin, black-headed gull, common tern, and oystercatcher is prohibited in the whole of the county of Chester. IV. The Act of 1880 will now apply within a portion of the hundred of Wirrall (area defined) to the following species: red-backed shrike, whinchat, spotted flycatcher, sedge warbler, blackcap, grasshopper warbler, wood warbler, garden warbler, mistle thrush, common bunting, reed bunting, goldfinch, wheatear, chiffchaff, golden-crested wren, yellow wagtail, pied wagtail, skylark, and titlark, as if they were included in the schedule to the Act of 1880. V. The taking or destroying of the eggs of all wild birds is prohibited within the above-named area.

CORNWALL.—By an order dated Dec. 12, 1894, the taking or destroying eggs of the Cornish chough is prohibited throughout the county of Cornwall, under a penalty not exceeding £1 per egg.

CUMBERLAND.—The taking or destroying eggs of the following birds is prohibited throughout the county of Cumberland, *viz.*: goldfinch, kingfisher, owls, woodpeckers, black-headed gull, raven, wild ducks, terns, redshank, common buzzard, dotterel, dipper, kestrel, pied flycatcher, peregrine, and merlin.

DEVONSHIRE.—By an order dated Nov. 27, 1895—I. The taking or destroying eggs of any wild bird is prohibited for the period of 1896 to 1900, both years inclusive, within the following area: (1) Lundy Island and the neighbouring islets. (2) Baggy Point district (area specified). (3) Lynton district, parishes of Lynton and Countisbury. (4) Slapton Ley and Start district. II. The taking of eggs of the following birds is prohibited throughout the entire county of Devon, *viz.*: Ring ouzel, wheatear, whinchat, redstart, nightingale, blackcap, garden warbler, Dartford warbler, fire-crest, wood warbler, reed warbler, grasshopper warbler, dipper, nuthatch, white wagtail, golden oriole, pied flycatcher, goldfinch, hawfinch, crossbill, corn bunting, ciril bunting, reed bunting, rose-coloured pastor, chough, raven, woodlark, nightjar, great spotted woodpecker, lesser spotted woodpecker, green woodpecker, kingfisher, hoopoe, barn owl, long-eared owl, tawny owl, marsh harrier, hen harrier, Montagu's harrier, buzzard, kite, honey buzzard, peregrine falcon, hobby, merlin, kestrel, osprey, gannet, little bittern, night heron, bittern,

rockdove, quail, oystercatcher, woodcock, snipe, dunlin, green sandpiper, lesser black-backed gull, greater black-backed gull, razorbill, and common guillemot. III. The Wild Birds Protection Act, 1880, will now apply within the county of Devon to the bearded titmouse, nuthatch, Richard's pipit, water pipit, mealy redpoll, lesser redpoll, snow bunting, nutcracker, buzzard, honey buzzard, hobby, merlin, kestrel, and osprey, as if these species were included in the schedule to that Act. Cormorants and shags are exempted within the limits of the river Exe.

DUMFRIESSHIRE.—By an order made in May, 1895, the taking or destroying eggs of the following birds is prohibited throughout the entire county of Dumfries for a period of one year from the first day of June, 1895, *viz.*: Buzzard, goldfinch, great crested grebe, common gull, black-headed gull, kingfisher, kestrel, barn owl, tawny owl, long-eared owl, short-eared owl, oystercatcher, ringed plover, pochard, sheld-duck, shoveller, great spotted woodpecker, crossbill, dipper, siskin, skylark, tufted duck, osprey, nightjar, chough, quail. The Wild Birds Protection Act, 1880, within the county of Dumfries will now apply to the following birds as if they had been included in the Schedule to that Act, *viz.*: Buzzard, kestrel, crossbill, dipper, siskin, tufted duck, osprey, and quail.

DURHAM.—The close time has been varied so as to extend from March 1 to Aug. 31.

ESSEX.—The close time has been varied so as to extend from March 15 to Aug. 1 for curlew, dunbird, godwit, oxbird, snipe, wigeon, wild goose, and woodcock, but is unchanged for other birds.

GLAMORGANSHIRE.—By an order dated March 12, 1895, the taking or destroying of the eggs of the kingfisher and goldfinch is prohibited in any part of the county of Glamorgan.

HAMPSHIRE (see SOUTHAMPTON).

HERTFORDSHIRE.—The close time has been varied so as to extend from Feb. 1 to Aug. 31.

HUNTINGDONSHIRE.—By an order dated June 25, 1895: I. The Wild Birds Protection Act of 1880 will now apply to the linnet, nuthatch, and swallow, as if those species were included in the schedule to that Act. II. The taking or destroying eggs of the kingfisher, nightingale, nuthatch, owl, wild duck, and woodpecker is prohibited within the whole of the county. The close time has been varied so as to extend from March 15 to Aug. 31, and applies to the Isle of Ely.

KENT.—By an order dated March 11, 1896, the taking or destroying of wild birds' eggs is prohibited within the following areas in the county of Kent for the space of two years from March 20, 1896:—(1) So much of the Isle of Sheppey (including therein Elmley Island) as lies south of the road running from

Queenborough through Eastchurch to Warden Point. (2) So much of the Sittingbourne and Sheerness railway as lies between Kingsferry and the Sittingbourne railway station, and bounded on the south by the London, Chatham, and Dover Railway, from Sittingbourne railway station to Whitstable railway station, and bounded on the east by the main road from Whitstable station to the sea, and bounded on the north by the Swale and Whitstable Bay. (3) The west by the Minster and Deal Branch of the South-Eastern Railway from Minster railway station to Deal railway station, and bounded on the south by the road from Deal railway station to Deal pier, on the east by the sea, and on the north by the South-Eastern Railway from Minster station to Ramsgate station. (4) East and south of the main road from Walmer through Dover to Folkestone from the point where such road passes through the southern boundary of the Walmer urban district to the point where such road enters the borough of Folkestone, such area being bounded on the east and south by the sea, on the north by the Walmer urban district, and on the south by the borough of Folkestone. (5) South and west of the main road which runs from Appledore railway station through Snargate, Brenzett, and Old Romney to New Romney station, and thence to Littlestone-on-Sea; such area being bounded on the north-west by the Royal Military Canal from Appledore railway station to the Sussex boundary, on the south-west by the Sussex boundary, and on the south and east by the sea. II. The taking of eggs of the following birds is prohibited within so much of the county of Kent as is not within the Metropolitan Police District: Bearded tit, buzzard, goldfinch, golden oriole, great plover or thickknee, hawfinch, hobby, honey buzzard, Kentish plover, kestrel, kingfisher, martin, merlin, nightingale, osprey, owl (all species), peregrine falcon, swallow, swift, turtle-dove, wryneck. III. The Wild Birds Protection Act, 1880, will now apply within so much of the county of Kent as is not within the Metropolitan Police District to the following species as if they were included in the schedule to that Act, *viz.*: Bearded tit, buzzard, chaffinch, hawfinch, hobby, honey buzzard, Kentish plover, kestrel, martin, merlin, moorhen, osprey, peregrine falcon, swallow, swift, turtle-dove, wryneck. IV. The close time limited by the Act of 1880 (except as regards the common wild duck) is varied throughout the county so as to be from March 1 to Aug. 12 in each year. A separate order has been made by the Secretary of State under the said Acts applying to so much of the county of Kent as is within the Metropolitan Police District.

KIRKCUDBRIGHT AND WIGTOWN.—By an order made in May, 1895, the taking or destroying eggs of the birds named in the order for Dumfriesshire [which see] is prohibited for a period of one year, from June 1, 1895.

LINCOLNSHIRE.—By an order dated May 10, 1895, the taking or destroying of the eggs of the sheldrake, sea-pie or oystercatcher, ringed dotterel, arctic, common and lesser terns, redshank, and common sandpiper, is prohibited within the following area within the administrative county of the ports of Lindsay, Lincolnshire, *viz.*: The sea coast, sandhills, dunes, waste lands, fitties, foreshore, and warrens, situate between the sea and the land side of the sea-wall, embankment, ditch, quick fence, or other artificial boundary separating the same from the cultivated land. This order came into force June 10, 1895. The close time has been varied so as to extend from March 15 to Aug. 31. By an order dated Jan. 3, 1896, the Wild Birds Protection Act, 1880, will apply within the administrative county of the parts of Kesteven, Lincolnshire, to the kestrel, merlin, hobby, buzzard, honey buzzard, swallow, house martin, sand martin, swift, and wryneck, as if those species were included in the schedule to that Act. II. The taking of eggs of the following birds is prohibited within the administrative county of the parts of Kesteven, Lincolnshire, *viz.*: Goldfinch, kingfisher, nightjar, nightingale, owls (of all species), ruff or reeve, woodpecker, kestrel, merlin, hobby, buzzard, honey buzzard, swallow, house martin, sand martin, swift, wryneck, teal, and wild ducks of all species.

MIDDLESEX.—By an order dated Jan. 29, 1896: I. The Wild Birds Protection Act, 1880, within the county of Middlesex, applies to the wryneck, swallow, martin, swift, bearded tit, shrike, kestrel, merlin, hobby, buzzard, honey buzzard, osprey, and magpie, as if those species were included in the schedule to that Act. II. The taking of eggs of the following birds is prohibited within the county of Middlesex, *viz.*: Nightingale, goldfinch, lark, nightjar, woodpeckers, kingfisher, cuckoo, owls, kestrel, buzzard, honey buzzard, merlin, hobby, osprey, wryneck, swallow, martins, swift, bearded tit, shrike, magpie, wheatear, stonechat, whinchat, redstart, flycatchers, sedge warbler, reed warbler, blackcap, garden warbler, wood warbler, willow warbler, chiffchaff, whitethroat, lesser whitethroat, long-tailed tit, nuthatch, wren, golden-crested wren, wagtails, hawfinch, linnet, buntings, starling, landrail or cornerake, and coot. The close-time has been varied within the county council area, so as to extend from Feb. 1 to Aug. 31.

NORFOLK.—By an order dated April 8, 1895: I. The taking of eggs of any wild bird is prohibited for a period of one year, from May 1, 1895, within specified areas (which include Hickling and neighbouring broads with surrounding country to the sea-shore, and the series of broads known as Ormesby, Rollesby, Hemsby, Filby, and Burgh Broad). II. The taking of eggs of any wild bird is prohibited for a period of one year from May 1, 1895, within a further specified area—namely, the whole of the foreshore . . . from the estuary sluice at North Wootton to the

eastern boundary of the parish of Cley-next-the-Sea. III. The taking of eggs of the following wild birds is prohibited throughout the entire county of Norfolk, *viz.*: The bearded titmouse, crossbill, white or barn owl, wild ducks and teal of all species, Norfolk plover, stone curlew or thickknee, ruff or reeve, ring dotterel, oystercatcher or sea-pie, terns or sea-swallows, and great crested grebe or loon. IV. The Wild Birds Protection Act, 1880, within the county of Norfolk, now applies to the bearded titmouse and crossbill as if these two species had been included in the schedule to that Act. This order came into operation on May 1, 1895, and by an order dated April 7, 1896, its provisions are to remain in force for another year, namely, until May 1, 1897.

NORTHAMPTONSHIRE.—By an order dated Jan. 15, 1896: I. The Wild Birds Protection Act, 1880, within the whole county of Northampton, applies to the heron, buzzard, honey buzzard, kestrel, merlin, hobby, osprey, hen-harrier, nuthatch, and wry-neck, as if those species were included in the schedule to that Act. II. The time during which the taking or killing of wild birds is prohibited, so far as regards the heron, is extended so as to be from March 1 to Sept. 1. III. The taking of eggs of the goldfinch, buzzard, honey buzzard, kestrel, merlin, hobby, osprey, hen-harrier, kingfisher, nightingale, nightjar, nuthatch, owls, sandpiper, woodpeckers, and wryneck is prohibited throughout the county. Within the liberty of Peterborough the close time has been varied so as to extend from March 15 to Aug. 31.

NORTHUMBERLAND.—The close-time in this county is from March 24 to Aug. 11 for all birds except the following: Dotterel, eider duck, guillemot gull (except black-backed gull), kittiwake, oystercatcher, puffin, razorbill, sea-swallow or tern (the close time for these being from March 1 to Aug. 31).

OXFORDSHIRE.—By an order dated March 22, 1895, the taking or destroying of the eggs of any owl is prohibited in any part of the county.

SHETLAND.—The taking or destroying eggs of the following birds is prohibited, *viz.*: White-tailed or sea-eagle, great skua or bonxie, arctic or Richardson's skua, whimbrel or tang-whaup, red-necked phalarope, and red-necked diver (rain bird or ember goose)

SOMERSETSHIRE.—By an order dated July 27, 1895, the Wild Birds Protection Act, 1880, applies within the whole of the county to the kestrel, merlin, hobby, buzzard, and osprey, as if those species were included in the schedule to that Act.

SOUTHAMPTON.—By an order dated Sept. 7, 1895, the taking or destroying eggs of the buzzard, honey buzzard, kingfisher, Montagu's harrier, nightingale, owls, and woodpeckers is prohibited in any part of the county of Southampton.

STAFFORDSHIRE.—By an order dated Nov. 28, 1895: I. The

taking or destroying eggs of the following birds is prohibited throughout the entire county of Stafford, *viz.*: The goldfinch, buzzard, merlin, kestrel, hobby, osprey, kingfisher, nightingale, nightjar, owls, nuthatch, sandpiper, woodpeckers, wryneck, curlew, and great-crested grebe (loon or diver). II. The Wild Birds Protection Act, 1880, applies within the whole of the county of Stafford to the spotted flycatcher, pied flycatcher, tree-creeper, sand martin, martin, swallow, wagtail, and swift, as if those species were included in the schedule to that Act.

SUFFOLK, EAST.—By an order dated Dec. 24, 1895, the taking of eggs is prohibited in the years 1896, 1897, and 1898 in the following places, namely: The sea-coast, beach, foreshore, sand-hills, saltings or salt-marshes, situate between the sea or estuaries and the land side of the sea or estuarial wall, embankment, ditch, fence, or other artificial or natural boundary separating the same from the cultivated land, from the north side of the river Blyth to Landguard Point (excluding the estuary of the Alde above the ferry at Slaughden Quay, Aldeburgh).

WESTMORLAND.—By an order dated May 29, 1895, the taking or destroying of eggs of the barn owl, brown owl, long-eared owl, short-eared owl, buzzard, merlin, kestrel, goldfinch, black-headed gull, peregrine falcon, kingfisher dotterel, raven, heron, bittern, woodcock, dipper (or water ouzel) and golden plover is prohibited in any part of the county of Westmorland for five years from June 25, 1895.

YORKSHIRE, E. RIDING.—By an order dated April 1, 1895, the taking of birds' eggs on the promontory of Spurn, including Kilnsea Warren, south of the line taken by the road leading from the village of Kilnsea towards the site of the old village of Kilnsea, is prohibited for a period of five years from March 31, 1895. By an order dated May 10, 1895, the time during which the killing or taking of wild birds is prohibited under the Wild Birds Protection Act, 1880, is now varied in the East Riding so as to be from March 1 to Aug. 15 in each year.

YORKSHIRE, W. RIDING.—The close time for wild birds in the West Riding of Yorkshire has been extended so as to be from March 1 to Aug. 11, both days inclusive.

YORKSHIRE, N. RIDING.—The close time has been varied so as to extend from March 1 to Aug. 11.

NOTES AND QUERIES.

CETACEA.

Bottle-nosed Dolphin in the Thames.—I have now no doubt that you are quite correct in your surmise (p. 143) that the Dolphin caught here some days ago is the species known as the Bottle-nosed Dolphin, *Delphinus tursio*. The very pale colour of the under parts led me to suppose it was *D. delphis*. However, the shape of the beak (the lower jaw being curved and longer than the upper jaw), the comparatively few teeth, as well as the large size of the animal, point, I think, unmistakably to *Delphinus tursio*. A second Dolphin was found dead on the shore at Isleworth on the 20th inst. This also is *D. tursio*, but a smaller specimen. It is a male, of a uniform dark grey, and measures $9\frac{1}{4}$ ft. in length by $5\frac{1}{2}$ ft. in girth. I counted 22 teeth on each side of each jaw ($\frac{2}{2}\frac{2}{2}-\frac{2}{2}\frac{2}{2}$); they were all, I think, pointed, not truncated like the back teeth of the Chiswick specimen. It would be interesting to discover what induced these large marine Cetacea to make their way through the traffic-laden waters of the Thames to London.—ALFRED SICH (Burlington Lane, Chiswick).

[Another correspondent, Mr. Walter Crouch, of Wanstead, who examined the specimen, has kindly furnished some further particulars. He states that the teeth in both the upper and lower jaws were much worn down, indicating that the animal was of mature age. A photograph forwarded by Mr. Sich enables us to correct certain faults in the figure given by Bell in his standard work on British Quadrupeds, and furnishes a reliable outline for any future illustration that may be required.—ED.]

BIRDS.

Sale of Great Auk's Egg.—On April 20th last a crowd of naturalists flocked to King Street, Covent Garden, for a sale by auction of a Great Auk's egg, which belonged to the late Mr. J. H. Tuke, of Hitchin, Hertfordshire, and was disposed of by order of his executors. This egg is believed to be of Icelandic origin, and in 1841 was in possession of Friedrich Schulz, of Dresden, who in May of that year sold it to an English dealer, Hugh Reid, of Doncaster, for £2 6s., as Reid himself informed the late Robert Champley, of Scarborough (*cf.* Grieve's 'History of the Great Auk.' 1885, Appendix, p. 28). From Reid it passed into the possession of the late Mr. Tuke, and it is now the property of Mr. Noble, of Henley-on-Thames, to whom it was knocked down at the recent sale by the auctioneer, Mr. J. C. Stevens, for the sum of 160 guineas.

Greater Nightingale in Kent.—In the last two lines of his article on the Nightingale, in the fourth edition of 'British Birds,' Prof. Newton has remarked, "there is no sufficient reason for supposing that the larger

Nightingale of Eastern Europe has ever visited this country." Writing from Frinsted, Kent, on May 5th inst., Mr. Gervase F. Mathew remarks:—"I saw a couple of queer warblers yesterday, and while they are fresh in my memory will describe them. They were considerably larger than Nightingales, stoutly and robustly built, of a smoky olive-grey colour, under parts lighter; tail short and square; beak strong shining brown or black; large black eyes. They were evidently a pair, and were chasing each other about; they came quite close to me, and I had them in view several minutes. Their note also was quite strange to me. What could they have been? I have never seen anything like them before. They were in a small coppice by the side of the road between this and Sittingbourne." On this communication the Rev. M. A. Mathew observes:—"I enclose a note from my brother. The strange warblers are without any doubt *Daulias philomela*, the Northern Nightingale, of which as yet there is no record in this country that I know of. My brother's description of the birds tallies closely with that given by Mr. Dresser in 'Birds of Europe.'—MURRAY A. MATHEW."

Red-throated Pipit in Sussex.—As I am perhaps in some measure responsible for the recognition of the specimen of *Anthus cervinus* reported in a recent issue of 'The Zoologist' (*supra*, p. 101), I may be allowed to add one or two particulars. The bird was shot by a boy near this town on Nov. 13th last, and was taken by him to Mr. G. Bristow, our well-known taxidermist. After setting it up Mr. Bristow asked me to examine it, when I suspected its identity. My suspicion was confirmed after reading the account of this species in Mr. Dresser's 'Birds of Europe,' and in the work of the same name by the late Dr. Bree, and I submitted the specimen for examination to Prof. Newton. Not having an example of *A. cervinus* in winter plumage available for comparison, Prof. Newton was unable to pronounce with certainty, but was inclined to regard it as assignable to this species. Mr. Dresser next examined the bird, and found, after "carefully comparing it with a series of specimens of both *A. pratensis* and *A. cervinus*, that in all specimens of the latter the markings on the breast are much larger and broader." Dr. Sharpe then examined the bird, and declared it to be without doubt an example of *Anthus cervinus* (Pall.). It was by him exhibited at a meeting of the B. O. U. Club held in the month of December last. Your correspondent omitted to point out that the specimen in question is the first one obtained in Britain in autumn—the others having occurred in spring (*cf.* Sharpe's Brit. Birds in 'Allen's Naturalists' Library,' vol. i. p. 109). I cannot agree with the assertion of your correspondent that the "distinguishing features [of the lately-procured specimens when placed among a series of *A. pratensis*] are readily observable." A similar comparison in my own case convinced me of the truth of the remark of Col. Irby, that "in winter the difference

between the two species is hardly distinguishable" ('Key List,' 2nd ed. p. 20). In the diagnosis here, "under tail-coverts" is printed for "upper tail-coverts," the same slip having also crept into this author's 'Ornithology of the Straits of Gibraltar,' 2nd ed. p. 115). My thanks are due to the three gentlemen above mentioned for kindly examining the bird, and to Mr. Bristow for drawing my attention to it.—W. RUSKIN BUTTERFIELD (St. Leonards-on-Sea).

The Song of the Icterine Warbler.—I have been greatly interested in reading Mr. O. V. Aplin's account of "Bird-life in Eastern Algeria": I only wish that I could enjoy similar experiences. With regard to the song of the Icterine Warbler, I must confess that I agree with those who think it one of the finest we can possibly hear. Prof. Collett, writing of the occurrence of this bird in Norway, remarks:—"It is the very best of our songsters; its song not a little resembles that of the Nightingale, but one finds in it again the ditty of the Thrush." This description seems to me to be true to the life. Some years ago I had the pleasure, with my boy, of hearing this remarkable song in the Bosch, or Public Park at the Hague, and we thought it fully equal to that of the Nightingale, although at times it uttered some very strange and jarring notes. I found this bird nesting at Kissingen afterwards, and the hen allowed us to overlook her on the nest without being disturbed. The male usually perched in the trees near the Saale river close by, and there he continually emitted those strange cries which are well described by Mr. Seebohm when he says, "it screamed and warbled and chuckled, and sung voluminously." Some of the notes reminded me of a Parrot, and were almost startling, so loud and weird were they, I often wondered that the passers-by did not stop to reconnoitre. But the sweet song we did not hear at Kissingen, nor afterwards at Karlsbad, where I also heard this bird. My lamented friend Mr. J. G. Rathbone, of Dunsinea, Co. Dublin, who shot the only specimen of this bird ever obtained in Ireland, assured me that its song was really splendid, and he was an excellent authority in these matters.—CHARLES W. BENSON (Rathmines School, Dublin).

Supposed Occurrence of the Buff-backed Heron in Ireland.—In working through the Reports of the Historical Commission, I came across the following passage, which may perhaps have escaped the observation of Irish naturalists, for whose benefit I have copied it. It occurs in a long letter addressed to J. C. Walker by Major-General Vallancey, and is dated from Cove (= Queenstown, Cork), January 25th, 1794:—"I have seen what Mr. Pennant has not seen—the small white Crane of Asia and Africa. It is a most beautiful bird, about the size of a turkey pullet of three months. In Asia it is called the 'Paddy-bird,' from its eating the green 'paddy' or rice; its plumage milk-white, its bill and legs yellow. This bird, one of a

couple, was seen by Mr. Daunt in a bog near Roberts Cove, half-way between this and Kinsale Harbour. He shot one, and sent it to Mr. Daunt, apothecary, in Cork. It is about a month killed; the legs and beak begin to turn black. Dr. Longfield has asked it, to send to Mr. Pennant. I claim it for the Academy, or College Museum; and if refused the whole bird, half of it cut longitudinally, and each half glued on a board, would satisfy both parties. If not the half, I claim the liberty of making a drawing. I am afraid I shall succeed in neither unless Mr. Daunt, apothecary, is written to in the name of the Academy" (Thirteenth Report, App. pt. viii. p. 227). The colour of the soft parts points to the Buff-backed Heron having been the species mentioned. The bird being in winter dress the buff plumes would be absent. At all events, the note preserves the fact of one of the rarer Herons having been killed in Ireland a hundred years ago.—H. A. MACPHERSON (Carlisle).

Wood Wren in Co. Donegal.—On May 8th three Wood Wrens were singing close to my house, in larches and oaks. It is about fifteen years since I heard the song in Ireland, then, as now, in Co. Donegal, but about twelve miles south of this, at Glenalla, when I obtained a specimen, which is preserved in the National Museum, Dublin. Since that outrage they never returned to Glenalla to my knowledge. Years before that, in the early seventies, I often heard the Wood Wren in Wicklow, at Derrybawn and at Powerscourt; but of late years I have looked for them there in vain. They always arrived in the first week of May, and twenty years ago used to remain throughout the summer, probably or almost certainly breeding, at Derrybawn. Other observers have, I believe, lately met with this warbler, which is so rare in Ireland, and no doubt Mr. Ussher has full statistics; but, so far as my experience goes, the bird is getting scarcer instead of commoner, as appears to be the case in Scotland. The Wood Wren has also been met with in Mayo and Sligo. The song of the birds I heard here was not fully uttered, the early high plaintive notes being omitted, and only the latter double trill uttered, with a broken beginning; but this is often the case.—H. CHICHESTER HART (Carrablagh, Portsalon, Letterkenny).

Wild Geese on Migration affected by Electricity.—In the 'Revue Scientifique' of April 11th is a curious observation on this subject. On March 10th, between 10.30 and 11 a.m., a large flock of Wild Geese, travelling in triangular formation to the number of about 200, were observed passing at a great height over the commune of La Réorthe (Vendée), going northwards. On their way they encountered a thick black cloud, though no wind was perceptible to the observer. As soon as the Geese reached this cloud they were abruptly dispersed, and were seen to divert their course in all directions in small parties of four or five, uttering

bewildered cries. The cloud continuing to advance, they were driven back about three kilometres, and it was nearly three-quarters of an hour before they appeared able to rally and re-form in line as before, almost where they had originally dispersed. This incident, says the writer, may perhaps be explained as follows:—The cloud, which had not shed a drop of water, though presenting a stormy appearance, may have been charged with electricity; the Wild Geese, on coming in contact with it, would then have received a severe shock; hence their rout and agitation. But it is surprising that birds accustomed to migration were not instinctively warned of the danger, and did not turn a little out of their way to avoid it.—J. E. HARTING.

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

April 16th, 1896.—Mr. W. PERCY SLADEN, Vice-President, in the chair.

Messrs. V. H. Blackman and W. B. Hemsley were elected, and Messrs. J. W. Cornwall, W. M. Christy, P. Ewing, and J. H. Leigh were admitted, Fellows of the Society.

Mr. George Masee read a paper on the types of Fungi in the collection of the late Rev. M. J. Berkeley, which was presented to Kew in 1879, and which contains rather more than 11,000 species. Many of the species were described more than fifty years ago; hence the diagnoses are in some cases too brief, and do not embody points which at the present day are considered to be of importance. In many instances this has led to the same species being redescribed by others as new. Mr. Masee now supplied careful descriptions of the types, with a view to obviate future confusion, and to secure for Berkeley as the original describer the priority in nomenclature which is justly his.

Mr. A. D. Michael read a paper upon the internal anatomy of *Bdella* (the Red-snouted Mite), giving the results of three years' work and of many hundreds of dissections and serial sections. The material was furnished chiefly from the Zoological Station at Port Erin, and the subject is practically new, only one paper (describing a few parts of the female) having been hitherto published. The male organs of *Bdella* are extraordinarily complicated: a pair of testes on each side of the body are joined by a tubular bridge to those on the other side. In *Bdella Basteri* these testes are sunk in the thick walls of great "embedding sacs," which are glandular, but are absent from other species. The vasa deferentia are transformed into immense mucous glands which communicate by "antechambers" with the

penial canal, into which a great azygous accessory gland and another divided by a number of fine lamellæ discharge. Two chitinized air-sacs, spiked inside, are sunk in the genital organs and communicate with the outer part of the penial canal. The female organs are very simple. There is a large stalked organ, resembling the so-called "sucking-stomach" of Diptera, arising from the œsophagus; no such organ has hitherto been known among the Acarina; it is proposed to call it the "receptaculum cibi." The pharynx is exceptional in having a wholly flexible roof, instead of the chitinized one found in allied Acari: this involves numerous other modifications. The brain and nervous system are fully described. The respiratory organs consist of a long tubular air-sac on each side of the body, which gives off a multitude of fine unbranched tracheæ and communicates by a single tracheal trunk running along its exterior with the stigma by the mandibles. The salivary glands are very large and elaborate, but allied to the *Trombidium* type. The epipharynx is a highly specialized organ. The paper was criticised by Mr. Sladen, Prof. Howes, and Mr. A. R. Hammond.

ZOOLOGICAL SOCIETY OF LONDON.

April 21st.—Sir W. H. FLOWER, K.C.B., LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of March, and called special attention to a young female Gorilla, *Anthropopithecus gorilla*, from French Congoland, obtained by purchase; a young male Markhoor, *Capra megaceros*, from the vicinity of Peshawar, British India, presented by Col. Paterson, March 18th; a pair of a rather scarce species of Duiker Antelope, *Cephalophus coronatus*, from West Africa, purchased; and a Silver-backed Fox, *Canis chama*, from Cape Colony, presented by C. W. Southey, Esq., of Culmstock, Schoombie Station, South Africa.

Mr. Sclater exhibited and made remarks on some specimens from Nyasaland, lately sent home by Sir H. H. Johnston, K.C.B. Amongst these was a fine head of the Sable Antelope, *Hippotragus niger*, from the Zomba plains, and an example of the Brindled Gnu, *Connochates gorgon*, or of a nearly allied form, believed to be the first specimen of this Antelope sent home from British East Africa.

Mr. Sclater also exhibited, by the kind permission of Mr. Justice Hopley, of Kimberley, a pair of horns of the so-called *Antelope triangularis*, said to have been obtained somewhere on the Zambesi. These horns are now generally supposed to be abnormal horns of the cow Eland.

Mr. W. E. de Winton gave an account of a small collection of Mammals from Ecuador, lately sent to the British Museum by Mr. L. Söderstrom, H.B.M. Consul at Quito. It contained examples of only three species,

but two of these appeared to be new to science. One of them was a new Deer, proposed to be called *Pudua mephistophelis*, and the other a Rodent of the genus *Ichthyomys*, which was named *I. söderstromi*.

Mr. F. E. Beddard read a paper on the Anatomy of a Grebe, *Æchmophorus major*, and added some remarks upon the Classification of the Charadriiform Birds, to which he considered the Auks to be more nearly related than to the Grebes.

A communication was read from Messrs. F. D. Godman and O. Salvin on the Butterflies of St. Vincent, Grenada, and the adjoining islands, based on the collections made by Mr. Herbert H. Smith.

A communication was read from Miss E. M. Sharpe containing an account of the Lepidoptera obtained by Dr. Donaldson Smith during his recent expedition to Lake Rudolf. Examples of ninety-one species were obtained, of which two were apparently new: these were described as *Panopea walensensis* and *Papilio donaldsoni*. A second paper by Miss Sharpe contained an account of the Lepidoptera obtained by Mrs. E. Lort Phillips in Somaliland. Eighty-four species were enumerated, one of which, *Teracolus ludoviciæ*, appeared to be undescribed.

A communication from Mr. W. F. Kirby contained descriptions of some Dragonflies obtained by Mr. and Mrs. Lort Phillips in Somaliland. Three of these were described as new to science.—P. L. SCLATER, *Secretary*.

NOTICES OF NEW BOOKS.

The Life of Joseph Wolf, Animal Painter. By A. H. PALMER.
8vo, pp. i—xviii, 1—328. With numerous Illustrations.
London: Longmans, Green & Co.

TWO-AND-TWENTY years ago, when reviewing, anonymously,* Wolf's 'Life and Habits of Wild Animals,' published in 1874 by Macmillan, we took occasion to give a sketch of the artist's life, and a brief notice of his works to that date, commenting upon the extraordinary way in which the general public at that time failed to recognize and properly appreciate his unrivalled skill as an animal painter. Mr. A. H. Palmer, in the 'Life' which is now before us, has unconsciously paid us the compliment of printing an extract from that review as one of the very few which he says is worth quoting from the score or so of press notices collected by him. Twenty years is a long time to wait for a

* 'The Field,' 3rd January, 1874.

public acknowledgment of the correctness of one's views, but it furnishes one more illustration of the old adage that "truth will prevail," and affords additional gratification in the reflection that the artist still lives to receive the homage which is his due.

Whether it is a wise course to publish a biography in the life-time of the subject of it, is a question which may, for many reasons, admit of doubt; but it has at least this advantage, that it enables the biographer to collect and utilize much information, the correctness of which can only be properly vouched for by direct appeal to the person chiefly concerned, who is naturally in possession of the largest number of facts concerning his own work. For this reason we are disposed to welcome the publication of this volume, although issued somewhat before the time when it might be more properly expected to appear. It is evident that the biographer has taken extreme pains with its preparation, and has produced a volume which will be welcomed alike by naturalists and artists. It appeals perhaps more strongly to the former class of readers, because Mr. Palmer's comments are those of a lover of nature rather than an art critic. On the other hand, students of animal life will highly appreciate the illustrations with which the book is filled. These consist of more than fifty full-page reproductions of finished drawings and paintings by Mr. Wolf, with a smaller number of sketches in the text.

Mr. Palmer, we trust, will forgive us for saying that we do not think he has made so good a selection of pictures as he might have done. Too many of his reproductions are copied from the 'Proceedings of the Zoological Society,' wherein the aim of the artist has been not so much to compose a picture, as to give a severely accurate portrait of some mammal or bird sufficient to indicate its distinguishing characters, and to enable its identification by scientific zoologists. Many of these pictures, naturally, can have little attraction for the general public, who, knowing nothing of the species represented, are unable to form any opinion as to the merit of the drawings. Take for example *Accipiter collaris* (p. 22), *Astur griseiceps* (p. 62), Germain's Polyplectron (p. 69), *Leucopternis princeps* (p. 80), *Pithecia monachus* (p. 92), *Dactylopsila trivirgata* (p. 97); or the Dead Aye-aye (p. 103), the Silver Marmoset (p. 146), and the Bashful Monkey (p. 186). Except as careful studies of particular species, none of these have anything to recommend them outside the pale of

scientific criticism. What ninety-nine people out of every hundred will most admire are the beautiful compositions in which the artist has a story to tell, and tells it famously, without any catalogue description. Of those reproduced by Mr. Palmer, it will suffice to name:—"A Storm in the Alps" (p. 149), wherein Ptarmigan, Chamois, and a Mountain Hare are seen seeking shelter from a pitiless snow-storm; "Morning" (p. 171), which shows a dead Lion, shot the previous day, discovered dead in the morning light by Vultures; "Tame and Wild" (p. 171), depicting a fight between a Bison and a domestic Bull on the borderland between prairie and cattle-ranche; "Surprise" (p. 176), where two Hares foraging over the snow encounter a wild-looking scarecrow, which seems to be solemnly warning them with uplifted arms,—it is a still frosty night, yet some snow is dropping from those arms,—for crouched against the stake that supports the figure is a Fox, quivering with hungry excitement; "A Night Attack" (p. 210), depicting a raid by a Marten upon a Wood Pigeon's nest in a pine tree; "Inquisitive Neighbours" (p. 221), two Squirrels frolicking round the stem of a pine come suddenly on a Ringdove sitting upon her eggs; she is indignant at the intrusion, and rises from her eggs with half-opened wings, prepared to buffet the nearest assailant. These are amongst the most pleasing of the artist's works, and could they be engraved, we feel confident they would become as popular as those by Sir Edwin Landseer and Sir John Millais.

The reproductions by process as exemplified in the volume before us seem to us tame and inadequate. We miss the individuality of the painter, which is much better interpreted in the vigorous engravings by Whymper, which form the illustrations to the earlier work, 'The Life of Wild Animals.'

Joseph Wolf is one of the very few painters whose works can stand the test of criticism by artists, naturalists, and sportsmen, and we should like nothing better than to see published, in a good-sized quarto or folio volume, a representative collection of his finished pictures, reproduced not by process or photogravure, but in the very best style of engraving.

For such a series we could name several pictures in private collections which are not mentioned in Mr. Palmer's volume, and a few others, also unnoticed, which have been exhibited in public. Meantime everyone should read the artist's 'Life.'

THE ZOOLOGIST

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RACES AND RELATIONSHIPS OF HONEY-BEES.

BY RICHARD HELMS.*

The Honey-bee originated in a warm climate.

THERE can be no doubt that the Honey-bee was originally an inhabitant of a mild climate, where it could avail itself of the abundant supply of food required by its prolific and reproductive disposition, and where moreover the conditions were most favourable for the development of that particular variation which ultimately produced the extraordinary communal character we find them possessed of at present. None of the allied families of the order (Hymenoptera) which are found indigenous to cold climates show this character to an extent approaching that of the Honey-bee, except some genera of ants; but as these possess the instinctive faculty of excavating, and almost invariably construct their nest in or just above the ground, or in fallen timber, the dense covering of snow protects them during the severe cold of the winter; the development of the burrowing instinct, therefore, enables them to resist the extremes of climatic differences. The Honey-bee, however, not being possessed of such an instinct, has to seek a ready-made home, which she generally finds at some considerable elevation above the surface of the ground, in a hollow

* From the 'Agricultural Gazette of New South Wales,' vol. vi. part 9, pp. 631-642.

tree, that would be exposed to all the rigours of a cold winter. In very warm climates they are able to breed in the open, and there attach the combs on limbs of trees, or under an overhanging ledge of a rock. Under certain conditions they may even seek a very shady place to keep the combs from melting. This habit of building in the open may still be observed amongst domesticated bees that have become feral, and must be inherited from an ancestral race, as it could not well have been acquired in a climate like that of New Zealand, where I once noticed it, and where it would act detrimentally to the survival of the stock. Even in Australia, where it is not an uncommon occurrence, it seems not to be conducive to their prosperity, since the combs I have seen attached to rocks in the northern parts of New South Wales were never very large, nor their builders apparently very numerous. On the other hand, it is well known that bees thrive extremely well in this country when they have nested in a hollow tree, where they obtain sufficient protection against the changes of the weather. They are therefore evidently the production of a tropical or subtropical region of the globe, where an equable climate predominates throughout the whole year, for they succumb in colder climates without artificial protection.

It seems fairly certain that the bee has been introduced into many countries at a very early date. Even in remote times they have been found either domesticated or feral in countries which they could not have reached naturally, owing to their geographical position. I will only mention Corsica, an extensive island in the Mediterranean, whence the ancient Romans drew large supplies of wax. The bee could never have reached an island except by artificial introduction. Many similar cases might be instanced, but it is scarcely necessary, as it is well known to naturalists that even when the multiplication of an insect merely depends upon a single pair, or perhaps only upon a pregnant female, its distribution becomes frequently limited through geographical barriers, such as mountains or water, it is obvious that the Honey-bee could not establish itself in a new locality, when it would have to encounter such difficulties, because it would require at least a swarm, with a fertile queen, to do so. The expansion of the species could not take place except by an open landway, and therefore must have been artificially assisted when natural obstacles intervene.

All Bee-races have descended from one type.

No reasonable objection exists against the theory that all known domesticated bee-races and their sub-races descended from one original stock. Experience proves that all the domesticated races of the Honey-bee and their varieties freely intercross, and are fertile; their mongrel offsprings are perfectly fertile likewise with each other, and the parental races as well. Such is quite sufficient evidence of their descent from one species, for it has been observed as an almost invariable fact, that when once varieties have been modified to such an extent as to become true species, the offsprings of their hybrids, as a rule, are sterile. The opinion held by some naturalists that, through lengthy domestication, this tendency towards sterility in the offsprings of hybrids, when they can be made to breed at all, becomes gradually obliterated, cannot well be applied to bees, which, though called domesticated, are not so in the same sense as other animals, which are kept more or less in confinement, and are fed and tended.

To decide what was the original type of the Honey-bee is a matter surrounded by great difficulties, and therefore it may not be possible to produce unquestionable proof of its appearance and character at the present date, but certain indications point to the probability of its being closely allied to either the "brown" or the "Egyptian" bee. These signs are principally manifested in the tendency of the reversion of certain crosses towards the colour of one or other of these races. Before, however, discussing the interesting phenomenon of "reversion," or "throwing back," towards an original type, it will be as well to consider the principal races of the domestic bee so far as they are known at present.

The Races and their Varieties.

1. *The "Brown" or "Northern" Bee (Apis mellifica).* — Is of a uniform dark brown colour, sometimes greyish when young, owing to the greater quantity of hair with which it is covered at this age; the hair is of a dirty yellow colour, as a rule, but sometimes shiny; with some strains an indistinctly reddish brown band makes its appearance on the first abdominal segment.

This bee is found throughout Europe, some parts of Asia, in Algeria, and round the west coast of Africa, in the Old World. It was early introduced into America and the Cape of Good Hope,

and within this century to Australia. The Spaniards introduced it into Mexico and Central America soon after the conquest of those parts, and later into Cuba, where it has thriven exceedingly well ever since. From this island it was probably first brought to the Southern States of North America, where it became feral as in the Cape Colony and Australia. This shows that a tropical or subtropical, as well as a warm climate, is equally agreeable to this race, and the term "northern" is not specially applicable to it. No doubt it received this name on account of its domestication in somewhat remote times in Germany and England, whence it became known through the literature of these nations.

The following varieties or geographical sub-races must be distinguished:—

(a) *The "Heath Bee" of Lüneburg.*—This variety is found throughout the high moors of Northern Germany, and nowhere else. In colour and size it is identical with the Brown bee, but it is characterised by its strong swarming propensity, which most likely has to a large extent been purposely cultivated to suit the prevailing system of bee-keeping in those parts of the country.

(b) *The "Nether-Austrian" Bee.*—This variety seems not to be very widely distributed, and is mainly found to the east and the south of Vienna. It is slightly lighter in colour than the typical race, and the greatest number of them have the first abdominal segment coloured reddish brown, some specimens very markedly so.

(c) *The "Carniolian" or "Carinthian" Bee.*—A widely distributed South European variety, but predominating in the two Austrian provinces after which it is named. It is slightly larger than the Brown bee, with whitish hairs fringing the abdominal segments on their lower margins, which gives it when young a very bright appearance. It is famous as being the mildest-tempered among all the domesticated bees.

(d) *The "Attic" or "Cecropean" Bee*, also called "*Hymettus*" Bee (from Mount Hymettus, near Athens).—It was considered a distinct species by naturalists, and therefore is known as *Apis cecropia*. Besides the home it is named after, this distinct variety is found all over Greece, and is said to occur in Upper Italy and Spain. It is probably also found in Asia Minor and the islands of its western coast. It is slightly smaller than the Brown bee,

and occasionally rather more hairy; the first, and more or less the second, abdominal rings are bronzy-brown-red, or sometimes rusty-red.* By some it is considered a cross-tempered race. Berlepsch says:—"Küchenmeister thinks that the Cecropean race stands midway between the native (German) and the Italian race of *noble colouring*, and that it is identical with the one occurring in the Canton Tessin, which is distributed from Mona under the name of Italian. I am inclined to agree with him."

The Attic bee has a classic as well as a legendary reputation, for, besides being mentioned by Grecian writers, it is said that the Athenians, who were great bee-keepers in olden times, asserted that all bees in the then known world had sprung from Mount Hymettus. It is by no means impossible that this legend is based upon some fact regarding the distribution in a westerly and north-westerly direction, although it is more likely that the original type of the domesticated bee occurred much further east than Greece.

Besides the four varieties mentioned, I have not the least doubt that there is a far greater number to be found which differ from the ordinary Brown bee in physical or mental characteristics. These will be found in more or less isolated regions, as it is generally acknowledged that isolation frequently produces alterations, which may be passed over by ordinary observers, and cannot be determined from dead specimens.

2. *The Egyptian Bee (Apis fasciata)*.—This is the furthest removed from the brown race of bees. In size it is nearly a third less; its colour is light, owing to the anterior part of the first three abdominal segments being yellow, and the hair of the thorax and on the posterior margins of the abdominal rings, &c., being light yellow and sometimes whitish; the upper part of the thorax between the wings is also yellow. A mild-tempered race on the whole, but when once excited, a very vicious stinger.

The extent of its distribution is very considerable, for, besides Egypt, it is found in Arabia, Syria, and other eastern countries through the central parts of Asia into China. No doubt, when critically examined, it will be found to vary more

* Berlepsch describes the queen as of ordinary size, and bronze-red to the end of the second abdominal ring, and from there brownish black, just like a poor cross of the native (German) and the Italian race, in which the native blood strongly predominates.

or less in distant localities, but evidently not to such an extent as to allow of their variability in dead specimens being observed.

The Egyptian bee is probably the oldest race known to mankind. The earliest positive reference to bees occurs in the Egyptian hieroglyphic monuments of the ancient history of that country. Two thousand years before the present era they are found to represent the symbol of monarchical government, which proves for certain that the economy of the hive was known to this people, and makes it very probable that the bee was domesticated before those remote days. A much older people, the Indians, used honey and drank mead; the earliest known cultured people, it appears, disseminated the knowledge of a more extended use of honey, besides other useful knowledges and arts. Since both agriculture and stock-breeding had reached the highest proficiency in India and Egypt,* it appears more than probable that bees were cultivated as well, especially since no other source is known from which saccharine matter could be drawn for the enormously dense population of those countries. When the Jews were driven out of Egypt, Moses soothed their tribulation by promising them a land where milk and honey flowed, which may, figuratively, mean a land of plenty, but most assuredly proves honey to have been a coveted and familiar product.

The supposition of an early domestication of the bee is justified by the fact that the silkworm is known to have been systematically reared in China for upwards of 5000 years back. As the product of this insect must be considered entirely a luxury in a country which yields abundant fibre from various plants, the demand for it cannot be compared with that of such pleasant and nutritious food as honey, for which, besides, no substitute was known in those days. It is more than likely that the bee was domesticated by man over 6000 or even 7000 years, or longer, ago, for so long it is known that cultured people have existed, and in densely populated countries the supply of wild honey would not cover the demand. All uncultured people are fond of sweets where such are found in nature; they either rob the insect

* Grafting of trees and gelding animals was practised in those countries. In Egypt the bull which symbolised Osiris required to be perfectly white, with certain well-defined marks on the body. After the death of this bull it was always replaced by another. To enable the priests to do this they must have been most careful breeders.

that gathers it for its own food, or they take it from the flowers direct, as, for instance, the aborigines in Western Australia, who suck with pleasure the *Banksia* flowers, which in consequence have been named "honeysuckle" by the whites. The inherited liking for sweet food, it is well known, is increasing rather than diminishing with the progress of civilisation, and when the ancient Indians more than 6000 years ago discovered what a pleasant beverage mead is, the demand for honey must have increased enormously, quite enough, I should think, to encourage systematic apiculture, which, however, probably existed long before that time.

The known varieties standing nearest to the Egyptian bee are the Syrian and the Cyprian. The colour of these is exactly like that of the Egyptian, except that the hairs are not so light. They differ, however, in size from the latter, as both varieties are nearly as large as the Brown bee. The Cyprian besides differs considerably from the Egyptian in temperament, for its viciousness is notorious.

Although the Brown bee, *Apis mellifica*, and the Egyptian bee, *A. fasciata*, differ most from each other among the domesticated races, still they are not species. They can only be regarded as varieties, or, perhaps more correctly, as geographical races. They are perfectly fertile *inter se*, and their offspring are so likewise. Which, however, of these two races most resembles the original type whence they and all the other domesticated varieties have primarily sprung, it is difficult to determine, but it seems to me that the Brown bee probably resembles it most, and may in appearance perhaps not have been modified to any great extent. This point will be discussed further on, when I come to speak of the law of variation, and the tendency of reversion to the original type. Meantime I must say something of another race, namely:—

The Ligurian Bee.—This bee, when first discovered by Spinola, was by him considered a good species, and therefore named *Apis ligustica*. It possesses the typical bands of the Egyptian bee and its near varieties, but its thorax is uniformly brown, and is not marked yellow like with these. Although breeding fairly true as to colour, which is a sure sign of a long pre-existence of such a characteristic, it is probably not a true geographical race, but is a cross between the Brown and the Egyptian bee. How this

cross was first naturally brought about I will try to explain further on, but that it is a fact cannot be doubted, since the race has been artificially produced by a cross between these bees.

Mr. F. W. Vogel, who stands next to Dzierzon among the scientific apiarists of the continent of Europe, published, in 1883, his work on the Honey-bee, wherein he describes the extensive experiments he made by crossing various races by selection. He found that when the Brown and the Egyptian bees were crossed, the offsprings of the first generation exhibited mixed characteristics of both parents; but in the second generation a true Ligurian race became the result, which remained true to the typical colouring if kept pure. He also found that if Italian and Brown bees were successively crossed that the offsprings would throw back by degrees into either of the characteristics of their original ancestors, and not produce a new race. From this the conclusion has been drawn that the Brown and the Egyptian bees are primary geographical races, and that the Ligurian bee is a secondary race produced by a cross of the two primary races under natural conditions. This secondary race must have originated soon after the contact of the two primary ones in Italy.

The Brown bee is still found in some parts of Italy, and most likely was the first to be introduced into that country, probably by the Greeks, if not by the Phœnicians. The Egyptian race must have been introduced later, for the banded bee has been the favourite from the earliest historical times, and if it existed in Italy before the brown bee, this race would scarcely have been introduced. Virgil knew of two races, as may be gathered from the following lines of his fourth Georgic. Describing the Kings, he goes on to say:—*

“The people’s looks are different as their King’s,
Some sparkle bright, and glitter in their wings;
Others look loathsome and diseased in sloth,
Like a faint traveller, whose dusty mouth
Grows dry with heat, and spits a mawkish froth.
The first are best”

Why the first are best is not further enlarged upon, but we may suppose that it was practically so in Virgil’s time, and that his statement is not the mere expression of an æsthetic fancy.

* Addison’s translation.

Variation and Reversion.

Having ventured the statement that probably the Brown bee approaches more nearly the original ancestral type than any other of the domesticated races, I will try to explain my reasons for this theory; but as this opinion is based upon the law of variation, and the tendency of some variations towards reversion, or throwing back, to the original type, it is necessary to say something about this law, and the tendency which generally, more or less, accompanies it.

The disposition towards variation exists throughout all nature, and must be apparent both in plants and animals to every observer. It is only necessary to refer to what is daily achieved by the skill of nurserymen and agriculturists on the one hand, and by breeders and fanciers on the other; but these would not be able to produce variations and races, which are often quite different in appearance from the original type, were it not that a disposition of variation exists within every organism. Although this law is not entirely under man's command, for the simple reason that it is not perfectly understood, it is extensively made use of by him, either directly or indirectly. Directly, when a certain inclination towards a variation is specially cultivated, and indirectly when the finest and most vigorous strains are selected for the propagation of the race, and by means of modifications which are often exceedingly minute in certain individuals, a gradual change is brought about that will ultimately produce a characteristic variety.

Wherever a tendency towards variation appears, such a tendency may be, and frequently is, intensified by selection, and a new variety often rapidly springs up. It will, however, greatly depend upon circumstances whether a variety will possess sufficient vitality to last, for unless due regard is paid to the propagation of a general stamina, a selection in one direction may prove in the end fatal to the strain.

The gradual adaptation to a new climate, the more abundant supply of food or the reverse, or local geographical conditions, impress themselves upon individuals, and by imperceptible gradations may bring about a variety from the ancestral race. This, however, is merely assisting the law of variation to which the individual bends involuntarily, for, unless this law existed, altered

and unfavourable conditions would ultimately lead to the destruction of the species, instead of these being able to adapt themselves to the altered conditions. The power of adaptation to new conditions in a species is therefore simply another expression of the law of variation.

The most striking proof of the existence of a disposition towards variation is the occasional occurrence of a sudden variation, which is known as a "sport" when appearing in plants, and as a "monstrosity" when among animals. Besides such abrupt and very striking manifestations of this law, a perpetual variability productive of lesser differences pervades all animated nature. This becomes evident when we take into account the minute differences which appear between the individuals of every existing species. It is a well-known fact that not a single animal or plant can be found which is identical with any other of its kind, not even among those that emanated from the same parent at one birth, nor is there a single leaf of the same tree, or the many thousands of them that may be found in the forest, which does not possess some minute peculiarity of its own found in no other of its kind. Through that most powerful and universal law of nature, the law of inheritance, the general character of variation, if beneficial to the individual, may be propagated and increased under natural conditions, and still more so by artificial means; often, indeed, under unnatural conditions. In fact, the law of variation is extensively made use of by man, and worked upon by him through selection, which, under domestication, is frequently carried in a direction that would be disastrous to the existence, or at least very disadvantageous, to the species under natural conditions.

The pig, for example, is bred for the production of flesh and small bones. Through domestication it has lost its abundant covering of hair, and to a large extent its strength of jaws and the size of its tusks. Under the protection of domestication the pig does not suffer by these degenerations, because it is artificially fed, and, where needed, guarded against the extremes of the climate. With natural surroundings these detrimental variations could never have reached the extent we find them to exist, for the obvious reasons that the want of a strong covering of hair would expose the animal to the extremities of the climate, the absence of a strong jaw would hinder it getting sufficient food by

rooting, and the reduced tusks would leave it almost defenceless, and therefore a prey to its enemies.

It is apparent that variations acquired under natural conditions will be propagated only when they are beneficial to the individual of any species among which such a variation is developed. If, therefore, a sport or monstrosity appears, not possessing beneficial advantages, it disappears frequently as suddenly as it sprung up. Small variations, meaning such as are perceptible or more strongly expressed than those minute differences which are to be found between every individual of a species, may, under certain circumstances, be neither beneficial nor disadvantageous to a race. Such variations frequently affect the coloration or markings, say, of a flower or an insect, and, on account of their indifferent effect, remain stable, and produce a local variety. If such variations become more extensive, and predominate among a strain, these, when distributed over a more or less extensive area, form what is termed a geographical race. Further modifications may convert such a variety into a true species.

It is frequently difficult to determine between a species, a geographical race, and a variety, such distinction depending to a great extent upon individual opinion regarding these definitions. A true species is, however, generally defined as a physical modification. This may either be characterised by a disinclination to cross with other species of the same genus, or, if crossing takes place, it is unproductive, or when hybrids are produced—these, as a rule, are infertile among themselves. But, as these characteristics cannot at all times be proved, the definition of species is often arbitrary, because it is generally based upon outward appearances, which may be considerable, and still not have altered the internal character sufficiently to influence the sexual functions. The error into which naturalists fell when they considered the various bees as species is therefore excusable, since only the fertility among each other and of all of them has proved them to be geographical races and varieties.

The stability of certain varieties and geographical races is very remarkable, but when they are subjected to new conditions of life, whether these are climatic or dependent upon a different food-supply, &c., it frequently happens that they are affected by a new impulse of variability, and this may probably to some

extent account for an occasional reversion to the original type ; but under quite normal conditions the reversion to an ancestral type takes place without any apparent reason for it, and seemingly without any influence of external conditions. It must, therefore, be attributed to a latent heredity which from time to time asserts itself by an unprovoked impulse.

This tendency towards reversion is one of the most remarkable phenomena of heredity, which, although very erratic in its appearance, is one of the most valuable evidences for the tracing of species back to an otherwise obscure origin. Did we, for instance, possess nothing but polled cattle or sheep, and occasionally a specimen was born which developed horns, we should be justified in concluding that these animals, by selection under domestication, had lost their organs of defence, but that their ancestors at one time possessed them. In this case we are certain of it, for though the origin of some of the polled races of sheep is not known, yet the occasional birth of a lamb that more or less distinctly develops horns leaves no doubt of their original descent from a horned race.

It will scarcely have escaped the most casual observer that children sometimes do not resemble either of their parents, but are much more like one or the other of their grandparents. In most of such cases it will be found that the blood of the father predominates. Such instances are the simplest presentations of reversion, but occasionally a characteristic makes its appearance which is not found in either parent or grandparent, but can be traced back to a more remote ancestor. In such cases the characteristic in question has lain dormant in the intervening generation. It may also be frequently noticed that a male offspring resembles the maternal grandfather more in some attributes than those of his father. Such interesting occurrence is especially noteworthy, as it is also analogous, and constantly observable, with the procreation of the drone. By reversion, however, must not be understood an entire reversion to the ancestral type. This could scarcely take place under the simplest change of condition, as, for instance, a return to the same climate after the removal to another has been productive of a distinct variation.

Even if the original conditions were most completely reproduced and were to assert themselves in all their complex effects,

the variability of each generation, and, for the matter of that, of each individual, since modified through altered surroundings, would have left its impression upon the race, and thereby have become inheritable. For this reason reversion can manifest itself only in one or the other predominately aboriginally inherited direction, whilst, at the same time, newly-acquired characteristics, whether physical or mental, and which perhaps have obliterated others, may remain more or less stable.

A complete reversion is, therefore, impossible to take place, and what at times becomes observable is only a partial or indicated one, which is always modified by later acquisitions. This applies equally to species, geographical races, climatic races, or varieties. It is obvious that the further either of these are removed from the typical ancestor, the more are the physical or mental peculiarities modified, and in like measure the tendency towards reversion will be modified both in character as well as frequency.

The nearest approach to a complete reversion that is known to me, at least so far as coloration goes, is that of the rabbit, which, as most Australians well know, has in this country assumed, in a comparatively short time, a very uniform greyish fur, as nearly as possible like that of the typical wild European species. But this cannot be solely attributed to the tendency towards reversion, powerful though this tendency happens to be in this animal, but it is greatly assisted by natural selection. In a country like Australia, abounding in birds of prey, those individuals not possessing a protective colouring stand a lesser chance of survival. On the other hand, the reversion is not complete, because the fertility of this pest has enormously increased, which is probably entirely due to climatic influences, since it is found in a near ally—the hare.

The most surprising reversion known to naturalists is, however, that of the *Axolotl*—an amphibian belonging to the Salamander family, which is found in the Lake of Mexico. This remarkable animal has reverted to nearly the exact condition of the larval stages of other species of this genus, but it is sexually perfect and quite prolific. In this case the reversion has extended to a form that occurs in the genealogy of its evolution, under which it appeared in a former epoch of the earth's history.

The Typical Bee dark-coloured.

Having thus given a short account of what is understood by the law of variation, and the tendency of throwing back or reversion, I will now try to apply these laws for the establishment of my argument, that probably the Brown bee most resembles the original type from which all the known domesticated races and varieties have descended.

The characteristic of any animal which is most subject to variability, more especially pronounced when under domestication, is, without doubt, that of colour, and on this account it is, likewise, generally most affected by the tendency towards reversion. Bees form no exception to this rule, and are to a considerable extent subject to this variability, which has been proved by the easy manner in which, during a few years, the yellow colour of some strains has been increased, so that at present four and five yellow-banded, as well as, so-called, golden bees are produced. This variability would have been before now still more intensified, or, at least, would have been even more rapidly accomplished than it has been, if a direct selection between individuals, which show the specially desired colouring, could be made; but such a distinct selection for any special purpose cannot be achieved on account of the peculiar structure of the bees, which necessitates an inflation of air for the purpose of accomplishing the act of coition, and which, therefore, can only take place during the flight of the insects. The strongly-inherited inclination towards a yellow colouring, found in many strains, would almost tend to demonstrate that this was probably the colour of the typical ancestor.

However, it must not be forgotten that when a variation is once acquired it may almost indelibly imprint itself upon a strain, and, under favourable conditions, be accentuated in the descendants. The fact that a number of races and varieties are yellow-banded is, therefore, no proof that their remote ancestors were likewise yellow-banded; on the contrary, a colour variation, unless it appears as a "sport," or is decidedly detrimental to the welfare of a species, may readily be influenced by sexual selection, and become perpetuated. It must also be borne in mind that among insects colour does not always play nearly the same important part that it does, for instance, among reptiles, birds,

or mammals, since with these, under natural conditions, it is almost invariably more or less protective.

I do not mean to infer hereby that the colour is not protective with insects;—in fact, in many instances, and more particularly during the stages of development, it is so to an extraordinary extent; but this is not so universally the case as with the other mentioned classes of animals. It is to a great extent compensated by an extraordinary power of reproduction, and by other protective qualities than that of coloration; as, for instance, offensive odours, the ejection of pungent fluids, or—as is also the case with the bee—with organs of defence, which are frequently venomous. A protective colouring is, therefore, not essentially necessary to the bee, and its variability in this direction is probably but little influenced by natural selection. Consequently, I should not like to attribute the yellow colour of the Egyptian bee to a selection in this direction, although it is suggestive on account of the conformity of the coloration with the general ground tint of the arid regions which this race inhabits.

This seems to be borne out by the fact that the Cyprian bee has not modified its colouring, although the climate and other conditions of life in its habitat differ considerably from those of Egypt and Syria, whence it was undoubtedly introduced, most probably by the Phœnicians; but, on the other hand, its pugnacity and greater strength of flight must be attributed to natural selection, and are the result of an adaptation to altered surroundings. If, therefore, colour variation with these bees cannot be considered protective, and as resulting from natural selection, it must be ascribed to a latent disposition which, under certain not yet explainable external influences, has developed to a considerable extent in certain varieties. This disposition towards the coloration of the abdominal segments is found to pervade nearly all varieties of the Brown bee, and may even be occasionally observed amongst the most uniformly-coloured races, *e.g.* the Heath bee. In the Nether-Austrian variety it is a common occurrence, as also in the Attic bee. In this latter, in fact, it is so pronounced that the Attic bee is, by some, considered identical with the bee found in Tessin, which is very closely allied to the Ligurian. Such a moderate disposition towards coloration in some varieties, and the more distinct one in others, seems to point towards a variability in that direction

rather than away from it, although, perhaps, it may be thought justifiable to consider it equally in favour of an opposite view. If, for instance, it were admitted that the Athenian assertion be true that all bees originated from Mount Hymettus, the question might be readily solved.

As the Attic bee stands about half-way between the Brown and the Egyptian bee, both in colour and in size, it could be said that the variation in the direction of an increase of the yellow colour went together with a diminution of size; and, on the other hand, that the elimination of the red colour occurred together with an increase of size, and in this way the variability had been compensated. The original communal type, however, must have originated long before the bee now inhabiting Mount Hymettus existed, therefore such a commonplace explanation will not stand a scientific test.

It has been pointed out that when once a variability occurs, a continuation of the conditions of life under which it originated tends to increase it, and under natural surroundings to fix it, thus forming a distinct variety. Under methodical sexual selection, it stands to reason, a variability can be increased at a considerably more rapid rate than under the most favourable natural conditions, and it may, moreover, be maintained under conditions of life quite different from the normal ones amongst which it first appeared. This kind of selection, however, must be rigorously continued, in order to counteract the influence of any external effects to prevent what is usually called deterioration, which, perhaps, may more justly be called variation in a different direction, or adaptation to the altered surroundings. The variability of any organism is subject to so many imperceptible influences, and often diverges into such extreme ramifications, that the character of the original stock may become unrecognizable.

The fact that many varieties of bees inherit a yellow colour is no proof that the ancestral type was of a yellow colour, or that the Egyptian race comes nearest to this type. This is, however, only a negative argument, and is not in itself sufficient to establish the claim of the Brown bee to a nearer relationship with the original type than the Egyptian. A more positive argument may be adduced from a study of their tendency towards reversion, which is a universally acknowledged principle of inheritance.

It is a well-known fact that the Ligurian bee, when brought away from its original home, is, to a certain extent at least, subject to colour variation. For the matter of that, a considerable difference exists among the various strains found in Italy, and, as mentioned before, those found in the Canton of Tessin are rather dark, leather-like in the bands, whilst the more southern are of lighter yellow tints. Now such local variations, whilst occurring in their native home, appears frequently in a more pronounced manner when the Italian bees are removed from their original habitat. Queens which are unquestionably purely mated will occasionally produce offspring differing considerably in colour; this is noticeable in the same hatchings sometimes, and between the different hatchings of the same season, and very often between the hatchings of successive seasons. No doubt this is largely due, in many cases, to individual variability, and is not always, or not entirely, attributable to altered conditions of life; still, ever since the Italian bee has become the favourite race, it has been found necessary to renovate the blood at times to prevent deterioration, or for the purpose of keeping them up to the required standard. If this renovation of blood is not attended to, the loss of the high colouring frequently results, and in some cases is soon perceptible. This deterioration may probably be due to altered conditions of life, but it shows, to a certain degree at least, the instability of the colour variation, and seems to indicate this to be a subsequently acquired character, which the typical ancestor did not possess.

Still stronger evidence than this is the tendency towards a dark colour, which is nearly always the case when a stand is left for some time without the infusion of a new, well-coloured strain, or without careful attention being paid to selection. This is generally more noticeable in a large stand than in a small one, and must be accounted for by the fact that a greater mixture of blood takes place between, say, fifty colonies, than between six to ten. In the latter the descendants are more closely related to each other than in the larger number, and, consequently, will remain more uniform on account of the lesser chance of the effect of variation asserting itself in any particular colony. On the other hand, in a large stand all colonies rarely descend from the same swarm, and even if it were the case, their relationship would have

become collateral to a far greater extent than in a small stand, and the effect of individual variability would make itself more felt.

If a large stand is examined, which we will presume has been descended from a first-class coloured Italian strain, and to have been kept unmixed for several years and allowed to increase by natural swarming, it will be found that nearly all colonies vary more or less in colouring, and probably more still in other characteristics. No doubt some extremely fine-coloured colonies will be met with, but the greater number, as a rule, do not come up to the desired excellence. Some cases may perhaps be noticed that are not much better than a cross between a Brown and an Italian bee, and, on the whole, a tendency towards a dark colour is perceptible.

It may be advanced that, as the Ligurian bee is a secondary race produced by a crossing of the Brown and the Egyptian race, the Ligurians are in reality hybrids, and that consequently it is not a very weighty argument to apply the test of reversion upon these bees, as hybrid blood is more subject to reversion than that of a purely-bred variety. Admitting this fact, it must, however, be remembered that the deterioration of the Ligurian bee, which is the same as reversion in this instance, is always stronger towards the dark colour than towards the light, whereas in a true half-blood there should be no greater tendency in the one direction than in the other.*

Moreover, as has been shown, the disposition to vary in the direction of coloured bands prevails among all varieties of the Brown bee, and must, therefore, be considered an innate characteristic of its organisation, and consequently, according to the principle of the frequent accumulation of a variation, should rather assist than check the perpetuity of the yellow bands. That such is at times the cases is shown by the crosses between the Brown and the Ligurian bees, which when allowed to breed

*The reversion to an ancestral type must not be confounded with the reversion of a half-blood to a characteristic possessed by one or other strains of the cross. Such a reversion is of common occurrence, but it has not been observed to happen after many generations, and certainly ceases to appear beyond the twentieth generation. This kind of reversion, therefore, cannot apply to the Ligurian bee, which was produced at least two thousand years ago.

among themselves revert in time to the colour of either of their original parents. When this takes place, the appearance of the yellow bands must have been assisted by the natural variability in this direction, which is the characteristic of the Brown bee.

Seeing that the disposition towards coloration occurs in the brown race and that such disposition occasionally asserts itself, the inclination of the Italian race to assume a darker colour, caused undoubtedly by a tendency towards reversion, cannot be due to its more immediate ancestor, but must be attributed to an older inheritance from the original type, which therefore was probably a uniform dark species. It has to be borne in mind that a complete reversion of every characteristic at the same time can never take place, and that even colour, although it is more likely to reappear in perfection than any other characteristic, rarely reverts entirely to its former tone. On account of this it is impossible to give more than a general expression regarding the colour of the original type. Considering, however, that all domesticated bees belong to but one species, which, so far as is known, occurs in two primary geographical races, the Brown and the Egyptian, the tendency towards a dark coloration in their crosses, under certain conditions, seems to me strongly in favour of my suggestion.

NOTES ON THE ORNITHOLOGY OF OXFORDSHIRE, 1894-1895.

BY O. V. APLIN, F.L.S.

THE delay in transcribing these notes, as well as the paucity of the notes themselves, arose from my absence from England during the greater part of 1895. Where no other locality is mentioned, the notes refer to the parish of Bloxham.

JANUARY, 1894.

The weather in the early part of the month was very severe. The 4th was the most unpleasantly cold day we had experienced since Jan. 18th, 1881. The east wind was painfully cutting, and the dust terrible; about an inch of snow fell at night. On the night of the 5th the thermometer went down to 6° in a sheltered garden, and must have gone to zero down by the stream. It thawed on the night of the 8th, and the 11th was very mild.

2nd. Two Grey Wagtails seen by my nephew by the brook between Bodicote and Adderbury. This bird was fairly plentiful before the frost of 1890-91, and I believe was at that time established as a breeding species in the district; but it has been very scarce since.

11th. The Rev. J. Goodwin reported large flocks of Bramblings at Milcombe lately. In the frost some came into the stack-yards, and some were shot. Wyatt, the taxidermist at Banbury, had one or two. Many Fieldfares were shot in the frost—thirteen at a double shot. Redwings were very scarce. I had not seen more than two or three all the season. Mr. Warde Fowler, writing on the 19th, said:—"Like you, I see only Fieldfares here now; no Redwings. But just before the frost there were vast numbers of Redwings in the meadows here (Kingham). As soon as the snow was on the ground both species vanished utterly."

16th. At Sarsden I learned that Hawfinches breed there regularly. The "white" Moorhen, sent to the Zoological Gardens thence some years ago, was of a silver-grey colour. Another similar bird occurred about eight years ago, but wandered in a frost, and was probably shot. Red-legged Partridges are numerous there now, and I handled a remarkably heavy young cock this day. I saw a Rook's nest, built last autumn; the young were actually hatched, but probably perished in the frost. Mr. Warde Fowler about this date reported a female Goosander shot on Port Meadow on the 15th.

FEBRUARY.

4th. Warm stormy weather has prevailed from the third week in January.

9th. Some Partridges still unpaired.

11th. Furious gale from the S.W. at night.

14th. Blackbird opened song.

15th. Chaffinches singing.

17th. Rain from 11 p.m. last night to same time to-night; the best rain we have had for two or three years.

19th. I examined, at Mr. Wyatt's shop, a pair of Long-eared Owls, shot at Cornbury Park a month ago.

26th. Mr. Fowler about this time noticed very many Redwings in Christ Church Meadows, Oxford, and one Brambling among Chaffinches.

MARCH.

7th. Had news of some Gulls seen on the 5th here. The second week in this month was very wet and stormy.

17th. Saw a Chiffchaff.

18th. Several pairs of Peewits on the fallows.

26th. Flocks of Fieldfares now, and some Redwings.

APRIL.

3rd. My nephew watched a pair of Nuthatches building; they brought the material from the dead limb of an oak. Three days later they were dispossessed of the hole by Starlings. There was no mud round the edges of the hole, which I saw.

6th. Saw a Barred Woodpecker at Bodicote, and again in this parish the next day.

17th. Saw a Grey Wagtail, in spring dress, in the brook near Wickham Mill.

The season, as shown by the state of the fruit-blossom (very fine this year), and the foliage generally, was extremely forward in the middle of April; according to some old men it was the most forward they remembered. The most remarkable ornithological event of the season was the early arrival of the Cuckoo. It was heard by a competent observer at Milcombe about 7.30 a.m. on April 1st, and the same person saw two birds the next day. An old farmer and several labourers heard it at Tadmarton on the 2nd, as the former truly said, about three weeks before its usual time. Curiously enough it is said, locally, to come to Tadmarton first. Another farmer here reported it on the 5th, and a dozen people heard it at Bloxham on the 8th. I was talking this over with some of the village people, when one of them remarked, "But do he ever go away?" "Well," I replied, "you never see him in the winter, do you?" "No," he answered, "he be the hawk, but he calls cuckoo in the spring." Another old worthy opined that the Cuckoo's voice got broken later on, because he "couldn't get no eggs to clear it!" I may add here that the Cuckoo continued in full song up to June 20th.

21st. I put a Carrion Crow off her nest; she sat until I was close to the tree, and was doubtless incubating. The next day I saw, in a spinney here, a nest with the remains of at least three eggs, which had been knocked out of a tree.

22nd. Saw some Fieldfares.

28th. A Linnet's nest with four eggs in Milcombe gorse, which is early.

MAY.

5th. Saw a pair of Common Sandpipers in Port Meadow, Oxford, and three near Eynsham the next day.

7th. Mr. Fowler and I observed the Reed Warbler at Parson's Pleasure, Oxford, and a Lesser Redpoll, with a beautifully bright red cap, which came down to drink as we stood on the bridge; we could see no red on the bird's breast.

13th. Saw a Jay in a spinney on the hill here, and a noisy pair in an ash-holt near Milcombe four days later; it is quite uncommon to find Jays breeding in the small spinneys about here.

17th. Saw a male Red-backed Shrike on the telegraph-wires at Wickham.

The Nightingale, which has been appearing again in small numbers in this district the last few years, has been observed this month at Bodicote (two birds), Adderbury, Milcombe, and South Newington.

I think a good many Swallows perished in the cold and stormy weather this month.

Mr. Fowler saw a Black-headed Gull, with full dark hood, in Port Meadow this month.

JUNE.

17th. I had news from Mr. Fowler that the Marsh Warbler had come back to the same place it haunted last year.

I heard the Chiffchaff in song continuously up to July 12th, but chiefly very early in the morning in the latter part of the time, and, exceptionally, as late as July 27th in the daytime. Its song ceased then, but recommenced in the last days of August.

30th. I could see no Crested Grebes on Clattercote Reservoir, the water having been very low all the season; there were a few Coots, with young varying from half-grown birds to downy chicks, and two young broods of Wild Ducks.

JULY.

13th. At 11 p.m. I heard the Grasshopper Warbler singing between Hook Norton and Milcombe.

AUGUST.

9th. A Wheatear in immature plumage was shot near Banbury about this date.

Swifts remained rather late. Many were screaming loudly on the 23rd, and a great gathering of them was seen by my brother over his garden at Bodicote. That and the next day were cold; but the Swifts were in full force on the evening of the 26th, and I saw a few on the 27th and 28th. The summer, on the whole, was wet and ungenial.

16th. Mr. Fowler saw an immature Ring Ouzel in a mountain-ash tree in his garden at Kingham.

22nd. Early this morning a shepherd saw two grey Wild Geese, with some Swans and cygnets, on the Sorbrook below Broughton; they flew away on his approach.

SEPTEMBER.

6th. Examined, at Mr. Wyatt's shop, a very small Golden Plover in the flesh, which had been shot in a ploughed field at Wroxton. Axillaries white, marked, on some of them, at the tips, with light dusky brown. This is a most unusual date for this bird to visit Oxfordshire.

9th. Being at Deddington about 8 p.m., I heard Whimbrel passing over, high up.

21st. A little flock of twenty or thirty Meadow Pipits passing over, going south, at no great height, about 5.15 p.m. 26th. A flock of about one hundred at 5 p.m. were going S.S.E. This line of flight would take them into the Cherwell Valley, down which they very likely proceed. I know the flocks get into the valley, but a little later in the year than this. At this season the birds seem to move from the turnip-fields at evening and fly onwards; probably they fly all night, and pitch in another turnip-field at dawn. Meanwhile their place has been taken by others.

28th. In the afternoon (dull with a light N. wind) I distinctly heard the short clear whistle of a Ruff or Reeve, "fü-whit" (there is hardly any break between the syllables) from a bird passing over close to this village.

30th. A fully moulted Pied Wagtail, which passed this sunny morning on the house-roof, sang very prettily at intervals. I had never heard this bird sing in autumn before.

OCTOBER.

13th. Grey Wagtail appeared here; Mr. Fowler saw them at Kingham the day before.

20th. Hardly any Swallows or Martins were to be seen after the 8th, but to-day I saw about a dozen Martins feeding over the village, and there were young birds still in a nest. The weather was very cold in the early part of the month.

22nd. Saw two or three Martins; a very sharp frost the night before. A pair of Swallows built a nest this year in the passage of the "Carrier's Arms" public-house, Adderbury, and, notwithstanding the number of people going in and out, reared their young in safety.

29th. A flock of about a score of Fieldfares appeared.

NOVEMBER.

2nd. Redwings arrived.

5th. A Bittern, shot at Headington on the 3rd, was found by Mr. Fowler in Oxford Market.

There was much rain from the latter part of October onwards, and by the 15th of this month we had the biggest flood we have experienced for fourteen years. A great many Gulls visited this district. Mr. Wyatt had four Kittiwakes in the immature dress, in which stage they are, I believe, not common on the east coast. Mr. Bartlett had nine Kittiwakes (seven of them immature), and two young Herring Gulls.

17th. At Oxford Mr. Fowler and I saw a few Redpolls in Christ Church Meadows.

18th. We saw a Barred Woodpecker at Beckley.

DECEMBER.

6th. Mr. Bartlett showed me a Knot in adult winter dress, shot recently at Tussmore. It is a most unusual visitor to Oxfordshire. Also a Crossbill, an adult male, of a very deep red mixed with clear yellow, the rump being of the latter colour. It was killed in August at Banbury.

21st. Mr. Darbey wrote:—"I had to-day sent me from Witney a Barn Owl, a very fine bird indeed; and instead of the breast being white, or buffy-white with dark spots, it is a deep buff, and the spots only faintly showing. I never before saw an English Owl with such a deeply coloured breast."

1895.

I left England on the 28th December, 1894, and did not return until the 28th June following. I therefore missed the

opportunity of making any notes during the long and terribly severe frost which prevailed in the early part of this year. A few notes came into my hands on my return. Two Little Auks were picked up in an exhausted condition in January. One in Port Meadow, near Oxford, for a note of which I am indebted to Mr. Fowler; the other, found at Charlbury, I examined in Mr. Coombs's shop at Chipping Norton.* Mr. Coombs also showed me a Great Grey Shrike, killed at Hook Norton in the winter of 1894-5, and two of four Spotted Woodpeckers procured in that neighbourhood during the same period. About the first week in February, as Mr. Melliar Foster-Melliar informs me, five or six Wild Swans (probably Whoopers) came to their old haunt, just above Bestmoor in the Cherwell valley, near North Aston. One of the birds was described as being in the brownish dress of immaturity. Mr. Fowler tells me that a Waxwing was seen by a friend of his on Headington Hill, Oxford, in the early part of the year. Two Snow Buntings were shot, and another seen, near Crowmarsh on the 4th of February. When first observed (on the 2nd) they were working about, sometimes among the grass at the sides of the road, and sometimes among the droppings on the road. Mr. W. Newton, in a letter communicating these facts to Mr. Fowler, added that he had a Snow Bunting (from his description, an adult bird) shot at Crowmarsh Battle about twenty years ago, and another shot eight or ten years since. Some Snow Buntings also occurred in Berkshire, but so close to our borders that a notice of them comes fairly within the scope of these notes. They were seen by Mr. Fowler just under Cumnor Hurst on the 6th and 7th. He writes that they were "so tame that they came right up to my feet. . . . The thermometer that morning was 3° below zero." Being out of England I was unable to make any observations on Chaffinches at the end of the winter. But I have a suspicion that the Chaffinches which spend the winter here leave us about the end of January, or in the first days of February. Their places are taken almost immediately by others; at the same time I have more than once remarked that the species had almost entirely disappeared for a few days just before they were to be seen in their usual early spring abundance.

* Since writing this I have heard of three picked up about the same time at Henley-on-Thames.

I hope to make further observation before definitely stating the fact.

JULY.

9th. I went to Kingham to see the Marsh Warbler's nest found by Mr. Fowler. Four eggs had been laid. The next day Mr. Fowler reported that two young were hatched.

AUGUST.

16th. A few Swifts were to be seen on this date, but none after.

SEPTEMBER.

I was sitting under a hedge one day, watching a covey of Red-legged Partridges running in straggling order over a bare stubble, and talking to an old labourer who is very keen on such subjects, when he told me he remembered the first appearance of the bird in this neighbourhood. The first he ever saw was sent from Worton to the late Dr. John Colegrove, of Bloxham (with whom he was then living), over forty years ago. The doctor brought it into the kitchen to show them, and then had it stuffed. The species was said to have been introduced at Worton by a Frenchman (?), who then lived at Upper Worton House, and who imported some, which he kept in confinement for a time, and then turned out. About that time, according to my informant, they began to preserve the game about here.

1st. Blackbird singing faintly. This is the only occasion on which I have heard it sing in autumn; but it was a glorious day, one of the most delicious I have experienced in any country.

18th. A flock of about fifty Grey Geese were reported as flying across the village, and more on the 20th. They were going N.E., which is unusual at this time of year. The appearance of Wild Geese flying over, N.E. and S.W., in spring and autumn respectively, is perfectly well known to some of the inhabitants of this village, the local idea (which is probably a tradition) being that they come "out of the Fens." I have for a long while suspected that we are occasionally visited by Greylag Geese in early autumn, but apparently they very rarely alight here.

I bought (28th August) at a sale of the furniture and effects of an old house—long inhabited by a man who horsed the coaches, and afterwards by his widow—called Bury Barns, Burford, a case containing a male pure-bred *Phasianus colchicus*, a pied male of the same, a Blackcock, and a Golden Plover. It is extremely

likely that all these were local birds. Like everything else in the place, the specimens were very old. The only other bird in the house was a Short-eared Owl, but this had a label still on the case, stating that it was shot on Kennel Fields, 21st October, 1856.

From the 23rd September until the 21st October I was again abroad.

NOVEMBER.

1st. A flock of Fieldfares.

8th. Redwings seen.

16th. I flushed a Woodcock from an upland grass-field close to this house; it rose from the first of some furrows which lay broadside to the wind then blowing, the rest of the furrows in the field lay at right angles. The first half of the month was wet, and we had three gales, the last on the 15th and 16th, from S.W.

DECEMBER.

2nd. I saw a Peregrine Falcon near the village, and again a few days later in the meadows. It appeared to be an adult male.

NOTES AND QUERIES.

Nesting of the Dunlin in Wales.—I know not whether it is the aim of Dr. Bowdler Sharpe to embody comparatively recent ornithological discoveries in his new work on 'British Birds,' but in his latest issued volume—the 3rd—the author writes of the Dunlin as follows:—"nothing is known of its nesting in any part of Wales." From this it is manifest that Dr. Sharpe has been neglectful of the stores garnered by 'The Zoologist,' seeing that in the July number for 1893, at page 269, there is a reference to the Dunlin having been found breeding in Cardiganshire; while, again, in the July number for 1895, at page 275, there is another reference to the species which had been discovered nesting in Merionethshire. In his preface to the first volume Dr. Sharpe alludes to "a record of the distribution of birds throughout the British Islands," as being "a very important subject;" no one will deny this, or that 'The Zoologist' has for many years been regarded as the most suitable repository for current matters of interest relating to British Ornithology, and, as such, of presumed inestimable value to those who issue books on the subject. Nevertheless, it is essentially with a view to prevent, if possible, further dissemination of what is contrary to fact in the present day that I venture to send this note.—H. S. DAVENPORT (Skeffington, Leicester).

Song of the Icterine Warbler.—I am glad that my remarks on the song of the Icterine Warbler have called forth a note on the subject by so experienced an observer as the Rev. Charles H. Benson. His note is very interesting to me, especially with regard to a remark of mine that “perhaps the examples of *H. icterina* I found spending the breeding season in Africa were less imbued with spirit and energy than those which go further north in spring—it is quite possible.” Mr. Benson states that although he heard the Icterine Warbler at the Hague singing a remarkable song, which he thought fully equal to that of the Nightingale, yet on subsequent occasions, when he encountered the bird again in two other localities, he did not hear “the sweet song,” but heard it sing as described by Seebohm in the passage which in my paper I quoted as to my mind the best description Seebohm gave of the song. It would appear then, from Mr. Benson’s observations, that the Icterine Warbler in Central Europe does not invariably give utterance to that song, the sweetness and melody of which have ravished the ears of some of those who have written about it. I certainly never heard this sweet song in Africa, although I have listened many times to the bird, and made sure of the singer more than once by shooting the specimen. Personally I never heard any bird utter notes to equal the finest of those of the Nightingale in their own peculiar quality; or any bird whose song resembled that of the Nightingale save the Marsh Warbler, and sometimes, more remotely, a very fine Song Thrush. But as, among Nightingales, there are some which are remarkably fine and brilliant singers, so there are others which are comparatively poor performers; and it must have been indeed a wonderful melody which, according to Hewitson, equalled, if it did not surpass, that of the Nightingale, unless Hewitson compared it with one of little merit. That the song of the Icterine Warbler, in a locality where it sings its best, would have, even to my ears, some resemblance to that of the Nightingale is very likely, for Seebohm speaks of it coming nearest to that of the Marsh Warbler, and a very wonderful song it must be if it does so, unless it wants all the Mocking-bird part. I have no wish to belittle the song of the Icterine Warbler, but rather to give the facts of my own observations, and once more to draw attention to the probable fact that birds inhabiting more or less widely separated localities in the breeding season (and therefore, whether resident or migratory, probably of different races), may differ in their song and habits. That birds do undoubtedly vary in the quality and the manner of delivery of their song in different localities seems certain. For one instance I would refer to Seebohm’s remarks on the Crested Lark, Mr. Dixon’s notes (which he quotes), and my observations on the same species (p. 127), which agree very much with Mr. Dixon’s, made in the same country. Seebohm apparently knew the Crested Lark best in South Holland and Germany. I have hopes of hearing the Icterine Warbler again in the north of Europe next month, when perhaps I shall be treated to an exhibition of its finer song.—O. V. APLIN (Bloxham, Oxon).

Sussex Heronries.—It will be of interest to students of the Sussex avifauna to learn that the surmise expressed (p. 100) in reference to the breeding of Herons at Iden Wood, near Rye, has proved correct. Iden Wood is situated on the right of the highway from the village to Peasmarsch, and is about 100 acres in extent. On May 27th I found eleven nests placed in fine old oaks at an average height of about thirty-four feet. Four of the nests were empty, the young having left a few days before, as the keeper informed us; while one contained three eggs, and the rest had young mostly ready for leaving the nests. I found on climbing to the nest containing eggs, a Ring Dove's nest built immediately underneath and also containing eggs. The Herons have visited this colony for four or five years, but do not seem to have increased in number. I much fear that some of the nests have been disturbed, notwithstanding a declaration to the contrary from the keeper. The colony is favourably situated, and if protection were extended to its occupants it would no doubt speedily become one of the largest in the county. There is also a small settlement of Herons, of which I do not remember to have seen an account, in the Heron Wood, near Appledore, the property of Dr. Bernard.—W. RUSKIN BUTTERFIELD (Stanhope Place, St. Leonards-on-Sea).

On the Specific Validity of Brünnich's Guillemot.—As the beautiful plates of this bird in Lord Lilford's 'Birds of the British Islands' have only recently been issued, and as I have not seen any remarks on the subject in hand in any periodical devoted to Ornithology or otherwise, I should like to say a few words on the matter. I am the possessor of two out of the three specimens which were taken in this county (Yorkshire) during the exceptional winter of 1894-95, and examined all three in the flesh. Moreover, I have spent a great part of my time by the seaside, often with my gun, and always with my field-glass, and have examined a great number of Guillemots at various times. The facts recorded have come under my own personal observation; my conjectures may be right or they may be wrong; but if they lead to any elucidation of the difficulty I shall be glad. In my humble opinion, Brünnich's Guillemot is not a good species. I have examined many Guillemots that have been shot and washed ashore on the Yorkshire coast, have measured them, and noted their points of difference, and have come to the conclusion that they vary *inter se* to an enormous extent, both as regards size, colour of the soft parts, length and depth of bill, absence or presence of white line thereon, &c., and that no hard and fast line can be laid down as to where this species begins, and that ends. If a large series of skins were examined taken from birds frequenting the northernmost latitudes to which this species goes, right away down to the most southern point that they frequent, I believe that every gradation would be found between them. Lord Lilford himself, in his account of *U. bruennichi* in the last issued part of his work, says:—"I am

inclined to consider it as merely a large form of Common Guillemot; perhaps I should express my meaning more correctly by saying that I look upon our Common Guillemot as a local race of the species of which I am treating." On the other hand, Prof. Newton, to whom I wrote shortly after obtaining my specimens, replied that he considered Brünnich's Guillemot a good species, and states that the Guillemots inhabiting the Baltic are stated to be larger than those bred on the North Sea and Atlantic coasts of Europe, and some such bird I have, which I obtained about the same time as the two Brünnich's; it has a bill somewhat similar to Brünnich's, only the white line is fainter, but the tarsi and toes are those of the Common Guillemot. Then again, as I mentioned in 'The Zoologist' (1895, p. 71), I obtained what to all intents and purposes was a Ringed variety of Brünnich's Guillemot. (If the Ringed bird be only a variety—but I am very much inclined to think that it is as worthy of specific rank as the Brünnich's, and at any rate where I have had the greatest opportunities of observing it—at its breeding stations on the Yorkshire coast—it breeds true.) Unfortunately this bird was far too much damaged to be preserved *in toto*, and I was very busy at the time preserving my Brünnich's Guillemot and some Little Auks, but I managed to save the head and neck. The bill was short and stout, and the white line most distinct. The bird was very black on the upper parts, the white on the throat ran up to a point, and the tarsi and toes were of the Brünnich type. Now I have never heard of, or seen, a Ringed variety of Brünnich's Guillemot; but surely if the Ringed bird is only a variety of the Common, how comes it that there is not a Ringed variety of the at any rate closely allied Brünnich's bird, which "breeds in countless thousands in Greenland, Spitzbergen, and Novaya Zemlya" (Lord Lilford)? Structurally I can find no other distinctions between Brünnich's and the Common species than can be found in a large series of the latter. These are all interesting points; but probably, as pointed out by Lord Lilford, there is only one species, Brünnich's Guillemot, the others being local races. There are several points in the life-history of the Guillemot that require clearing up, apart from the question, what becomes of the immense hosts of northern birds after the breeding season? I have never been able to ascertain the simple fact as to the exact manner in which the young are conveyed down to the sea from the cliffs, though I have often tried to do so. I have seen with my glass the young one drop from the old bird, but as to how it was carried I cannot say. The cliff-climbers believe that the young are taken down either on the backs or in the beaks of the old ones; but, so far as my experience goes, this is certainly not the case on the Yorkshire cliffs: the young seem to be tucked up somehow underneath the old one, but as to the exact *modus operandi* I am still ignorant. It seems curious that, with the numbers of birds breeding round our coasts, and the ever-increasing numbers of

intelligent observers, we should still be in the dark as to exact facts, but so it is. Guillemots are found on our coasts very early in the year in nuptial dress. On January 20th, 1893, I saw several birds in full summer plumage, swimming close to my boat, a few miles off Scarborough.—OXLEY GRABHAM (Westfield House, Flaxton, York).

[As to the mode in which the Guillemot brings down its young from the cliff, see Zool. 1875, pp. 4342 and 4666.—ED.]

Nesting Habits of Cormorants as observed in Co. Donegal.—On May 9th I visited a breeding place of the Great Cormorant, or “Scart,” and another of the Green Cormorant, or Shag (*P. cristatus*), about 300 yards apart, and a few miles from here. The breeding-places of both species are on low cliffs, about sixty feet, and less, vertically above deep water. The Green Cormorants, or Shags, occupy those at the mouth of a cave, as is their habit. The nests are placed in several instances only three or four yards below the upper edge, so that one can sit and watch them, with an opera-glass, in perfect leisure, for they never dream of leaving their nests. The two colonies are close together, but one consists almost wholly of “Scarts,” the other largely of “Shags.” The first thing that struck me with surprise was the appearance of Jackdaws on the scene. They had their nests in deep narrow fissures, and were on terms of perfect amity with the Cormorants. Several pairs of Jackdaws went in and out of these fissures, which were in some cases only a few inches from the nests of the Cormorants. Again, a pair of Ravens certainly breed close by, from their ceaseless din all the time I remained in the neighbourhood. This din is not the deep croak uttered by a Raven flying leisurely overhead, or at a season other than the breeding season. It is an angry, quick cry, and not nearly so deep. The Ravens went for the Jackdaws, but the latter eluded them easily, and considered it mere pastime. I imagine the Jackdaws are useful scavengers, and are tolerated for that reason. The Ravens probably fear no foe, but they are on good terms apparently with their sooty aquatic neighbours. The nests of the Cormorant are constructed, as is the case with many another bird, of the substances most easily obtainable. In this case the outer framework is in every case made of the dead wood of the burnt heather sticks. Burning heather to obtain young growth for pasture is an infamous practice which has reached a maximum on the mountains above these cliffs. The nests were lined also in every case with mosses gathered from the hills above. Indeed, when the nests are within a few yards of these materials, it would be rank stupidity to descend to the sea and after some difficulty obtain an inferior material to be carried *up*, not *down*. Some of the nests (of either species) were just completed. The next one might have eggs, while in many others the young were hatched and crying like little chickens. This irregularity in their breeding date may be compared with that of the individual in its incubation. The tribe

has the tendency of its component parts. I have found in a "Scart's" nest a fresh egg, one nearly hatched, and a couple of young birds. This was at Horn Head. While I watched, now and then a well-trained husband flew up with a fish, which he instantly placed in the beak of his mate, and which as instantly disappeared. They were brown fishes (rock-fish) about five or six inches long. I could discern no difference in the plumage of the male and female Shag. The female sits brooding with head and neck bolt upright, and when not fishing the male generally stands on the edge of the nest by her side—that is, on the assumption that it is the female that hatches. The Great Cormorant did not appear to me to be quite so uxorious, but hatched similarly. The notes of the Cormorants on their nests are curious: there is a deep note, not pitched much lower than that of a Guillemot's call to its young; this is, I think, the Shag's note of alarm. Then there is a wondrous and appalling deeper note which issues from the male Cormorant's throat—a warning of danger, but which always remains unheeded; it is so deep that it quivers and vibrates through the air like an organ tone, and I do not know any bird that can beat it—though it is not music. Another note which emanates from the Cormorant colony is an exact imitation of a sheep's bleat, except that it is rather too deep; to the best of my belief this came from the Green Cormorant, for I never heard it when visiting nesting places composed altogether of Great Cormorants, like that at Breaghy Head, near Horn Head. Lastly, the "intolerable stench" often referred to as belonging to these birds' nests was absent here. I have noticed it at Breaghy, where the nests were of seaweed, clumsy things compared with these, which are fairly tidy. The stench may come from the decomposing seaweed, which is not seen here. The Jackdaws may also be helpful in this direction, which is distinctly an improvement. — H. CHICHESTER HART (Carrablagh, Portsalon, Letterkenny).

Unusual Abundance of Golden Plover near Bath.—I was agreeably surprised, when on Lansdown this spring, to see large numbers of Golden Plover, *Charadrius pluvialis*. Every winter small flocks may be seen in the above locality, but I have never before noticed them in such abundance in this neighbourhood. I should think there were over four hundred birds, and seen on the wing, on a sunshiny day, it was a most beautiful sight.— C. B. HORSBRUGH (4, Richmond Hill, Bath).

A Plea for the Jay and Magpie.—In a recent notice in the 'Saturday Review' of a new ornithological work, the reviewer, after lamenting the decrease in our country of most of the more interesting birds, to make room for a monotonous plethora of game, remarked that the Jay and Magpie were getting very scarce, and he hinted that they were no particular loss, except from the point of view of the picturesque. A few lines further on he regretted the great and increasing abundance of Wood Pigeons. I have not the remotest idea who the writer of the review in question may be;

but, taking him from his writing to be a field-naturalist of some experience, the wonder in my mind is that it did not occur to him to connect these two facts together, because they seem to me to be cause and effect. The Jay and Magpie are great hunters of hedgerow and plantation, and have a keen eye for eggs, as every one knows. They are not seen much on the ground, but in hedges, bushes and low trees continually. Except in the acorn season, I hardly remember to have seen Jays on the ground. But from the places they frequent, the big white eggs of the Pigeons, placed conspicuously (from above) on a flat, dark-coloured platform, catch the eye of a Jay or Magpie at once. Indeed I have long regarded these two birds as the natural and chief check upon the Wood Pigeon. The Turtle Dove, whose nesting arrangements are similar to those of the Wood Pigeon's, is very much on the increase in this neighbourhood. I counted, a little more than a month ago, nearly thirty Wood Pigeons' and Turtle Doves' nests of last year (they are too flimsy to last much longer) in a small piece of a wood of certainly not two acres. It is not unusual to see thirty or more Turtle Doves rise from an acre or so of tares, and this at the end of May—not in autumn, when they are collecting to leave us, and when much greater numbers may be seen together. Blackbirds and Thrushes, again, are a great plague to gardens in some districts. I do not think that we should suffer from an excessive number of these, or of Pigeons either, if the Jay and Magpie, now pitilessly, and senselessly, harried towards extinction, were allowed to perform their legitimate function in the complex system of nature. No doubt they do at times what we are pleased, with a sad want of judicial impartiality, to call harm; but I do not think that, even on that account, too keen preservers of game are justified in relentlessly persecuting Jays and Magpies to the death because at times they expect their wages.—HENRY H. SLATER (Thornhaugh Rectory, Wansford, Northamptonshire).

Nesting of Short-eared Owl in Essex.—I have been much interested in finding a Short-eared Owl's nest on my island (Northey, Maldon), with eleven young ones, three out of the nest, two good snappers, and two just hatched, the rest graduated in pairs. Although I write "nest," there really is none, properly so called, the young being on the bare grass against a tussock. My man said two of the eggs were unhatched on May 26th. There are eighteen colts on the marsh, and the way the old Owls "go for" these my man says "is a caution," as good as any dog he ever saw!—EDWARD A. FITCH (Maldon, Essex).

Great Skua and Black-throated Diver in Somersetshire.—I have seen a Great Skua, *Stercorarius cataractes*, which was killed by Mr. W. Haselem at Berrow, near Burnham, in Dec. 1883. This, so far as I am aware, is the first recorded occurrence of this bird in Somerset. A Black-throated Diver, *Colymbus arcticus*, immature, was killed near Burnham on

Dec. 9th, 1895, and is in the possession of Mr. A. B. Percival, of Somerset Court. On Oct. 11th, 1893, a Sabine's Gull, *Xema sabinii*, in immature dress, was killed between Burnham and Steart Island, and is now in the collection of Sir O. Mosley, of Rolleston Hall, near Derby.—H. S. B. GOLDSMITH (King Square, Bridgwater).

Notes from Hastings.—We have had the usual spring visits of Hoopoes in this neighbourhood. So far as I have been able to ascertain, some half-dozen were here during parts of April and May. I had hopes that a pair or two would remain to breed, but I fear the birds that escaped the gunners have left us. A year seldom passes without bringing a few Hoopoes to our shore, and Mr. Howard Saunders tells of six being shot in one week by the Earl of Ashburnham's head-keeper. Since writing a note on the Hawfinch in 'The Zoologist' of last year (p. 272) I have heard of several nests of this species in the neighbourhood. Stock Doves appear to have quite forsaken the cliffs to the east of Hastings, where in 1879 Mr. J. H. Gurney frequently saw these birds, and thinks three or four pairs nested between the glens of Ecclesbourne and Fairlight. Mr. Borrer is of opinion that the species has of late years increased in this county. During the latter part of April very large numbers of migrating birds passed along the coast, and several times I heard the clamorous multitudes passing over the town late at night. In the early spring I paid daily attention to the migratory movements of the Pied Wagtail, and I was fortunate enough to see parties of birds arrive on many occasions during March and the early part of April. The birds usually reach the shore just after daybreak in the manner described by the late A. E. Knox, in his excellent and well-known account of the movements of this species (Orn. Rambles, letter vii.). Mr. Knox says that the birds remain in the neighbourhood of the coast for a few days after their arrival, and then proceed inland in a northerly direction. This is opposed to my own experience, for I have found that the birds disperse landwards shortly after alighting on the shore, and this I find is Mr. Borrer's experience. The late Mr. E. T. Booth expresses a conviction in the first volume of his 'Rough Notes,' that the White Wagtail appears on the Sussex coast later than the commoner species, and Mr. Borrer does not mention an earlier appearance than April 6th. I saw on the morning of March 24th three birds which I took to be examples of the White Wagtail, and I had a good opportunity of contrasting them with some of the commoner species whom they had probably accompanied across the Channel. I have seen no indication whatever of the West-to-East movement in species mentioned by Mr. Booth, and I am inclined to think this author was confounding spring with autumn when such movements do occur.—W. RUSKIN BUTTERFIELD (St. Leonards-on-Sea).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

May 7th.—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Mr. A. F. Crossman was elected a Fellow, and Professor Alphonse Milne-Edwards, Prof. Douglas H. Campbell, and Prof. C. O. Whitman, Foreign Members of the Society.

In view of the approaching Anniversary Meeting, the appointment of Auditors was proceeded with, when Messrs. W. Percy Sladen and A. Smith Woodward were elected on behalf of the Council, and Messrs. James Groves and F. J. Hanbury on behalf of the Fellows.

Mr. George Murray exhibited and made some remarks upon an engraved portrait of Charles Darwin, presented to the Society by Dr. F. Forstheimer, of Cincinnati, to whom, on the motion of the President, a vote of thanks was unanimously accorded.

Mr. F. Enoch exhibited a series of lantern-slides illustrative of the metamorphosis and habits of the Tiger Beetle, *Cicindela campestris*. He described the peculiar position of the mandibles of the larva as adapted to its mode of capturing prey; the formation of the burrow; the spinous processes on the 8th segment of the abdomen used for supporting itself in the burrow; the mode of ejecting small stones or other obstacles met with in the course of work; and lastly, the changes incidental to the pupal state, and the adaptation of the burrow to the altered requirements of its inmate.

Mr. Enoch also exhibited living specimens of two minute aquatic Hymenoptera, viz. *Caraphractus cinctus*, Haliday (*Polynema natans*, Lubbock), which uses its wings in swimming. The other, *Prestwichia aquatica*, Lubbock, using its legs for propelling itself in the water, the wings being kept closed. This insect has not been recorded since its first capture in 1862.

Mr. H. M. Bernard exhibited preparations under the microscope of hermaphrodite glands of *Apus*, showing what he assumed to be the formation of sperm in the ovaries of four different species or varieties, and the condition of the eggs, which in two cases were being resorbed. These, he suggested, may have been parthenogenetic females in process of losing the female and assuming the male functions; possibly to ensure the presence of males in times of emergency, when "resting eggs" were required in order to tide over periods of drought.

Dr. H. A. Cummins, on behalf of Prof. M. M. Hartog, exhibited some hybrids of *Saraca* grown in the Botanic Gardens of Queen's College, Cork, from the collection of the late Wm. Crawford, of Lakelands.

Messrs. H. and J. Groves exhibited specimens of *Ranunculus tripartitus*, DC., recently discovered by Mr. R. A. Phillips in a small lake near Balti-

more, Co. Cork. Mr. J. Groves remarked that they were probably the most satisfactory examples of the true *R. tripartitus* which had been collected in the British Isles.

On behalf of Mr. W. E. Hoyle, Prof. Howes exhibited some Röntgen ray skiagraphs, showing the positions of a mouse when partially and completely swallowed by a snake, and showing the displacement of the jaws of the reptile during deglutition. The specimen of the snake was further interesting by way of showing a "half vertebra," about which in the Ophidia considerable discussion had arisen.

Dr. J. E. Aitcheson, C.I.E., exhibited some specimens of an Indian Woodpecker, *Dendrocopus himalayensis*, obtained on the Murree Hills at an elevation of 7000 feet, for the purpose of calling attention to an unrecorded habit of this bird of fixing walnuts in the bark of trees in order to extract the kernels. Dr. P. L. Sclater and Mr. J. E. Harting made some additional remarks on a similar habit of storing acorns recorded of a Californian Woodpecker, *Melanerpes formicivorus*, Bonap. (*Picus providus*, Jardine). So far as had been ascertained, no such habit had been observed, or at least recorded, in the case of the European Pied Woodpecker, *Dendrocopus major*, which is closely allied to the Indian species.

Dr. H. W. Marett Tims read a paper on the Tooth genesis in the *Canidæ*, the main object of which was to trace the order of cusp-development and the inter-relations of the various tooth-cusps, and to examine the evidence thereby obtained bearing upon important and interesting problems of Phylogeny. The paper also dealt with the cingulum in relation to cusp-formation, and with the questions whether *pm*.⁴ or *m*.¹ more nearly approximates to the type tooth, and is therefore safest for the comparison of known forms, whether the milk or the permanent dentition is the more primitive, and whether *Otocyon* is primitive in both the number and characters of its teeth. A discussion followed, in which Mr. Martin Woodward, Mr. C. W. Andrews, and Prof. Howes took part.

ZOOLOGICAL SOCIETY OF LONDON.

May 5th.—Dr. JOHN ANDERSON, F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of April, and called special attention to a young male Indian Elephant, *Elephas indicus*, from Burmah, obtained by purchase.

Mr. W. E. Hoyle exhibited a Röntgen-ray photograph of a Snake in the act of swallowing a mouse.

Mr. G. A. Boulenger read a paper on some little-known Batrachians from the Caucasus, based chiefly on specimens recently transmitted to the British Museum by Dr. Radde, of Tiflis, C.M.Z.S. Among these was an example of the new Frog of the genus *Pelodytes*, for which he had proposed

the name *P. caucasicus*. Altogether ten species of Batrachians were now known from the Caucasus.

Mr. F. E. Beddard read the second of his contributions to the Anatomy of the Picarian Birds. The present communication related to the pterylosis of the *Capitonidæ*.

Mr. M. F. Woodward read a paper on the dentition of certain Insectivores, and pointed out that there was strong evidence to show that the milk-dentition was undergoing reduction in this group as a whole, some of the milk-teeth in *Erinaceus* and *Gymnura* being present as small calcified tooth-vestiges only, while in *Sorex* there were apparently no calcified milk-teeth, but only vestigial milk-enamel organs. He concluded that $i. 3$ and $\frac{pm. 1}{pm. 1}$ were tending to be suppressed, and that the latter when present was a persistent milk-tooth, that d.p.m. 4 was probably a true but precociously developed molar, p.p.m. 4 being a retarded milk premolar. From a consideration of the ontogeny of the molar-cusps, he concluded that the true primary cone in the upper molars was Osborn's "paracone," its homologue in the lower jaw being the protoconid. From palæontological evidence, Mr. Woodward pointed out that there was not sufficient proof to justify the tritubercular theory as applied to the upper molars.

A communication from Mr. A. D. Bartlett contained some notes on the breeding of the Surinam Toad, *Pipa americana*, as recently observed in the Society's Gardens.

May 19th, 1896.—Sir W. H. FLOWER, K.C.B., LL.D., F.R.S., President, in the chair.

Mr. Selater exhibited a Daguerreotype portrait of what was believed to be the first Gorilla that was ever brought alive to Europe. It was living in Wombwell's Menagerie in 1855. This portrait had been lent to Mr. C. Bartlett by Mr. Fairgrieve, formerly associated with Mr. Wombwell, who had sent with it an account of the animal and its habits.

A communication was read from Mr. G. E. H. Barrett-Hamilton on a variation in the pattern of the teeth of a specimen of the Common Field Vole, *Microtus agrestis*, in which the first upper molars on both sides had a small but well-developed extra enamel fold, giving three angles on the outer side and four on the inner side of each tooth and six cement spaces. A second communication from Mr. Barrett-Hamilton contained remarks on the existence in Europe of two geographical races or subspecies of the Common Field Vole. He considered the Field Voles of England, Belgium, and the North of France, and possibly of a large part of the Continent, as distinct from the Scandinavian animals, which would remain the typical *Microtus agrestis*, while the British and western continental form should be called *Microtus agrestis neglectus*, Jenyns. This view agreed with that of De Selys-Longchamps in 1847.

Mr. F. E. Beddard read the third of his contributions to the anatomy of Picarian birds. The present paper related to the variations in pterylosis and in anatomy of the *Alcedinidæ*, of which he had examined specimens. Although this family was so uniform in external structure, it presented considerable differences when the pterylosis and anatomy were examined.

Mr. de Winton described a new Rodent of the genus *Lophuromys* from British East Africa, which he named *L. ansorgei*. Its nearest ally was *L. sikapusi*, Temm.; but it differed externally in its larger size and in being of a smooth dark chocolate colour on all its upper parts, and, as regards the skull, in having a longer facial portion in comparison to the cranium.

June 2nd.—Mr. F. DUCANE GODMAN, F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of May, and called particular attention to a Red-naped Fruit-Bat, *Pteropus funereus*, from Australia, acquired by purchase, and new to the Society's list; to four examples of a Tortoise belonging to the group of Gigantic Tortoises (apparently *Testudo daudini*) from the Aldabra Islands, deposited by the Hon. Walter Rothschild; and to two Rüppell's Vultures, *Gyps rueppelli*, from Egypt, received in exchange from the Zoological Gardens, Cairo.

Mr. Sclater exhibited the skin of an African Monkey of the genus *Cercopithecus*, originally received alive from Mombasa, which he believed to be referable to Stairs's Monkey, *C. stairsi*.

Mr. Sclater also exhibited a series of water-colour drawings of African Antelopes by Mr. Caldwell, and a photograph of the Gorilla now living in the Society's Gardens, by Mr. Henry Scherren.

A communication was read from Mr. Henry J. Elwes and Mr. Edwards, containing a revision of the European and Asiatic Butterflies of the Family *Hesperiidæ*. The species treated of in this paper were about 450 in number, and were divided into about 100 genera.

Mr. Charles Davies Sherborn gave an explanation of the plan he had adopted in preparing his 'Index Generum et Specierum Animalium.' He stated that the absence of any reliable lists of the species of particular genera had led him to commence the compilation of an 'Index Generum et Specierum Animalium' in 1890. Since that time 130,000 generic and specific names had been recorded in a manuscript which was stored at the Natural History Museum.

Mr. G. A. Boulenger read a paper on the dentition of Snakes, and added remarks on the evolution of the poison-fangs in this order of Reptiles.
—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

May 6th.—Prof. RAPHAEL MELDOLA, F.R.S., President, in the chair.

Mr. Percy Evans Freke, of Step House, Borris, Co. Carlow, was elected a Fellow.

Mr. Champion exhibited specimens of *Amara famelica*, Zimm., from Woking, Surrey, a recent addition to the British list. He also exhibited, on behalf of Mr. Dolby-Tyler, a series of *Eburia quadrinotata*, Latr., from Guayaquil, Ecuador, showing variation in the number of the raised ivory-white lines on the elytra.

Mr. Horace Donisthorpe exhibited a specimen of *Pterostichus gracilis* with three tarsi on one leg, taken near Weymouth last month.

Mr. G. T. Porritt exhibited a series of *Arctia menthastris* which he had just bred from Morayshire ova; the ground-colour of the specimens varied from the usual white, through shades of yellow, and dark smoky brown.

Mr. Merrifield exhibited specimens of *Gonepteryx rhamni* bred from larvæ found in North Italy and Germany, the pupæ of which had been subjected to various temperatures. He said that high temperature appeared to cause an increase of yellow scales in the female, and low temperatures generally reduced the size of the orange discal spot on the fore wings of both sexes. He also exhibited some bred specimens of species of *Vanessa*, the result of experiments tried with a view to ascertain the extreme of high temperature that the pupæ would bear, and its results. The species exhibited included *Vanessa atalanta*, *V. urticæ*, and *V. antiopa*. Mr. Merrifield said that the effects on the imago produced by temperature were being made the subject of systematic research by Prof. Weismann, Dr. Standfuss, Mr. E. Fischer, and others. Mr. Elwes asked if these experiments had been made on pupæ only or on the larvæ as well. Mr. Merrifield said that the results were only noticeable when the experiments were made on pupæ. The effect of them on larvæ was not apparent.

Mr. Kirkaldy exhibited and made remarks on ova of *Notonecta glauca* var. *furcata*.

Mr. Tutt exhibited living larvæ of *Apamea ophiogramma*, together with the grass on which it was feeding. He said the species was formerly considered rare in Britain, but was now found freely in any localities where ribbon-grass (*Digraphis arundinacea*) was plentiful.

The Secretary read a communication from Mr. E. Meyrick on the subject of Prof. Radcliffe-Grote's criticisms contained in his paper published in the 'Proceedings' of the Society, 1896, pp. x-xxv, on the use of certain generic terms by Mr. Meyrick in writing on the group of Lepidoptera known as the *Geometridæ*. Mr. Meyrick stated that he rejected the main assumption on which the criticisms were based.

Mr. McLachlan opened a discussion as to the best means of preventing

the extinction of certain British Butterflies. He referred to the extinction of *Chrysophanus dispar*, *Lycæna acis*, and *Aporia cratægi*, and to the probable extinction, in the near future, of *Papilio machaon*, and more especially of *Melitæa cinxia* and *Lycæna arion*. He stated that one of the objects he had in view in bringing this matter forward was to see whether some plan could not be devised to protect those narrowly localized species which were apparently in danger of being exterminated by over-collecting. Prof. Meldola said he fully sympathized with the remarks of Mr. McLachlan, and he thought that a resolution passed by the Society, possibly in conjunction with kindred Societies, might produce some effect. Mr. Goss stated that *P. machaon*, although apparently doomed to extinction in its chief locality in Cambridgeshire (Wicken Fen), would probably linger on in the county in smaller fens, such as Chippenham, where the larvæ had been found feeding on *Angelica sylvestris*. It would certainly survive in the Norfolk Broads, both from the irreclaimable nature of the fens there and the extensive range of the species in the district, which Mr. Goss said he had explored in 1887 in boats. He said that *M. cinxia*, although gradually disappearing from most of its old localities in the south of the Isle of Wight, was still found in the island further west in localities in which he had seen it in some numbers in May, 1895. He added that *L. arion* was far from extinct in Gloucestershire, and was distributed over a much wider area in the extreme south-west of England than was generally supposed. Its disappearance from South Devon was due to the burning of the grass, and the consequent destruction of the food-plant. Mr. Elwes stated that in the district in which he lived, in Gloucestershire, he had found *L. arion* in three or four places, on his own property, some ten or twelve miles distant from its known localities, but the species had disappeared of late years. The fact that *L. arion* had disappeared from his own property, where it was not collected, seemed to point to the fact that it was dying out from natural causes—perhaps owing to changes in climate not perceptible to us. Colonel Irby said that *L. arion* had disappeared many years ago not only from Barnwell Wold, Northamptonshire, but from another part of the county on the estate of Lord Lilford, not accessible to the public, and that its disappearance there was no doubt caused by the destruction of the food-plant and other herbage, by burning the pasture and by the grazing of sheep. Mr. Crowley, Mr. Tutt, Mr. Waterhouse, and Mr. Blandford continued the discussion. It was moved by Mr. Tutt, and seconded by Mr. Elwes, that a committee be appointed by the Council to investigate the matter and to report thereon. This was carried *nem. con.*

Mr. Guy A. K. Marshall communicated a paper entitled "Notes on Seasonal Dimorphism in South African Rhopalocera."

Mr. P. Cameron communicated a paper entitled "Descriptions of new species of Hymenoptera from the Oriental Region."—H. Goss, *Hon. Sec.*



THE LATE LORD LILFORD, F.L.S., F.Z.S.
PRESIDENT OF THE BRITISH ORNITHOLOGISTS' UNION.

(From a Photograph by Russell & Son.)

THE ZOOLOGIST

No. 235.—July, 1896.

THE LATE LORD LILFORD, F.L.S., F.Z.S.

President of the British Ornithologists' Union.

THE unexpected death of this distinguished naturalist and sportsman, which took place at Lilford Hall, near Oundle, Northamptonshire, on June 17th, has evoked a universal expression of concern and regret wherever it has been made known. Those only who were privileged to know him intimately, and for many years, can alone rightly appreciate his worth, and understand how widely his loss will be felt by those who shared his taste for natural history, especially ornithology, and his life-long devotion to field sports.

His keenness for the outdoor observation of birds and beasts made itself manifest at a very early age, for even as a boy at Harrow in the fifties he commenced to write letters to the editor of 'The Zoologist' which embodied many interesting facts that have proved useful to subsequent writers of local faunas.

Born in 1833, the Hon. Thomas Lyttleton Powys was only seventeen years of age when as a Harrow boy he began to write for 'The Zoologist'; and from the nature of the observations which he communicated to this Journal from 1850 onwards, it is clear that he lost no opportunity of recording the occurrence of such uncommon birds as came under his notice wherever he happened to be—at home in Northamptonshire, at Harrow in 1850–51, at Oxford (Christchurch) in 1852, on the Devonshire coast during summer vacations, or on the Continent.

Some of these early observations were turned to good account in after years, when, as an experienced ornithologist, he began to generalize from the records he had amassed, and commenced to write the text for his beautiful work on British Birds, and his two delightful volumes on the 'Birds of Northamptonshire.' As an example of the way in which some of his early notes were turned to account in after years, we may refer to what he has written of the Red-backed Shrike ('Birds of Northamptonshire,' vol. i. p. 76), which in his schooldays was so abundant in the neighbourhood of Harrow, that he used "often to find two or three nests on a summer's afternoon in the thick and ragged fences that divided the great grass fields of that district." Forty-five years later it had become quite uncommon there, doubtless from the growing practice of "plashing" the tall hedgerows, which deprived these birds of their favourite haunts.

When in 1859 the British Ornithologists' Union was founded by a few enthusiasts, who undertook the publication of a quarterly journal of ornithology, yclept 'The Ibis,' Lord Lilford's name soon appeared as a contributor to its pages. In the volume for 1860, for example, we find an excellent article from his pen on the birds observed by him in the Ionian Islands and the provinces of Albania Proper, Epirus, Acarnania, and Montenegro.* Again, in the volumes for 1865 and 1866, we find a valuable series of articles by him on the ornithology of Spain,† to which country he made occasional visits at intervals, and did much to enlighten English naturalists on the fauna, and more especially the avifauna, of a country concerning which little, zoologically speaking, was then known. We do not doubt that these papers of his paved the way for the more complete investigation of the Spanish fauna which has since been so admirably carried on by Lieut.-Col. Irby, Mr. Howard Saunders, and Mr. Abel Chapman. Perhaps the most delightful of the articles contributed by him to the pages of 'The Ibis' is his "Cruise of the 'Zara,' R.Y.S., in the Mediterranean." This cruise was undertaken between December, 1873, and June, 1874, and shows, as the author himself stated (*tom. cit.* p. 2), "how much may be done comparatively near home, even by a naturalist so incapacitated by lameness as

* 'The Ibis,' 1860, pp. 1-19, 133-140, 228-239, 338, &c.

† 'The Ibis,' 1865, pp. 166-177; 1866, pp. 173-187, 377-392.

myself." The fact is that at that date he was already suffering from rheumatic gout, as he tells us (p. 4), which sometimes laid him up for weeks at a time, and which, a few years later, eventually confined him almost entirely to the house. To such an ardent sportsman as he was, indulging at one time in Otter-hunting, Grouse-shooting,¹ and Deer-stalking, when he rented Gaick Forest, by Kingussie, in the Badenoch district,^{*} and had the run of 12,000 acres of fine stalking-ground, this enforced confinement to the house must have been most irksome and wearisome. And yet with what patience he supported the trial is well known to those who, like the present writer, visited him in his charming Northamptonshire home,[†] and noted with admiration the many ways in which a well-stored mind could relieve the tediousness of time. Had he lived earlier in the century, Sir Walter Scott might well have had his case in view when he penned his "Lay of the Imprisoned Huntsman" :—

" My hawk is tired of perch and hood,
 My idle greyhound loaths his food,
 My horse is weary of his stall,
 And I am sick of captive thrall."

The allusion to the hawk would, in his case, have been a happy one, for no one was more enthusiastic on the subject of falconry, no one more anxious to uphold the practice of that ancient sport. As a member of the "Old Hawking Club" he set a good example in this respect, and with the assistance of the veteran falconer Paul Mollen, and R. Cosgrave, he trained and flew many a good falcon and goshawk. Of some of these flights the present writer was an eye-witness, and the treat which he experienced in examining the splendid collection of living birds of prey at Lilford Hall will never be effaced from his memory.[‡] Seven different kinds of Eagles, eight or nine species of Owls, Buzzards, Falcons and Hawks, and a pair of Kites in an aviary,

^{*} An excellent photogravure of Gaick Forest Lodge is given in Grimble's 'Deer Forests of Scotland,' recently published.

[†] A view of Lilford Hall forms the frontispiece to vol. i. of 'The Birds of Northamptonshire.'

[‡] On one occasion, in December, 1891, a curious flight was witnessed. A goshawk named "Barbara," belonging to Lord Lilford, suddenly turned from a rabbit she was chasing, and pursued and captured a Barn Owl!

large enough and lofty enough to admit of their flying round and round, spreading their great forked tails, afforded a spectacle not easily to be forgotten. Nor should we omit to mention the unique sight of a pair of Lammergeiers, which might be seen "flying at hawk" in unrestrained freedom within sight of the house. To see a Lammergeier on the wing in England would be a sight for which any ornithologist would willingly undertake a long journey.

Nor is the collection of live birds at Lilford Hall confined merely to birds of prey. The out-of-door aviaries contain Bustards, Storks, Cranes, Herons, Spoonbills, Ibises, and Waterfowl of all kinds, in the highest perfection of plumage, which indicates their enjoyment of health arising from the natural conditions under which they have been maintained.

The reader who would know more of these wonderful aviaries should peruse an article on the subject from the pen of the late owner which will be found printed in the 'Transactions of the Norfolk and Norwich Naturalists' Society,' 1890-91 (pp. 128-143), and is full of interesting information.

In this article Lord Lilford has referred (p. 129) to his "excellent friend and teacher in falconry, the late E. Clough Newcome, of Feltwell, the first practical falconer of his day, and a very acute field ornithologist." Allusion is also made (p. 132) to the fact that "Peregrines have been taken at Lilford alive and uninjured, in the recognised Dutch fashion with bow-net and decoy pigeons, and the almost indispensable assistance of a Great Grey Shrike as sentinel."

The latest information of interest concerning the live birds in these beautiful aviaries was communicated by Lord Lilford, in a letter dated May 23rd, which is published in the current number of 'The Ibis' for July. It relates to the breeding in confinement of the Australian Wattled Lapwing, *Sarciophorus pectoralis*, and the pairing of one of their progeny with a Cayenne Lapwing, *Vanellus cayennensis*, resulting in the successful hatching of two young birds. The letter further contains some interesting details concerning the deposition of an egg by a Kiwi (*Apteryx oweni*) in a hole made in the bank of a pond, and the successful breeding of a pair of Burrowing Owls (*Speotyto cunicularia*).

In the same spirit of enthusiasm which prompted him to

encourage every branch of sport, even though prevented at times from taking an active part in it—we have known him to attend a meet of the Otter-hounds in his Bath chair—he commenced, in 1885, the construction of a decoy at Aldwinckle, not far from his home, under the direction of Gilbert Skelton, one of an ancient family of decoymen who came from Friskney, in Lincolnshire.* This decoy is triangular in form, and has three pipes, one at each corner. It is situated in the valley of the Nene, at a spot likely to be attractive to wildfowl, which not only pass over this valley in large numbers, but also rest there on their migration, especially when the river is in flood. In this spot Lord Lilford has seen from 1000 to 2000 wildfowl on the low lands, when the water is out along the course of the Nene, and has obtained almost every kind of duck there, including Gadwall. Spotted Rail and Water Rail also have been snared in the decoy.†

In the direction of the acclimatisation of exotic game-birds mention should be made of the experiment carried out by Lord Lilford to introduce the Virginian Colin (*Ortyx virginianus*) into Northamptonshire. A considerable number of these birds were imported by him and turned out, but, for reasons which he has stated ('Birds of Northamptonshire,' vol. i. p. 300), the experiment was not regarded as very successful. Some Long-eared Owls were turned out by him in a suitable locality, and established themselves under his protection (Zool. 1895, p. 47), as was likewise the case with the Little Owl (*Athene noctua*), several of which were turned out at Lilford Hall, in July, 1888 (*cf.* Zool. 1889, p. 426; 1891, p. 46; 1892, p. 90).

Of the great encouragement given by the deceased nobleman to the study and advancement of ornithology it is almost unnecessary to speak; his liberality in that direction to the Zoological Society of London, the Northamptonshire Natural History Society, and the British Ornithologists' Union, of which he was for many years President, being well known to all interested in such pursuits.

* Of this remarkable family, various members of which have constructed or remodelled nearly all the best decoys in the country, some account is given by Sir R. Payne Gallwey, in his 'Book of Duck Decoys,' 1886, pp. 12-14.

† For remarks on the wildfowl seen at this decoy see the "Notes on the Ornithology of Northamptonshire," 'Zoologist,' 1891, pp. 41-42; 1892, p. 202; 1893, pp. 89-90; 1894, p. 211; 1895, p. 48.

His published works, especially his beautiful 'Illustrations of British Birds,' and his recently issued volume on the birds of his own county, testify abundantly to his keen power of observation, and his excellent judgment as a writer on ornithology. His loss will be deplored, not only by the learned societies of which he was so distinguished a member, but by a very large circle of friends and acquaintances to whom he had endeared himself by an unflinching kindness of heart and constant readiness to help.

He passed peacefully away at the age of sixty-three, surrounded, as was fitting, by all that he loved best in his beautiful home in Northamptonshire. Here he had chiefly resided for many years past, though he also owned a fine property in Lancashire, in addition to the lands of the Fox family, to which he succeeded in Wiltshire, and at St. Anne's Hill, Chertsey, the former abode of Charles James Fox. These two estates he inherited respectively from his aunt, the last Lady Holland, and his brother the Hon. Leopold Fox Powys, who died about three years ago. He was a son of the third Baron Lilford, his mother being a daughter of the third Lord Holland, a most charming old lady, whom it was the writer's privilege to know when she resided in London. Lord Lilford married for his first wife Miss Brandling, of Low Gosforth, Northumberland, who died in 1885, and whose son, the Hon. John Powys, succeeds him in the title. With his second wife, who survives him (a daughter of Mr. Ker Baillie Hamilton), all who had the privilege of knowing him will sympathise in the loss which she, and they, have sustained by his death.

The accompanying portrait is reproduced, by permission of the publishers, from 'Black and White.'

ORNITHOLOGICAL NOTES FROM ROMNEY MARSH AND ITS NEIGHBOURHOOD.

BY BOYD ALEXANDER.

"TIMES are not as they were" is a saying that might well be applied to this district as regards the numerical distribution of species of birds now breeding there, as compared with formerly. Disturbing influences of one kind and another have come about which have sadly thinned their number. Indeed, in the case of

the Kentish Plover and Thickknee, it well nigh approaches extinction, since the "Lydd Beach," the breeding resort of these species and of several others, has long been threatened. In his 'Birds of East Kent,' Mr. George Dowker thus describes the "Lydd Beach":—"This extraordinary accumulation of stones is not only the home of many rare birds, but is a perfect wilderness, while a fauna and flora are found which are nowhere else to be met with in the South-eastern corner of England. The beach, which has been accumulating round Dungeness for many centuries, is upwards of three miles in width at its broader part, a stony desert relieved here and there by large ponds" (p. 36). This locality can hardly at the present time be described as a "wilderness," or "the home of many rare birds."

The direct causes may be attributed to the increased firing of both artillery and small arms during the height of the breeding season, and also to the Dungeness railway, which has opened out a considerable portion of it. On the other hand, there are portions of the shore-line, between Pevensey and Dungeness, quite as rich as they were in the days of Knox in the visits of summer migrants that pass northwards to breed.

On May 9th a female Temminck's Stint was obtained on the Pevensey Levels, and during the following day a number of Bartailed Godwits appeared near Rye Harbour. Several were shot. The last of the Godwits were seen on May 28th, when a party of five immature birds alighted on the sands at low water. One of these, a male, was shot. This bird was still assuming the pale plumage.

Several Grey Plovers, with black breasts, were also obtained on May 10th, and individuals of this species continued to arrive on and off up to June 13th, when I saw two of them in company with a Knot on the Midrips.* By the next day, however, all three had disappeared. On May 22nd a flock of six passed over my head. They were making in a northerly direction.

A pair of Black-tailed Godwits appeared on May 18th on the Pevensey Levels. This seems somewhat a favourite spot for these birds. A pair were obtained in the same place last year on May 11th. The Pevensey Levels are also mentioned by Knox in regard to the occurrence of this species in Sussex. From May

* These are a series of shallow ponds on the "Lydd Beach."

15th onwards a number of young Herons, covered with undeveloped quills, continually invaded the dykes and shallow pools here* in search of eels. This is frequently the case during a dry season like the present one, when the water has become low. These birds must chiefly hail, I think, from the heronry at Brede. On these partial migrations in search of food many are shot by the farmers, who esteem them good eating.

The breeding numbers of the Redshank have decidedly diminished here. Increased drainage and the dry weather of the last two summers have done a great deal towards the banishment not only of this species, but especially of the Coot and Little Grebe.

Many parts of the large dykes and pools that were only a few years back favourite breeding resorts of these birds have dried up and are now nothing more than thick reed-beds. In these "reedy" places the Reed Warbler has found a home. Any sudden noise will cause this bird to sing vehemently, while the footfalls of a passer-by invariably draw from him a song.

The Little Grebe is locally known as "Spider Diver." When considering the decrease of the Redshank, the taking of their eggs by the country people for eating must not be lightly disregarded. The immediate locality of the nest is soon discovered, for no bird, with the exception of the Lapwing, betrays the whereabouts of its nest more readily than does the Redshank. It flies overhead in concentric circles uttering alarm-notes, which are for all the world in tone like a string of plaintive sobs that become wilder and more heartrending as the nest is approached. A short search will soon find the eggs.

On May 22nd a pair of Thickknee Plovers appeared on the "Lydd Beach." After carefully watching them for some days I was rewarded in finding their two eggs. They were deposited amongst some flowering foxglove—altogether a pretty site—but all the same unhappily selected, since the locality was continually being subjected to a "dropping" artillery fire. I had hopes of being able to see the young, but after four days of sitting the birds deserted the nest. The extraordinary sense of smell possessed by the Thickknee renders a near approach to the nest without disturbing the bird difficult.

* "Here," in this article, refers to the Lydd Beach and its immediate neighbourhood.

Of the two species of Terns breeding here, the Common and Lesser, the latter is by far the more numerous. But the numbers of both have sadly diminished of late years. Both species keep separate in their breeding haunts, the Lesser Tern preferring rather the close proximity of the sea. The restricted breeding area taken up by the Common Terns is distinctly prejudicial to the safety of their eggs. The children of the fishermen and coast-guard officers soon discover these spots, and the eggs are robbed right and left for purposes of eating. Over these places sheep have invariably been feeding, and where they have poked their noses, forming small stone-padded hollows, the eggs are more often than not laid. On May 21st a nest of the Common Tern was found containing five eggs. They were of the reddish-buff variety.

On May 23rd I was fortunate enough to discover, with the aid of my field-glasses, a pair of Sandwich Terns breeding here. The birds, however, deserted after the first egg was laid. I am inclined to think that the Common Terns must have driven them away.

A pair of Black Terns were seen on May 24th, following the sea-board.

The sandy portions of the Rye coast attract now and again a certain number of Oystercatchers. They are more numerous, however, in the autumn than on the spring migration. When going northwards to breed, the Oystercatcher makes a rapid journey, rarely tarrying for any length of time by the way like other members of the *Scolopacidæ*. At 5.30 on May 29th six of these birds appeared here. They "shelved" on to the sand, and immediately "made for" shelter along the nearest groyne. They "bunched" themselves up together and remained almost motionless for nearly an hour, after which they aroused themselves and began to dabble in the nearest pools. Shortly before seven o'clock one of the birds—presumably the leader—uttered its call-note, whereupon the little flock formed once more in close order and got up like one bird, making in a north-westerly direction. A solitary pair of these birds may be found breeding annually on the beach not far from Dungeness. But it is doubtful whether any young are ever reared.

The presence here of the Wheatear can hardly escape the notice of the most unobservant. The curious sites chosen by these birds for their nests—and especially is this the case down

here—is no safeguard against intrusion, but rather, if anything, the exact opposite, for it seems to linger in the memory of the birdnesting boy, with the result that every tin can, kettle, and empty shell is zealously turned over and examined, when the Wheatear's treasure is very often found. Though the first nest be taken, it is not uncommon to find the same site occupied again for the second lay. I came across a nest on the "Lydd Beach," this summer, under a turned-over pig-trough. The hole by which the bird gained access to its nest was no larger than that of a mouse. Another was found in an empty four-pounder shell—a good example truly of "peace and war." The crevices in the gabion casemates here are also frequently chosen. Again, it is not unusual here to find the Wheatear's nest in a depression on the bare beach. In a case like this, dry grass alone is used, the nest resembling then a large edition of the Lark's. The normal feather-lining is absent, and in this way conspicuousness is nicely avoided. If not disturbed, I fancy the Wheatear returns annually to the same nesting-site.

The Ringed Plover breeds on the "Lydd Beach" in fair numbers, and seems to be the least affected of its genus by the artillery practice. These noisy little birds course over the beach all day long, uttering their whistling cries. Even the Skylarks of the locality have caught their plaintive notes, and they produce them amongst their own with startling exactitude.*

Four pairs of Kentish Plover bred on the beach not very far from Dungeness Lighthouse. The nest of this species is, to my mind, by far the most difficult to find of all the Plovers. The bird seldom makes any demonstration in the way of a call-note; it creeps away like a mouse through the dry beach-grass, which it resembles so closely in colour. To lie down flat on the beach, armed with a good pair of glasses, is the only chance of success, and then one may be rewarded by seeing a little brown thing wending its way back to its nest, stopping now and again, and when in close proximity to its treasure standing motionless for many minutes together. When the eggs are hatched the bird is even still more wary. It often drops the food close to the young without even alighting. I have found that the male alone of this species undertakes the task of incubation.

* See Witchell, 'Evolution of Bird Song,' 1896, p. 209.

On May 29th the first flock of Sanderlings appeared. They were in full summer dress. The female of this species seems more backward in assuming the nuptial dress than the male. A female out of this flock was obtained with plumage hardly differing from that attained in autumn. The resemblance in the markings of the crown, nape, and mantle, and especially the latter, of the male Dunlin, and Sanderling, in summer dress, is very remarkable. The last flock of Sanderlings was seen here on June 2nd.

A pair of Dotterel appeared here on May 29th, a rather late date for this species. They remained in a field of young peas close to the shore for several days.

On May 30th two pairs of Common Sandpipers came to one of the dykes, but disappeared a few days later. I have searched in vain for the nest of this species in many portions of Kent, and have carefully watched the birds, but they never remained for any length of time in one locality. Knox, in his 'Ornithological Rambles' (p. 231), says that this bird "is frequently met with on the banks of inland streams, among the grassy borders of which the nest is placed." This can hardly be taken as evidence of this species having nested, even in Sussex, during his day. The breeding haunts of the Common Sandpiper must be looked for on higher altitudes than are to be found in Kent and Sussex.

June 3rd, saw a number of Dunlin with black breasts; a somewhat late date. So far as my experience goes, none of the adults remain here during the entire summer. When feeding, the Dunlins seem convinced of the justice of the rule, "Share and share alike." Extended order is formed, or when in flock the rear portion alternately comes to the front, and in this way each bird partakes equally of what the tide lays bare.

On June 4th I made an expedition to the Hoppen "Petts" for the purpose of inspecting the colony of Black-headed Gulls. These "petts," which lie about four miles south-east of Lydd, consist of two large pieces of water of unknown depth. They are furthermore fringed with treacherous reed-beds which possess all the qualities of a dangerous bog. They are also the home of many leeches. When within a mile of these "petts" I could discern a number of Black-headed Gulls lining the banks, and looking like so many lumps of white chalk. On a nearer approach they all rose up, full of clamorous consternation—a veritable

sea-rookery—and circled above the water. They numbered about 200, and at least a quarter of these wore the dress of immaturity. I discovered over twenty nests, all containing eggs, with the exception of two which had young. These nests were invariably placed close to the edge of the reed-beds nearest the water. On one small “reedy” promontory there were no fewer than eight, situated hardly a yard apart. Of late years this colony of gulls has suffered much persecution, but the owner, Mr. Samson, of Lydd, exercises now a strict surveillance over it, with the result, I am glad to say, that the colony is rallying.

On June 12th a White Spoonbill appeared near the Midrips. Its appearance created considerable excitement amongst several of the fisherfolk. I have the following records of the occurrence of the Spoonbill in this locality. Two adult males were shot, May 9th, 1889, by two of the Southerden family. One of these specimens was subsequently sold to Mr. Gray, of Dover, for £7. In June, 1890, a party of five appeared: but, to use the words of the fishermen, “We were too greedy; we wanted the ‘blooming’ lot, and ended by getting none.” On May 24th, 1891, an immature bird was obtained. There is another still in the possession of the Southerdens, shot some twenty years ago. This specimen is a very perfect one. The broad suffused rust-coloured ring at the base of the neck is remarkable for its intensity. The above records will show that these visits have become fewer and farther between of late years. The bird now in question was at the time of its being seen feeding along with five Herons. I have also observed this species on the sands in company with gulls.

The shore-line now (June 16th) is a perfect blank, save for a few immature gulls of sorts, who are regular attendants at such times when the tide lays bare the mackerel-nets, waiting in hopes of seizing some of the small fry which are left by the fishermen. Terns are also there to swell the company, and it is wonderful with what precision they dart into the nets and carry off their prey, while there are others, not so bold, who keep out at sea, hovering all the while over its surface, watching for the floating remnants of small fry which have been washed by the current through the net-meshes. After these they drop, falling into the water like so many ounces of lead.

On June 16th two Skylarks’ nests were found in a meadow,

containing four and two eggs respectively, perfectly white—a variety which is identical with the texture of the Kingfisher's egg. The nest of four eggs was quite good, but the other had been deserted.

NOTES AND QUERIES.

MAMMALIA.

Otters and Badgers near Colchester.—I have within the last month purchased a young Otter and two half-grown Badgers, captured within five miles of this town. The Otter, rather under half-grown, was caught by a dog in a small brook at Alresford, Essex, and was offered me for sale May 23rd, the day it was captured. As it did not seem much injured I purchased it and sent it to the Zoological Gardens, fearing if I set it at liberty it might not be old enough to get its own living. The Otter was for many years very rare in Essex, but during the last few years would appear to be increasing in all our rivers, and is now found, as in the days when Daniell wrote his 'Rural Sports,' in the reed-beds of our marshes and in the sedges bordering our fleets, and I frequently at night hear its whistle in the river Colne, where it passes through this town. In this river it is becoming fairly common, and as it is admirably adapted for hunting with hounds, a visit from a pack would afford us a new sport, and I feel sure would give us great assistance in our endeavours to preserve the race. The Badgers were caught on May 4th at Stanway Hall, about four miles from Colchester, by the gamekeeper there, who had a few days previously captured and unfortunately destroyed their mother. These animals are not so rare in Essex as they were at one time, for it is not so long since several were caught near Braintree, and there are reasons for supposing that Badgers have continuously existed at Stanway and the neighbourhood. I purpose keeping these in their native county by setting them at liberty in Epping Forest, if it meets with the approval of the Verderers, to whom I have offered them. They would not have been disturbed at Stanway, had not the owner of the Hall, who is an enthusiastic foxhunter, been advised to get rid of them for fear of their injuring the foxes.—HENRY LAVER (Colchester).

Habits of the Stoat.—What is the number of young usually produced at a birth? In the case of its near relation, the Ferret, it is known to differ considerably; but domestication changes the nature and constitution of creatures, and alters their economy materially. The few books to which I have had access give the number of young as four or five, and occasionally six, and although this may be the usual average, yet I have known several instances where the number has been above six. I recollect, in one of my

entomological rambles in the dusk of evening, sitting down near a dense furze-brake. I had not been long seated before I heard a rustling close at hand, and turning round saw within a few yards of my feet an old Stoat and several young ones. It was very amusing to watch them at play; their active movements and sharp turnings, accompanied by a self-satisfied and happy sound between a purr and a chirp, was an experience not easily forgotten. On this occasion I am sure there were eight, if not nine, young in the litter. On another occasion a friend of mine was out with his gun and saw a Stoat with a young one in its month hastening to an old tree-stump in an hedge-bank. He shot it just before it reached its goal, and on going forward to pick it up was surprised to see several other young ones issuing from a hole in the bank near their dead parent. He stood at some little distance, and by uttering a chirping sound he drew forth six more young ones, all of which he killed. Last season a gamekeeper told me he had found a nest of young Stoats with a litter of ten; I thought perhaps in that case two litters might have been associating together. An accident that occurred at the end of May, however, set the matter at rest in my own mind. A gravid female Stoat having been found dead in a trap was sent to me, and curiosity led me to open the uterus, when I found that it contained no less than *eleven* well-formed young which would have shortly seen daylight. This may have been, and undoubtedly was, an unusual case of fecundity with the species, which both surprised and interested me; for, on the other hand, I have been informed on pretty reliable authority that sometimes a litter consists of but three young ones; so that it may be said to vary from two to twelve, which seems an extraordinary variation in a truly wild animal. On referring to 'The Royal Natural History,' now in course of publication, I observe that the late Prof. Bell is credited with the statement that the number of young is five; but that Dr. Coues states the number may vary from a pair to a dozen, although five or six may be taken as the average; still personal observations from readers of 'The Zoologist' would be interesting. In the work above named the statement as to the change of colour of the Stoat in winter is, I think, scarcely correct, as it is said to "always take place in the Highlands of Scotland; but proceeding further south the change becomes more and more rare, only occasionally taking place in counties like Cambridgeshire and Lincolnshire, while in Cornwall and Hampshire it is almost unknown." I cannot speak from experience of localities farther south or west, but in this part of Hampshire the change of colour takes place in a greater or less degree every winter, instances of which I have from time to time recorded in the pages of this Journal, and it is certain that an intensity of cold is not required to produce the change, for during the last extraordinary mild winter I saw two or three parti-coloured individuals, and one which was wholly white, except the head, and of course the characteristic black tip to its tail.—G. B. CORBIN (Ringwood).

Whiskered Bat in Carnarvonshire.—In the first week of June I found a male Whiskered Bat, *Vespertilio mystacinus*, in a short tunnel connected with some disused lead-mines near Abersoch. It was sleeping at a distance of some twenty feet from the mouth of the tunnel, where there was sufficient daylight to enable me to see it without lighting a candle.—CHARLES OLDHAM (Romiley, Cheshire).

Lesser Horseshoe Bat in Denbighshire.—On April 4th I was successful in finding several specimens of the Lesser Horseshoe Bat, *Rhinolophus hipposideros*, in the Cefn Caves, Denbighshire, and one in a cave at Tremeirchion, Flintshire. I send you one of the former alive, and hope you will receive it all right.—CHARLES OLDHAM (Romiley, Cheshire).

[Unfortunately, when the Bat arrived we had left London to spend Easter in Wiltshire, and on our return it was of course lifeless.—ED.]

BIRDS.

On the Specific Validity of Brünnich's Guillemot.—I do not propose to enter here into the vexed question of what constitutes a species. I simply record my experience and opinion. I have seen thousands and tens of thousands of both Common and Brünnich's Guillemots. The latter I have had abundant opportunities of studying closely, in North Greenland, Spitsbergen, and Novaya Zemlya, and in various parts of the Arctic Seas. I am well acquainted with the Common Guillemot from visiting many of its breeding-places in the British Isles and the Færoes. In the latter group I have handled hundreds of Common Guillemots that had been captured for food, and in the Arctic Regions I have examined hundreds of Brünnich's Guillemots, shot for a similar purpose. After long and intimate acquaintance with the two birds, I am left with the conviction that I never saw a Common Guillemot that I could for an instant confound with a Brünnich's Guillemot, nor an *Uria Bruennichi* that I could confound with *Uria troile*.—H. W. FEILDEN (Wells, Norfolk).

I was very much interested in Mr. Oxley Grabham's note on the "Specific Validity of Brünnich's Guillemot," for I also have been puzzled with birds occasionally thrown ashore in winter, not being able to satisfy myself of their identity. I have found specimens on the Enniscrone sands from time to time, and particularly one last winter, that in colour were quite as pure a black on the upper parts as a Razorbill, quite unlike the ordinary sooty brown colour of the Guillemot; but not seeing any apparent greater thickness in the bill, I could not look on it as a typical Brünnich's Guillemot. Like Mr. Grabham, I have picked up specimens with the feet varying in colour: so except for a marked thickness of bill, I cannot see how the bird, if a good species, can be identified.—ROBERT WARREN (Moyview, Ballina, Co. Mayo).

Remarks on *Anthus cervinus* in Sussex.—Owing to absence in the North of Ireland, I have only just read Mr. Ruskin Butterfield's note (p. 193). As he challenges my assertion that I could easily detect the specimen of *Anthus cervinus* amongst a flock of autumn-plumaged *Anthus pratensis* in the field, a few words in reply are necessary. Mr. Butterfield seems surprised that I did not make special mention of the fact that the specimen in my possession is the only one in autumn or winter plumage which has been met with in Great Britain; such a statement, however, would have been superfluous, for two previous examples only are on record, and in each case the period of the year when they were procured is well known. I have glanced again at my winter-plumaged *A. cervinus*, and compared it side by side with winter-plumaged *A. pratensis*, and cannot withdraw in any degree whatever from the assertion I made (*supra*, p. 101). The pale and very distinct cream-coloured stripes down the back, as well as on the crown, accompanied as they are by the bold blackish stripes; the generally pale coloration of the sides of the head, with the rufous tinge pervading, and the narrow stripes of black down the breast, are characteristics which at once distinguish the bird from the winter-plumaged *A. pratensis*. Wild birds arrange their feathers with a neatness and order which the most skilful taxidermist would find it difficult to imitate, and I do not hesitate to say that the most skilfully prepared skins, and probably the bulk of mounted specimens of either *A. cervinus* or *A. pratensis* have an untidy, disarranged appearance, which make them quite unlike the living originals. This observation has special reference to birds which have either dark or light tips to their feathers on the head, back, or breast. Taking the Pipits as an example, it will be found that in most cabinet specimens—and I am sorry to say in most illustrations too—the dark tips to the feathers are made to look like spots over the back or breast. But look at the living wild bird, and you will find that these dark tips to the feathers are arranged with such perfect order and regularity one over the other that they form clearly defined stripes and not spots. This is important when making a comparison between the winter-plumaged *A. cervinus* and *A. pratensis*, for, with its feathers neatly arranged in their proper order, the stripes of *A. cervinus* show far more distinctly and boldly than do those of *A. pratensis*. But if a skin or carelessly mounted specimen be used for comparison, the points of difference in most cases are obscured and identification becomes difficult. I have remounted the *A. cervinus* since I have had it in my possession, for I am very careful to show these distinctive stripes in all specimens in my collection. The remounting has so altered the appearance of the bird, and brought out its special features so prominently, that if Mr. Butterfield were to see it now, he would perhaps scarcely recognise it, but would see at a glance how materially it differs from an autumn-plumaged *A. pratensis* mounted in exactly the same style, and placed side by side

with it. I have laid stress on "winter-plumaged" *A. cervinus* and *A. pratensis*. Some importance attaches to this point, for *A. pratensis* in winter is a very different-looking bird to *A. pratensis* in spring or summer; the difference in the plumage of *A. cervinus* at these two seasons is well known to all. In this district *Anthus pratensis* occurs only as a winter visitor, and most of the specimens in my collection are in winter plumage. In April last I visited North Wales, and near Cader Idris I procured this bird in full breeding plumage. I was anxious to get one from this district, for I knew that I should not be likely to find clearer-plumaged birds elsewhere. Now comes the important point. Place this *spring-plumaged A. pratensis* by the side of the *winter-plumaged A. cervinus*, and the resemblance is so striking that I should be sorely puzzled to distinguish between the two birds at a very little distance indeed. In fact, I might not be able to do so unless I had the birds in my hands. And here I venture to think that Mr. Butterfield, and perhaps the authorities quoted by him, may have been led into some confusion with regard to these birds by comparing undated specimens of *A. pratensis* which may have been in spring plumage, with winter specimens of *A. cervinus*: this would not be a fair comparison. It must be obvious that when I stated that I could readily distinguish the difference between *A. pratensis* and *A. cervinus* in the field, I was referring to both birds in winter plumage, for who would ever expect to see together in the field *A. cervinus* in winter and *A. pratensis* in spring dress? The quotation from Mr. Dresser's letter that "the dark tips to the feathers in all stages of *A. cervinus* are broader than in *A. pratensis*" surprises me much, for in all specimens of *A. pratensis* I have the dark tips are broader than in this *A. cervinus*. It will be noted that I have stated above that one of the characteristics of my *A. cervinus* is the narrow stripes down the breast. Unfortunately I do not possess a series of skins of *A. cervinus* for comparison; indeed, this is the only specimen of the bird I have ever seen. It would perhaps have been better to quote more of Mr. Dresser's letter. I may here state that an important point of distinction between the two birds, apart from plumage, is that the bill of *A. cervinus* is much smaller and finer than in *A. pratensis*, and in cabinet specimens the legs of the latter dry much darker in colour than the former. In conclusion, then, so far as my observations go, *A. cervinus* and *A. pratensis*, both in winter plumage, may be readily distinguished one from the other, even in the field; but *A. cervinus* in winter so closely resembles *A. pratensis* in spring that it is extremely difficult to distinguish them, so far as plumage is concerned.

—F. COBURN (Holloway Head, Birmingham).

Nesting of the Hawfinch in Lincolnshire.—I think it possible that readers of 'The Zoologist' may be interested to know that a nest of the Hawfinch, *Coccothraustes vulgaris*, has been found in the park at Lea Hall, near Gainsborough. It is placed rather more than half-way up a large old

hawthorn (see Yarrell, 4th ed. vol. ii. p. 100), and made of small black twigs with a sort of cup in the middle. Our butler discovered the nest accidentally by finding two young nestlings below the tree on the ground. He put them in a small wire-cage, and tied it half-way up against the trunk. He has since seen the old birds come and feed the caged young ones. The latter are almost fully fledged, and have the black and white wing-feathers very strongly marked. Their large beaks are still (June 13th) quite soft. They sit solemnly side by side on the perch in the cage, and look very funny with small tufts of down sprouting from among the head feathers. They allow visitors to approach quite closely without moving, or appearing in the least alarmed. I see Yarrell (*l. c.*) states that the Hawfinch has increased and spread enormously of late years, and that the discovery of its nest in Lincolnshire "is probably only a matter of time." It has been sought for here for many years, but never until now with success. There are every summer several pairs of Hawfinches about the garden, feeding on the peas. In the autumns of 1879 and 1880 I often saw these birds feeding on the yew berries and pecking about on the gravel beneath the yew tree in a garden on the banks of the Trent.—Mrs. ANDERSON (Lea Hall, Gainsborough, Lincolnshire).

Song of the Icterine Warbler.—Like Mr. Benson, I think the song of *Hypolais icterina* is one of the finest we can hear, and I cannot understand the late Mr. Seebohm affirming that it is "immeasurably inferior" to that of the Nightingale. The song certainly "does not fill the ear" like that of the last-mentioned bird, and Mr. Seebohm here expresses precisely the feeling I have experienced while listening, though I have not had the good fortune to hear both species singing at the same time. Personally I do not think the two songs can rightly be compared; each is original, and possesses perhaps more points of difference than of resemblance to the other. Mr. Aplin is doubtless correct in surmising that birds "vary in the quality and manner of delivery of their songs in different localities." The author of 'A Year with the Birds' (3rd ed. p. 258) has stated that he found in 1886 the Yellowhammers in South Dorset "singing in a different manner from" those in Oxfordshire, "though it would be almost impossible to describe the difference;" and the same author also mentions that he has noticed the same in the Chaffinch, but in this case the localities were more widely separated.—W. RUSKIN BUTTERFIELD (10, Stanhope Place, St. Leonards-on-Sea).

Rooks Nesting in Laurels and Holly.—Being desirous of procuring a few varieties of the eggs of the Rook, Mr. Thomas Parkin and I on April 11th drove over to Beaufort, the seat of Sir Archibald Lamb, Bart., through whose kindness our desire was not only gratified, but we were enabled to learn many interesting particulars of the fine old Rookery in the

park there. The nests are for the most part placed in oaks and firs, but there are several (one of which we found to be about nine feet from the ground) built in laurels, and one in a holly. There is no obvious reason for the choice of these low sites, the park being studded with hundreds of acres of tall and suitable trees. The owners of these nests do not appear to be harassed by their more elevated neighbours, and the nests are in good condition. One of the eggs we secured was from a nest of three, all of which were no larger than eggs of the Mistletoe Thrush.—W. RUSKIN BUTTERFIELD (St. Leonards-on-Sea).

Increase of the Turtle Dove in Lincolnshire.—It may be of interest to record the fact that this summer and last, the increase of Turtle Doves in the garden and grounds here has been quite extraordinary. In Yarrell's 'British Birds' (ed. 1841) there is a note by my father-in-law, the late Sir C. Anderson, as follows:—"A pair of Turtle Doves bred here in 1870." This is recorded as a rarity. In the fourth edition of this work (vol. iii. p. 22) it is remarked that, "Owing to the great increase of conditions suitable to their habits, these birds are both more numerous and more widely distributed than in former years." This, however, would hardly account for the fact that they seem to have driven away the Wood Pigeons. In former years the loud, clear note of the Ring Dove sounded incessantly all day long in this garden. It is now seldom heard; while the low "purr" of the Turtle takes its place. In May it was incessant, and sounded from morning to night all over the garden. The birds themselves are so shy I have never seen them; but their deep, rich "karoo" begins at dawn, and I often hear it at 4 a.m. from my bed-room. Last year an interesting experiment was tried with the eggs of the Turtle Dove. Our butler found a nest in an elder-bush in a small plantation near the house. He cleverly made an exchange between the eggs of a tame Indian dove—then sitting in a cage against the house—and those of the Turtle. Both birds continued to sit on their substituted eggs; but the Turtle, from some unknown cause, deserted at the end of a week. The tame dove persevered in her duties and hatched out two young Turtles. One died, but the other was reared and kept for some time in a cage. It was, however, so wild, and beat itself about the cage in such a painful manner whenever a human being approached, that it was set free and flew away, returning once or twice to feed with the tame doves on the lawn, but eventually departing for good.—Mrs. ANDERSON (Lea Hall, Gainsborough, Lincolnshire).

Incubated Cuckoo's Egg on the Ground.—I was lately shown an egg which in my opinion the finder rightly regards as a Cuckoo's. The egg was found on June 4th, 1894, on a slight declivity near the rectory garden, without any trace of a nest. On being blown it proved to be incubated, I should say for about five or six days. It might have been

placed where found by some birds-nesting boy, or it may have been carried there by some bird, though this seems unlikely, for egg-stealers among birds usually, I believe, carry away their spoil impaled on their bill. Perhaps, after all, there is more in the habits of *Cuculus canorus* than is dreamt of!—W. RUSKIN BUTTERFIELD (St. Leonards-on-Sea).

Cuckoo's Egg in Rock Pipit's Nest.—On June 4th I took two eggs of the Rock Pipit and one of the Cuckoo from a nest on the cliffs at Abersoch, Carnarvonshire, and as Mr. E. Bidwell informs me that the Rock Pipit is a rather rare fosterer of the Cuckoo, the present instance is therefore perhaps worth recording. — CHARLES OLDHAM (Romiley, Cheshire).

Disease in Wood Pigeons.—During last autumn and winter the unusual abundance of Wood Pigeons in the western portion of the New Forest and neighbourhood was a cause of frequent remark, and many of the birds were killed, a majority of which presented the peculiarity of having lost their flight-feathers in a greater or less degree, and of being attacked more or less with a tuberculous disease which appeared particularly about the beak, legs and feet, causing unsightly swelling, with a discharge which in some cases smelt disagreeably. Whether this disease was contagious or not, I am not prepared to say; but, viewing it in the light of the often-discussed "germ theory," it seems possible, if not probable. At the time that the Wood Pigeons were suffering in this way I saw a female Merlin almost in the same plight, with swollen feet and nostrils, possibly from feeding upon the diseased birds, if indeed this little falcon, like the more powerful Peregrine, takes so large a quarry. Amongst the pigeons I saw one which was suffering badly from the before-mentioned disease, and not in good plumage, had the head pale grey, neck, back, and wing-coverts uniform vinous or purple-grey—reminding one of the Turtle Dove's breast, only darker—shading off almost to rust-colour on greater wing-coverts; breast paler vinous, and the twelve feathers of the tail were mottled dark grey and white, the latter colour predominating. The larger quill-feathers of the wings were of the usual leaden hue, with white edges; there was no indication of the "ring" upon the neck, and the eyes were of a much deeper yellow than in the ordinary type. Sex, female.—G. B. CORBIN (Ringwood, Hants).

Nightingales on the Welsh Border.—On May 13th we heard the Nightingale here, for the first time since 1889, in agreement with the local tradition that they come once in seven years. I believe there are only two pairs. We are seven miles from the Welsh border.—(Miss) MARGARET G. ROBINSON (Peterchurch, Hereford).

[The accuracy of this information is vouched for by the Rev. J. E. Kelsall, who is known to many of the readers of this Journal as a good ornithologist.—ED.]

Hérons and Watercresses.—In the April number of the 'Agricultural Students' Gazette,' Miss Ormerod—so well known for her investigations of the habits of injurious insects—contributes an interesting note showing the prejudicial effect on watercress-beds which may be caused by the thoughtless destruction of Herons. This observation reminds us of Darwin's remarks concerning cats and clover, through the intervention first of mice and then of bees ('Origin of Species,' chap. iii.) and is worth quoting. Miss Ormerod writes:—"We all know that Herons eat fish; in the present instance trout are the kind especially under consideration; also that trout eat water insects of various kinds (in this instance the well-known 'Caddis worms') which often feed partly or wholly on vegetable matter. But to have these facts in sequence—in successive series—on one area of less than an acre in extent, culminating in such destruction of the vegetable food (in this instance watercresses) that on special investigation three-quarters of the crop was found to be materially damaged, if not totally destroyed for sale purposes, is what may be considered an only too complete observation. It was on January 23rd that I received a bottle containing specimens of injured watercresses, together with a plentiful supply of what are so very well known as 'Caddis-worms,' that it is unnecessary to describe them. Several of these trichopterous larvæ were free from their cases, and thus their somewhat cylindrical shape, horny head, leathery three following segments, with a pair of legs attached to each, and white soft succeeding segments were clearly noticeable. So also were the two strong curved hooks, placed far apart, one on each side of the caudal extremity, of which it is said the larvæ make use to fix themselves where they may desire to be stationary. These strong little hooks were a very striking point in their economy, for on lightly drawing the larva along my finger, their catching power was distinctly perceptible; or on drawing them along the woollen tablecloth they raised threads of the wool. In due time the larvæ go through their changes up to the state of the four-winged flies, known as 'Caddis flies,' or 'water-moths.' These when at rest have the wings deflexed, and as a regular thing both pairs are furnished with branching nerves. The front pair are usually somewhat hairy, the hinder pair sometimes, if not always, folded when at rest. Most of the kinds appear during the summer, and of the vast number of species Stephens says (Illustr. Brit. Ent., Mandibulata, vol. vi. p. 146) in general habit they greatly resemble each other, and from the almost total uniformity of colouring that obtains amongst them, they are extremely difficult to divide specifically from each other. In regard to prevention of attack of these water-grubs, which was the object with which the collection of specimens and report of investigations was sent me, I felt very much at a loss, never having had experience in the treatment of watercress beds on the scale of management for sale. It was obvious, however, that poisonous applications, either to the leafage, or thrown into

the water, were inadmissible, and the only practical measure appeared to be introducing some live agency (possibly the common carnivorous water-beetles) which might clear the obnoxious plant-eating larvæ. To this suggestion I received the reply that 'there were lots of trouts till the Herons came;'—but for reasons (which might give offence if specified here) there were difficulties in the way of having the Herons got rid of. Here we come to what appears to me of a good deal of interest. Besides what is known to, or is before us all, as to partiality of trout for insect food, on turning to Walton's 'Complete Angler' (7th ed. pp. 302–308), I found a mass of observations on the 'divers kinds of Caddis, or Case-worms . . . which be a choice bait for any fish,' and at page 305 he mentions some that 'be usually bred in the very little rills or ditches,' of which (piscatorially speaking) he writes 'doubtless they are the death of many trouts.' This is followed by directions of how the Caddis-worm is to be *ordered*, and then thrown 'into any great still hole where a trout is, and he will presently venture his life for it, it is not to be doubted, if you be not espied,' &c., &c. Other causes of destruction may just possibly have been present, but the subject having been repeatedly investigated in the course of report to myself, I see no reason at all to doubt that it was the great amount of presence of the Caddis-worms that caused mischief, and Isaac Walton's evidence of the love of trout for Caddis-worms as baits points strongly to their knowledge of the goodness of the larvæ for food in more natural circumstances; and that in their removal the watercress grower lost very helpful friends. The habits of Herons need no comment, and the sequence of events consequent on local encouragement (beyond what in these days is called 'natural balance') of one large species of birds of special habits, downwards through destruction of insect-eating fishes, and overplus of vegetable-eating insects, to the great pecuniary loss of the grower of the insect-injured crop, is, I think, of some interest.—E. A. ORMEROD."

Bird-life in the Dutch Water Meadows.—A writer in 'The Spectator' of May 23rd last, who though anonymous is evidently an observant naturalist, gives a pleasing description of the appearance presented in summer by the reclaimed marshes or "polders" of Holland, which afford such excellent pasturage for cattle; and from personal observation we can vouch for the accuracy of his description. He says:—"Whitethroats, Linnets, Finches, Blackcaps, Thrushes, Flycatchers, Robins, and other hedge and thicket-living birds are absent in a region where dykes take the place of fences, and there is no hedgerow timber. Only in the dense copses of alder, rooted in stagnant water and matted with a jumble of marsh-plants, do the river-side warblers appear. There the Sedge-bird, the Reed Warbler, and the Great Sedge Warbler, the finest of all Continental song-birds, except the Nightingale, may be heard at all hours of the day. But in the open 'polders' between the long rhines of water which run parallel, like lines of

ribbon, between the strips of sound ground, even the Lark and Pipit are scarcely seen. Their place is taken by birds which in England are only found in the salt-marshes or on the high moors. Hundreds of Redshanks nest in the mowing grass, and every few acres hold a pair of these noisy but most ornamental birds. They are incessantly in motion, skimming low over the grass and water, with bright red legs stretched backwards, and uttering their musical call. Godwits, a large wader, are almost equally common, and their fine olive-clouded eggs, as well as those of the Redshank, are brought in numbers into the towns for sale as 'Plover's eggs.' Another 'polder' bird is the Oystercatcher. These not only nest in the meadows,* but fly in at all times of the year when the flood-tide has driven them from the sands of the shallow sea beyond the dunes. Of all the birds of the district the Oystercatchers are the most restless and vociferous, dashing at any trespassers, whether dog or man, and pursuing them with incessant screams until they have left the neighbourhood of their nest, when the pursuit is generally taken up by a second pair. The Curlews nest on the margin of the sand-dunes, but haunt the wet meadows at all hours of the day and night. Even Swallows and Martins are not common, their place being taken near the coast by the beautiful white Terns, the 'sea-swallows,' which twist and hover over the canals and dykes on the watch for fish. These Terns are as tame as English Sparrows; tamer perhaps, for while the Sparrow has the boldness which comes from familiarity with danger, the Terns pursue their fishing by the roadside as if man did not exist. Each bird beats a certain length of canal, drifting on long white wings almost as the wind carries it, and falling instantaneously to the surface when it sees a fish. When tired the birds fly to the locks, and there sit sunning themselves on the black-and-white mooring-posts which stud the water near the bank. Wild Ducks are scattered over the whole of the 'polders,' though nowhere in great numbers, except round the large country-houses where they are preserved. But every alder copse seems to hold a brood, and the old Mallards lie out all day in the sun in the thick grasses among the butter-burrs. Herons frequent every part of the polder flats, and the number of heronries in the thick canal-bordered woods which surround the mansions of the Dutch country squires is very large. That at the Royal Palace, which was the scene of the last meets at the Loo Hawking Club, is the largest and best known. But in many of the least wooded districts they seem equally common, though suitable sites for nesting-places do not exist. Like the Cormorants in the Amsterdam Zoological Gardens, which have built nests upon the ground adjoining the lakes, these Herons have abandoned their usual habits, and nest wherever a few trees offer a home. One considerable colony, between the Hook of Holland and Schiedam, is

* This information will be new to those who are accustomed to regard the Oystercatcher as almost exclusively a shore bird.

built in the small elms surrounding a farmhouse and buildings, and the Herons, with a number of Rooks, bring up their young above the sights and sounds of a cow-stable and poultry-yard. Storks, formerly so common, seem to be gradually deserting Holland. A pair have built in the topmost pinnacle of the spire of the new Reichs Museum at Amsterdam, and a tree which was inhabited eighteen years ago near the house of Oesterbeg, at the Hague, still holds a nest. But the spectacle of a brood of young Storks, wading about in the wet grass and catching frogs in the evening, is no longer one of the common sights of Holland. Towards the southern shore of the Zuyder Zee the level of the polders sinks, and there, at more than one point, even the Dutch engineers are unable to free the flat from stagnant waters. But the transition from dry polder to wet polder, and thence to marsh, is shown only by change of vegetation and the disappearance of sheep from the meadows. The bird-life remains the same."

MOLLUSCA.

Carnivorous Habits of *Limax agrestis*.—In a foot-note to Mr. F. V. Theobald's paper, "Mollusca injurious to Farmers and Gardeners" (Zool. 1895, p. 208), the statement that *Limax agrestis* eats earthworms is questioned, and it is suggested that the slug had been mistaken for *Testacella*. Mr. Theobald's authority for the statement was, presumably, the late Dr. Gwyn Jefferys, who quotes Mr. J. F. Whiteaves, but does not say whether the earthworms eaten were alive or dead ('British Conchology,' vol. i. p. 134). I have occasionally seen *Limax agrestis* feeding upon dead earthworms in my garden, and in the fields here. Mr. W. A. Gain ('Journal of Conchology,' vol. vi. p. 361) found that in confinement it would not touch earthworms, although mutton, raw and cooked, was eaten. The dead bodies of other slugs are sometimes devoured. A few days ago I watched an individual of *Limax agrestis* feeding upon the crushed body of an *Arion subfuscus*. Mr. H. W. Kew has seen it eating a dead *Limax flavus* ('Naturalist,' 1889, p. 107), and the Rev. A. H. Cooke states that it has been known to feed upon the crushed remains of *Arion ater* ('Cambridge Natural History—Molluscs,' p. 31). Perhaps the most remarkable instance of its carnivorous habits is that recorded by Mr. Cooke (*loc. cit.*), in which five examples were observed, each feeding upon a May-fly.—CHARLES OLDHAM (Romiley, Cheshire).

ANNELIDS.

Large example of *Trocheta subviridis* in the Thames.—Early in the spring of this year Mr. Latimer Clark, F.R.S., brought to the Natural History Museum a large Leech which had been found in a canal opening into the Thames, near Maidenhead. He wrote me that "the men who found it said they knew Lampreys and Leeches well; they were confident it

was not a Leech or Lamprey, and were quite afraid to touch it; they said they never saw one like it before, so I am afraid there will be a difficulty in getting more of them, but will try." Later on Mr. Clark sent me a note from one of his servants, from which I gather that other similar specimens had been seen, though unfortunately not secured. As the Editor of this Journal directed attention to Dutrochet's "Land Leech" in 1887 (see Zool. 1887, p. 515), and as this large Leech is said by Dr. R. Blanchard, who is the best living authority on the group, to be "*une gigantesque Trocheta subviridis*," I think it as well to put on record the appearance of this huge form. During my absence in the spring Mr. Pocock had it under observation in water for something like two months, and he often observed it extend itself to about the length of a foot, or about twice the known maximum length. Preserved in spirit it measures about 230 mm. or something like 9 inches. Its great size appears to be the only point worthy of special remark.—F. JEFFREY BELL (British Museum, Nat. Hist.).

SCIENTIFIC SOCIETIES.

ZOOLOGICAL SOCIETY OF LONDON.

June 16th.—Sir W. H. FLOWER, K.C.B., F.R.S., President, in the chair.

Mr. Sclater exhibited and made remarks on a coloured drawing of the Gnu of Nyassaland, taken by Mr. Caldwell from the specimen transmitted to the British Museum by Sir H. H. Johnston, K.C.B., and exhibited by Mr. Sclater at a former meeting. The specimen seemed to be referable to a new local form of the Brindled Gnu, which Mr. Sclater proposed to name *Connochates taurinus johnstoni*.

Mr. Holding exhibited and made remarks on various abnormal horns and antlers of the Caucasian Wild Goat and two species of Deer.

Mr. E. E. Austen gave an account of a journey undertaken by Mr. F. O. Pickard-Cambridge and himself up the Lower Amazons, on board Messrs. Siemens Bros. Cable s.s. 'Faraday,' for the purpose of making zoological collections on behalf of the British Museum. No terrestrial mammals were met with, but observations were made on the two species of freshwater Dolphins, *Inia geoffroyensis* and *Sotalia tucuxi*, or *S. fluviatilis*, which are extremely abundant in the Lower Amazons. Among the birds the only species of special interest collected were a little Goatsucker from Manaos, referred provisionally to *Nyctiprogne leucopygia*, and a Woodpecker, *Celens ochraceus*, of which the British Museum previously possessed but two specimens. The Reptiles and Amphibians met with all belonged to well-known and widely-distributed forms, and the chief interest of the collections centred in the Invertebrates. Among these Mr. Pickard-Cambridge made

a large collection of Spiders, including an extensive series of the large hairy *Theraphosidæ*, eleven species of which were pronounced to be new. An interesting collection of the nests of some of these forms was also obtained. Mr. Cambridge likewise secured several specimens of *Peripatus*. Mr. Austen, who devoted himself chiefly to Insects, obtained some 2500 specimens of different orders, of which it was expected that a fair proportion would prove to be new. Attention was drawn to some interesting examples of mimicry.

Mr. P. Chalmers Mitchell read a "Contribution to the Anatomy of the Hoatzin (*Opisthocomus cristatus*)." He stated that from the characters of the alimentary canal, the Hoatzin might be placed either between the Sand-Grouse and the Pigeons, or between the *Gallinæ* and the *Cuculidæ*. He described some interesting individual variations in the condition of the ambiens muscle, and referred to other points in the muscular anatomy.

Mr. G. A. Boulenger gave an account of the occurrence of *Tomistoma schlegeli* in the Malay Peninsula, and added some remarks on the atlas and axis of the Crocodilians.

A communication was read from Mr. W. Schaus containing notes on Walker's American types of Lepidoptera in the University Museum, Oxford.

Mr. Hamilton H. Druce read a paper entitled "Further Contributions to our Knowledge of the Bornean *Lycanidæ*," in which he referred to about forty species of this family not hitherto recorded from Borneo. A number of these were new, and were now described by Mr. G. T. Bethune Baker and the author.

Mr. F. G. Parsons read a paper on the anatomy of *Petrogale xanthopus* as compared with that of other Kangaroos.

Dr. J. Anderson communicated, on behalf of Miss M. E. Durham, some notes on the mode of swallowing eggs adopted by a South African Snake, *Dasypeltis scabra*, as observed in the specimens now living in the Society's Gardens, and illustrated by a series of drawings.

Mr. F. O. Pickard-Cambridge read a paper on the Spiders of the Family *Aviculariidæ*, taken during the expedition up the Amazons previously described by Mr. Austen.

Mr. G. A. Boulenger read the description of a Gecko which he proposed to refer to a new genus and species as *Mimetozone floweri*, in honour of Mr. Stanley Flower, who had obtained the specimen at Penang.

This meeting closed the session.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

June 3rd.—Dr. D. SHARP, F.R.S., Vice-President, in the chair.

Mr. Gervase F. Mathew exhibited the new species of *Leucania*, *L. flavicolor*, recently described by Mr. Barrett (*Ent. Mo. Mag.* 2nd ser. vol. vii. p. 99), and also the varieties of *L. pallens* noticed by Mr. Barrett in the same

article (*l. c.* p. 100). He also exhibited a remarkable variety of *Mamestra subjecta*, which bore a close resemblance to *Apamea gemina* var. *remissa* and to *Hadena genistæ*, and a bred specimen of *Eupithecia castigata* (?), with nearly the whole surface of the wings (the margins excepted) denuded of scales.

Mr. Elwes exhibited a collection of butterflies taken in the neighbourhood of Gibraltar during last April, and said that he had found the district very unproductive, owing to the great drought. Mr. J. J. Walker remarked that Mr. Elwes had been unfortunate, as during three spring seasons his experience had been very different; at the same time it seemed to be agreed that Spain, as a whole, was not so rich in Lepidoptera as in other orders of insects.

Dr. Sharp exhibited, on behalf of Mr. Hampson, specimens of the female of *Oiketiscus crameri*, recently sent by Mr. Dudgeon from Sikkim. The females in this species are so maggot-like that it is difficult to recognise them as perfect moths. There were also two pupa-shells, one of which was used as a receptacle for eggs, and in the other eggs had hatched, so that it had the appearance of a pupa filled with young larvæ.

Mr. R. W. Lloyd exhibited a specimen of *Athous hæmorrhoidalis*, from Savernake Forest, Wilts, with a curious malformation of the right antenna.

Mr. Waterhouse exhibited several branches of oaks from the New Forest, entirely denuded of foliage, and stated that throughout large tracts of the forest the oaks had been stripped of their leaves in the same fashion by lepidopterous larvæ, especially *Cheimatobia brumata*, *Hybernia defoliaria*, and *Tortrix viridana*. Certain trees, however, though situated among the denuded trees, had quite escaped. Dr. Sharp suggested that they belonged to a different species; but Mr. Waterhouse said that he had carefully examined them, and that this was not the case. Mr. McLachlan said that the immunity of the trees referred to was probably due to irregularity in coming into leaf. The discussion was continued by Messrs. Elwes, Champion, Blandford, Jacoby, and others.

Mr. Tutt exhibited living pupæ of *Enodia hyperanthus* and *Epinephele ianira*, and pointed out how different the pupæ of these two species were in general appearance, structure, and cremastral attachment. He pointed out that these two species had for a long time been erroneously placed in the same genus, but that, in all stages, they were widely separated, and that not only should they be placed in different genera, but that they appeared to belong to different tribes—*Enodia hyperanthus* being in the Cœnonymphidi and *Epinephele ianira* in the Epinephelidi (*vide* Entom. Record, vii. p. 301). He also exhibited living pupæ of *Thecla pruni* which had been sent to him by Mr. H. Moulsey. He called attention to the great resemblance that the pupa bore, in its dorsal aspect, to a bird-dropping. Black in ground colour, the two whitish prothoracic patches, and

the similarly coloured metathoracic patch which extends transversely across the constricted waist, give it a resemblance that cannot be misunderstood.

Mr. Blandford exhibited live specimens of *Callidium variabile*, L., bred from the bark of beech timber from Blenheim Park.

Mr. A. J. Chitty exhibited two specimens of *Osphya bipunctata*, F., taken by himself and Mr. J. J. Walker at Chattenden Roughs, and two species of *Psylliodes cyanoptera*, Ill., from Wicken.

Canon Fowler exhibited specimens of *Xyletina ater*, Panz., taken by Dr. Chapman in Herefordshire; this was the first time this beetle had been recorded from this or the neighbouring counties.

Mr. Blandford exhibited and described series of Tropical American butterflies from the Godman-Salvin collection, arranged to show the existence and geographical distribution of homœochromatic groups. Mr. Elwes characterised the exhibition as the most interesting that had been before the Society for many years, and hoped that the series would not be broken up, as was intended, until an opportunity had been found for full discussion of the various questions raised. The latter point was also urged by Dr. Sharp and Col. Swinhoe, and at the conclusion of the meeting Mr. Blandford announced that Mr. Salvin had kindly consented that the series should be kept intact in order that it might form the subject of a special discussion later in the year, and that he himself would defer the publication of his remarks in view of the anticipated re-opening of the matter.

Dr. Chapman communicated a paper "On the Phylogeny and Evolution of the Lepidoptera from a pupal and oval standpoint."—W. W. FOWLER, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

The Hare. Natural History, by the Rev. H. A. MACPHERSON; Shooting, by the Hon. GERALD LASCELLES; Coursing, by CHARLES RICHARDSON; Hunting, by G. H. LONGMAN and J. S. GIBBONS; Cookery, by Col. KENNEY HERBERT. 8vo, pp. 263. With Illustrations. London: Longmans, Green & Co. 1896.

THIS is the fourth volume which has been issued of Messrs. Longmans' "Fur and Feather" series, and a very good volume it is. In the previous contributions to the series only game-birds have been dealt with, namely, Partridge (*Zool.* 1894, p. 199), Grouse (*tom. cit.*, p. 358), and Pheasant (*Zool.* 1895, p. 397). In the present case, we have to reckon with an animal which may not only be shot like its predecessors, but may be hunted with

harriers or beagles, and coursed with greyhounds. Hence the necessity for finding an extra number of contributors to the volume; and this should have suggested to the editor a modification of the first sentence on the second page of his Preface, as well as the substitution of the word "species" for "variety" in the second sentence on that page.

The first section of this volume on the natural history of the Hare seems to us too sketchy, and not full enough of information. Several points of interest are not touched upon at all. For example, we find nothing said about the period of gestation, or about superfoetation, on which Sir Thos. Browne has discoursed so quaintly; about the condition of the young at birth as compared with young Rabbits; about Hares burrowing and going to ground; about their carrying the young; about the call of the doe Hare to the young; about their fondness for hawthorn berries (Zool. 1867, p. 604), though holly berries are mentioned (p. 27); about the change of colour in winter of the Irish Hare; and about the comparative weights of English and Scotch Hares. Mr. Macpherson remarks (p. 6) that he has "not been able to obtain the weights of Russian Hares." Some statistics on this point will be found in 'The Field' of Nov. 18th, 1893. On the subject of varieties, melanism, and albinism, more might have been said. Mr. Macpherson states (p. 48) that "a list of the black Hares that have been killed in Great Britain would be a very short one." He will find several mentioned in an article on "English and Scotch Hares" in 'The Field' of August 29th, 1891, since which date others have been reported. For example, a black Hare was shot near Newmarket on the 12th September, 1893 ('The Field,' Sept. 23rd, 1893), and another was killed at Haverhill, Suffolk, in January last ('The Field,' Feb. 1st, 1896).

The chapter entitled "The Hare and the Lawyers" is a very meagre one, and affords no adequate view of the present state of the law affecting Hares, a subject of much importance, which should have been more fully dealt with.

Mr. Lascelles in the succeeding section on Shooting has some remarks on the Ground Game Act of 1880, with which we entirely agree. He says:—

"Leaving out all questions of sport, it is difficult to see what good has resulted to anyone from this unfortunate piece of legislation. Never once have we heard a good word spoken for it, either by

labourer, tenant, or landlord. The shooting tenant, to whom the landlord looks for the means to pay the charges on his estate, is the principal sufferer, because farmers do not care to forego any right they may possess—however useless or unsought it may have been—in order to assist a stranger. On some few estates the Act has been a dead letter, because the farmers' relations with their landlord were such that they did not desire to vex him or curtail his enjoyment of his own property for the sake of any advantage forced upon them without their request by the Government of the day."

Another passage in this chapter deserves quotation, on the barbarous practice of shooting at Hares at long ranges. Mr. Lascelles writes:—

"Here let me put in a word, addressed chiefly to the youthful sportsman, never to fire a long shot at a Hare going straight away from him. It is but useless cruelty. I will suppose in these days of weapons of precision, and careful education, that all our young friends have learned to hold pretty straight. They do not, therefore, miss the unfortunate Hare, as little bits of fleck floating in the air demonstrate; but what becomes of her? Occasionally she is picked up by the beaters, dead in a hedgerow three fields away, but more often she is killed—an emaciated wreck—by some shepherd's dog or cur three weeks afterwards. The error and the cruelty are not chargeable to the powers of the gun, nor to the aim of the owner, but to his bad and hasty judgment in firing shots, some of which no doubt will occasionally kill but which in nine cases out of ten he ought to leave alone."

Mr. Lascelles lays it down that thirty yards is the outside range at which Hares should be shot when running straight away from the sportsman, though when crossing the gun they may easily be killed ten yards further off. He gives some useful hints on aiming, and on the necessity of keeping the gun moving in the direction in which the Hare is running.

The sport of hunting the Hare with a pack of hounds is one of the oldest, and in early times was very different to what it is now. Mr. J. S. Gibbons points out some of the changes which have taken place in the method pursued, as well as in the breed of hounds, and after discussing the best size for a harrier—the limit of height being placed between 18 in. and 21 in.—and the easiest way of securing a level pack of hounds (p. 203), mentions "a few points which may be borne in mind by a young hunts-

man" (p. 217). These strike us as being sound and practical. There may be nothing very new in them; it would be difficult indeed to write much that is new on the subject of Hare-hunting, but what the writer has to say is well put, and appears to be the outcome of his own experience. The same may be said of the sections on "Coursing," by Mr. Charles Richardson, and on "Beagling," by Mr. G. H. Longman. To the readers of a natural history journal, however, these portions of the volume will appeal less strongly than the pages for which Mr. Macpherson is responsible. An improvement throughout the volume would be effected by the substitution of headlines that indicate the contents of each page, for in the absence of an index it is very troublesome to discover, without reading several pages, whether any information is given on a particular point or not.

The illustrations, by Messrs. Giles, Thorburn, and Charles Whymper, are for the most part excellent, and have been well reproduced from the originals by the Swan Electric Engraving Company.

The Birds of Berwickshire: with Remarks on their Local Distribution, Migration, and Habits, and also on the Folk-lore, Proverbs, Popular Rhymes, and Sayings connected with them. By GEORGE MUIRHEAD, F.R.S.E., F.Z.S. In two volumes. Vol. II. 8vo, pp. 390. With numerous Illustrations. Edinburgh: David Douglas.

WHEN noticing the first volume of this excellent work (Zool. 1890, p. 114) we expressed the hope that it might be speedily completed, and though at that time we were not prepared to anticipate a delay of five or six years, we are now pleased to congratulate the author on the accomplishment of his task.

In our former notice we dwelt upon the fact that Mr. Muirhead does not confine his attention merely to an enumeration of the various birds to be met with in Berwickshire, but discourses on folk-lore, proverbs, and popular rhymes, which treatment of the subject has so swelled the proportions of his work as to necessitate the publication of a second volume.

It is scarcely possible, in the space at our disposal, to give an adequate idea of the variety of interesting matter which this second volume contains. It begins with the Accipitres, and

includes at the outset a sketch from ancient records of falconry as formerly practised in Berwickshire and the adjacent country. Then come the Steganopodes, amongst which the account given of the Gannet is notable by reason chiefly of the excerpts which are given from the books of John, Duke of Lauderdale, respecting the price of Solan Geese, or, as they are therein termed, "Sollengeese," between the years 1674 and 1678.

At page 43 we find a list of the heronries (fourteen in number) which were found to exist in Berwickshire in 1887, the statistics showing the number of nests in each colony, and the kind of trees selected.

The account given of Billie Mire, an extensive and almost impassable morass, the haunt of innumerable wildfowl, is especially interesting from the fact of its being the principal resort of the Bittern in Berwickshire, as well as of several other birds, such as the Hen Harrier, which are now rarely or never seen in the county.

There can be little doubt that in ancient times, long before the days of agricultural improvement and drainage, whilst as yet the Merse was covered with bogs and morasses which are now drained, the Bittern was to be found in every part of this county; and it may be well supposed that King James IV., who frequently resorted to Bathgate Bog to fly his falcons at the Bittern there, would not fail to try their mettle at this ancient quarry in some of the Berwickshire marshes when he visited Lauder in 1489, and Hume Castle in 1496, with his falconers.

Immense flocks of Wild Geese frequent Berwickshire during the autumn and early spring, and these, according to Mr. Muirhead, consist of the Bean Goose and the Pink-footed species, the average date of their arrival being the 26th of October, when they are generally observed flying from the north-west to the south-east. In a tabular form, extending over fifteen pages, Mr. Muirhead gives a good deal of information about Gray Geese under the following headings:—Parish, Farm, Fields on which the Geese alight; Date of arrival in Spring; ditto in Autumn; and Name and Address of Correspondent supplying the information. An illustration is given (p. 86) of Hile Moss, a picturesque sheet of water of about seventeen acres in extent, on a lonely part of Greenlaw Moor, a favourite haunt of Wild Geese, to which they resort in October and November. Mr. Muirhead

states that although it is probable that the Greylag Goose visits Berwickshire at the same season as the other two species mentioned, yet there appears to be no record of its positive occurrence in the county. The White-fronted Goose, too, "probably visits the county in small numbers in autumn and spring," but the author is able to record but a solitary instance of its appearance, *i. e.* in February, 1884, when one was shot by a keeper on the Kimmerghame estate.

A propos of wildfowl in Scotland, it will be of interest to quote the following list of species which are enumerated in an Act of the Scottish Parliament (16 James VI. c. 23), passed in November, 1600, "against the slaughter of wildfowles":—

"Seing in tyme of peace in all tyme bygane the said pastymes of hunting and halking were the onely means and instruments to keepe the haille Leiges bodies fra not becoming altogether effeminat . . . they discharge any persons whatsomever within this Realme in any wyse to sell or buy any fastan reid or fallowe Deare, Daes, Raes, Hares, Partridges, Moore-fowles, Black-cokes, Aith-hennes, Termigants, Wyld-dukes, Teilles, Atteilles, Goldings, Mortym, Schidderems, Skaildraik, Herron, Butor, or any sik kynde of fowles, commonly used to be chased with Halkes, under the paine of ane hundreth pounds to be incurred alswell by the buyer as the seller."

At pp. 363–364 of this volume Mr. Muirhead gives a list of Berwickshire names for birds, but as he does not include *Aithhen*, *Atteel*, *Golding*, *Mortym* or *Schidderem*, we must conclude either that they are now obsolete, or perhaps were never in use in this county. We should nevertheless be curious to know to what species these names were respectively applied in any part of Scotland.

The chapters on Red Grouse and Blackgame in this volume are especially interesting from the statistical information which they contain, collected by the author from ancient records and little-known histories. The Pheasant, he tells us (p. 170), is first mentioned in Scottish Acts of Parliament in 1594, but how long previously it was known there is uncertain. In the information given by our author concerning game-birds generally he seems well posted up to date, for he quotes Mr. Griffiths' experiments to test the rate of speed of Pheasants and Partridges (pp. 176, 180), and Mr. Ogilvie Grant's remarks on the distinguishing signs of the sexes in Partridges (p. 187). No instance is known to him

of the occurrence of the Red-legged Partridge in Berwickshire, and there is no record of the Great Bustard having been found in that county since the early part of the sixteenth century.

An extremely interesting chapter is that on the Dotterel, concerning which we find seven pages of statistics in tabular form, showing the various parishes in which this bird has been met with, the date of arrival and departure, and the number of individuals commonly observed in the flocks.

With the exception of those birds which stay to nest, the whole of the Woodcocks which are seen in the woods of Berwickshire during the shooting season leave for their breeding-quarters in the northern parts of Europe in March and April; while it has been observed that those which breed in the county disappear towards autumn, having probably migrated southwards. The autumnal flights of Woodcock from the north generally arrive in Berwickshire about October and November (p. 233).

Although there is no record of the nest of the Dunlin having been found in Berwickshire, yet the presumption is that this bird has bred on the moors about Longformacus, for it has been met with there high up on swampy mossy ground in the middle of July.

We have not space to follow Mr. Muirhead through his enumeration of the many kinds of wildfowl and seafowl which haunt the rocky coasts of his county, or come inland to the mosses and tarns at different seasons of the year, some to nest and rear their young, others to seek shelter and food during the autumn and winter months. Enough has been said to show the nature of the volume before us, and its varied contents. It is a work full of curious information calculated to delight the reader, whether he be naturalist or antiquary, and we heartily commend it on that account. To the collector of county bird books it will be especially acceptable, since it deals very completely with a portion of North Britain which to most naturalists has been hitherto a *terra incognita*. The delicacy of the numerous illustrations with which it is adorned renders it in this respect all the more attractive.

The Evolution of Bird-Song: with Observations on the Influence of Heredity and Imitation. By CHARLES A. WITCHELL, Author of the 'Fauna of Gloucestershire.' 8vo, pp. i-x, 1-253. London: A. & C. Black. 1896.

THE songs and cries of birds have attracted the attention of mankind from ancient times to the present day, and sportsmen, poets, and many others as well as naturalists, have considered these subjects. The references to the voices of birds, in books treating even to a limited extent of ornithology, are exceedingly numerous; but, practically, all of them are generalizations from the habits of one or two individual birds under observation. The music (as writers term the intervals of musical pitch) uttered by birds has often been mentioned with some attempt at description in notation, as in Gardiner's 'Music of Nature' (1832), Smee's 'My Garden' (1872), and especially in Cheney's 'Wood Notes Wild' (1892), which work treats at great length of this branch of the subject under discussion.

But investigation of the origin and meanings of the notes of birds has been less often attempted, and apparently with less success. The most important observations on this theme, written in the last century, were those of the Hon. Daines Barrington (Roy. Soc. Phil. Trans. vol. lxiii. 1773, pp. 249-291), which are still quoted as the most conclusive proof of the power of mimicry in perpetuating the vocal characteristics of certain song-birds. But beyond the record of his personal experiments in subjecting young birds to the influence of foster-parents of other musical species, his treatment of the voice in birds is of little value; indeed, his analysis of song itself merely resulted in an arbitrary division of "songs" from "cries," by the test of their comparative duration.

In 1833 appeared 'The Domestic Habits of Birds,' published in the "Library of Entertaining Knowledge," in which bird-song received somewhat extensive treatment; but the author of this section of the book discredited the imitativeness of our wild song-birds, even in so polyglot a species as the Sedge Warbler; and Rennie's statement that the individuals of this species which he heard even in different parts of the country, uttered not only the same notes resembling those of other birds, but also in the

same order of succession, is so contrary to what later and more careful observers have recorded, that it discounts materially the value of his other observations.

In July and August, 1890, Mr. Charles A. Witchell published in 'The Zoologist' two papers, giving certain original theories of the origin and development of the voice and of the songs of birds. The subject was then scientifically so unworked, that it was not easy for ornithologists to determine the accuracy of Mr. Witchell's records, or the value of his theories; and though six years have since elapsed, we are yet without any record of as systematic and extensive a discussion of the subject whereby his propositions can be finally tested.

In the intervening period, however, Mr. Witchell has further considered his position and elaborated his themes, which are now fully stated, though of necessity with some brevity of illustration, in the volume under notice.

In this book the author propounds a theory of the evolution of the voice in birds, and also necessarily discusses, in connection with the main theme, the influence of heredity and imitation. Although the general scheme of his earlier papers (above referred to) is here followed, the author does not travel quite so far in his conclusions; and we think he is wise in thus restricting himself to so new a field as that upon which he has entered.

The "Introduction" informs the reader of the circumstances under which the study of the subject was commenced, and briefly states how the various themes dealt with in later pages were suggested by the habits of the birds observed. We also learn somewhat of the author's method of work, and note the perseverance with which he accumulated almost daily records for a period of eighteen months, before making any comparison of the materials collected.

In Chapter I., "The Origin of the Voice," he suggests a new theory, namely, that the voice may have been of accidental origin, produced by the bodily contortions of animals during combat, and as a result of such contortions, rather than as a direct result of the excitement of the sensorium,—the cause suggested by Darwin ('Expression of the Emotions,' pp. 83, 84). Mr. Witchell adduces the Newt, as an animal which still exhibits the accidental production of the voice, first giving utterance to a vocal sound when wriggling in the grasp of an enemy, and thus

forcing air through the glottis, which in this creature, as in the Frog, is closed during the intervals of breathing.

In this place the puffing and hissing of birds are very properly considered. From original battle-cries the author passes on to alarm-notes, and in this connection we have the first suggestion that Evolution is now proceeding in the formation of a long cry, by the utterance of a shorter one many times repeated in quick succession. Instances are given of the occasional construction of such alarm-phrases by the Blackcap, Long-tailed Titmouse, Nightjar, and other birds, leading to the development of habitually long alarms, like those of the Black-bird, Mistle Thrush, and Magpie.

Chapter II. deals with the influence of combat, including rivalry and emulation; and here we note a suggestion that certain of the Finches may include in their songs sounds which indicate defiance. Hence singing during combat, as exhibited by various species, is also considered.

Chapter IV. deals with the call-note; and here we find a complaint of the lack of attention on the part of ornithologists, who, it seems, have been too ready to call any prominent note a "call-note," such, for instance, as the *pink* of the Chaffinch, which Mr. Witchell shows to be more correctly describable as a "battle-cry." It is suggested that the first call-notes were mere cries of distress inherited by the young, and retained by them as advantageous after leaving the nest. In song-birds the tones might have been "gradually affected by any recurrent prevalent sounds falling on the receptive senses of successive generations of the young."

Chapter V. deals with "the simplest songs," and these the author finds to be at present mere repetitions of call-notes uttered in varied intervals of pitch; in many more elaborate songs the call-note is still retained and frequently employed. Thus the Sky Lark, Nightingale, Goldfinch, House Sparrow, Titmice, Brown Wren, and others, utter their call-notes in their songs. The inference is that in some species the song was originally developed from mere repetitions of the call-note.

In dealing with "noticeable incidents" of bird-song, the author clears the ground of side-issues, before entering upon the more important themes of heredity and imitation. The "incidents" cover a wide range of subjects—the influence of sex,

age, time of day, weather, vehemence, size of bird, and arboreal life. Accent in song, exercise of ears or of eyes in detecting danger, necessity for leisure, flight in song, fluttering of wings as a means of address, and singing in chorus, are all dealt with in this chapter. One point claimed by the author is that a life in foliage leads to a development of hearing, because by that sense birds would most readily learn what was going on in their vicinity; also that a life in foliage is only suited to small birds, as compared with the increased sustenance to be found in larger kinds of food afforded by a more open habitat. Hence singing birds are arboreal and small. The Sky Lark is not mentioned here; but possibly the author would say that the size of the bird and its inconspicuous colouring enable it to survive, despite the conspicuous appearance it presents when singing.

The necessity of leisure for singers is claimed as a reason why laborious birds, as the Rook and Crow, do not sing; and the effects of the demands of young birds, and of enforced idleness in captivity, are here considered.

In Chapter VII. the *crux* of the whole argument—the influence of heredity—is discussed; and here, as elsewhere, the author, though traversing a good deal of ground, has felt himself obliged for want of space to cite but a few examples only in each branch of the subject. He begins by proving the absolute inheritance of the voice in certain non-singing birds, such as the Domestic Fowl, Duck, Swan, Pheasant, &c. Other inheritors of the voice are mentioned, who possess the same tones and notes whether reared artificially or naturally, but we are reminded that in some song-birds every note of the young is acquired by imitation of the parents.

Mr. Witchell traces a family resemblance in the cawing of birds of the Crow family. He finds similarity between the call-notes of several birds of the *Turdidæ*, indicating relationships between the Redwing and Blackbird, Common Thrush and Mistle Thrush, Ring Ouzel, and others. The long high distress-note of the Blackbird he finds to be used on similar occasions by the Robin. The young of the latter approximate to the Redstart, and this bird exhibits as an alarm-note a certain little whistle common to several Warblers.

Similarly the author finds the alarm-croak of the Nightingale reproduced in a modified form in several of its allies.

Among other orders of birds thus discussed are the Finches. The young Chaffinch has a note like that of the young House Sparrow, and the *pink* of the Chaffinch is heard in some other Finches. The Sparrow's *tell* cry is heard prominently in the young Greenfinch and young Brown Linnet. Many other kinds of birds are mentioned in connection with this new and hitherto practically unworked and unnoticed but valuable field for research. Mr. Witchell claims that it is rational to conclude that such family cries as those he adduces "have been employed during a much longer period than songs, which are varied locally and individually; and that the original cries of the various kinds are recorded in their danger-cries and call-notes; and that the tones of the later-developed cries, and modes of singing, are indicated in the first part of the songs, for these have the most generic characters" (p. 137).

In dealing with Variation (Chapter VIII.), it is laid down as an axiom that vocal utterance is always subject to variation. In connection with this theme, extravagance of demeanour is considered, and the progressive song of a Blackbird heard in a garden during several seasons is illustrated in notation (pp. 148, 149). Instances of variation in a House Sparrow, Robin, and Cuckoo are mentioned.

Chapter IX. treats of the influence of imitation, a twin subject to the influence of heredity, in both of which the author has practically broken new ground. Some forty kinds of birds alone are discussed in connection with this matter—a list quite beyond consideration in the space at our disposal.

But notwithstanding the extensive claims made for mimicry in the Thrush, Robin, Sky Lark, Starling, and other birds, and although Mr. Witchell claims as of imitative origin the curious alleged resemblances between the notes of certain birds and sounds made by the elements, by quadrupeds, insects, and by other birds, we do not gather that he claims that a similarity between a bird's note and any other persistent sound is due to the bird in question having deliberately tried to imitate the other sound; but that the species of bird may have been unconsciously influenced during "a long period" by the persistent sound continually falling on its sense of hearing, with the result that its cries might have been only very slightly altered in time or in tone, and this small variation being followed by the young, might

be increasingly modified in seeming imitation during ensuing generations (p. 181).

In allusion to this line of argument, the author asks (p. 228), "Is it strange that a Woodpecker should have a cry exactly like the note of its neighbour a Tree Frog (p. 188), whose cries may be a survival of the complainings of the permian epoch? Is it wonderful that in autumn the Brown Wren should particularly affect a little chirp like the chirp of its companion at that season, a cricket, whose note may have first been produced by an orthopterous ancestor in the coal period"?

The music of Bird-song is the concluding theme, and treats of the strains of various birds; but in regard to the musical notation given of the songs of the better singers, such as the Robin, Blackbird, and Blackcap, the author gives some of the strains he has heard, not as recording the whole song of any one species—which he says are impossible to record on account of their variety—but as indicating how diverse such songs really are, and how impossible it is to attempt, as is sometimes done, to give an idea of a whole song by means of a few bars of music.

Mr. Witchell has attacked a very large subject, and, as he tells us in his preface, he thought out his method of attacking it without the aid of books. The points he raises are so many, and not a few of them so new, that a considerable time must elapse before any general conclusion on the merits of his labours can be reached. It is probable that (as we feel sure he would admit) some of his positions would be found untenable in the light of the fuller investigation which his book should occasion; but, on the other hand, many of his views seem not only plausible, but are justified by a considerable amount of evidence. At any rate, he has produced a volume which enters laboriously upon an unworked field, and no one interested in the voices of wild birds and desirous to investigate the evidence of their development, should miss an opportunity of perusing it. It is to be regretted that the Bibliography was not revised, and made more complete, as it might well have been.

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THE PRESENT RANGE OF THE LION IN INDIA.

A WRITER in a recent number of the Calcutta 'Asian,' who has resided for twelve years in the province of Kathiawar, where, in the Gir Forest, the Lion is still occasionally to be found, gives the following account of its present haunts as compared with its former range in India, and hints at the causes which have contributed to its gradual extinction. He writes:—"We are told that a few Lions are still left in Guzerat and Kutch; but such is not the case.* I am rather doubtful if Lions were ever found in Kutch; at any rate, there are none left there now, and they have long since ceased to exist in the district of Guzerat, where at one time they are said to have been fairly plentiful. The last Lion seen in these districts was, I believe, the one which was shot near the Deesa Cantonment by the late Colonel Heyland, of the 1st Bombay Cavalry. At the present day Lions are only found in the Gir Forest in Kathiawar; formerly they abounded in all the wilder parts of the province, such as the Barda, Aleche, and Girnar Hills, as well as in the hilly tracts round Rajkot and Jasan.

"It is said that in the year 1832-33 the officers of the 3rd Bombay Cavalry, stationed at Rajkot, used to shoot Lions off horseback, but those good times are gone for ever, and now the Gir Forest is the only place in the province where Lions are still

* It is curious to find so recent a writer as Mr. Sterndale, who ought to be well informed, perpetuating this myth in 1884 (*Nat. Hist. Mamm. India and Ceylon*, p. 161).—ED.

to be found, though in very considerably reduced numbers. At a later period the late Jam of Nawanagar used to shoot Lions in the Barda Hills, but it is long since they have been cleared out of this locality too. A few years ago a family party of Lions, consisting of a fine old Lion, a Lioness, and a cub, found their way into these hills during the monsoon when the crops were high from the Gir—a distance of some eighty miles, and doubtless if they had been left alone would have prospered; but this was hardly to be expected with the number of armed men roaming about the hills, and before very long the whole family was wiped out.

“Formerly there was not much fear of the Lions becoming extinct in the Gir Forest, as the latter covered a very much larger area of country than it does now, which, besides being very sparsely populated, was rarely entered by outsiders, who had a wholesome dread of the desperate outlaws who, driven from their homes by the oppression of their native rulers, invariably resorted there. The jungles, too, had a bad reputation for fever, and from want of roads were very difficult of access, so the Lions were left practically undisturbed, and increased and multiplied. With the quieting down of the country everything has much changed by the march of cultivation, the forest has been very much curtailed in area, villages and hamlets have sprung up in every direction, and in the hot weather especially the whole forest is overrun with swarms of cattle and their drivers.

“In the absence of any game or forest laws, it can readily be imagined what the effect of these improvements has been upon the Lions. Slowly but surely their numbers have been decreasing, and unless some more efficient steps than heretofore are taken for their preservation they will certainly become extinct before the lapse of many years. It is true that the Junagarh Durbar in Kathiawar has issued an order that no Lions are to be shot for a period of six years. This is a step in the right direction, but it is not enough. If the Durbar is really anxious to keep up the breed, it must in addition set apart a suitable tract of forest as a reserve under rules similar to those which obtain in British districts, into which not a soul should be allowed to enter under any pretext whatever. Such a reserve, besides benefiting the State in the matter of forest preservation, would afford a sanctuary for the Lions, who would once more find themselves left in peace. The promiscuous shooting which is now carried on amongst the State

forest and police sepoy, without let or hindrance, should be put a stop to with no light hand; and, lastly, the Durbar should, for some years, at any rate, desist from the practice of capturing the cubs. Without some such measure to back up its order prohibiting the killing of the Lions, the latter will not be of much avail.

“The damage is not done by the occasional shikar parties which kill a Lion, perhaps one in two or three years, but by the capturing of the cubs, in effecting which, as often as not, the mother is killed; by the indiscriminate slaughter of the Deer, the Lion’s natural prey, which necessitates its taking to killing cattle—a habit which, sooner or later, leads to its death, and chiefly by the reckless destruction of the forest which is allowed to go on. When the forest disappears nothing will save the Lions; they cannot exist without it any more than fish can exist without water.

“It is strange how the theory that the Kathiawar Lion is devoid of a mane should have been started, but once having been so, there has been no want of writers to keep up the fallacy. During a residence of twelve years in the province I have seen many Lions, both in their wild state in the Gir as well as in captivity in the Junagarh State gardens; but I have yet to see a full-grown Lion without a mane. They all possess this appendage to a more or less degree, according to age, and some of the older beasts I have seen carried manes which, though scantier than those of menagerie Lions from Africa, would, I am sure, have lost but little by comparison with their African brothers in a wild state. As a rule, the manes of the captive Lions in the Junagarh gardens are longer and shaggier than those of the wild animals; but, owing to their habit of avoiding thorny jungle, there is not much to choose in this respect between the two. A Lion when taking his walks abroad invariably follows the cattle tracks and paths which intersect the jungle in all directions, and for resting during the day he prefers to any other covert the shade of a large banyan tree, where the cool breeze will reach him.

“The statement made in the ‘Badminton Library,’* that a black mane is unknown in India, is not correct. In the account of the Kathiawar Lion given in vol. viii. of the ‘Bombay Gazeteer,’ which was contributed by a well-known Kathiawar sportsman, who

* ‘Big Game Shooting’ (India, by Lieut.-Col. R. Heber Percy), vol. ii. p. 194.

knew more about the Gir Lions and their habits than I suppose any one of his time, we are told that with age the whole body of the Lion becomes darker and his mane grows black. I have not myself seen a Gir Lion with an entirely black mane, but I have assisted at the skinning of an old Lion which was shot by a friend, of which the mane was partially black, and with increasing age would doubtless have become entirely so.

“In point of character I do not fancy there is much to choose between the Kathiawar and the African Lion. Although Gir Lions are often found alone, they prefer to move about in family parties or pairs. Of several Lions I have shot, only one was alone—a grand beast, which had been marked down by my trackers on the summit of a low hill, where it was found sleeping in the breeze under the shade of a small tree.”

After describing several successful Lion hunts in Kathiawar, in which he was the principal actor, the writer proceeds:—

“In point of size, I imagine, the Gir Lion is not much, if at all, inferior to its African brother. Selous gives 9 ft. 11 in. as the extreme length of his largest Lion in a straight line between uprights, but this must have been an exceptionally large beast. In 1871 Captain Trotter, of the Trigonometrical Survey, is said to have shot a full-grown Lion, which, as it lay on the ground, measured from the nose to the tip of the tail 8 ft. 10 in., of which 5 ft. 11 in. was the length of the body; the height at the shoulder was 3 ft. 4 in., the girth of neck 2 ft. 6 in., the girth of chest 4 ft. 1 in., the girth of forearm 1 ft. 9 in., and the length of hair in the mane 5 in. One shot by Colonel Jackson measured 9 ft., two by the late Colonel Watson 9 ft. and 9 ft. 1 in. respectively, and one by the late Captain Hebbert 9 ft. 6 in. I am unable to say whether these measurements were taken between uprights or along the curves of the head and body. The following are the measurements of my best Lion, the one I have mentioned before as having been shot on the top of a hill:—

Total length, following the curves of the body 9 ft. 5 in.

Length of tail only 2 ft. 11 in.

Two of my others taped respectively 9 ft. and 9 ft. 1 in. measured in the same way.

“The skull measurements of the 9-foot Lion were as follows:—Length from insertion of incisors to end of occipital process, $13\frac{3}{4}$ in.; depth, $6\frac{1}{4}$ in.; width across zygomatic arches, $9\frac{1}{4}$ in. A

very fine old Lion, which was shot only last year by the late Lieut. P. Hancock, measured 9 ft. 5 in. It was a grand old beast with a fine mane, which was just beginning to turn black.

“From its colour, which varies from ashy to tawny, the Lion is sometimes called the *Unthia Bagh*, or camel tiger, but the name by which it is generally known in the Gir is *Savai*, which is said to be of Arabic origin, meaning ‘he who causes the flocks to bleat.’ The Lioness is called *Shian*, and a pair of Lions hunting together are called *Belar*.

“The cubs, so far as I have been able to ascertain, are generally born in the monsoon months,* and the Lioness generally deposits her litter [from two to six] in one of the holes or earths formed by the action of water, which are found scattered about the Gir, and known locally by the name of *bohiras*. Some of these *bohiras* are very large, and said to be of great length, and to hold water at the bottom; consequently they are cool, and for this reason are often resorted to by Lions during the hot weather. I know of one instance in which three Lions, and of another in which two Lions, were marked down in one of these *bohiras*.”

Dr. W. T. Blanford, in his ‘Fauna of British India’ (Mammalia, 1891), which may be regarded not only as the latest but also as the most authoritative work dealing with the subject, remarks (p. 57), under the head *Felis leo*:—“In India the Lion is verging on extinction. There are probably a very few still living in the wild tract known as the Gir in Kattywar (*sic*), and a few more in the wildest parts of Rájputána, especially southern Jodhpur, in Oodeypur, and around Mount Abu. About twenty years ago (1868) Lions were common near Mount Abu, several were shot near Gwalior,† Goona, and Kotah, and a few still existed near Lalitpur, between Saugor and Jhansi. One is said to have been killed near Goona in 1873. In 1864 one was killed near Sheorajpur, twenty-five miles west of Allahabad; and when the railway was being made from Allahabad to Jubbulpur, in 1866, a fine Lion with a good mane was shot by two of the engineers near the eightieth milestone from Allahabad. About 1830, Lions were common near Ahmedabad. Several years previously, in the early part of the century, Lions

* Sterndale states that the period of gestation is fifteen or sixteen weeks. *Op. cit.* p. 161.—ED.

† Jerdon states that two Lions were killed most unexpectedly near Gwalior in 1874 (‘Mammals of India,’ p. 92).

were to be found in Hurriana* to the northward, and in Khandesh to the south, in many places in Rájputána (one was shot in 1810 within forty miles of the Kot Deji in Sind), and eastward as far as Rewah and Palamow. It is probable that this animal was formerly generally distributed in North-Western and Central India." †

Dr. Blanford adds that he has never heard of a Lion in Kutch, and suspects that Jerdon ('Mammals of India,' p. 92) was mistaken in supposing it to be found there.

Eastward and north of India the Lion is not found, and almost the only part of Western Asia in which it is common is in Mesopotamia and part of South-Eastern Persia.

ON THE NESTING OF THE MARSH WARBLER,
ACROCEPHALUS PALUSTRIS.

BY W. WARDE FOWLER, M.A.

ONCE more I have had exceptional opportunities of studying this bird in the breeding season; this being the fifth year of its annual return to its favourite osier-bed. In May the osiers were being cut, and I was on the point of abandoning my hopes of seeing our visitor again this year; but the owner of the acre or so of withies most kindly consented to postpone further operations until the autumn, and on June 5th I had the satisfaction of listening to the expected song. This is the same day of the month on which I first heard the bird here in 1892, and within my experience the birds have always been as regular in all their operations as if they went by an almanack. I have described the song before, and will here only add that in my opinion it is quite unrivalled for variety and pure silvery tone. The mimicry contained in it does not detract from its peculiar charm, and might well pass unobserved by a careless listener. The birds imitated were almost exclusively those inhabiting the osier-bed

* Andrew Murray states that it was extirpated at Hurriana in 1824 (Geogr. Distrib. Mammalia, p. 93).—ED.

† Cf. Journ. As. Soc. Bengal, xxxvi. part 2, p. 189; Proc. As. Soc. Bengal, 1868, p. 198; and Journ. Geogr. Soc. 1870, p. 204. The last we have heard of were two reported to have been killed by some officers of the Central India Horse when stationed at Goona in 1881.—ED.

or its surroundings at the time—*e. g.* Whitethroat, Reed Bunting, Chaffinch, Tree Pipit, &c.

On the 13th the singing ceased, nor did I hear it again except in occasional snatches. This has been my experience every year about the middle of June, and I am driven to conclude that in this country the song practically ceases when the nest-building begins. In Switzerland I have several times heard this bird in full song close to nest and eggs.

There was, however, just sufficient indication of the bird's presence to lead me to make gradual search in one portion of the osiers; and here, on the 27th, I found the nest with five eggs. The spot was but a few yards from that chosen last year; and again I had to admire the skill, aided no doubt by good fortune, with which the birds contrived to escape all mishaps. Ploughs and ploughboys have been at work, weeds have been burnt, and grass cut within a very few feet of the nest, yet a few simple precautions on my part have been enough to secure it from discovery. I suspect, however, that an earlier nest had been destroyed before its completion, for this one was the most fragile I have ever seen, and was evidently built in a great hurry. It was composed entirely of dry grass, without the usual lining of horsehair, and also without any moss on the outside. It was placed in the fork of an osier-sapling at about a foot and a half from the ground, and had three or four shoots of meadow-sweet woven into the rim. As usual, it was quite close to the edge of the osier-bed, and well away from water.

I was now able to visit the nest daily, and as I frequently had the birds within a couple of yards of my head I became very familiar with their appearance and alarm-notes. I cannot agree with the writers who describe this species as having the upper parts *olive*-brown at this time of year: I can discern nothing approaching to a greenish hue in the living bird, unless it be perhaps towards the tail. The colour is to my eye a pale earth-brown, uniform all over the back. The head is slightly darker; the legs are pale or dull flesh-colour; the stripe over the eye is barely visible in one of the pair—I am not sure which; in the other it is a faint buff. The alarm-note is much like that of the Sedge Warbler, but higher in pitch and less grating: I learnt to distinguish the two without difficulty. When much excited the birds—or possibly the male only—would utter a musical

and most pleasing chirrup as well as the usual alarm-note, an utterance which frequently occurs in the song; and in fact once or twice the bird almost broke out into song, as the Sedge Warbler does when angry.

After a short absence, I found four young birds in the nest on July 12th. The first contour-feathers were almost black: on the tongue were two barb-shaped spots, or rather processes, with the narrow end towards the bill fixed, while the broad one towards the throat was loose, and was raised when the nestlings opened their bills wide. Two days later brown feathers on the back began to appear, the brown being decidedly darker and more rufous than that of the parents. The iris was very dark brown; the legs and feet light flesh-colour. The throat was buffish white, and the breast dull buff.

On the 18th the family left the nest; but I had no difficulty in finding them again, for by this time they were almost the only occupants of the osier-bed. The Sedge Warblers had been gone some days before and also the numerous Whitethroats; only a Reed Bunting or two broke the general silence. It was easy to distinguish the young birds by their darker brown backs, their yellow bills, and the duller white of throat and breast. I found them using as a call-note the same sibilant cry which their parents used as an alarm; but it was shorter and fainter, and almost more like a hiss than a croak. One young bird had died in the nest and been ejected, and I had taken one egg; so we have three young birds at present in the osiers. They were not to be found on the 22nd; they were the last to leave the osier-bed, which now (July 28th) seems entirely deserted.

THE HIBERNATION OF BUTTERFLIES.

From the French of M. G. de Rocquigny-Adanson.

BY THE EDITOR.

THE hibernation of butterflies belonging to the genus *Vanessa* is not of that exceptional character which one is accustomed to assign to it. On the contrary, it must be regarded as an annual periodical phenomenon, perfectly normal. Whether the winter be mild or excessively cold, it matters not. This we are to some extent able to prove from actual facts collected in the centre of

France during the past ten years. We have, as a matter of fact, for the period 1887-1896, the dates of appearance of the hibernating species noted for each year with the greatest care, as shown in the following table.

As will be seen, neither the long and snowy winter of 1887-88, nor the great winter of 1890-91, nor the hard and prolonged winter of 1894-95, seems to have exercised the least influence, except, of course, as regards the earliest and latest date of appearance.

HIBERNATING SPECIES.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.
<i>Vanessa c-album</i>	Mar. 7	Apr. 1	Mar. 23	Mar. 13	Feb. 22	Mar. 17	..	Mar. 21	Mar. 19	Mar. 14
<i>polychloros</i>	.. 5	Mar. 23	Apr. 5	Feb. 20	.. 28	.. 20	Mar. 22	..	.. 23	.. 14
<i>urticæ</i>	Feb. 26	.. 8	Mar. 9	.. 18	.. 21	.. 17	.. 21	Mar. 21	.. 17	Feb. 9
<i>Io</i>	Apr. 18	Apr. 1	.. 10	Mar. 28	.. 27	Feb. 20	.. 12	.. 28	Apr. 5	Mar. 15
<i>Antiopa</i>	.. 18	Mar. 28	Apr. 10	.. 27	Apr. 10	Mar. 17	..	.. 27	.. 5	.. 23
<i>Atalanta cardui</i>	Mar. 7	Apr. 18	.. 19	.. 27	.. 10	.. 21	..	.. 24	..	Apr. 27
<i>Rhodocera rhamni</i>	Feb. 4	Mar. 8	Mar. 9	Jan. 5	Feb. 20	Jan. 30	Mar. 21	Mar. 1	Mar. 18	Feb. 11

It may perhaps be a matter of surprise that we did not succeed in taking a single hibernating specimen of *V. cardui* during the whole ten years. Such is the case nevertheless, and we cannot alter it. Other parts of France doubtless are more privileged than ours from this point of view. The appearances of this *Vanessa* are, moreover, always more or less irregular.

It should be remembered that the earliest normal broods of *Vanessa* usually appear in June and July, rarely towards the end of May, and only with *V. urticæ*, at least so far as our experience goes.

There are other hibernating Lepidoptera which appear regularly after or even during winter, amongst which we may name, for example, *Rhodocera rhamni*, *R. Cleopatra*, *Macroglossa stellatarum*, *Gonoptera libatrix*, *Larentia dubitaria*, and *Tinea misella*.

Rhodocera rhamni (the "citron" of Geoffroy) is the most precocious of all. We have seen it on the wing on the 5th January, 1890, and the 30th January, 1892.*

* Translated from the 'Revue Scientifique' for August, 1896.

ON THE BREEDING OF THE WALL CREEPER,
TICHODROMA MURARIA.

By W. H. ST. QUINTIN.

THE interest which attaches to the habits of this charming little bird is my excuse for asking you to insert the following in your pages. On the 5th inst. I was descending the gorge of the Trift, so well known to visitors to Zermatt as giving access to some of the most interesting of the minor peaks to be reached from that most attractive climbing centre. As I reached the lower end, and was coming out into the main valley, the movements of an object on the face of the opposite wall of rock attracted my attention. A glance through a glass made certain that it was, what I had suspected, a Wall-creeper. Sitting down, I watched and saw that the bird was gathering food, and that the bunch in its beak of what appeared to be light-coloured moths and spiders' nests was rapidly accumulating as the bird pursued its irregular course up and along the precipitous rocks, shifting its position with jerky leaps more frequently in a horizontal direction, flirting its wings and tail, and showing the lovely rose-coloured shoulders in a way which, with its general plumage of quaker-grey, irresistibly suggested comparison with an enormous crimson underwing moth. Presently, dropping off the cliff, the bird, which by this time I had identified as a female, passed me in its fluttering flight, and disappeared round a projecting rock nearly on my level. While I watched to see if it would return, I suddenly saw before me the male hunting over the same rock, on which he seemed to find an abundance of food, for in a very few minutes he too had his "load" ready for delivery to what I now knew was at hand, an expectant brood. His search concluded at a considerably higher level than that of his mate, and letting go his hold, he allowed himself to sink through the air until, when opposite to me, he arrested his drop, and pursued an exactly similar flight to that of the female.

It did not take me long to turn the angle of the rock in question, and I soon discovered a likely-looking crevice, and I sat down against a grey stone with my glass in readiness at a distance of some thirty-five or forty yards. I had seen neither bird commence its hunt for food, nor leave the spot in which

I expected the nest to be. But as I watched I had not long to wait before one of the birds, the male again, came swinging round the corner with a beakful of food and lit upon the slab of stone a few yards from the crevice. I was discovered at once, and the bird seemed irresolute whether the risk of approaching the nest was not too great; but, as I remained quiet, he soon commenced with sidelong hops to approach the crevice, and at last disappeared within it.

The crevice seemed six or eight inches wide at the outside, and was some twelve or fifteen feet long, horizontal, and appeared to have been caused in the fall of a gigantic block as large as a four-roomed cottage, which had left the mountain-side, and had found a resting-place on the upper edges of the boulders in the torrent-bed. A further slip had apparently occurred, and the upper portion had moved forward, causing it to project over the lower half, and of course made a projecting roof to the crack in which the nest was placed. The rock overhung the torrent, swollen with the rapidly-thawing snow, and nothing could be done in the way of further examination of the nest-site without a rope and crowbar, neither of which was at hand.

I watched several visits of the male bird, but the female did not appear for some time. At last, after one of the visits of the male, after leaving the crack, and when on the point of taking wing, he scrambled up the slab again, fluttering his wings and showing the beautiful colours to the greatest advantage, in much excitement. From the nest out slipped the female, bearing away in her beak what was evidently the dropping of one of the brood, and I watched her flight until she began, in her turn, to search for food, the male having taken a longer flight round an angle of the mountain side.

At this point I was obliged to leave them, as there was a dance going on in a half-finished chalet above, and I noticed that I was arousing the curiosity of the young people passing up and down by my movements, and I was of course afraid of betraying the secret which I had accidentally discovered. But a friend told me that a few days afterwards, in passing the place, which I had described to him, he saw the parent birds still busy, so no doubt the brood was soon afterwards safely launched.

I was surprised to find that a site had been selected by these birds, which one is accustomed to see in such desolate

surroundings, within forty yards of a turn in a track up the gorge, certainly never a much-frequented one, and probably this late season not in use at all at the time when the birds made their choice, but still quite within the "bounds of civilisation," and within sight, and almost within hearing, of the stir and bustle of Zermatt down below.

THE NATURAL HISTORY MUSEUM AT CARLISLE.

By REV. H. A. MACPHERSON, M.A.

My friend Mr. J. H. Gurney has suggested that a brief notice of the Carlisle Museum might fitly follow his article on the Norwich Museum (p. 81). For my part, I am not fond of comparing great things with small; the Norwich Museum is a *fait accompli*, while the Carlisle Museum is only gasping for its first breath. A few years ago Mr. Charles Ferguson, of Carlisle, the eminent architect, brother of Chancellor Ferguson, F.S.A., a well-known authority on the archæology of North-west England, persuaded the public to purchase a large house in Carlisle (called "Tullie House," after a former owner of that name), with the view of converting the same into a Museum of Antiquities and a School of Art. The late Bishop Goodwin warmly espoused the cause, as did many local gentlemen. The building was secured and presented to the Corporation of Carlisle. It then occurred to my late friend, Mr. J. W. Harris, of Broughton, Cockermouth, to offer the Corporation his collection of mounted British birds, to be exhibited in Tullie House on certain conditions. The Corporation did me the honour of requesting my advice on the subject. In association with the late Messrs. T. Duckworth, John Sinclair, and other genuine working men, I had been struggling for years to persuade the local public of the need of a local Natural History Museum worthy of the name. It was therefore a great pleasure to be able to advise the Corporation, that if they were willing to regard the Harris collection as only a nucleus, and to mount the rarer skins in my own collection, which I was willing to place unreservedly at the service of the public, I felt convinced that within a few years we could bring together a really useful collection of British birds, chiefly local,

and illustrating as far as possible the various changes of plumage which the different species pass through. I persuaded my valued friend Mr. Harris that the older birds in his series should be replaced by fresh specimens. I deeply regret that his death deprived us of the advantage of the advice of a senior naturalist, whose practical knowledge would have been helpful in many ways. To cut the story as short as possible, the Harris Collection came to Carlisle, and, after the usual inevitable delay, was lodged in Tullie House. The Chairman of the Corporation Committee was Chancellor Ferguson. He was kind enough to adopt such suggestions as Mr. D. L. Thorpe and I could make. A deputation of the Corporation Committee visited Newcastle, and a careful examination of the Museum in the hands of Mr. Howse satisfied them that they could accept my suggestion to mount our birds in similar cases to those which Mr. Hancock approved. A birdstuffer—Mr. Hope, of Penrith—was engaged to commence with such of the Harris birds and my skins and fresh specimens as were most suitable. His time, however, could only be given by instalments.

The Corporation have treated the natural history department of Tullie House in a generous spirit, but it is only one item in their scheme—an item for which they have no personal taste or appreciation. We have now a fair number of groups of British birds ranged on shelves along the walls of a large gallery on the ground floor; but the time which the birdstuffer can devote to the work is very limited. We have not as yet given much time to the Passeres; but the cases of the Black Redstarts, Bearded Tits, and a few others are already appreciated by the public. A fine series of the four British Skuas includes an adult Buffon's Skua in full summer dress from the neighbourhood, as well as many specimens in different stages. The *Anatidæ* include a good series of certain species, notably *Harelda glacialis*, *Fuligula marila*, *Dafila acuta*, and others. The Dotterels were mostly skinned by myself. An exception to this may be made in regard to the nestling in down presented by Mr. Evelyn Rawson. One day in 1893, when Mr. Thorpe was studying wildfowl in Western Canada, and I was away on sick furlough, Mr. Rawson arrived with three little downy Dotterel, all in the flesh, and intended for the Carlisle Museum. In our absence we lost the opportunity. Nevertheless Mr. Rawson gave us the only nestling which

remained in his hands when I returned to duty. Some other cases of waders may be said to rise above mediocrity. One of the downy Grey Plovers, which Messrs. Seebohm and Harvie Brown brought back from Siberia, has been lately added to the Museum. Two beautiful adults in full summer livery, a phase very difficult to obtain on the Solway Firth, are included in the same case.

The Phalaropes also come out pretty well. The best Grey Phalarope is an old female, shot on the Solway in December, and wearing complete winter dress with the exception of a single red feather still retained among the upper tail-coverts.

The prettiest case of *Laridæ* is that of *Xema sabinii*, which is only, however, represented by two immature birds. One of these was shot on the Dorset coast, at the beginning of December, 1893 (not, as I recorded, in November); its fellow is a bird which was shot on the Solway Firth the same year. The next group is that of *Larus minutus*. The two adults are of foreign origin; but both the immature birds and the specimen in change were shot on the Solway.

It would be tedious to give such cursory jottings as these at any greater length; but it may be pardonable to point out that the collection includes a few local rarities. Mr. Edward Tandy was good enough to give the Museum the only Cumbrian specimen of the Pectoral Sandpiper. Mr. J. H. Gurney most generously allowed the Crofton-killed specimen of the Surf Scoter to return to the county in which it was shot. (I gave him the only good bird I had myself in exchange, an adult Ivory Gull, which had belonged to Sir W. Jardine.) The unique British specimen of the Isabelline Wheatear was given to the National Collection before the present Carlisle Museum was opened, but we have the promise of the loan of a local Alpine Swift; and Mr. Heywood Thompson has lent his immature male specimen of the Surf Scoter, which he shot on the Ribble. Mr. John Young was kind enough to bring us the downy young of the Little Ringed Plover from Hungary, with a pair of old birds. Mr. John Benson was good enough to bring two nestlings of *Turdus pilaris* from Norway at my request. Professor Collett has most kindly presented nestling skins of the Shore Lark, Siskin, and two or three other species.

No public funds are available for acquiring specimens. We

cannot, alas! get the mounted Mammals or Fishes under weigh in the meantime. The limited funds at the disposal of the Committee are wholly absorbed by the expenses of mounting and casing the Birds. It is therefore obvious that the Museum cannot advance so fast as could be desired; but we should be most thankful to receive gifts for the series of birds or birds' eggs. We have very few eggs, and I am no oologist. My personal endeavour is to secure the downy or nestling dress of each species, as the first link in the changes of dress. I am aware that few of the readers of 'The Zoologist' are Cumbrians; but I am not in any sense a local man myself. It is my ambition to help, in a humble way, any public museum; and I have no special interest in helping that of Carlisle, which has stronger claims upon those who have some permanent and life-long connection with the county. But the half-fledged Museum of the little Border city already affords a vast amount of pleasure to hundreds of working men, many of whom spend their evenings and half-holidays in criticising the cases, and explaining to their friends how they think they could be improved. We have a cabinet of local Lepidoptera, which was purchased by a subscription, and this is of great interest to our young but enthusiastic school of field naturalists. For their sake, therefore, I venture to say how thankful we should be for any additions to our series. I have no immediate prospect of going abroad myself to fetch any of the desiderata from distant collecting grounds; I am therefore emboldened to repeat that the friends of the Museum would be grateful for any duplicate specimens which their fellow-naturalists may care at any time to present to this public institution.

NOTES AND QUERIES.

Census Specierum Animalium Viventium.— We are indebted to Mr. P. L. Sclater for the following Census, which we understand was drawn up by the contributors to the 'Zoological Record' in February last:—

Mammalia	2,500
Aves	12,500
Reptilia and Batrachia	4,400
Pisces	12,000

Tunicata	900
Mollusca	50,000
Brachiopoda	150
Bryozoa	1800
Crustacea	20,000
Arachnida	10,000
Myriopoda and Protracheata	3,000
Insecta	230,000
Echinodermata	3,000
Vermes	6,150
Cœlenterata	2,000
Spongiæ	1,500
Protozoa	6,100
Total	<u>366,000</u>

MAMMALIA.

The Rabbit Plague in Australia.—An American writer, Mr. Bosse, of New Orleans, has addressed a letter to the United States Minister of Mines and Agriculture, suggesting the advisability of introducing into Australia the American Eagle Owl (*Bubo virginianus*), in order to keep down the Rabbits. Australia already possesses several diurnal birds of prey which habitually kill and feed on Rabbits, as, for instance, the Wedge-tailed Eagle (*Aquila audax*), the Australian Goshawks (*Astur approximans* and *A. cruentus*), the Black-breasted Buzzard (*Buteo melanosternum*), and the Australian Kite (*Milvus affinis*); and if these birds were only left unmolested they would do good work in the direction desired. The proposed introduction of another bird of prey is not only unnecessary, but also highly undesirable for other reasons. The American Eagle Owl would, no doubt, kill Rabbits, but it would certainly not confine its attention to these animals, and the account given of it by American naturalists shows it to be a very unwelcome neighbour to farmers and poultry keepers. Dr. A. K. Fisher, at page 175 of his useful work, ‘The Hawks and Owls of the United States in their relation to Agriculture’ (Bull. U.S. Department of Agriculture, No. 3, 1893), thus describes its habits:—“Of all the birds of prey, with the exception possibly of the Goshawk and Cooper’s Hawk, the Great Horned Owl is the most destructive to poultry. All kinds of poultry seem to be taken, though when Guinea Fowls and Turkeys are obtainable, it shows a preference for these. In sections of the country where it is common, the inhabitants often complain bitterly of its ravages. An examination of the table at the end of this article will show that a large proportion of the specimens contained the remains of poultry.” The following, from the pen of Dr. P. R. Hoy, shows how destructive a single Owl may be:—“The specimen in the Museum of the Philadelphia Academy was known to carry off from one farm in the

space of a month not less than twenty-seven individuals of various kinds of poultry before it was shot" (Proc. Philad. Acad. Nat. Soc. vol. vi. 1853, p. 307). Dr. Hart Merriam also, in his 'Birds of Connecticut,' 1877 (p. 97), states that he has known one of these birds to kill and decapitate three Turkeys and several hens in a single night, leaving the bodies uninjured and fit for the table. In portions of the country where game birds are common the depredations among them are nearly, if not fully, as great as in the poultry yard. Ruffed Grouse particularly seem to suffer, probably on account of their conspicuous size. Mr. E. E. Seton found two Ruffed Grouse and a Hare in the nest of a species in Manitoba ('Auk,' vol. ii. 1885, p. 21). A number of stomachs recorded in the table drawn up by Dr. Fisher contained the remains of this noble game bird. Domesticated Pigeons seem to be particularly agreeable to the Owl's taste, and the neighbouring dovescotes suffer correspondingly. With these authoritative statements in view, therefore, it seems to us that it would be extremely unwise to adopt Mr. Bosse's suggestion, and we trust that the Australian authorities will be warned in time against taking any such step as that proposed.

Date of Birth of Young Otters.—On May 27th last a female Otter, *Lutra vulgaris*, weighing 17 lbs., was killed in the river Irt near Holmrook, by the West Cumberland Otter-hounds. The huntsman, Mr. Isaac Fletcher, when cleaning it, found three perfectly formed young ones *in utero*. He preserved one in spirits and destroyed the other two. I believe I am justified in stating that the young in this instance would have been produced about the middle of July.—JOHN R. DENWOOD (Kirkgate, Cockermonth).

Fecundity of the Stoat.—A few summers ago I had reason to believe that a pair of Stoats were rearing their offspring beneath the *débris* of an old haystack near to Ashlands, in Leicestershire. A trap, baited with a House Sparrow, was set overnight some twenty yards away, with the result that the following morning the female Stoat was found dead in it, but the bait gone. Thereupon I worked down to the presumed nest, from which the male bolted and was shot, and in due course I came upon *thirteen* young ones and the dead sparrow, quite intact, lying in their midst. The male had obviously carried the bait from the trap after the female had been caught and killed by it. The young, I may add, were only two or three days old. With regard to the manner in which Stoats convey eggs, and concerning which questions are frequently asked, it may be of interest to state that the eggs are *not* carried in the mouth, but are rolled along the ground, propelled and directed by the chin and fore feet alternately. At least such is my conviction after ocular experience of the performance at fairly short range.—H. S. DAVENPORT (Skeffington, Leicester).

Squirrel killing Small Birds.—As some doubts have been expressed about the Squirrel being carnivorous, perhaps the following fact may interest some of your readers. A few days ago (in July) my daughter's attention was attracted to the top of an ivy-covered garden wall by hearing a sudden commotion there. Upon hastening to the spot she saw a pair of Robins scolding at a large handsome Squirrel which had robbed their nest, and was carrying off a full-fledged young Robin, which was uttering piteous cries. The Squirrel then ran along the garden-wall, and leaped from it to a pine-tree, when it disappeared with its prey.—(Mrs.) FRANCES J. BATTERSBY (Cromlyn, Westmeath, Ireland).

Squirrel killing Small Birds.—On July 18th my father had his attention attracted to an oak tree by the plaintive cries and flutterings of two birds which proved to be Flycatchers. The cause of their commotion was soon seen, for sitting on the poor birds' nest was a Squirrel coolly devouring a fledgling which he held in his paws as he would a nut. The nest was situated on the limb of the oak some fifteen feet from the trunk, and about the same distance from the ground. On the next day I procured the nest, and found further conclusive evidence of the carnivorous propensity of that Squirrel. Lying in the nest were two of the young birds' skulls, four legs, and one wing. They were what might be termed picked clean.—CHARLES CAMPBELL (Dalmeny Park, by Edinburgh).

Squirrel climbing a House.—On June 13th I disturbed a Squirrel in front of the school buildings at Giggleswick, Settle. On seeing me it ran up the side of the Hostel to the height of forty feet, and remained there for twenty minutes; then it made a jump and came down into the drive, and ran off into the wood behind the school. I have never seen a Squirrel run up a side of a house before.—W. RAMSBOTHAM (Meale Brace Hall, Shrewsbury).

BIRDS.

Sand Grouse breeding in Captivity.—The nesting habits of this beautiful group of birds are so little known that the following account of the successful breeding in confinement of *Pterocles alchata* may be of interest to readers of 'The Zoologist.' Two old pairs of this species of Sand Grouse nested in my aviaries this summer. The eggs of one pair were broken unfortunately by being walked upon by a pair of Nicobar Pigeons. The other pair successfully hatched off their young ones. The nests are deeply scratched in the gravel path that surrounds the turf lawn in the outer compartment of the aviary. The number of eggs laid were in one instance four and in the other two. I removed one egg from the pair which had four eggs, knowing that three eggs are the proper complement, and also because I thought that one egg appeared to have a thin shell. Incubation was commenced by the cock, who went on the nest the evening

of the day that the third egg was laid, his place being taken next morning by the hen, who went on and laid her fourth egg, and this arrangement was kept up all during incubation, which lasted twenty-three days, *viz.* the cock sitting all night and the hen all day. To my mind this is an extremely interesting fact: the brightly plumaged cock sitting during the dark hours, and the hen, with her protective colouring, sitting during the day. The breeding males did not begin to change their breeding plumage for the protective breeding plumage until after the young were hatched. As soon as the young were out of the nest (when twelve hours old) a very curious habit developed itself in the male. He would rub his breast violently up and down on the ground, a motion quite distinct from dusting, and when all awry he would get into his drinking water and saturate the feathers of the under parts. When soaked he would go through the motions of flying away, nodding his head, &c. Then, remembering his family were close by, would run up to the hen, make a demonstration, when the young would run out, get under him, and suck the water from his breast. This is no doubt the way that water is conveyed to the young when hatched far out on waterless plains. The young, which are most beautiful little creatures, and very difficult to see even in an aviary, are very independent, eating hard seed and weeds from the first, and roosting independently of their parents at ten days old.—E. G. B. MEADE-WALDO (Rope Hill, Lympington, Hants).

The Coloration of Pallas's Shrike.—Some years ago (*vide* Zool. 1890, p. 27; 1891, p. 187; 1892, p. 112) I wrote three notes in 'The Zoologist' upon Grey Shrikes, and especially upon the colour of the rump of *Lanius major*, in which I disputed the statement that the adult male of this form had a white rump. I have recently examined about a dozen examples of *L. major* in Norwegian museums, and found that in every case the rump was grey. In the case of several of these examples there was an entire absence of the semi-crescentic dark marks on the under parts, which have been said to characterize this species at all ages. Doubtless these were fully adult examples, and they prove that the adult *L. major* resembles the adult of *L. excubitor* in this respect. I examined the bird killed in Norway, and recorded as "hardly distinguishable" from a female of *L. borealis* (*cf.* 1892, p. 113), and I believe it is nothing more than an unusually brown example of *L. major* in immature dress.—O. V. APLIN (Bloxham, Oxon).

Birds and Garden Peas.—The rows of peas in our kitchen garden here have been so punished that my gardener quite gave up one long row, having all the peas in it taken, and in several others quite half. I put it down to Hawfinches, which have for several years nested near, and taken a fair share; but as the destruction was so great, I watched, and was much surprised to see two old Great Tits fly down and punch a hole through the pod, and, after flying up into a fruit tree, take the skin off the pea, then

give the inside to four or five of their young ones, which received this tender morsel with soft cries and shivering wings, suggestive of a certain amount of enjoyment. On carefully examining the pods I found that the Hawfinch and Great Tit took out the peas in different ways. The Hawfinches cut the pods as with a pair of scissors; the Tits punched holes on one side of the pod. I only hope the young birds will not take to this food; if so, we shall have to sow two or three extra rows every year. This is the first time I have noticed the Great Tit take green peas.—J. WHITAKER (Rainworth, Mansfield).

Spotted Flycatcher Nesting directly on Arrival.—This bird, which is nearly always the last spring visitor to arrive, was seen here for the first time on May 13th. They always arrive during the daytime, and not during the night or very early morning, as the greater number of spring birds do. The first pair were seen about 3 p.m. on the 13th, and on the 14th, at lunch-time, I noticed they were busy building in a box put up for them near the dining-room window here; the nest was finished and one egg in by the 18th, and now (July 10th) the birds, having reared their first brood, are again sitting. Two other pairs in the garden are building their second nests. We always have two artificial nesting boxes here for this species, put pretty near each other, for they never or seldom nest a second time in the same place during one season. This bird commences to nest sooner after arrival than any other spring migrant. All the earlier birds, such as Chiffchaffs and Willow Wrens, are about three weeks before starting; Swallows about a fortnight. We have a greater number of this interesting species than usual; seven pairs have nested round the house.—J. WHITAKER (Rainworth, Notts).

On *Anthus cervinus* and *A. rupestris*.—I have been much interested in Mr. Coburn's remarks upon *Anthus cervinus* in winter dress (pp. 101, 256, 257), but I confess that I cannot follow him when, referring to his specimen shot in November, he writes, "It is much paler in colour than *pratensis*" (p. 101). And as Mr. Coburn, in his second note (p. 257), tells us that this is the only specimen of the bird he has ever seen, I hope he will pardon me if I suggest the possibility of his having got hold of a rather peculiar specimen. I have only four specimens of *A. cervinus* in my possession, viz. a male from Egypt, killed in December; two spring females from Lapland; and a male which I shot in Tunis in the early part of April, but cannot be said to have assumed the full summer dress, although it is changing. All these birds are distinctly darker in colour on the upper parts than *A. pratensis* (of which I have a good series) in winter plumage, which in that stage always shows an oil-green tinge, lost in spring and summer. I have only seen *A. cervinus* alive in a wild state in April in North Africa, and in June in Arctic Norway; but it was then so distinctly

a darker coloured bird than *A. pratensis* that (in view also of my Egyptian skin) I cannot imagine that in its ordinary winter dress it could be rightly described as lighter in general colour than *A. pratensis* at the same season. I have recently examined examples of *A. cervinus* in the museums at Tromsø, Trondhjem, and Christiania, and although most of these were adults in summer dress, I find in my note-book the following remarks on eleven examples at Christiania (*viz.* seven adult males, and females, summer; three immature; and one adult female, autumn):—"All generally darker than *pratensis*, though the light edges are more pronounced, contrasting with the conspicuously dark centres; markings of under parts very bold, black, and big." The autumn female would not be different from the birds in winter dress, and probably the three immature examples would not differ very much. My impression of *A. cervinus*, founded upon the small amount of personal observation here detailed, is that it is certainly in all stages of plumage a darker bird than *A. pratensis* at corresponding seasons. The light coloured edges to the feathers of the upper parts of *A. cervinus* (they appear to be nearly white in some cases) give it a bright look; it is a brighter, more brilliant, and more striking bird than *A. pratensis*, but not, I think, a lighter coloured bird. Mr. Coburn writes that the resemblance is striking between an example of *A. pratensis* killed in April and his example of *A. cervinus*. As I write I have before me my Egyptian winter-killed *A. cervinus*, and an adult male *A. pratensis* killed on the 30th April, but there is no striking resemblance between them. In the general colour of the upper parts they certainly approach one another more closely than do examples of each species both in winter plumage. But *A. cervinus* is more distinctly marked on the back, and, not to mention other points of difference, the arrangement of the markings on the throat and upper breast is different. In my experience this last difference is more or less noticeable in all stages of plumage. In summer it is remarkable in live birds seen at a little distance (I have several times seen the two species within an hour of each other), and I can see no reason why it should not be equally noticeable in winter. A comparison of the skins in my collection shows that the differences alleged by Mr. Coburn to exist in the size of the bill, and the colour of the (dried) legs of the two species, cannot invariably be relied upon, although possibly *A. cervinus* will be found to have the bill usually smaller than average examples of *A. pratensis*. As I have only four examples of *A. cervinus* to compare, I can at present only say that the bills of these are not smaller than the bills of some of my examples of *A. pratensis*. The size of the bill varies in both species, and birds of both species likewise vary more or less in size. I do not think there ought to be any difficulty in distinguishing (so far as plumage is concerned) between examples of *A. cervinus* and *A. pratensis* in any stage of plumage, when one has the specimens in one's hands. And, given a clear view at a reasonable

distance, taking the size of the bird into consideration, it ought not to be difficult to recognise *A. cervinus* in a wild state. The first time I saw this species I was not at all expecting to meet with it; but I saw at once that it was a Pipit I had not met with before, although it was rather shy, and it was not until the following day, when I made a special search for the stranger, that I was able to secure a specimen. In conclusion, I wish to say that this note is not intended as a hostile criticism of Mr. Coburn's careful account of his specimen, but merely as a statement of the result of my own observations upon a species which has an especial interest for British field ornithologists, since it is not unlikely to occur on our coasts any season. And as I have been studying Pipits carefully for some years past, I may perhaps be allowed to add here that I cannot help thinking that one at least of, if not both, the so-called Scandinavian Rock Pipits, figured in Mr. Booth's 'Rough Notes,' ought to be referred to the Alpine or Water Pipit (*Anthus spipoletta*). For I have never yet been able, in any of the three Norwegian museums which I have visited, or elsewhere, to see a Rock Pipit killed in Scandinavia (*A. rupestris*) at all like Mr. Booth's birds; whereas the bird in the foreground of the plate does not differ in any way from *A. spipoletta* in summer dress. I should say that I judge only from the plate, and have not seen the bird; but I think one is quite safe in taking the figures in Booth's plates as accurate representations of the specimens in his collection.—O. V. APLIN (Bloxham, Banbury, Oxon).

Anthus cervinus and *A. pratensis*.—Some years since, when in Heligoland, in looking at some examples of these species, Mr. Gätke pointed out that the former might be distinguished, in the autumn plumage in which it visited Heligoland, by the rump being striped; in *pratensis* it was uniform. In the 'Birds of Heligoland' (English edition), the author says:—"It is distinguished, however, from both the Tree and the Meadow Pipit by the almost black broad central marking of the longest pair of the under tail-coverts, which in the other species in question are of a uniform whitish rust-colour." I agree with Mr. Coburn (p. 256) that a living wild bird in nature is a very different thing to the most skilfully prepared skin; at the same time I think it would be utterly impossible for any ornithologist, either with or without a glass, to distinguish amongst a flock of *A. pratensis* an example of *A. cervinus* in winter plumage.—JOHN CORDEAUX (Great Cotes House, R. S. O., Lincoln).

Occurrence of the Wall Creeper in Sussex.—Mr. William Mitchell, of 'The Look-out,' Winchelsea, invited me, while on a visit to that town on July 31st, to inspect a bird in his possession, "the like of which he had never seen before." His description of the bird's appearance as it climbed about a ruin, and of the crimson and white on its wings, rendered identifi-

cation almost certain even before seeing the specimen, and on reaching the house I at once saw that the "strange bird" was an example in breeding plumage of the Wall Creeper, *Tichodroma muraria* (Linn.). His attention was called to it by some men who had noticed its bright colours, and he shot it near the ruin of the Grey Friars' Chapel, on the property of Major Stileman. A plate of this picturesque ruin, with the adjoining house of its owner, may be seen in the late W. W. Cooper's 'History of Winchelsea,' facing page 149. The lower picture shows the lawn over which the bird was flying when shot just after it had left the ruin to the right. It was set up by Gasson of Rye. It is unfortunate that no note was made of the date of the occurrence, but Mr. Mitchell feels sure it was in late spring about ten years ago, *i. e.* about 1886. This is the third recorded occurrence of the Wall Creeper in Britain, and is an addition to the Sussex avifauna. The specimen is now in my possession, and it will be exhibited at a meeting of the British Ornithologists' Club.—W. RUSKIN BUTTERFIELD (St. Leonards-on-Sea).

Birdsnesting in August.—Although the nesting season is usually supposed to be long past by the month of August, at all events for most inland species of birds, I have never had much difficulty in finding a few late nests in that month, and even in September. Accordingly on Bank Holiday, Aug. 3rd, whilst staying in a corner of Cambridgeshire, I took my host's son, a boy of twelve, out for a walk, to try and show him a nest or two, and was even more successful than I anticipated. In less than two hours we found the following:—Two Yellowhammer, each with 3 fresh eggs; 3 ditto, with 4, 3, 4 eggs incubated; 1 Linnet, with 5 fresh eggs; 6 ditto, with 4, 4, 4, 5, 3, 4 eggs incubated; 2 ditto, with young, one brood just hatching, the other nearly fledged; 3 Greenfinch, with 4, 3, 1 fresh eggs; 4 Turtle Dove, each with 2 fresh eggs; 2 ditto, each with 2 eggs incubated; 2 ditto, each with 2 young; 2 Wood Pigeon, with 1, 2 fresh eggs; 3 Hedgesparrow, each with 1 addled egg. I may add that there are very few trees and hedges in the district, and the foregoing were all found in a small plantation of blackthorn and hawthorn bushes, and in a hawthorn hedge bounding an open farm of nearly 1000 acres.—ROBERT H. READ.

The Hawfinch and Turtle Dove in Lincolnshire.—With reference to Mrs. Anderson's notes on the Hawfinch nesting at Lea Hall (p. 257), I may add that it is now recognised as a regular nesting species in several localities in the county. In the winter of 1895-6 I met with old birds in three places in North Lincolnshire where it has not been previously recorded. In the present summer a young brood has been hatched off somewhere about my premises, but I was not aware of this till the young had left the nest. Subsequently the parent birds and their brood laid heavy toll on the peas. In driving about the country, or travelling by rail, during the present summer I have seen more Turtle Doves than in any

previous year: the increase in their numbers in the northern division of the county is most marked.—JOHN CORDEAUX (Great Cotes House, R. S. O., Lincoln).

Increase of the Hawfinch around Bath.—During the past spring and summer I have heard and seen the Hawfinch (*Coccothraustes vulgaris*) in unusual abundance in different localities in this district. That it has nested fairly plentifully this year I am certain, for I have seen young birds in several gardens in the neighbourhood feasting on the peas, much to the annoyance of the gardeners. In the winter months I heard reports that large numbers of Hawfinches were daily to be seen frequenting the Clifton downs.—C. B. HORSBRUGH (4, Richmond Hill, Bath).

Song of the Icterine Warbler.—When residing in Dresden in 1886 I had almost daily opportunities of listening to the song of the Icterine Warbler (*Garten Laubsänger*), and with the experience then gathered came to the conclusion that the song in compass, quality, and sweetness was not to be compared to that of the Nightingale or Blackcap, and yet it is a remarkable song, and not to be forgotten. If any readers of this care to refer back to 'The Zoologist' for 1886, pp. 356–357, "Wayside Notes from the Continent," they will see what my impression was at that time of the song of this charming little warbler.—JOHN CORDEAUX (Great Cotes House, R. S. O., Lincoln).

Hedgesparrow breeding on the Bass Rock.—Perhaps you may consider the nesting of the Hedge Accentor on the Bass Rock as worthy of insertion in 'The Zoologist.' On May 16th I found a nest of this bird containing four eggs. The nest was placed under an overhanging tuft of grass which grew on a low rock-face. This, I believe, is the first case of the Hedge Accentor breeding on the Bass. I may mention also at the same time that I found a Blackbird's nest with four eggs in one of the beam-holes in an old house on the rock.—A. H. MEIKLEJOHN (St. Andrews, N.B.).

Eared Grebe in Somerset.—A few days ago (July 23rd), I had brought to me the remains of an Eared Grebe, *Podiceps nigricollis*, which had been found in an old clay-pit not far from this town. Unfortunately it had been dead so long that it was perfectly useless; but I do not know that the bird has ever been recorded as having been found in Somerset before.—H. S. B. GOLDSMITH (King's Square, Bridgewater).

Nightingale at Scarborough.—An undoubted Nightingale took up its residence in May last at Throxenby Mere, at the edge of Raincliffe Wood, near Scarborough. It was first heard by Mr. H. Head on May 8th, and was afterwards seen and examined, with the aid of glasses, on May 13th by Mr. W. Gyngell, a competent observer, and one well acquainted with the bird in the south. It was heard by myself on May 15th, 18th, and 29th, the last date on which it was heard to sing. I saw the bird and examined

it with glasses on May 31st, and it was subsequently reported to have been shot with a catapult on the evening of that day.—W. J. CLARKE (44, Huntriss Row, Scarborough).

[With regard to the occurrence of the Nightingale in Yorkshire, the authors of the very useful 'Handbook of Yorkshire Vertebrata,' 1881, write of it (p. 20) as "a summer visitant of regular occurrence in very limited numbers in the neighbourhood of Barnsley, Wakefield, York, Beverley, Patrington, Brough, Selby, and Doncaster, arriving early in May. West and north of the frontier formed by these towns it is only of exceptional occurrence, and a line drawn from Huddersfield through Bradford, Otley, and Ripon to Baldersby, Bagby, and Sessay near Thirsk, and thence to Flamborough Head, will include all the localities for which there is satisfactory evidence of its ever having occurred or bred, and also defines the extreme northern limit of its distribution in Britain." On May 8th, 1866, as we find by reference to an old note-book, we had the pleasure of listening to a Nightingale in full song in a copse by the lake at Walton Hall, four miles from Wakefield.—ED.]

Albino Wheatear and Swallow.—Four white Wheatears, *Saxicola oenanthe*, and a white Swallow, *Hirundo rustica*, all birds of the year, frequented a quarry in the cricket-field in this neighbourhood during the present summer.—W. RAMSBOTHAM (Meale Brace Hall, Shrewsbury).

Iceland Gull in Co. Sligo.—You may think fit to record in 'The Zoologist' that I picked up an adult Iceland Gull, *Larus leucopterus*, Fab., on April 5th last, at Mullaghmore, Co. Sligo. It was dead, and had apparently been shot at, having both legs broken and wounds in the neck and stomach. I cleaned off the maggots on it and salted it inside, and sent it to Mr. Williams, of Dublin, who identified it. Is it not unusual for it to be obtained in Ireland so late in the spring?—CHARLES LANGHAM (Tempo Manor, Co. Fermanagh).

Cuckoo's Egg on the Ground.—I was interested in reading the note on this subject in your July number (p. 259), for a similar occurrence came under my notice in June, 1895. An ornithological friend, Mr. W. Gyngell, was birdsnesting on Seamer Moors, when he noticed laid on the ground a quantity of feathers, as if some bird had been attacked and devoured by a hawk. On examining the feathers he found them to be those of the Cuckoo, and further examination revealed an egg of this bird lying underneath them and quite uninjured. The feathers comprised not only body but tail-feathers and primaries and secondaries from the wing. The egg was not incubated. In this case the probability appears to be that the parent had either been surprised just after depositing her egg on the ground, or on being attacked had deposited the egg during the death-throes.—W. J. CLARKE (44, Huntriss Row, Scarborough).

FISHES.

The Pogge (*Agonus calaphractus*) at Scarborough.—A nice specimen of this curious little fish was taken by Mr. Harrison in a rock pool on the North Shore, Scarborough, on July 26th. Although stated by Messrs. Clarke and Roebuck, in their 'Vertebrate Fauna of Yorkshire,' to be common along the Yorkshire coast, this is the first example that either its captor, myself, or other members of the local Naturalists' Society, have met with in this neighbourhood.—W. J. CLARKE (44, Huntriss Row, Scarborough).

Power of Electrical Fishes.—Prof. d'Arsonval has been making a series of experiments with the Torpedo or Electric Ray. He found that fish 30 centimetres in diameter could give out a shock of twenty volts. He ingeniously applied some small electric lamps to the fish, and they were lit by the discharge from its body. In some instances he states that the discharge was so powerful as to carbonize the lamps. The electric current generated by the Torpedo is sufficiently powerful to enable it to procure food by killing small fish with which it comes in contact, but diminishes as its strength decreases. The maximum electric discharge is stated to be as high as 120 volts.

The Opah, or King-fish, off Aberdeen.—There was lately on view at Messrs. J. and T. Sawers', fish merchants, Belfast, a fine specimen of the Opah or King-fish, *Lampris luna*, caught off the coast of Aberdeenshire. It weighed 70 lbs., was about 4 ft. long, and measured $2\frac{1}{2}$ ft. at the broadest part. In shape this fish resembles the Sunfish, and its hues are very brilliant. The back and sides are of a rich green, with purple and gold reflection, while the under parts are yellowish green. There are some white spots above and below the lateral line, and the fins are vermilion. The discovery of this fish in English waters is comparatively of recent date, and the title "Opah," by which it is sometimes known, was obtained in somewhat curious fashion. A name not being obtained for one of the first specimens secured, it received this designation on the authority of an African prince, who stated that it was known by this title in his own country, though the presence of the species in African waters is more than doubtful. In general outline this fish, though considerably thicker in the body, is not unlike the common Sea Bream. Its colouring is gorgeous in the extreme, and rather reminds us of the varied hues common to the occupants of tropical waters, than of the sober tints of British fishes. The "Opah," or Kingfish, inhabits the deeper waters of the North Sea, and is common off the coast of Norway. A good figure of it is given by Day, in his 'Fishes of Great Britain and Ireland' (vol. i. p. 118), and an enumeration of the specimens recorded to have been captured on various parts of our coast, including some half-dozen Irish examples.

Short Sunfish near Scarborough.—On July 29th, whilst a fisherman named Albert Reeve was proceeding to take up his crab-pots, about a quarter of a mile out to sea, off the Peak, a little to the north of Scarborough, he noticed at some distance from his boat something projecting above the water, which he took to be the buoy attached to his lines. On approaching he discovered the object to be a strange fish floating, apparently asleep, and having “gaffed” it he got into his boat. On reaching shore he brought it to my shop, when it turned out to be a Short Sunfish, *Orthogoriscus mola*. The extreme measurements were 18 inches long, 12 inches wide, and 26 inches from tip to tip of fins. The stomach, on dissection, proved to be empty, excepting a little yellowish fluid. On the gills were found a number of the large parasite, *Lernæa branchialis*, which is usually found infesting this fish. It is a formidable creature, about an inch in length, and must be a source of much discomfort to the unwilling host.—W. J. CLARKE (44, Huntriss Row, Scarborough).

[Borlase, in his ‘Natural History of Cornwall’ (p. 260), remarks that this fish is called by Ray and others the “Sun-fish,” as being round, and emitting a kind of splendour in a dark room; by others (as Rondeletius) the “Moon-fish,” because not only round and shining by night, but having the shape of the crescent betwixt its little pectoral fin and the eye. Referring to one captured at Ilfracombe, Gosse described it (Zool. 1852, p. 3579) as moving slowly, with a waving motion, from side to side, like a man sculling a boat,—to use the comparison of the sailor who helped to take it,—the back fin appearing above water. The fish permitted the boat to come close up without exhibiting alarm, even when the boatside came in actual contact with it. The men made a bowline-knot and slipped it over its head, tightening it before the dorsal and anal fins, so that the knot came in the middle of its side. Thus they hauled it in, not without a wetting, for with a flapping action of the ample fins (again a kind of sculling) it scooped up the water and threw it over them and into the boat. A writer in ‘The Field’ (Feb. 4th, 1882), reporting the capture of a Sunfish near Plymouth, added that a friend cut off a large portion, and sent it as a present to an acquaintance who was fond of Turtle-soup. It was boiled by his cook, and he asserted that it was the best Turtle-soup he had tasted for a long time, having that delicate green tinge always characteristic of the best Turtle. As no ill results ensued, it was supposed the fish must be wholesome.—ED.]

MOLLUSCA.

A Carnivorous Habit in *Limax*.—Despite the destructive habits of the genus *Limax*, it is still possible that the species may do good, for interesting observations have been made upon the American *Limax campestris*, Binney, which was seen feeding upon plant-lice. Prof. Webster, of the Ohio Agricultural Experiment Station, U.S.A., kindly sent me the ‘Bulletin’ (68)

of his Station, in which he records this new and interesting habit in *Limax*. "I was somewhat surprised," he says, "one day to observe one of the slugs stretch out and grasp a plant-louse, hundreds of which were swarming on the leaves of the dock, where they were breeding in myriads. The slug not only disposed of one Aphis, but another and another followed in quick succession." He also states that they "climbed the leaves and stems of the wheat to the height of eight or ten inches, and, crawling along the larger leaves, cleared them almost completely of the Aphides." On receipt of this interesting note I placed a number of *L. agrestis* in a breeding-cage with numbers of hop-lice, *Phorodon humuli*, and found that three or four soon commenced feeding on them; but on placing lettuce-leaves in the box they left off eating the lice and devoured the leaves, but some of them continued to prefer the carnivorous diet.—
F. V. THEOBALD.

NOTICES OF NEW BOOKS.

The Wild Cat of Europe (Felis catus). By EDWARD HAMILTON, M.D., F.L.S. Illustrated by P. & P. J. Smit. 8vo, pp. i-xxi, 1-99. London: R. H. Porter. 1896.

CONSIDERING the amount of material which is available for a monograph on this subject, we must confess to considerable disappointment with the book before us. It is by no means exhaustive, nor are the materials, so far as they go, well arranged. Indeed, it would seem in some places as if the pages of the author's manuscript had become misplaced before printing. Thus we find the bibliography of the subject at the beginning of the volume instead of at the end (though this perhaps is not very material), and the description of the animal itself is in the middle of the volume (p. 37) instead of at the commencement. The authorities cited, of which a very imperfect list is given in the bibliography, are quoted apparently at haphazard as the author happened to come across them, and not in chronological sequence, as one would expect to find them. Thus we see Prof. Rolleston followed by Aldrovandus (pp. 80, 81), Charles St. John followed by Gesner (pp. 93, 94), Donovan preceded by Harrison Weir (p. 88), and a sentiment of Mrs. Janet Ross (1889) sandwiched between two extracts from Le Normant's work on Greece (pp. 82, 83).

In justification of our remark that the bibliography is incomplete, we may remark, to mention a score of names off-hand, that it does not include any of the following, though many of the writers are mentioned in the text:—Bartholomæus, Chapman, Abp. Corboyle, Sir Joseph Fayrer, Hunt, Huxley, Lindsay Johnson, Kennedy, Lartet, Latouche, Lord Lilford, Sir John Lubbock, Morton, Murray, Palladius, Poulton, Rope, Sanford, Scott (Field Sports), and Selys Longchamps. This is unfortunate, but still more irritating to the reader is the constant omission to give references to the authorities for statements of value.

Commencing with the synonymy (p. 1), a list of vernacular names is given on the next page, to which might be added, as the Russian, Greek, and Polish names are given, the Arabic *quit*, and the Turkish *kedî*. Discussing the etymology of the word "cat," the author gives us the old High German, though not the Anglo-Saxon. Nor does he give the origin of the name "puss," concerning which an ingenious suggestion has been made (Zool. 1879, p. 487).

In his section on geographical distribution, which is inconveniently dealt with in two places (pp. 4-5 and 31-36), some of the remarks are a little inconsistent. For instance, on p. 5 we read that at the present time the Wild Cat "may perhaps occasionally still be found" in Spain, while on p. 34 it is stated to be numerous in Andalusia; and (on p. 35), on the authority of Messrs. Chapman and Buck, "common throughout Spain wherever rabbits abound." As regards Greece, very little information is given. The author might have found some interesting details in Heldreich ('Faune de Grèce,' 1878), who is inclined to recognise the Wild Cat in the *Ailurus* of Aristotle.

As to its ancestral descent (p. 6), Dr. Hamilton thinks it derived "in all probability directly from one or both of the species of Cat whose osseous remains have been found in the Pleistocene deposits both in this country and on the Continent"; although Prof. Boyd Dawkins and Mr. W. A. Sanford, in their "British Pleistocene Mammalia" (Trans. Palæont. Soc. 1872-73) contend that the bones from the Liège caverns and from Bleadon Cave belong to a larger animal than *Felis catus*, and conclude that a Wild Cat closely allied to *F. caffer* lived in Northern Belgium and France in the Pleistocene period, and probably also in

Britain. They remark "there is nothing unreasonable in the suggestion of a Cat now found only in Africa having once ranged over Europe, since the Spotted Hyæna, the Hippopotamus, and the Panther were members of the Pleistocene fauna, as well as being now associated with *Felis caffer* in Africa." If this supposition be correct it would seem, as Dr. Hamilton observes, that the smaller species was enabled to survive throughout Europe during all the geological changes, owing to its natural food (in the shape of the leporine and other rodent forms) continuing to exist, for, according to Owen, there is no difference between the fossil bones of the Pleistocene species of *Lepus* and *Arvicola* and those of the present time; while the larger species, from some cause as yet unexplained, became extinct. It would have been more convenient, we think, if at this point (p. 16) Dr. Hamilton had introduced the comparison of skulls and other bones which he has instituted, instead of deferring (to p. 47) his consideration of these points, the most valuable in his memoir, for the sake of interposing (pp. 16-30) his collected records of *Felis catus* in Britain and on the Continent.

This section is interesting enough, although readers of 'The Zoologist' who happen to bear in mind the many records of British Wild Cats which have been published during the last fifty years in this journal will notice many gaps which might have been filled with a little more research, and will regret the omission of references to many of the records quoted.

Some of the extracts furnished by Dr. Hamilton must have been quoted by him second-hand, for they are not only inaccurate, but in some cases valueless. Take, for example, the following sentence on page 16:—"In the Booke of St. Albans, printed by Wynkyn de Wode [Worde] in 1496 [why not quote the first edition, 1486, as being earlier?], the Wild Cat is mentioned among the 'Bestys of chase swete and stynking.'" Now, had Dr. Hamilton referred to the work he purports to quote, he would have discovered that amongst the "Bestys of the chase of the swete feute & stynkyng" (to quote correctly), the Wild Cat is *not* mentioned, and the quotation, therefore, is valueless.

In the next sentence Dr. Hamilton observes:—"Three years previously [how did he fix the date of an undated folio?] he, *i.e.* Wynkyn de Worde, printed a translation, by Thomas Buller, of 'Bartholomæus de Proprietatibus Rerum,' in which the Wild

Cat is likened to a Leopard," &c. Now the translation of the Latin work of Bartholomæus de Glanvilla (or Glanville, as we may call him), which Wynkyn de Worde printed (probably in 1495), happens to have been made by John Trevisa. From this we conclude that Dr. Hamilton has not looked very closely into the matter. Nor is it really of much importance; for whoever the translator was, or whatever the date of publication, the extract quoted is not worth the trouble of transcription so far as English records of the Wild Cat are concerned. It may be of interest, however, to note, *en passant*, that this particular folio from the printing press of Wynkyn de Worde happens to be the first book which was printed on paper made in England. It was manufactured at Hertford, by one John Tate, whose name is mentioned in the 'Prohemium.'

But this by the way. We cannot follow Dr. Hamilton through his collected "records of the Wild Cat in England and Wales" (pp. 16-21) "and Scotland" (pp. 22-26), for to do so would necessitate our suggesting several corrections and numerous additions, which for the present must be reserved. With regard to its alleged existence in Ireland, Dr. Hamilton quotes Thompson's remark (Nat. Hist. Ireland, vol. iv.) that "it cannot with certainty be given as a native animal," and recapitulates the negative evidence which he had previously placed on record (Proc. Zool. Soc., 1885). He concludes that "further investigations since Thompson's time all tend to prove the non-existence of this species in the sister island."

The volume concludes with a section on "the interbreeding of the wild and tame races," and another on "the propensity of the domestic race to assume the colour of the wild race." In support of the latter proposition, the truth of which has often been forced upon our notice, he quotes Darwin and Wallace as authorities for the statement, but does not, as he might have done, furnish the reason in Darwin's own words, namely, "oddly coloured and conspicuous animals would suffer much from beasts of prey, and from being easily shot" ('Variation of Animals and Plants,' vol. ii. p. 33, ed. 1868). Those of our readers who are accustomed to pheasant shooting must have frequently remarked how quickly a tortoiseshell or black-and-white cat is detected in covert, and how inconspicuous, even when in motion, is the animal which mimics in colour the true *Felis catus*.

We cannot congratulate the author on the figure of a Wild Cat which forms the frontispiece to his volume; nor can we believe that he himself is satisfied with it. He must have seen far too many Wild Cats in the course of his shooting excursions in Scotland to regard this as in any sense a portrait. The expression is tame to a degree, the markings are too faint, and the tail is neither short enough nor thick enough to pass muster for the true Wild Cat.

Notwithstanding the shortcomings which, as we have said, have caused us some disappointment, Dr. Hamilton's interesting contribution towards the history of a British animal fast approaching extinction, is one which our readers, we feel sure, will peruse with both pleasure and profit.

Sport in the Alps in the Past and Present. An account of the chase of the Chamois, Red Deer, Bouquetin, Roe Deer, Capercaillie, and Blackcock; with personal adventures and historical notes, and some sporting reminiscences of H.R.H. the late Duke of Saxe Coburg-Gotha. By W. A. BAILLIE GROHMAN. 8vo, pp. i-xv, 1-356. With numerous illustrations and photographs from life. London: Adam and Charles Black. 1896.

CONSIDERING the large number of books which have been written during the last forty years about climbing and adventure in the Alps, it is curious that up to the present time so little has been published upon Alpine sport. At the present moment we can recall but a single volume on the subject. It has long reposed on our book-shelf, and has been read more than once—Charles Boner's 'Forest Creatures,' a delightful book in its way, though a small one, the work of an enthusiastic sportsman possessing the true instincts of a naturalist, with an eye always for the picturesque. That little volume, however, deals only with a small district, of what the "climber" of the present day would describe as the foot-hills of the real Alps.

Mr. Baillie Grohman is to be congratulated on the attempt which he has just made to fill this void in sporting literature. It is true that his book leaves almost unnoticed the very country which to the alpine climber as well as to the ordinary tourist possesses the greatest attraction, namely, Switzerland. But he is

quite aware of this, and gives his reasons for confining his remarks to the central and eastern Alps, dealing with the western only to include that small portion on the southern, or Italian, side which is the haunt of the Ibex or Bouquetin. The first and best reason is that the Swiss Alps harbour comparatively few Chamois, and no Red Deer; the second and more personal reason given is that "Switzerland, since fashion has made it the goal of ever-increasing crowds of holiday makers, has lost its charm for an admirer of alpine solitude and unsophisticated mountain life." To view nature amid surroundings to which one is condemned by this invasion is not an unalloyed pleasure. Fortunately there are wide and beautiful districts left in the Alps which are as yet uninvaded by fashionable crowds, and to these byeways Mr. Baillie Grohman invites us to accompany him.

As the title of his book implies, his object is "sport"; and were it nothing but a record of sport, we should not feel called upon to review it at much length in a journal devoted to natural history. But incidentally we come across such good descriptions of the haunts of wild game, and such interesting statements concerning its abundance or otherwise, and geographical distribution, that we are tempted to give a longer notice of the work than might otherwise appear justifiable.

As the title above quoted sufficiently indicates the contents of the book, we may plunge at once *in medias res*. Several authorities on Chamois state that 300 years ago these animals were scarcer in the Austrian and Bavarian Alps than they are at the present time, and, in proof of this contention, aver that the old game registers of noble sportsmen afford little or no evidence of their former abundance. In this our author does not agree, for what is true in the case of the Roe Deer (*viz.* that 300 years ago there was but one Roe to every six Red Deer, while to-day this order is reversed), does not hold good to anything like the same extent for the Chamois. The extermination of the Bear, the Wolf, the Lynx, and the Wild Cat, all deadly foes of the Roe Deer, and accountable for its decrease, was a matter of less moment to the Chamois, owing to the elevation and barren nature of its haunts.

It is true that the greatest enemies of the Chamois, namely the Lammergeier and the Golden Eagle, have well nigh shared

the fate of the wild animals above mentioned, but, on the other hand, the primitiveness of firearms made man then a much less dangerous foe than he is at the present day. The truth is that to a great extent the chase of the Chamois was left to the natives of the Alpine valleys, while men of position, who enjoyed all the sport they cared for in forests full of Red Deer and Wild Boar, did not trouble themselves about a chase which presented so many difficulties, and was enshrouded in so much superstition. *A propos* of the Lammergeier Mr. Baillie Grohman states that its former abundance is shown by the registers kept in the monastery of St. Bartolomeo. According to an inscription upon a large wooden tablet there dated 1650, upon which two Lammergeiers are pictured life-size, one Hans Duxner killed one hundred and twenty-seven of these birds, while Urban Fürstmüller, a hunter and fisher, killed twenty-five Bears and forty-three Lammergeiers, and his two sons captured thirty-one of the latter.

According to the official report which is annually drawn up for the Austrian Government, the number of Chamois killed in an average year (say 1892) in the Austrian Alps amounted to no less than 8144 head, or more than three-fourths of the total in the whole Alps. Tyrol is at the head of the list with 2392, then Styria with 2176, and next Salzburg with 2039. In the Bavarian Highlands over 1000 Chamois, it is believed, are shot annually. Italy and Switzerland, with a few in the French Alps, bring the annual total for the Alps to over 11,000 head. We are accustomed to read the statement by irresponsible writers that the number of Chamois has within the last fifty years greatly decreased, but Mr. Baillie Grohman is confident that this is not the fact, and gives statistics which confirm his view.* He adds

*We find amongst our memoranda on Chamois a letter from a correspondent at Geneva, dated March 26th, 1879, in which are these remarks:—“In 1878, 779 Chamois were shot in the Grisons, of which number 210 were killed in the district of the Irn, and 101 in that of the Albula, the remainder in other parts of the canton. There were also killed 4 Bears, 5 Vultures, 4 Eagles, 15 Owls, 69 Sparrow Hawks, 324 Magpies, and 1 Otter. In comparing this statement of the Chamois shot during the past season with those killed in former years, it would appear that instead of their number diminishing, as was feared, it is considerably on the increase in those districts in which the pursuit of them is permitted by law.”

that in the Alps about three-fifths of the Chamois are killed by "driving," the rest by "stalking," and the two methods are described at considerable length, and, we may add, with considerable skill. We must confine attention, however, to what Mr. Baillie Grohman has to tell us of the natural history of the animals of which he treats.

As to the seasonal change of colour he writes:—

"Between the appearance of a Chamois in July (when the shooting season opens) and that of the same animal in December (when it closes) there is a vast difference. The grayish ochre-brown colour and the short hairs of the summer coat have turned into an almost black shaggy garb with hairs three times as long, that give the animal, particularly an old buck, a very burly appearance. Along the backbone of the male the hairs grow in winter to a great length, and except at the tip, where they turn a yellowish white, they are of a glossy black, and stand upright, waving in the wind. These long hairs, most carefully bunched together, form the much-prized *Gems-bart* or 'chamois beard,' which ignorant tourists suppose grows on the lower jaw of the male Chamois! The longer the hairs and the whiter the tips, the more valued is the bunch."

It is not to be implied from this that the old male Chamois is not bearded, but only that imitations are oftener seen than the real article.

"Though the beard reaches its highest perfection only during or after the rut, which commences about the middle of November, keepers and beaters will pounce eagerly upon a buck killed in October, for even at that time the beard, though short and not of the peculiar gloss acquired later on, has pecuniary value."

The Chamois is apparently not subject to much variation in colour. In Styria and Salzburg individuals are to be met with that even in summer are much darker than their fellows, and have hardly any white about the head. These are called *Coal-chamois*, and are much prized. In Tyrol, on the other hand, the silver bucks are a freak of nature, delighting the heart of the ardent sportsman. They never get such a dark winter coat as the rest, and there is a peculiar silver shimmer about the hair. Albino Chamois are even rarer. The author mentions but two instances known to him of white Chamois being shot (p. 32). For a second edition he may note that Von Tschudi, in his important work on the Alps, describes an albino Chamois which

was killed in 1853 in the Grisons above Sculms, a small village on the Hezenberg, between Bonaduz and Versam. In this animal even the hoofs were white, and the irides rose colour. The horns were a little more than an inch in length; the hair very thick and close, particularly about the neck. Several other instances of the occurrence of white Chamois will be found recorded in 'The Zoologist' for 1878, p. 337; and 1886, p. 331.

Partially white Chamois are also rare. The author mentions one with pure white hind-quarters which was shot by a friend near Kufstein. For a second edition he may note that another similarly marked, an eight or ten year old buck, was shot by Forstwart Reisigl at Vomper Loch, Tyrol, in the autumn of 1882. It is figured and described in 'Der Weidmann,' July 31st, 1896 (Band xxvii., No. 45).

When quoting the remarks (more or less fabulous) of Jacques du Fouilloux, the great French sportsman of the sixteenth century, about a kind of wild goat which he calls *Ysarus* (p. 28), allusion might have been made to the fact that the Chamois of the Pyrenees is known as *Izard*. We believe it is not specifically distinct, but certain differences have been observed which will be found enumerated by Schinz in his 'Europäische Fauna' (vol. i. p. 86), and are translated by the late Lord Clermont in his 'Guide to the Quadrupeds of Europe,' 1859 (p. 140).

With regard to the horns, which are borne by both sexes, the longest pair known to collectors measured over the curve a trifle more than twelve inches in length, which is about one-third more than the average length. Mr. Baillie Grohman has seen two specimens of this abnormal length: one in the late Duke of Coburg's collection; the other in the collection of Count Arco Zinneberg at Munich. The author himself once shot a buck in South Tyrol with eleven-inch horns, four inches in girth. Ten-inch horns, he says, are not too common, and are carried by perhaps one buck in fifty. He adds, as an observed fact, that Chamois frequenting a limestone formation have bigger horns than those found in slate or granite mountains, and this confirms what has been noted in regard to the growth of Red Deer antlers.

At page 34 we note some remarks on the rarity of a Chamois with four horns, and Mr. Baillie Grohman is of opinion that in

the majority of such reported cases fraudulently prepared heads have been made up to deceive the unwary collector of hunting trophies. He does not make any allusion to a reported four-horned Chamois which was figured and described in 'The Field' of Dec. 13th, 1879, and concerning this we should be curious to know his opinion.

There is one point in connection with the natural history of the Chamois on which Mr. Baillie Grohman does not enlighten us. We do not find any mention of the period of gestation in this animal. Authorities differ on this point. Lord Clermont states, in his 'Guide to the Quadrupeds of Europe' (p. 139), that the female goes with young between seven and eight months, and produces one at a birth. The Marquis de Cherville, in his excellent 'Dictionnaire des Chasses,' 1885, writes of the Chamois (p. 49): "Les femelles portent cinq mois, et mettent bas en Avril un petit, rarement deux." According to Charles Boner twenty weeks is the period.

We pass over the next hundred and odd pages, devoted to an account of Chamois hunting both by "stalking" and "driving," for the purpose of seeing what our author has to say of the Red Deer of the Alps, and come to a chapter (Chapter IX.) which is if possible even more interesting than those which precede it.

In Austria and Germany the chase of the Red Deer has not undergone any such radical changes as in France and England; indeed, in the Alps, according to our author, it is conducted to-day in almost precisely the same manner as in the Middle Ages. Upon two important facts historical research throws a strong light, *viz.* upon the great diminution in the number, and an almost equally great deterioration in the size of stags that has taken place within the last 250 years. We have not space to quote the statistics given on this subject, but they are so curious that those of our readers who are deer-stalkers will find them well worth perusal. The illustrations which accompany them are valuable, too, as enabling us to compare some of the antlers of the past with those obtainable at the present day. We are very glad to learn from a footnote on p. 172 that the author proposes to reproduce a series of twenty-one plates, from an illuminated MS. Chronicle of the Duke Casimir of Coburg (1564-1633), which were painted more than 250 years ago by the Coburg

Court painter, Wolff Pirkner. One or two of them are given as full-page illustrations, though on a reduced scale, in the volume before us, and are most curious and instructive.

Chapter XIII. is devoted to the Roe Deer, and opens with the surprising statement that in Austria alone, excluding Hungary, between 68,000 and 69,000 Roe are shot *annually*, and that nine out of every ten are killed with the rifle. Counting Hungary, we are told (p. 246) that the annual bag of Roe exceeds 100,000 head. The province at the head of the Austrian list is Bohemia, where in 1892 (an average year) 12,920 Roes were shot, Lower Austria coming next with 11,683. Much interesting information follows on the chase of this animal in past and present times, but as the species is comparatively well known we need not stop to quote passages which would otherwise deserve notice. Some curious heads are figured, but none of which the types have not already been described in an illustrated article on Abnormal Heads of the Roe Deer in 'The Zoologist' for 1884 (pp. 353-366).

The chapter which will have the greatest novelty perhaps for most readers is that devoted to the Ibex, Bouquetin, or Steinbock as the Germans call it (Chap. XIV.). This animal is comparatively so little known except to the exceptionally fortunate few who pursue it in its natural haunts that the account given of it is especially welcome, the more so because of its increasing rarity. In the Tyrol it became practically extinct towards the end of the last century, though isolated examples have been met with very much later. For example, a fine male was spied by a Tyrolese chamois-hunter in the mountains near Nauders so recently as 1874. The Carpathian Mountains are said to have once been the home of the Ibex, as they still are of the Chamois, but Mr. Grohman states that he has never come across any documentary evidence to support this allegation.

As compared with the Chamois, the Ibex is a very much heavier animal. An adult male will weigh 200 lb., the doe less than half that. The weight of an adult male Chamois is about 65 lb., the doe being about a fifth lighter.

In 1821 an enthusiastic naturalist (Zumstein by name) prevailed upon the Piedmont Government to pass stringent laws for the protection of a small herd of Ibex which had found a refuge in the heart of the Graian Alps, and his successful exertions,

followed thirty-five years later by the personal efforts made in the same direction by King Victor Emmanuel, resulted in effectually saving this splendid animal from extinction in that Alpine retreat. It is stated that when in 1877 the king visited for the last time that part of the country where he had annually shot from 50 to 60 Ibex in the season, there were estimated to be from 500 to 1000 of these animals in that unique preserve. Fifty-five keepers held ward and watch in those barren solitudes over their precious charges; and the officers of the law, says Mr. Grohman, "had but few opportunities to inflict the nine years' imprisonment which was, and, for all I know to the contrary, still is, the punishment for killing one of the king's Bouquetins."

The last chapter but one (Chap. XV.) deals with Capercaillie and Blackcock shooting in the Alps, and the last chapter contains some "Early Recollections of Sport in the Alps."

We regret that want of space precludes us from following our author further. His book is one that we may cordially recommend to the perusal of our readers. Its merit lies in its being very largely the outcome of the author's personal experience and that of his friends. His descriptions of the haunts of big game in the Alps are excellent, and the historical information which, gathered from authentic and reliable sources, is scattered throughout its pages, makes the work, from a naturalist's point of view, extremely interesting.

British Birds' Nests: how, where, and when to find them. By R. and C. KEARTON. 8vo, pp. i-xx, 1-368. Illustrated from Photographs. London: Cassell & Co. 1896.

WE ought not to let the summer pass by without drawing attention to a very attractive book which has been published with the above title.

The species are arranged alphabetically to facilitate reference, to which end also the names are boldly printed in capitals. Then in separate paragraphs with italic side-heads we find *Description of Parent Birds, Situation and Locality, Materials of Nest, Eggs, Time, and Remarks.* This dispenses with the necessity for an index, and enables the reader to obtain information on any of these points with the least possible trouble.

On the whole the information given is fairly accurate, though sometimes it does not go far enough. For example, the expression "in suitable parts of Scotland" hardly indicates with sufficient clearness the nesting haunts of the Wigeon. No doubt the author has aimed at compression. He does not always name the locality wherein the photograph of a nest and eggs was taken, but when he does so, the information is very acceptable, as, for example, when we read that in the case of the Twite the photograph was taken "on a small island near Oban, where we found several nests"; that the Shoveller, Pochard, Teal, and Woodcock's nests were taken in Norfolk; the Curlew's nest on the Westmorland Hills; that the Red-necked Phalarope nested in the Orkneys in 1892; and that "two pairs of the Roseate Tern succeeded in rearing their young at the Farne Islands in the year 1894." A pretty illustration of Arctic Terns on their nests at the Farne Islands faces p. 286, and the "typical Norfolk Duck Mere" (p. 214) is good.

The illustrations on the whole are excellent, the outlines being well defined, and the subjects well chosen. Those which illustrate the nesting of the Curlew, the Stone Curlew, the Red-breasted Merganser, the Gannet, and the Red-throated Diver (the last-named procured in the Outer Hebrides), are especially to be commended. The difficulty experienced in taking photographs of some of the nests was occasionally very great, especially when the wind happened to cause a vibration of the camera, or a movement of the leaves or sedges amongst which the nest was placed. But the energy and perseverance of the authors in most cases triumphed, and the result oftentimes exceeded their expectations. To realise the adverse conditions under which the camera had to be brought into position, the reader would do well to peruse the preface, in which some of the authors' adventures are graphically described. The value of the plates in many cases has thus become enhanced by reason of the difficulty of obtaining them.

If we have one fault to find, it is with the highly-glazed paper on which the book is printed. Not only is this very trying to the eyes from the strong light which it reflects, but from the white lead which it contains, it adds considerably to the weight of the volume.

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SPOONBILLS AND STORKS IN HOLLAND.

BY REGINALD LODGE.

ON a recent visit to Holland, intent on photographing from the life some of the marsh and water birds, which at one time were so numerous in this country, until banished by drainage and over-population, I was fortunate enough to obtain an introduction to an eminent Dutch ornithologist, who was good enough to pilot me himself to one of the very few remaining breeding-places of the Spoonbill in Western Europe.

It was a novel experience, and one I shall never forget, to find myself at length, after sixteen hours' travelling, afloat in an immense meer, being propelled through narrow channels cut in the reeds, which towered over our heads, just wide enough for the passage of the punt. The reeds on both sides appeared full of Great Reed Warblers, their chattering song being almost continuous, though the birds were too skulking to be often seen, and in our progress, during which we saw occasional Purple Herons, Spoonbills, and Cormorants, we had constant opportunities of watching the graceful evolutions of the Black Terns, which skimmed in swallow-like flight over the reeds.

The Spoonbills, however, were the chief object of the expedition, and we did not tarry until we had reached the first small colony. The birds had, we learned, been disturbed and were somewhat scattered, apparently not more than seven or eight nests being together. At the time of our visit most of the nests contained nearly full-grown young ones, some of which at our

approach were old enough to leave the nest and scramble out of sight amid the dense forest of reeds. Only one nest did we see containing eggs, three in number, round and dirty white, splashed with faint rust-coloured spots.

The nests were large flat platforms of reeds trampled and bent down, and just raised above the surface of the water. The young were nearly feathered, and the short primary feathers were of a jetty blackness, contrasting with their white plumage. All the



YOUNG SPOONBILLS ON NEST.

(Photographed from life by R. B. Lodge, Enfield.)

time we remained near the spot the old birds were flying uneasily round and round, high up in the air, but without uttering a sound, looking very white in the glaring sunshine against the blue sky.

I was extremely anxious to obtain a photograph of some of the old birds; but the high wind was blowing the reeds about so violently, that I had great difficulty in photographing the nests and young, and in all probability any attempt to secure the parent birds would have resulted in failure even if I had waited for their return. This, however, as I was not alone, was out of the question. I have before now waited concealed at nests for seven hours to secure a photograph of the parent birds, and would willingly wait still longer to secure anything out of the common,

but I cannot expect other people to wait with me. However, I am in hopes of having an opportunity of spending three or four days next year by myself, at an earlier date, in this most interesting marsh.



NEST OF STORK WITH TWO YOUNG.

(Photographed from life by R. B. Lodge, Enfield.)

The Spoonbills, I am informed, had settled in the meer some years previously, on the draining of another large meer some miles away. Then an attempt had been made to drain this meer also, and the birds had been driven away for several seasons; but the attempt was not successful, the meer had reverted to its former condition, and the Spoonbills and other marsh birds had returned to their haunts, where I hope, in the interests of all ornithologists, they may long be permitted to remain.

Before leaving we found nests of Purple Herons and Common Herons, both containing young birds, and eggs of the Great Reed Warbler, and on reaching my host's house I seized the opportunity, almost in the dusk of the evening, of photographing a Stork's nest in his grounds, in case I did not get another chance. I was very glad afterwards that I did so, for I only saw one other nest during five days in Holland, and that was near the Hague, from the windows of the passing train. Both were built on the summit of tall poles fixed upright in the ground, on which a cartwheel had been fastened. I heard, however, of another a few miles distant, though I believe they are not so common as is generally supposed.

The one here figured contained two young nearly able to fly and one of the old birds, which is standing in the characteristic and traditional manner on one leg. While I was there I only saw one old bird, for as soon as one appeared the other went off for food. It was a fitting close to this my first day on Dutch soil, to watch the birds silhouetted against the evening sky as we sat out in the beautiful grounds after dinner, enjoying with the zest of novelty their quaint and contemplative postures, recalling the events of the past hours and planning a journey to a distant locality where the Avocets still breed, together with Ruffs, Godwits, Oystercatchers, and Sheldrakes.

A NATURALIST'S JOURNAL IN HOLLAND AND BELGIUM.

BY O. V. APLIN, F.L.S.

WE arrived at the Hook of Holland early in the morning of Sept. 26th, 1895, and proceeded up the Maas to Rotterdam, where a few Black-headed, Herring, and Common Gulls were to be seen.

At Rotterdam we stayed until the 29th, making various excursions by river and canal to Delft, Dordrecht, Amblasserdam, &c.; but there was very little bird-life of interest to be seen. I only noted twenty species of birds, the most interesting being the Crested Lark (*Alauda cristata*), which I saw in some of the fields. This bird has been occasionally recorded as occurring in England, and some doubt has been occasionally expressed as to the identity of the species (*cf.* Zool. 1895, p. 451). I am inclined

to think that these doubtful cases should be consigned to oblivion. The Crested Lark is such a very distinct and well-marked bird that no one who knew both species well would have the slightest chance of confusing it with the Sky Lark, or of mistaking the one for the other. Again, no one who really saw a Crested Lark for the first time ought to have the least doubt that he had seen a bird new to him, or have any difficulty in convincing others, by his description of the bird, of its identity. Apart from its long drooping crest of quite a different shape and character to the Sky Lark's, the Crested Lark, in all its forms, is of a different colour to the Sky Lark; it is a broad-chested, massive bird, with a very big head, and (except in a pale southern form) a strong beak, a short tail (in which there is no white), and a shape altogether different. Its flight is different; it looks heavy on the wing, and has the appearance of having the bend of its wings higher than its body, which seems to hang between the wings curiously; this gives the bird a clumsy, awkward appearance, not lessened by its conspicuous head and beak. All this contrasts with the appearance of the elegantly-shaped Sky Lark. I am afraid I have not made my meaning very clear; it is difficult to do so; but I think that any one who knows the Crested Lark will follow me. Then, again, the Crested Lark is fond of uttering its call-note; it invariably does so upon alighting after a short flight, and this call-note is loud and quite peculiar. It is very sweet, and may be written "kay-see-sweet-weet," or "sweet-a-weet" in some cases. There were numbers of Peewits in the grass marshes or "polders," also Black-headed Gulls and some Herons. We used to have Teal for dinner. The Ring Dove and Stock Dove both frequented the little park at Rotterdam, together with various ordinary birds. White Wagtails I saw by the canals, sometimes on the moored timber-rafts—*e. g.* between Delft and Rotterdam. I noticed the Black Crow. At Dordrecht I saw a single Black Redstart (*Ruticilla titys*) about the Groote Kirke. There is a nice Diergaarde at Rotterdam, where they have a big open aviary for pinioned fowl, containing Night Herons, Storks, Spoonbills, Flamingoes, &c. Also another aviary with some good waders, *e. g.* Reeves, Spotted Crakes, and Cayenne Lapwings (*Vanellus cayennensis*). One night I could clearly hear the cries of these noisy birds from my room in the hotel, which was a considerable distance away, and was instantly carried back in imagination to

the rolling "campo" of Uruguay, where the call of the "Têru-Têru;" was a common sound at night.

Sept. 29th. To Amsterdam. Teal again for dinner, these little ducks being evidently numerous just then.

Sept. 30th. To Zandpoort, where there is a bit of legitimate Holland, so to put it: high ground like the sandy parts of Norfolk, with sand, fir-trees, and scrub-oak, and always dry land, before the Dutch poached on the sea. But we only saw Jays and a Green Woodpecker. From Zandpoort we walked to Haarlem, through pretty agricultural country and the village of Bloemendaal, noted for its villas and gardens, and just then remarkable for its glorious beds of Begonias; but we hardly saw a bird. We returned to Amsterdam by train.

October 1st. A voyage in a wherry to the island of Marken, in the Zuiderzee, yielded us nothing but the sight of Black-headed Gulls, Peewits, and Starlings; nor were we more lucky when visiting Monnikendam and Broek, the noted clean village; so turned our attention to the dairying industry and old silver. But when the summer migrants are here the reed-grown drains must be a grand place for river warblers, and the little fruit-gardens on the edge of the drains and canals are I dare say alive with the song of various interesting warblers. The moral we learnt was, not to go to Holland in autumn to see land-birds, unless indeed you go to look for migrants on the sea-coast. I may say here that we never saw a Stork; doubtless they had already gone south.

Oct. 2nd. I tried to study Natural History in the Ryks Museum. There was a curious old gilded chariot dating from the middle of the 18th century, with painted panels, one of which was instructive. It represented a fierce Hedgehog advancing open-mouthed on a nest of bird's eggs (perhaps Blackbird's) placed conveniently for him on the ground. I am afraid this was no libel. On other panels were painted old-fashioned Pheasants (the true *P. colchicus*), Shoveller ducks, &c. In pictures by Melchior d'Hondecoeter (1636-95) I noticed a Bittern, Shoveller, Red-breasted Goose (*Bernicla ruficollis*), Smew, &c. The two last-named figure in the famous picture called "La plume flottante," which includes also a crested Crane, perhaps the "Peacock" of the guide-books. Another picture by the same artist, "Oiseaux morts," represents a Partridge with the horseshoe irregular, and

much white round it. In a picture by Frans Snijders (1579-1657) there is a Partridge with some white on the edge of the horse-shoe.

Oct. 3rd. A journey by steamer in very bad weather up the North Holland Canal to Alkmaar showed us no birds, and there was clearly nothing to be done in this way, so we determined to leave for East Holland and Belgium the next day, after seeing the Zoological Gardens.

Oct. 4th. In the Diergaarde we found a nice bird-house, and noticed a specimen of that lovely little bird, *Poephila mirabilis*, Gould, which displays blue, crimson, green, yellow, amethyst and claret-colour in its plumage. Some local Jays had the crown of the head unusually white. I was much interested in listening to the bright little trill, "chit-teree-ee," of some Crested Tits. There were also some Bearded Tits (the Baardmees of the Dutch). We saw three Bisons (*Bison americanus*) and two examples of the Aurochs (*B. bonasus*). The Aurochs bought by the Zoological Society of London in 1868 was bred here in 1865. We went through the birds in the Museum in the grounds. The most noticeable things were *Locustella luscinioides*, from Kralingen; a series of twelve *Anthus rupestris*, one or two of which approached *A. spipoletta*, but most of them were not to be distinguished from *A. obscurus*; local Hawfinches, rather brighter than our resident birds; many Sand Grouse (of the 1888-9 invasion), and two downy young born in the Diergaarde on the 15th and 16th July, 1890. There was, as might be expected, a very fine series of Ruffs, and three examples of the Red-breasted Goose (*Bernicla ruficollis*), one from Rotterdam and another from North Holland. As mentioned above, the bird was known to the old Dutch painters. Some very beautifully executed life cases of birds (like those in the British Museum), with space not spared, have been fitted up. They include Purple Herons and nest (Naardermeer); Spoonbills (two nests), and Great Reed Warbler and nest—a very pretty case; Ruff and Reeve; Herons and Cormorants; Sheldrakes; and Sand Martins, with one burrow opened. We went, *viâ* Utrecht and Arnhem, to Nymegen.

Oct. 5th. Nymegen. Walked to Berg en Dal, at some little elevation, whence you get a very fine view over the flat rich country of the Lower Rhine, with its villages, farms, and trees, the winding river and undulating wooded country. I noticed

White Wagtails, Jays, Magpies, Rooks, a Green Woodpecker, a Sparrowhawk, and a little party of Tree Sparrows, with some of their domestic relations. But my best luck happened in a little open wood of Scotch firs on the slope of a sandy, heathery hill facing the sun. Here I saw and heard the Chiffchaff (but only a few notes), and fell in with a little party of White-headed Long-tailed Titmice (*Acredula caudata*). One or two had signs of a dark mark through the eye, the heads of the others were quite white. They are very striking birds, looking rather bigger than our race, and were nearly white underneath—altogether they strike one as larger and lighter coloured than *A. caudata rosea*. But their habits were similar and their notes too; and I watched them with great pleasure as they made their way in a straggling manner over the top of the hill and into a scrub of low Spanish chestnut saplings. Here, too, were three or four continental Coal Tits (*P. ater*), with blue-grey backs, a Tree Creeper, &c.

Oct. 6th. The weather being very bad, we made a rush by train into Prussia—to Cleve—and back; but the heavy rainstorms interfered with observation, and I saw only a White Wagtail, Black Crows, &c. I am pretty sure I heard the song of a Black Redstart from the roofs of some of the houses, but I could not see the bird. In the Kronenburg Park at Nymegen, prettily laid out below the old fortifications, they have a nice collection of wildfowl, including the Red-crested Pochard (*Fuligula rufina*).

Oct. 7th. We left for Liège. A little way beyond Venlo, in a sandy agricultural country, I saw some Crested Larks. At Liège there were many Song Thrushes in the shops, and two old Partidges with the horseshoe white save for a few brown spots. *La chasse aux Grives* had begun.

Oct. 8th. A bunch of about a score of Meadow Pipits (*becs-fins*), the ordinary light-breasted birds, and another of the same number of Tree Sparrows, were offered to the hostess this morning. We left for La Roche in the Ardennes. At Melreux we had to stop an hour until the steam-tram started. The whole place was rather like a farmyard, for the cow in the Ardennes village is a most important personage; the street was profusely adorned with manure-heaps and pools of black water, which suit the White Wagtail very well. At a little auberge they gave us quite a zoological *déjeuner*, comprising a small Pike from the Ourthe

(the best I ever tasted, with firm sweet flesh), Hare, and Partridge. Swallows and Martins were still in some numbers round the church of Hotton, the next village, but we saw little of them after this. Arrived at La Roche, some way up the valley of the Ourthe (about 650 or 700 ft. above the sea), we went for a walk up one of the half-dozen valleys meeting at this place. White Wagtails were pretty common, also Jays, and we saw the Green Woodpecker and a Buzzard.

Oct. 9th. Walked by the terraced road leading part of the way through the Bois de la Roche to Samrée (550 metres altitude). Soon after leaving La Roche we saw two Black Redstarts, not fully adult. After entering the wood we saw a lovely fresh Comma Butterfly (*Grapta c-album*). Marsh Tits were the commonest birds in the forest, and were abundant; the woods were chiefly beech, with some oak in places. These birds had rather more extensive black caps, and were perhaps a shade greyer on the back than the British form. A wandering party of birds comprised Marsh and Great Tits, Tree Creepers, and Nuthatches; we saw too Wrens, Jays, and Chaffinches. Passing out of the woods we came on some open rough grass-land and cultivated patches near the top of the hill, perhaps the highest in the neighbourhood; there were a few Yellow Buntings. Some rowan trees were covered with berries, and, like others we had seen, were hardly touched by birds as yet. But the Song Thrushes, which fatten on them,* were just arriving, and we saw a little party of them visit the trees to-day. Samrée was, at that time at all events, a vast midden, manure-heaps and pools of black water being freely scattered over the place. Accordingly the White Wagtail found the place much to its liking, flying up as we passed from the manure-heaps to settle, as they love to do there, on the grey slate-stone roofs. As we were eating strange fare in a little farmhouse, which was (so a sign-board said) also an auberge, I watched from the window a bird with the yellowish tinge, often seen in autumn in *M. Yarrellii*, very strongly developed. Never were there such people as these for living with their cows; they beat the North Dutch, Norwegian, and Swiss people in this, I think. The auberge smelt so much of cows that I strongly suspect they had got them in the back room. There

* In Brussels, *Grives* from the Ardennes are esteemed the best.

were some Meadow Pipits, Chaffinches, and a big flock of Sparrows about Samrée, the first-named on a bit of pasture-land. To my great surprise I found a fine old male Black Redstart, sitting on the rough projecting stones under the eaves of a little farmhouse, and singing his bright little clear song. The strain was a little shorter than that heard in the Alps in June, and was only delivered occasionally, as the bird sat sheltered from the cold wind; but it was a bright little song for all that, and quite characteristic. The autumn song of the Black Redstart was new to me, but, as will be seen, I afterwards found the birds singing daily down at La Roche. The interesting point to-day was finding an individual staying so late in the season in this elevated and exposed spot. We walked down by a path through the forest without seeing more birds, the birch-woods being as quiet as they usually are. There are wild Boars, Roe Deer, and a few Red Deer in these forests, but they are only to be found in the most out-of-the-way parts by experienced local chasseurs. One, if not two, Black Redstarts singing about the rocks near the château of La Roche when we got back.

Oct. 10th. Drove to Nisramont, steadily uphill through woods. Then walked through some rather open scrub and heather (where was a chasseur in pursuit of a hare, so much excited, as his dog was giving tongue, that he could hardly reply to our enquiry whether he had shot anything), and down to the Ourthe at La Hérou. There is a beautiful reach of clear rippling river here; on the opposite bank the rocks rise high, precipitous, and rugged, partly clothed with birch, scrub-oak, rowan, &c. A Buzzard was wheeling overhead, a Green Woodpecker flitted from tree to tree on the further bank, and we disturbed a party of Ring Ouzels at some rowans, one of which, perched sentinel-like on a bare branch, uttered its loud tac-tac-tac-tac, and they made off. Song Thrushes were pretty numerous. A little party of House Martins, the first we had seen since leaving those at Hotton behind, were, I believe, travellers. A few which we saw on arriving at La Roche in the late afternoon were perhaps the same individuals moving down the river valley. We saw no more of them.

Oct. 11th. Cold wind again. We walked along a sunny sheltered terraced road above the river towards Mobage, and saw, chiefly in and near some little gardens, about twenty Black

Redstarts, one a very fine adult male. They like to haunt the houses and manure-heaps, of which there were many then in the streets of La Roche. These heaps were a nuisance, because they were placed in the gutters, and in an ordinary way the gutters afford the smoothest and best walking to be found in these cobbled streets. The people were apparently cleaning out their cowhouses for the winter, and could be seen wheeling out the contents through their own houses! If, as I suspect, *Ruticilla titys* winters here, the manure-heaps are an important factor in making the place suitable for the purpose. I saw a White Wag-tail, presumably a bird of the year, with the yellow tinge and a grey crown and occiput (*cf.* Zool. 1890, p. 375, and 'Naturalist,' 1891, p. 349). We noticed also a Stonechat and a Buzzard. A man repairing the road had just turned out a large Salamander (*Salamandra maculosa*) in moving some earth. He said they were common, and he often unearthed five or six in a day. Other reptiles seen were a dead Blindworm and the remains of a Colubrine Snake. Pearl-bordered Fritillaries (*Argynnis euphrosyne*) were common at the roadside. We saw more Black Redstarts about the château. There were bunches of Song Thrushes in the shops, and at the hotel they gave us Grives to eat daily; they were wonderfully fat, and had been feeding on rowan-berries. This it was easy to ascertain, as the cook did not draw or clean the Grives, and when we cut one open we always had a few berries on our plates.

Oct. 12th. Dull and a little rain. Black Redstarts in song about the roofs, morning and afternoon. I noticed one particularly fine adult male. Watched a Dipper in the Ourthe with a dusky head, which undoubtedly had sooty under parts, *i. e.* no chestnut on the belly. In this respect it resembled *Cinclus aquaticus melanogaster*, which is said to occur in North Germany. La Roche is only a little north of lat. 50°, and only about 700 ft. above sea-level. But the country is drained by the Northern Meuse or Maas, of which the Ourthe is a tributary; unlike part of the Vosges (where *C. aquaticus albicollis* is said to occur), which are drained by the Southern Saône and Rhone. This individual was sitting on a bit of drift at the edge of the river, and was singing. The song was a sweet bright warbling, rather rapid, with some shrill squeaking notes and some very Skylark-like; my wife noticed this independently. After singing for a

little while the Dipper began to feed. The Ourthe just there is a shallow crystal-clear river, with not more than a foot of water over a brown stony bottom. The bird often plunged into the water to swim and to wade over the big stones, and sometimes went under the surface with a splashing rush. Once or twice it turned up its tail-end almost like a duck, and more than once it took a header from a stone. As far as I could see, it was a considerable exertion to get under the water, and the bird remained not more than fifteen seconds under water on any occasion. In the afternoon we went by way of the little elevated village of Cielle—where I noticed Tree Sparrow and White Wagtail—to Jupelle, and came back up the very beautiful river valley. Saw some Golden-crested Wrens in a spruce-wood, and Linnets and Magpies by the way. Marsh Tits were everywhere by far the most numerous of the genus. A great and noisy concourse of Carrion Crows were wheeling about over a wood at the top of a ridge; there were about fifty of them. The Crow family was well represented in the Ardennes. Jays were naturally abundant in the woods, but I do not remember seeing any Rooks. The Roman Snail (*Helix pomatia*) is found at La Roche.

Oct. 13th. Milder. A Black Redstart was hawking flies from its perch on the roof a tiny chapel on the hillside; it sang a little. Its call-note was a faint soft "sit," repeated often. In the Bois we saw a Spotted Woodpecker (*D. major*) hammering an oldish oak-tree. On a sunny slope there were a few butterflies, including a "Camberwell Beauty" (*Vanessa antiopa*). Late in the afternoon we walked along the road through the Bois, in the hopes of hearing the Little Owl, which occurs here (and, south of the Mediterranean at all events, is very noisy about sunset), but without success; so I expect they must be rare. Lovely golden tints were coming on the beeches, which were very fine, many of them having smooth silvery bark. This variety is known to English timber-merchants as "yellow beech"; the timber is said to be very good, and much superior to that of the ordinary or "white beech." The production of the yellow variety seems to be chiefly a question of soil in England. One little park in North Oxon is noted for it. The effect of the different trees massed, and seen at different distances on the shoulders of the hills, varying in colour from yellowish green to purple, was extremely fine. I saw the following stuffed birds in La Roche:

—At a furniture dealer's, a Kite (*Milvus ictinus*), Goshawk (*Astur palumbarius*), Grey Shrike, Song Thrush, Fieldfare, and Coot; at a café, two Little Owls (*Athene noctua*); at the chemist's, a Grey Shrike and a Magpie. There may be bought in La Roche heads of the Red Deer and Roe Deer; of the latter, we got a nice head with antlers measuring ten inches and a quarter along the outside of the curve. Also you can get local skins of the Fox (with dark and thick fur, and remarkably large brushes) and Wild Cat. The facts of the Black Redstart being found here in some numbers in mid-October, and that it was singing at that season, were very interesting. I am inclined to think that these individuals intended to pass the winter in that little sheltered valley, where they had the advantage of houses and plenty of middens, for almost, if not quite, all the summer visitors among the migratory birds had moved southward by that date. The facts suggested interesting speculations. For instance, the questions whether the Black Redstart habitually sings in its winter quarters; and, if so, does *R. phoenicura* sing also? I have only seen two or three Black Redstarts in their southern winter quarters south of the Mediterranean, but they were not singing. Mr. Howard Saunders kindly tells me that in Spain he has heard the Black Redstart singing early in November, but that he has never been in Spain in October. If the Black Redstart sings habitually in autumn and winter, the fact is additional evidence of the relationship between this bird and the Robin, and I may add that I have occasionally heard a shrill strain from a Robin which reminded me strongly of the song of the Black Redstart. With regard to the white eggs of the Black Redstart, it may be worth recording that I once found a white Robin's egg, the only egg in the nest. Of course this was only an abnormal variety (the shape was normal), but it tends to show the direction abnormal variation may take in this group of birds, and other white Robins' eggs have been found. In the case of the plumage of birds, it is often quite possible to name the colour and character which variation will assume in an abnormal variety of a particular species of bird. The present point is, however, not worth much, for a colourless egg may occur to any bird. The connection between the olive-brown Nightingale's egg and the blue-green Redstart's egg is evidently close, for Partridges sometimes lay abnormal blue eggs; I had one some years ago, and I believe blue varieties of Pheasants' eggs also occur.

Oct. 14th. To Brussels. Near Namur I saw what I am pretty sure was a Great Grey Shrike. I only saw it for a moment, but it could have been nothing else. Many tourists on this railway have probably noticed the extreme beauty of the Forest of Soignes. The huge beeches, with tall towering trunks, are a glorious sight.

Oct. 15th. At Brussels. In the Marché de la Madeleine we found Meadow Pipits, Ortolans, Chaffinches, Greenfinches, Linnets, Tree Sparrows, Song Thrushes, and a few Blackbirds, Quails, and Partridges, with both white and speckled horseshoes. The shop-windows, too, were full of Grives. There is an extensive collection of birds in the Musée d'Histoire Naturelle, but so crowded and badly arranged that I had not time to examine them carefully. Ring Doves inhabit the little park here.

Oct. 16th. In the Palais des Beaux-Arts a picture by M. d'Hondecoeter included a Kingfisher coloured a black-blue, as are (with one exception) all those by the old Dutch and Flemish painters that I have seen.

Oct. 17th. Arrived at Antwerp, and went at once to the Zoological Gardens, where we saw three specimens of the Abyssinian Ass (*Equus taniopus*), three Burchell's Zebras (*E. burchellii*), and two true Zebras (*E. zebra*), two Giraffes (four females have been born here, 1871-76), a grand Bison, and a fine Aurochs. Also a blackish variety of *Felis pardus* from Java, with the spots showing indistinctly, and some Barbary Lion cubs with spotted legs. I noticed here, and at Amsterdam, that Armadillos repose quietly on their backs, with legs and nose in the air and tail sticking out. Other things worth notice were a pair of local white Jackdaws with ordinary eyes (we saw two more at Amsterdam); eight species of Toucans, including *bicornis*; *Copsychus macrurus*, which sang sweetly; and *Prothemadera novæ-zeelandiæ*, with white chest-tufts. There was a magnificent aviary of Rails, Ibises, Gallinules, Gulls, Waders, &c., and I was a good deal surprised to see some of the Waders still in summer dress; for instance, a Black-tailed Godwit, and a Ruff, whose (blackish) ruff was ragged, but nearly all there. The Antelope-house is a very fine one. It is horseshoe-shaped, with a large covered yard inside the curve communicating with each box, thus enabling all the animals to have exercise in turn.

Oct. 18th. In the Musée Plantin-Moretus there is a set of six

eaux-fortes, by Pierre Boel, of Hawk scenes. One represents two Falcons striking a Heron, which is almost on its back in the air. In another, which includes Ducks, a Merganser, a Heron, and two Bitterns, one of the last-named has its neck stretched upwards and its bill in the air; the other is crouched on the ground, with half its neck and its bill straight up; all the birds are apparently alarmed by a Hawk, which is not shown. Among various pictures of hunting scenes, dead game, &c., in the Musée (Palais des Beaux-Arts), I noticed especially one by P. Gysels (who lived between 1621-90). This wonderful production included, *inter alia*, representations of a Heron, Mute Swan, Bittern, Partridge (with chestnut horseshoe), Green Woodpecker, Roller, Kingfisher (of the usual black-blue), Spotted Woodpecker, and Jay. As a whole the birds were wonderfully well done, especially the two last-named. There is a fine picture also, by J. Fyt, of two Eagles on a crag, one holding a Mallard. The only well-coloured Kingfisher I saw in any of the galleries we visited was here, by J. Weenix (1644-1719). A few Black-headed Gulls were seen along the quay.

Oct. 19th. To Ghent, where for the first time I noticed Redwings among the Song Thrushes in the shops.

Oct. 20th. Bruges. Redwings in the shops here too.

Oct. 21st. Crossed from Ostend to Dover. A few Grey Crows were to be seen at Ostend and a little way inland. The sea was calm, and there was hardly any wind. Soon after starting we fell in with many Black Scoters (*Edemia nigra*), some Black-headed and Common Gulls, and a few Gannets. When we had been about an hour at sea a Robin came on board, settling on the deck close to our chairs, and two or three more passed over, going towards the continental coast. In mid-Channel we saw only Gannets—about a score, and all adults—and a few Gulls. But several flocks of small birds were going in our direction. I identified Chaffinches and Tree Sparrows; two or three of the latter (clean, bright-looking birds) came on board, and others followed in our wake and under our lee, a slight breeze only blowing from about S.W. Chaffinches are stronger and faster fliers, and could beat us easily, albeit we were on a good boat—the ‘Rapide.’

SOME OBSERVATIONS ON THE NOTE OF THE CUCKOO.

BY A. HOLTE MACPHERSON, B.C.L., M.A., F.Z.S.

DURING the spring and early summer of the present year I took every available opportunity of listening to the Cuckoo. Many friends kindly rendered me their assistance, the result being that I obtained a mass of observations relating chiefly to the pitch of the bird's voice, and to the interval which separates the two notes of its familiar call.

The Cuckoo has been the subject of so much discussion that it is with some hesitation that I record the following observations. No bird has had its natural history more thoroughly criticised, and no bird still remains so great a mystery.*

In this paper my remarks are confined to certain characteristics of the well-known call, and I shall say nothing of the other sounds which the Cuckoo utters. Nor do I intend to attack the generally accepted view that the cry "Cuckoo" is confined to the male bird, beyond saying that I have evidence (although it does not amount to proof) that the female is occasionally responsible for this cry.

On analysis, my records as to the interval between the two notes do not show much that is new.† They show that when the bird is in full song, shortly after its arrival in England, the interval is usually greater than the minor third, which it is popularly supposed to sing, and is to all intents and purposes a full major third. On an average the notes may be considered to be approximately E and C, but of this more will be said hereafter. The notes recorded have in all cases been determined by a tuning-fork, pitch-pipe, or piano; but in striking an average, allowance has to be made for the difficulty in always ascertaining whether the calls recorded were uttered by one or more birds, for a Cuckoo will often stay for days in a comparatively small area, frequently flying across from one side of it to the other. To

* Geddes and Thomson's 'Evolution of Sex' (pp. 274-279) contains an excellent criticism of the mysteries of the natural history of the Cuckoo.

† There are some interesting remarks on the voice of the Cuckoo in Gilbert White's tenth Letter to the Hon. Daines Barrington; see also Witchell's 'Evolution of Bird Song' and Harting's 'Ornithology of Shakespeare' for further notes on the subject.

an observer this bird certainly seems to be merely a "wandering voice."

Considerable variations in the interval were recorded, and at all times throughout the season. It is, however, quite clear that on the whole the interval tends to increase with the progress of time, and that about the middle of June the voice cracks. Personally, I have never heard a greater interval than a fifth. Mr. Witchell, however, whose researches in the songs of birds are well known, informs me that on the 10th June last he heard a Cuckoo "in the interval of a sixth," but he adds that he "never before heard a Cuckoo sing any interval beyond a major fifth."

Not infrequently the bird utters three notes. At Haileybury, on June 7th, Mr. F. W. Headley and I heard one sing E flat, D, C, two or three times, then it omitted the middle note, singing a minor third. These three notes were beautifully full and clear, and as perfectly in tune as if the bird's voice had been relegated to the few notes of our scale, whereas the intervals very rarely correspond exactly with those which we have become accustomed to recognise. A friend, writing from Hampshire on June 15th, says, "As I write one is singing F, F, C," and another sang F, D flat, C.

Some of the feathered species, when engaged in the performance of their love songs or antics, are oblivious of everything else; on such occasions certain game-birds are quite deaf; but the Cuckoo always seems to take an intelligent interest in neighbouring sounds. On June 6th I heard two birds at the same time. The first commenced singing E and C; the second sang F and C sharp, but, apparently horrified by the discordant result of his efforts, he at once altered the notes to E and C, and sang in unison with his rival. It was obvious that the change was purposely effected. Another bird was reported to me who was "evidently much put out by the crowing of a cock, for it sang its E, and then waited till the cock had finished crowing before singing its C sharp."

Now with regard to the pitch. This, like the interval, is subject to variation, but only within certain fairly narrow limits. Out of hundreds of recorded calls during the period when the bird was in good voice, the upper note in nineteen cases out of twenty is from F to E flat (both inclusive), and the lower note from D to B. And this brings me to a most curious point

which has caused me much perplexity. Although early in my investigations I found that my correspondents were practically at one with regard to the names of the notes which they heard, yet I found that when they wrote down the notes in musical notation they were divided into two camps. One half placed the notes exactly an octave higher than the other half; and whereas I had always written down the average call as E on the bottom line of the treble stave and the C next below it, by far the larger half of my correspondents considered it to be E in the top space of the treble stave and the C next below it. When, as happened in one case, two fairly musical people on hearing the same bird differed in their estimate to the extent of a whole octave, it was clear that there was something peculiar about the sound. Not caring to trust any longer to my own ears, which I believe to be fairly accurate for ordinary purposes, I enlisted the services of many of the most carefully trained musical ears of my acquaintance, and asked the owners to let me know the pitch and interval of every Cuckoo's call which they heard. My enquiries elicited a large number of careful observations, for which I am most grateful. One lady, a most accomplished violinist, compared notes with her friends, and at once experienced the same divergence of opinion. "I cannot tell why it is," she wrote, "but the pitch seems to bother so many people. I have asked several, and they all say the pitch is an octave higher than it is."

The result of these further enquiries was to dispel any doubts that had arisen in my mind as to the average call being the E and C in the middle of the piano. Those who assigned this position to the notes were in a considerable minority, but the weight of evidence is enormously in their favour.* But the question remains, why should there be any difference of opinion as to the pitch? I suspect that it is a question of harmonics. Having no knowledge of acoustics, I can only suggest this as the explanation, and leave those wiser than myself to test the accuracy of the suggestion.

It is a well-known fact that very few musical sounds consist of one simple note; they are composed of an assemblage of tones. These tones "are always members of a regular series, forming

* I once commenced a list of the notes assigned to the Cuckoo in musical compositions, but soon came to the conclusion that no significance could be attached to composers' views on the matter.

with each other fixed intervals.”* A well-trained ear will divide a musical sound into its component notes without difficulty, while to the ordinary ear a single tone will alone be audible. It is to these additional notes—these “overtones” or “harmonics”—that differences in the quality of sounds are due. Now to my ear the notes of a Cuckoo have few equals in quality; they give me as much pleasure as the finest notes of the Blackcap or Marsh Warbler, and I think as much as a well-played violin or the middle notes of a good French horn. When the Cuckoo is at its best both notes are deliciously full and “creamy,” but this is especially the case with the second or lower one. It is a curious fact that if you watch a Cuckoo when uttering its call, it is evident that all the labour is bestowed on the production of the first note, which is jerked out with considerable effort, while the second one seems to be produced without the slightest exertion. Yet the sound of the second note carries a long way the further; you can easily hear it at a distance at which the upper note is quite inaudible.

The notes of the Cuckoo are probably remarkably rich in overtones. It is an ascertained fact that simple notes without overtones are “soft, dull, and monotonous, and entirely devoid of shrillness or brilliancy; and it is a curious characteristic of them that they often give the impression of being lower in pitch than they really are. On the other hand, the addition of overtones gives life, richness, brilliancy, and variety to the sounds, and raises the impression of pitch.”† Throughout this last spring, whenever I was able to get into the country, I carried a tuning-fork, and never ceased to be struck by the miserable tone of the fork when compared with the voice of the bird. The “timbre” of a tuning-fork, after the preliminary discordant “buzz,” is very thin and uninteresting. “As compared with a pianoforte note of the same pitch, the fork-tone is wanting in richness and vivacity, and produces an impression of greater depth, so that one is at first inclined to think that the fork employed must be an octave too low.”‡

This last quotation indicates my belief as to the cause of deception. Whether the pitch of the Cuckoo’s voice is tested

* ‘Sound and Music,’ by Sedley Taylor, 3rd ed. p. 87.

† ‘Philosophy of Music,’ by W. Pole, F.R.S. (1879), p. 45.

‡ ‘Sound and Music,’ p. 101.

with a tuning-fork, pitch-pipe, or piano, you will find that the majority of people are apt to be deceived, because the bird's voice is so rich in overtones that it gives an erroneous impression of pitch. This view may not be well founded, but I put it forward for what it may be worth. Perhaps some of your readers can throw further light on the subject.

NOTES ON CANADIAN ORNITHOLOGY.

BY CHARLES A. WITCHELL.

ON arriving at Montreal, on May 19th, 1895, I was surprised to find the development of summer foliage less forward than that of Liverpool ten days earlier. The general temperature was also much colder. Near the docks were a few small birds closely like the Sand Martin, *Cotile riparia*, but their voices differed from those of any Hirundines which I had heard. The House Sparrow was introduced here some fifteen years ago, and now it is abundant in all but the busiest streets.

The city contains 300,000 people, and perhaps twice that number of Sparrows. Here, as in Britain, this bird builds a domed nest in creepers against the houses, if a better site for nidification is not available; but I saw no nests on the high trees. It has not the warm shelter of the ivy, which will not live in that climate. The severity of the winter is indicated by the fact that, at the date mentioned, there were in Montreal 3000 corpses awaiting burial. During the cold months no interment can take place, the ground is frozen so hard, and cremation has not yet become fashionable. The Sparrows are said to have driven the American Robin, *Turdus migratorius*, which is as large as an English Thrush, and the Bluebird from the city; and a friend told me that he had recently seen a Sparrow drive a Robin away from food. It is perhaps noteworthy that the Sparrows of Montreal utter the same notes and for the same occasions as those of Britain, and that in both countries the males "mob" around a female in the same noisy manner.

The most pleasing incident of bird-life visible between the eastern and western coasts of Canada was the soaring and swooping of the Nightjar. The common species is much larger than that

of Europe, is very common, and its power of wing marvellous. Rising almost vertically, by spurts of a hundred feet or more at a time, the bird would seem to climb to a considerable altitude, and then, in the well-known manner of its race, dive headlong, and so swiftly that its rushing could be plainly heard, especially just previously to the sudden turn which concluded the descent, when the sound "whong" was produced so loudly as to be audible when the bird was distant halfway to the vanishing point. The frequent cry of the bird, "pee-opp," can also be heard at a great distance. The Nightjars were abroad from four o'clock till late in the evening, flying extravagantly all that time. Probably no falcon could do as much.

One species which the Sparrows have not displaced from the tree-lined streets is the Yellow Warbler, *Dendroæca æstiva*, which was very abundant, flitting about in the manner of our Willow Warbler, from which species the female could not easily be distinguished. The male has much brighter tints: his breast is of an intense deep yellow, which colour seems to glow through the olive-green of his back; his eye-streak is conspicuous. On his breast are some longitudinal striations, of a faint brown, half indistinct, as though they represented a constitutional trait developed by the great heat of the Canadian summer. A male flitted about for some minutes within two yards of my head. Its nest is placed high in the trees. The call-note of the species is a short unmodulated chirp, like that of the young Willow Warbler. The song consists of four or five notes very rapidly uttered, and closely like the first four or five in the song of the Willow Warbler. Sometimes a note or two would be added, and these were always delivered slower than the others, and were much more like the ordinary whistled notes of the Willow Warbler. I heard this curious variation in Vancouver (B. C.) as well as in Montreal. The insect food of the species seemed to be of a kind smaller than that of the Sparrows, which, however, often took large insects on the wing, as they do in England.

I heard a small greenish bird, apparently a warbler, singing in the tree-tops a song exactly like the sibilous strain of the Wood Warbler.

On May 27th I arrived at Ottawa. A few Chimney Swallows, *Hirundo pelagica*, apparently a family party, were flying over my hotel. This species has much of the general appearance of

Cypselus apus, but, in flight, seems to have no tail. The birds sometimes chased each other a little, and their call-note was frequently uttered. This is a very short "see," not unlike the short notes sometimes uttered by the British bird when others near are uttering their long "swee-ree." Towards sundown a large number of Chimney Swallows were flying near the Houses of Parliament, which are magnificent piles, in a commanding position. Wilson described the evening assembling or "mobbing" of this species (*vide* Am. Or. 1812, vol. v.). At sunset the air near one of the buildings became crowded with these birds. They arrived in clusters of from one hundred to four hundred, or thereabouts, flying high, and every minute or two a fresh flock came into view. The general mass extended for some two hundred yards in every direction laterally, and slowly whirled round. All the birds seemed to be chirping, and their combined voices produced a vast rustling sound.

I repeatedly tried to gauge the numbers of this flock, but always concluded that at least five thousand birds were in the air at the same time. A bystander informed me that all of these would sleep in a certain chimney, which he indicated. I saw none of them alight on any of the buildings, but a dense crowd—a current—of them was perpetually breaking against the gratings towards the summit of a tower-like chimney. The birds, as they approached the openings, were so dense as to occupy more than half of the field of vision there, and since only a small proportion could enter at the same time the majority darted aside from the wall, or, obstructed by others, fell heavily for a few yards, and then, recovering momentum, rose in another current of birds to rejoin the main concourse. But birds entered so fast and so confusedly that I could not count them. Towards dusk the crowd had been greatly diminished. I waited until the last bird had entered the chimney before I left the scene. I was credibly informed that the whole interior surface of the chimney is covered with the nests of the birds. I should have sought an inspection of the premises had not the Parliament then been sitting in an earnest debate. During the brighter hours of daylight not more than a dozen of these birds could be seen; and four days later, when travelling westward, I saw not more than an average of two per hundred miles, though I was carefully watching for them.

At Ottawa the Goatsuckers were prevalent, as they were at

Vancouver. On the prairie we heard the clear "pill-willet" of the Plover of that name. There we also saw those piles of milk-white bones, and the frequent deep paths across the deserted land, which are the last evidences of the wild Buffalo in that region. At Vancouver water-birds are abundant, including the Heron and the Osprey. Both of the last can be watched feeding from the city bridges. I saw an Osprey carry a fish to the summit of a dead tree some two hundred feet high, but a half-dozen Crows were in pursuit, and gave the bird no rest. One of them would sometimes hover close above the Osprey, but none dared to come within reach of the larger bird; and when it spread its wings, ruffled its feathers, and uttered its whimpering cry, they retired to a more respectful distance; finally, they left the spot.

One day a White-headed Sea Eagle, *Haliaëtus leucocephalus*, flew from the giant trees in the park, and sped across a wide valley. The small red Sparrowhawk, *Falco sparverius*, sometimes entered the city, and then the Purple Martins, *Progne subis*, attacked it with admirable courage and skill. Two or three of them would successively stoop at it, like little falcons, "hammer and tongs," until the objectionable stranger had departed. The Crows at Vancouver city are numerous, quite tame, loquacious, and imitative. They are never molested, except by the Purple Martin and the Barn Swallow. When two Crows began to peer about the ledges of a house, near a Swallow's nest, the two little birds attacked the invaders with delightful gallantry, and, marvellous as it may seem to relate, I saw one upset a crow from its perch on a spout whence it was leaning forward inquisitively. I also saw a Purple Martin repeatedly swooping at a Crow in a hollow between two houses. Directly the large bird rose from the ground the little one darted at him and made such an attack that the other was glad to get away. Late in the evening the large Northern Black-cloud Swift, *Nephæctes borealis*, was speeding about; but I saw nowhere in Canada any behaviour comparable to that of *C. apus* when sometimes at nightfall it seems to retire into the sky.

The American Robin is common at Vancouver city. Its song is delivered like that of the Missel Thrush, *Turdus viscivorus*; but whereas the latter bird often utters four or five or more full tones in one strain, the former has generally only two and sometimes three. Its song is really pitiful, the more so as it is repeated

from an elevated position, and with a persistence worthy of a less barbarous utterance. The song-birds of that district are few and timid, and their notes are not varied individually. One strain was so frequent that nearly every Canary in the city had "caught" it. The notes of the Marsh Tit are repeated almost exactly by a closely allied bird, the Black-capped Chicadee, *Parus atricapillus*.

NOTES ON BIRDS IN KENT.

BY BOYD ALEXANDER.

THE congregating movement prior to migration is not the least interesting feature in bird-life. Swallows and Martins make an alliance, and they may be seen all day long winging their mazy courses to and fro over the cut corn-fields, and so deep at times do the Swallows pitch their flight that they well-nigh brush the shaggy corn-stalks with their breasts. The Swifts also fly in batches, circling round high trees and towers alike. The shrill sound of the ceaseless screaming of their voices fitfully strikes the ear as these weird-looking birds with their curved wings, sharply quivering, cut through the air, and swinging round the trees with such fine tact and precision that they hardly as much as tickle or scrape the leaves' smooth surface.

Linnets resort in large flocks to the fallow-fields, especially where charlock grows. The proverb which says that "safety lies in numbers" might well be reversed in the case of this bird. As soon as flocking takes place, the Linnets assume once more their shy habits, and carefully avoid our habitations, a trait also noticeable in other species of a similar timid nature. The delicate vermilion that smears the breast of the male Linnet is not attained till the second year. In immature birds a light chocolate colour takes the place of this.

Families of Red-backed Shrikes are abroad. Stout hedges, whose outgrowing branches serve as perches, or the sunny portions of a wooden fence, are at this time favourite resorts. They flit in close company from bough to bough in front of an intruder, the male parent bird uttering frequently his brisk "chuck." Mimicry is also resorted to, the movements of the Spotted Flycatcher being then very closely imitated, and except for his red-brown mantle and inordinately long tail he might at

first sight pass easily as that bird. When on a fence this Shrike will often turn backwards round its perch, and cling to the bottom of it, after the manner of a Titmouse. Several nests of this species may frequently be found in close proximity to one another. A "tiller,"* or some other favourable position, not far from the nest, is always chosen as a look-out post, and this is resorted to for some time before building is commenced. Incubation is performed by the female, who leaves her nest and flies to the "tiller," and is there fed by the male.

Around our gardens a few families of Spotted Flycatchers are still to be met with. These are the late broods. Although the majority of the young can look after themselves, yet in each family there are one or two wearing the spotted livery of first youth that have still to depend upon a mother's care. The task of feeding these devolve solely upon the female parent. Her mate has tired of her love-play, for as soon as the nestlings are abroad he leaves her, and becomes once more a bachelor. When catching prey for this backward brood she faces the prevalent breeze, and this enables her to detect more readily its drifting course.

The first appearance of the Wood Warbler in the Cranbrook district this year is a noteworthy incident. The favoured localities are certain spots in the Angley and Bedgebury woods, where tall firs and beech trees grow. From these high points this daintiest and prettiest of our Warblers proclaimed his arrival on one sunny day near the end of April by the utterance of his peculiarly fascinating song—a tiny "hip hip hip hurra." The first three syllables are given out with distinct hesitation, a mere prelude wherein to gain strength for the final outburst of song. This finale, which rises in pitch towards the end, and uttered with wings shivering and head thrown back, has all the appearance of being the expression of a deep passion of joy. Then, as if weary with such a supreme effort, it sluggishly flops to a fresh perch, and there gathers strength for another demonstration of its musical capacities. The male of this species arrives here before the female. And as soon as his songs have attracted and won a mate, they become less frequent, and cease altogether when the young are hatched.

* A local name given to a young oak-tree.

On May 15th a Golden Oriole (female) was shot in an orchard close to High Halden. A few weeks later (June 9th) a male was observed near Sissinghurst (about eight miles from the former place). On the day after its arrival rain fell heavily, and the bird was lost sight of, taking refuge no doubt in the thick fir portions of the Hemsted Woods. Prior to the above records another male bird appeared during May, 1893, in the same wood. The "Loriot" call, whence in France this bird derives its name, attracted the keeper's attention, and thinking his boy, engaged in arranging Pheasant-coops in a wood below his cottage, was whistling for help, he started out in the direction of the sound. This eventually led to the discovery of the bird, and also to its destruction.

The severe drought has at length abated; while it lasted things looked distressed. The dark foliage of copse and hedge-row stood out in bold relief against the brown of the parched-up pasture-lands, cropped close—and in places to the very roots—by grazing sheep and cattle. The conies even suffered. Of this many of the tender stems of the ash "tots" in the woods bear witness, for they are ribbed and marred by their teeth. The familiar sight of numbers of Rabbits feeding in broad daylight throughout the summer became eventually a rare one. Only scattered individuals were to be seen. The majority kept to their holes till dusk, realising that greater precaution was necessary, since they had to go further afield before food could be obtained. In bird-life the scarcity of food became also felt. It was quite a painful sight to witness Thrushes and Blackbirds on the parched-up fields, engaged in their spasmodic ramblings after worms which they could not get.

Premature migrations became general with Missel and Song Thrushes, and also with Blackbirds, when the currants and raspberries in our gardens no longer afforded them subsistence. These fruit-bushes were also attacked at times by flocks of Starlings, an uncommon trait in the good character of this species.

Compared with former years, the Nuthatches bred this season very sparingly. On the other hand, in the Tunbridge Wells district, a wonderful increase took place in their numbers. After the autumn moult the plumage of the male Nuthatch is remarkably handsome, the breast being a most delicate apricot, while the slate-blue of the upper parts is very intense in colouring.

Just now these birds are extremely restless ; most of their time is taken up in putting by a winter store of food, and this especially consists of hazel-nuts, which are plentiful this year.

The Sparrowhawk is still numerous. The thick portions of the Bedgebury and Hemsted woods often defy the keepers' search, and consequently not a few broods reared in these localities escape at least premature destruction. In this neighbourhood the nest is invariably placed at the base of two forked branches which jut out of the main stem of a fir or larch tree, and from 25-30 ft. from the ground. The front of the nest always faces the warmer side, while the back is usually protected by the main stem of the tree. During winter the old nest is resorted to as a roosting-place. In this way they often fall victims to the trap placed on the nest by the keepers. By the time the breeding season comes round again the winter storms have reduced the nest to a mere ragged bundle of sticks. On this foundation the new nest is occasionally built, although the general custom of this species is to build an entirely new one. Many authorities have stated that a deserted Crow's nest or Wood Pigeon's is made use of. I have never found it to be the case in this neighbourhood.

The Green Woodpecker, that bird who mocks with its bright laughter the treacherous coming of Spring, finds it difficult to rear a brood here, and consequently it is yearly decreasing as a breeding species. I attribute this fact to the great increase of the Starling. The big plagues of the small oak-green caterpillar and other arboreal insects, experienced the last two seasons, have caused large numbers of Starlings to breed in the woods, and these birds are not slow to take advantage of the old homes of the Woodpeckers. More than this, they engage in pitched battles with them over their newly-made holes. It is not unusual to find the Green Woodpecker resorting to the same nest-site of the previous year. In this instance the old hole is deepened. The drilling of a new one is accomplished generally by the tenth day, but the time varies according to the nature of the tree. The process of boring, as a rule, takes place during the small hours of the morning, when chances of discovery are thereby lessened, since the boring sound can be heard at a considerable distance. During the day the hole is left, and not returned to till the following morning. The Starling is quick to avail himself of

this absence. The bottom of the newly-drilled hole is soon lined with straw, and then there is every likelihood of a fight ensuing at daybreak. The tactics of the Starling are to terrify his adversary. To do this he takes full advantage of his rapid and mobile flight, which the Woodpecker cannot match. At one moment he darts at his enemy, and is away again before he can retaliate, while the next moment he will be pouring out volleys of angry abuse upon his foe. I have witnessed several of these fights, in which the Starling has invariably reaped an easy victory.

The woods are now destitute of bird-voices, save at times for the fitful cooings of the Ring Doves. The Nightjars, too, are silent. Their monotonous songs ceased as soon as the young were hatched. Nestlings of this species are frequently found here very late in the autumn. One was taken near Sissinghurst on Aug. 10th, and I have on record much later dates than this one. While pairing the Nightjar is very noisy. As soon as twilight begins to fade into dusk the male bird glides noiselessly up to a leaf-ridden and rotten tree-limb and immediately utters his call-note—a loud metallic “twyrrt.” When this has attracted the attention of a female, who utters back a similar note, he commences, though many trees may separate them, his grinding “churr,” resembling the noise of an axe being sharpened on a grindstone. This peculiar song is begun loud—so loud that the dead bough seems to vibrate with the sound. Suddenly the notes become soft and hardly audible, just as if the bird was taking breath for a moment, and then these soft notes are run again into the loud ones. This “churring” song, always marked at regular intervals by the soft bars, lasts at the most for two minutes. Then a short period of silence elapses before another “grind” takes place. And in this still silence one can almost picture to oneself the sharpener feeling his axe before putting the finishing touches to it on the grindstone. Besides this song and call, the Nightjar has an alarm-note. It is a strident “twyrrt,” accompanied by a double clap of the wings. A branch, dry and sapless, the bark of which hangs peeled off in long shrunk-up tubes—a white dusty road or a lately felled tree, shorn of its bark and shooting out its naked arms into the blank night—are places they seek by choice. From such points of vantage their large lustrous black eyes can the more readily

detect the white moths that flutter aimlessly amongst the undergrowth, like pieces of delicately-cut muslin falling from a dress-maker's table. The Red Underwing is also a favourite food. On a clear and calm night their "churrings" are loud and frequent. But when a night-wind is sifting through the trees, and grey-lag clouds darken the summer night, the Nightjars seem discomfited: they sit close, hugging the rotten boughs for very comfort, and the purring "churr" is seldom uttered. During the first week in September these birds will leave, not to reappear till the middle of next May.

Meanwhile the year passes.

NOTES AND QUERIES.

Acreage of the principal Zoological Gardens.—

Most of the large cities of Europe maintain Zoological Gardens, many of which are magnificent in appointment and rich in collections, but all, without exception, are confined to comparatively small areas, and some are much cramped for room.

In Europe.—London, 36 acres: Dublin (?); Bristol, 15 acres; Paris, 10 acres; Amsterdam, 25 acres; The Hague, 20 acres; Antwerp, 20 acres; Berlin, 63 acres; Cologne (?); Dresden (?); Hanover, 10 acres; Frankfort, 25 acres; Breslau (?); Vienna, 30 acres; St. Petersburg (?).

In America.—Philadelphia, 33 acres; Washington, 166 acres; Cincinnati, 36 acres. The Chicago, St. Louis, Pittsburg, Buffalo, and San Francisco gardens are in public parks.

In the East Indies.—Bombay, Madras, Singapore, Hong Kong.

The New York Zoological Society (incorporated by the Legislature in 1895) is taking steps to carry out a scheme for the formation of a large zoological park of not less than 300 acres in extent, the chief feature of which will be to reproduce natural conditions. The choice of locality lies between one of the four larger parks situated north of the Harlem River, *viz.* Crotona, Van Cortlandt, Pelham, and Bronx. It is proposed that the larger northern animals shall be shown "in free range," the tropical animals in suitable buildings and enclosures; the marine animals on the shore-line by means of tidal ponds. An influential committee has been formed for the purpose of considering and, if possible, carrying out the scheme.

MAMMALIA.

Squirrel with dark tail in August.—On August 2nd, while I was admiring the graceful movements of a Squirrel on one of the tall trees in Ashburnham Park, another of these animals appeared, and as I remained

perfectly quiet they allowed me to watch them for some time through a pair of binoculars. The second Squirrel was particularly interesting in the fact that it had a rich *brown* tail. I never before saw one of these animals with a dark tail in August.—W. RUSKIN BUTTERFIELD (St. Leonards-on-Sea).

Squirrels and Strawberries.—With reference to the correspondence on the carnivorous propensities of the Squirrel, I may state that in my experience they are practically omnivorous. I have several times seen them devouring young birds, but this summer a new phase in their character appeared. At Sheriff Hutton Park, near York, where they are encouraged, and have become very tame, such heavy toll was levied by them upon the strawberries that Mr. Coates was compelled to give orders to his gardeners that retribution was to be meted out to *Sciurus vulgaris*.—OXLEY GRABHAM (Flaxton, York).

Whiskered Bat near York.—A specimen of this Bat was brought to me by a boy who had knocked it down here the other evening. *Vespertilio mystacinus* is very local in the county, and its occurrence is worthy of record.—OXLEY GRABHAM (Flaxton, York).

Whiskered Bat in Co. Fermanagh.—A specimen of the Whiskered Bat (*Vespertilio mystacinus*, Leisler), was captured here in June last by a friend of mine. It flew into his room one evening, and after a long chase he secured it.—CHARLES LANGHAM (Tempo Manor, Co. Fermanagh).

BIRDS.

Food of the Great Titmouse.—Mr. J. Whitaker, in the most recent issue of 'The Zoologist,' has directed attention to the Great Tit's capacity for devastating rows of green peas, and I, to my cost, in a trifling degree, can give his observations the fullest corroboration. To such an extent did the species hereabouts during the summers of 1892 and 1893 take toll of this very desirable garden produce, that for the last three years I have discontinued growing it. I observe that neither in the fourth edition of Yarrell, nor in Seebohm's 'British Birds' is there any reference to the Great Tit's exceedingly marked partiality for this form of diet, and the question consequently arises, Is the taste one of comparatively recent development? The fact, too, that Mr. Whitaker in his lengthy experience has never noticed this mischievous propensity previously to the present summer induces the impression that it is not one of great antiquity.—H. S. DAVENPORT (Skeffington, Leicester).

Blackgame in Merionethshire.—It may interest your readers to know that last year Mr. R. E. Ll. Richards shot a well-grown young Blackcock on Cefn Creian, about four miles from Dolgelley. The last record I have of Blackgame in this neighbourhood is five and twenty years ago, when the

last pair were shot on Drwsynant moor, adjoining Sir Walter Wynn's Llannwchlyn moor. Perhaps some of your readers who reside in Merionethshire would kindly furnish instances of Blackgame in the county.—C. E. M. EDWARDS (Dolserau, Dolgelly).

Birds in the Rhone Valley.—To ornithologists visiting Switzerland, Bex, in the Rhone Valley, may be recommended as a very good centre for the observation of birds. I was chaplain there in July, 1890, and again in July, 1896; and I noted on the latter occasion, and that not in the best month of the year, no fewer than seventy species. What seemed most remarkable to me at Bex was the number of birds about the houses in the town, to be heard and seen without in many cases going outside the doors at all. We sojourned at the Grand Hôtel des Bains, and its kind and energetic proprietor, M. Hieb, took a great interest in our quest of birds, and gave us all the information in his power. There is also a museum close to the hotel which boasts of a good collection of local birds, and is under the direction of M. Borel. Around about the hotel grounds, or within earshot, we observed the following birds among others:— Warblers: Blackcap, Garden Warbler, Bonelli's Warbler, Whitethroat, and Chiffchaff; Common and Black Redstarts, Yellow and Cirl Buntings, Great and Marsh Tits, Chaffinch, Greenfinch, Goldfinch, Serin, Green Woodpecker, Nuthatch, Spotted Flycatcher, and at night the Tawny Owl. In the "Signal" wood just behind, birds abounded, and one afternoon, as my friend James Fitzgerald and myself were wending our way towards the Belvedere, we heard the cry of the Green Woodpecker, followed immediately by a louder and more piercing cry, which I took for that of the Great Black Woodpecker, and in a moment the bird appeared flying towards us; its body seemed as large as that of a chicken, as with rapid beats of the wing and a loud whirring sound it passed over our heads into the forest. In the marshes near the Rhone the Reed Warbler is abundant, but I could not detect the Sedge Warbler, nor, strange to say, the Willow Warbler, most delightful of birds, but which is, I think, rarer on the Continent than with us, whilst Bonelli's Warbler is met with almost everywhere. In going up the Riffel Alp we noticed, as usual, the number of Nutcrackers there, and the first and only Hedgesparrow we met with this year in Switzerland. On July 22nd we ascended to the Hospice of the Great St. Bernard, 8200 ft., and there the only traces of bird-life we could discover were the Meadow Pipit and Black Redstart, close to the Hospice, while high over head an Eagle was sailing—"Aigle noir" we understood from one of the monks; but as we went down by the lake behind the Hospice, a sweet but invisible songster among the rocks delighted us with a bright and charming song in that desolate place: was not this the Rock Thrush? The monks assured us that the Snow Finches came only there in winter, and we certainly saw none, though we had expected to find them

breeding there. About Liddes there were many Ring Ouzels and Wheat-ears, at an elevation of more than 4000 ft.—(Rev.) CHARLES W. BENSON, LL.D. (Rathmines School, Dublin).

The Scandinavian Pipits.—I was greatly interested in Mr. Aplin's remarks (pp. 300–302) on *Anthus cervinus* and *A. rupestris*, specially in his reference to the figures of the Scandinavian Rock Pipit (*A. rupestris*) in Mr. Booth's 'Rough Notes,' being in his opinion referable to the Alpine or Water Pipit (*A. spipoletta*). The question naturally arises, is the latter found in Scandinavia? Recently, in August this year, when at Vadsö on the Varanger Fjord, for the eclipse of the sun on August 9th, I had opportunities of making short excursions into the surrounding district, and on the 8th visited the whaling station in the Jarfjord, within a few kilos of the Russian frontier. To me this place proved a perfect paradise for Arctic flowers and birds. At the back of the flensing and boiling-down houses there is a considerable track of swampy ground overgrown with dense thickets of low-growing scrub (*Salix glauca* and *S. lanata*); between this and the back of the boiling-sheds were some pits or excavations filled with the odorous refuse of the place. This place literally swarmed with small birds, chiefly Pipits and Wagtails, attracted by innumerable forms of insect-life brought into existence by the unsavoury nature of the locality. In a few minutes I recognised old and young Blue-throats, Lapp Buntings, White Wagtails, Meadow and Red-throated Pipits, and numbers of *Anthus rupestris*. Here also were some Pipits which at the time I unhesitatingly referred to *A. spipoletta*, and entered as such in my note-book, also in that of a lady who was making a list of birds seen during the expedition. Subsequently, on consulting the books I had on board the steamer, I erased *A. spipoletta* as not being found in Scandinavia; at the same time I was by no means satisfied that I had done right. The Pipits in question were almost pure white or buffish underneath, without visible streaks, and a pure slate-grey above with very indistinct centre-feather markings on the back, also a very distinct buff eye-streak. None of us had a gun, so without a skin I am unable to speak positively as to the markings on the outer pair of tail-feathers. The late Mr. Seebohm, in his remarks on *Anthus obscurus* ('British Birds,' vol. ii. p. 247), which he treats with *A. rupestris* as one and the same species, says:—"In addition to the form, the summer plumage of which has already been described, with the streaked sandy-buff under parts, two others occasionally occur: one of these, which I found together with the typical form in the Varanger Fjord, has the ground-colour of the under parts almost pure white, possibly the effect of continuous daylight; the other, which is connected by a series of intermediate examples with the typical form, has the under parts scarcely differing from those of *A. spipoletta*, the streaks being nearly obsolete, and the colour of the breast pale chestnut-buff." The Arctic form of *A. rupestris* may probably be the one

figured by Mr. Booth. At the whaling station I also saw a single example of a large bright yellowish-brown Pipit with a strong bill, which was quite unknown to me. Like all the other small birds, it was excessively tame; so that I was able to watch it, with and without my binocular, at the distance of a few feet. I compared it to a large and very handsome Tree Pipit. Since my return to England I have identified it with the Siberian Pipit (*Anthus gustavi*), rediscovered by Messrs. Seebohm and Harvie-Brown on the Petchora. In this case the range of *Anthus gustavi* extends much further to the eastward than was supposed, and this is the first recorded example within the Norwegian frontier.—JOHN CORDEAUX (Great Cotes House, R.S.O., Lincoln).

Note on *Anthus cervinus*.—After reading my remarks on *A. cervinus* Mr. Coburn was good enough to send his specimen for my inspection. It is paler in colour than any other example I have seen, and I think he was right in stating that it was paler than *A. pratensis*. Whether his bird is an abnormally light-coloured one or not I cannot say; its pale coloration arises from the great development of the light edges of the feathers of the back and wings, and the predominance of the light edges of the feathers of the back over the dark feather-centres. Neither Mr. Coburn nor I can detect in his specimen "the almost black broad central marking of the longest pair of the under tail coverts," said to be a distinguishing mark of this species (*vide* p. 302); although I can find it in my examples of *A. cervinus*. Yet Mr. Coburn's bird was undoubtedly correctly named. The very light colour of the edges of the feathers of the mantle and wings, together with the boldly marked rump and upper tail-coverts, and the absence of the oil-green tinge on the upper parts, all point to this conclusion. Mr. Coburn's bird well exemplifies the character of a "brighter, more brilliant, and more striking bird than *A. pratensis*." To my eye the difference in the arrangement of the markings of the throat and upper breast (I should have added face and sides of the head—plainer and less marked in *A. cervinus*, and the ear-coverts light brown—in my former note) is also apparent, although it is much less so than in some other examples, and Mr. Coburn writes that he did not detect it. Mr. Coburn's bird is probably a bird of the year which had not long completed its autumn moult when it was killed. This would account for the very extensive feather-edgings which in the Pipits gradually wear away as the season advances. It is this abrasion of the feathers which gives such entirely different characters to the plumage of the upper parts in Pipits in autumn and in spring.—O. V. APLIN (Bloxham, Oxon).

Nesting of Summer Migrants.—A plausible reason for the promptness with which the Spotted Flycatcher sets about nesting operations on arriving in our midst may be found, I venture to suggest, in the very fact of its tardy advent. The season is then advancing apace, and domestic cares are not

invariably at an end with the launching forth on the world of the first brood. So recently as ten days ago (August 12th) I had a Spotted Flycatcher's nest in my garden, containing two young ones. It is not to be doubted that the earliest of the vernal migrants are more leisurely in their fulfilment of an inexorable law of nature; but my observations lead me to believe that most of those which put in an appearance from about the middle of April atone for their dilatoriness in migration—as compared, of course, with the first comers—by devoting themselves forthwith to the duties inseparable from the reproduction of their species. In this connection it may be of interest to observe that at page 337 of 'The Zoologist' for the year 1885, in 'Notes on the Vertebrate Animals of Leicestershire,' the Curator of the Leicester Museum quotes me as reporting the first egg of the Whinchat in 1884 as found on April 30th, and adds as a comment that he considers "Mr. Davenport must have mistaken it for the Stonechat, upon the nesting of which he is silent." Now the green pastures of High Leicestershire do not exactly commend themselves as breeding haunts to the Stonechat, and I was silent concerning the nesting of this species in my native county for the not wholly inadequate reason that I have only once set eyes on an example within its borders, and that was in the depth of winter. As a mere detail, however, my experience of this species in regions congenial to its requirements is to the effect that the eggs are procurable in March, and the young generally out of the nests by April 30th. Nevertheless, ignoring as altogether deficient in public interest the more personal question of my competence to discriminate between the two species—not the first time by any means that the accuracy of an observation by a field naturalist has been impugned by the *savant* of a museum—I think that Harley's ornithological attainments will scarcely be gainsaid, and this author has given April 12th as, in his experience, the earliest date of the arrival of the Whinchat in Leicestershire. Such being the case, and granting the correctness of my assumption as to the promptitude with which the mid-April migrants as a general rule go to nest, April 30th is not at all an impossible date on which to come across a Whinchat's egg. I should be sorry to assert that there is any very wide margin betwixt the dates of the arrivals of Whinchats and Redstarts, and yet I have the most perfect recollection of a nest containing five eggs belonging to the latter species on a certain May 3rd, some twelve or thirteen years ago. The hole in which the nest was built faced due north, and a driving and prolonged snowstorm at dawn on that date resulted in the nest, eggs, and locality being found altogether abandoned by the parent birds some few hours later. During the recent spring I spent a few weeks in North Wales, and found a Yellow Wagtail's nest containing eggs on May 5th. To my thinking, this question of how soon the various migrants busy themselves with nesting cares after reaching these shores is replete with interest. May I add that I conceive it a mistaken policy to denounce as

improbable or impossible any duly authenticated observation that does not exactly accord with our own preconceived notions concerning the laws of Nature?—H. S. DAVENPORT (Skeffington, Leicester).

The Extinct Philip Island Parrot.—Some of your readers will be interested to know that there is a hitherto unrecorded specimen of the Philip Island Parrot (*Nestor productus*) in a collection of birds belonging to the city of Birmingham, and now kept in the Museum at Aston Hall. As there are only about a dozen specimens of this now extinct bird in existence, any museum may be considered fortunate that possesses one, and I am surprised to find that in an enlightened city like Birmingham such a rarity should have remained for many years unknown, unnamed, and uncared for. These Nestor Parrots, of which the Kaka (*N. meridionalis*) and the Kea (*N. notabilis*) still survive in the unsettled districts of New Zealand, show a considerable resemblance in several points to the birds of prey, and are probably survivals of a primeval race of Parrots that existed before the two families had so widely diverged as at present from some common ancestor; for, just as the Celtic languages lingered long in secluded districts like Cornwall and the Isle of Man, so these early forms of Parrot-life continued, in New Zealand and Philip Island, long after more modern species had superseded them elsewhere.—J. B. WILLIAMS (Hollington, Westfield Road, Birmingham).

[A figure of the Philip Island Parrot (*Nestor productus*), from a specimen in the British Museum, is given by Prof. Newton (Encycl. Brit. 9th ed. art. 'Birds,' p. 735), who remarks:—"The last known to have lived, according to information supplied to the writer by Mr. Gould, was seen by that gentleman in a cage in London about the year 1851. Not much more than a dozen specimens are believed to exist in collections."—ED.]

Note on the Red-backed Shrike.—In a note on the Red-backed Shrike which I communicated to 'The Zoologist' a short time ago (1896, p. 70), I hinted at the possibility of the curious specimen figured by Meyer (Plate No. 43, upper figure) being a male over its first moult. This, I find, it could not be. On February 18th last I saw in the Zoological Gardens two young Shrikes still in a dress resembling the nest-dress. It may actually have been the nest-dress but I do not at present know whether a slight and partial moult takes place in this bird almost immediately after leaving the nest. Some birds wear the actual nest-dress for a very short time only; e.g. the Spotted Flycatcher, and the Pied Flycatcher also, to judge by Hancock's plate and description. On March 30th Mr. J. Young kindly wrote me word that Red-backed Shrikes moulted into adult dress at the first moult, which usually took place in February. On April 1st he wrote that he had, the day before, inspected the two Shrikes referred to above, and found that both of them had moulted

into adult male plumage, but that their breasts were quite white. When I was in town, in the latter part of April, I saw one of these birds, which was in beautifully clear bright adult plumage, and its breast had then acquired some colour, but was less pink than that of wild birds. The keeper told me that the other bird was exactly similar. The one I saw, which was in the small wall-cage at one end of the western aviary, sang a quiet, rather low-toned chant, with many sweet notes interspersed. It *might* have caught some of these notes from its near neighbours. The other bird had not then begun to sing. Meyer's bird remains a puzzle to me.—O. V. APLIN.

Strength of Wing in the Swan.—Every one is familiar with the popular notion that the strength of a Swan is so great that it is able to break a man's leg with a blow of its wing. This I cannot believe, nor did I until lately believe that a human arm might be fractured in this way. Under exceptional circumstances, however, it seems that this might happen, and a case of the kind has been actually reported to have occurred. A writer in the excellent American paper 'Forest and Stream' (May 20th last) states that the first surgical case that he had in the State of Arkansas was setting an arm that had been fractured by a blow from a Swan's wing. The accident occurred on Swan Lake, near Shawnee village plantation, in Mississippi county, in the winter of 1870. The patient, a hunter for the Memphis market, was "fire-hunting" at night, and a band of Swans flew at the light. The man was in a little pirogue, and instinctively threw his arms up to protect his head. The left arm was struck by the wing of one of the birds, and the man sustained a compound fracture of the forearm, both bones being broken. I never heard of a similar case, and should be curious to know whether such an accident has ever come to the knowledge of any reader of these lines. I have had personal experience of the strength of wing in a Wild Swan (*Cygnus ferus*), on going to retrieve one which I had shot at from a gunning punt and which fell winged on a gravelly island. I was severely buffeted with the uninjured wing, but no bones were broken except that of the Swan which the shot had shattered. This no doubt handicapped the bird considerably and prevented it from fully exerting itself. The details of this incident are given in my 'Essays on Sport and Natural History' (1883), pp. 440-449.—J. E. HARTING.

Catching Wild Swans.—Dr. Jón Stefánoson, in a communication to 'The Field' of Nov. 2nd, 1895 (p. 745), has described a curious mode of capturing Swans which he alleges has been practised for centuries in the north-east of Iceland. In the shortening days of autumn, when their moult is completed, the Swans leave the interior of that island for the coast in flocks of about a score, and at this time the dwellers on the coast assemble with their dogs and lie in wait for the exodus. As the flocks approach the men set up all manner of unearthly sounds, "shouting at the top of their

voices, turning round their rattles, knocking stones against stones, inciting their dogs to bark themselves hoarse—in short, behaving like madmen.” The young Swans of the flock are so maddled by the noise—“following as it does close upon the deep, unbroken silence of their inland lakes”—that numbers of them fall to the earth as if they were shot, and are despatched. In an editorial note appended to the communication mention is made of the singular fact that this mode of catching Swans appears to have been unknown to other writers on Iceland—as Olafson, Olavius, Faber, Van Troil, Newton, Shepherd, &c. In the issue of Nov. 23rd Mr. Harting mentions other cases of birds being captured when terrified by noises and shouting, but Stefánoson’s account has neither been denied nor received confirmation. Mr. Daniel Francis tells me he has never witnessed a Swan-hunt in Iceland answering to the above description, but his brother has some recollection of hearing of such hunts near Eidisvík. An interesting case mentioned by Mr. Harting (*loc. cit.*) refers to the capture by guachos of the Black-necked Swan. It is from Mr. W. H. Hudson’s ‘Naturalist in La Plata,’ and is as follows:—“When the birds are feeding or resting on the grass, two or three men or boys on horseback go quickly to leeward of the flock, and when opposite to it suddenly wheel and charge it at full speed, uttering loud shouts, by which the birds are thrown into such terror that they are incapable of flying, and are quickly despatched.” Mr. Harting’s concluding remarks are of much interest, and may be here reproduced:—“It would appear that the terrifying effects of the human voice upon birds in flight has been discovered and exercised for their destruction in many distant quarters of the globe. Indeed it seems likely that, in some form or other, this mode of capturing birds is of considerable antiquity, and it would not be difficult perhaps to find allusions to the practice of bird-catching by shouting and throwing sticks amongst the ancient Greeks, the Egyptians, and the Japanese.” Can any reader of ‘The Zoologist’ make allusion to this practice amongst either of the two nations last mentioned?—W. RUSKIN BUTTERFIELD (St. Leonards-on-Sea).

Habits of the Cuckoo in Confinement.—Mr. George Davis, of Gloucester, whose name has once before appeared in ‘The Zoologist’ as the successful breeder of a cross between *Carduelis spinus* and *Linota cannabina*, possesses a Cuckoo eighteen months old, whose appetite in captivity apparently has developed a singular trait. The owner of the bird is devoted to our wild avifauna, and to Cuckoos especially, having brought up no fewer than forty for his own delectation. Formerly, when at work in the city, with his home in the country, he used to carry backwards and forwards his Cuckoos, so that he might lose no chance of studying them, keeping the birds by his bedside, and rivalling a foster-mother by his diligence in feeding them with meal-worms, whilst this had to last never less than for six weeks or two months before they would peck up for them-

selves. When rearing up his last Cuckoo, a hen bird, he had occasion, whilst cleaning out some cages, to put a nest of live naked nestlings just outside the Cuckoo's cage. The bird at once appeared in a great state of agitation, trying to peck at the nestlings between the wires. Her owner, unable to see the meaning of this, tested the Cuckoo by giving her a nestling, with the result that she munched its head, its neck, and so on, until she reached the claws, when she again took it by its head and swallowed the whole nestling, head foremost, with the legs last vanishing. The same performance is regularly carried out with any small nestling, dead or alive. This Cuckoo, like others of past days, is fond of raw meat, and this though Cuckoos as a family are insectivorous. It is an observed fact that the Cuckoo often haunts the neighbourhood of a nest containing one of its own young, whilst often the nestlings of the builders of the nest once there are no longer even to be found dead; and, again, in nests containing a Cuckoo's egg, the other eggs have been found sucked and destroyed, leaving the Cuckoo's intact, and the old Cuckoo has been seen flying away. Can it be possible that the Cuckoo sometimes destroys nestlings that hustle its own young, by eating the former, or is the trait above recorded merely a strange development analogous to the devouring by hens of their own chickens in captivity, or to the drinking of port by a tame Rook until it is no longer capable of judging on the rookery bench?—W. L. MELLERSH (The Gryphons, Cheltenham).

Hedgesparrow breeding on the Bass Rock.—In the last number (p. 304) Mr. Meiklejohn reports his having found a nest of the Hedgesparrow with four eggs on the Bass Rock on May 16th, and surmises that such a case was previously unrecorded. I may refer him to my paper on "The Isle of May, its Faunal Position and Bird Life," being the President's Address to the Royal Phyl. Society of Edinb., session cxvi. p. 323, under "Hedgesparrow," which species bred there in 1884. From your correspondent's description of the locality of the nest, I would not be surprised to learn it was the same pair of birds he found in 1896—a low face of rock close to and above the old buildings and enclosure.—J. A. HARVIE BROWN (Dunipace, Larbert, N. B.).

Iceland Gull in Co. Sligo.—In my note on this subject (p. 305) there is a mistake in the date of my finding the Iceland Gull. I picked it up on June 5th—not April 5th. The fact of its being found in June was the reason I sent you the note, for though it is rare in adult plumage in this country, I don't think I should have troubled you with the record of it if I had obtained it in the winter. But as Mr. Cordeaux observed one in the Humber district "as late as April 18th," I thought it well to report that I had got one in June. It could not have been shot many days, for the weather then was very hot here.—CHARLES LANGHAM (Tempo Manor, Co. Fermanagh).

Osprey in Sussex.—I had brought to me on Sept. 5th a fine Osprey (*Pandion haliaëtus*), an immature male, weight two pounds nine ounces, length twenty-two inches. It was shot close to the military canal which runs from Winchelsea through Pett Level to Cliff Road, about nine miles from Hastings, Sussex. I note the last records from 'The Zoologist' in October and November, 1889. It is in the hands of Mr. Bristow, of St. Leonards, for preservation.—G. W. BRADSHAW (Hastings).

REPTILIA.

Deaths from Snakes and Wild Animals in 1895.—The Government of Madras has just issued the annual report on this subject for 1895. Altogether 1923 persons were killed by wild animals and snakes, of whom 277 were killed by wild animals, and 1646 are attributed to snakes. These returns of deaths from snake bite must be received with caution, for in many cases they are due to poison. Elephants killed, 4; Tigers, 177; Panthers or Leopards, 64; Bears, 12; Wolves, 10; Hyænas, 2; and other animals, 8. The total number of deaths is rather greater than in 1894. Practically the number of deaths from snake bite was the same as in 1894, which would seem to indicate that the removal of prickly pear and noxious vegetation from village sites (which, however, was carried out in 3346 villages only out of the 41,000 in the Presidency) has had no effect in reducing the death rate. The largest number of deaths from snake bite occurred in the districts of Chingleput, North Arcot, South Arcot, Tanjore, Trichinopoly, and Salem, 58 per cent. of the total being recorded as having happened in those districts. The largest number of people killed by wild animals, excluding snakes, was in Ganjam and Vizagapatam, of which 85 are reported from the former, and 73 from the latter, against 47 and 110 reported in 1894. The increase in Ganjam was due to a man-eating Tiger, which is believed to be still at large, although Rs. 500 was offered for his destruction. The decrease in Vizagapatam is stated to be due to the fact that a man-eating Tiger there was killed by Mr. H. D. Taylor, C.S. The greatest mortality amongst cattle caused by Tigers and Panthers was in Malabar and Canara, and also in North Arcot and Coimbatore, more than half occurring in those districts. Wolves are on the increase in Cuddapah and Kurnaol. The amount paid in rewards fell from Rs. 23,217 in 1894 to Rs. 20,822 in the year under review.

FISHES.

Largest Trout caught in English Waters.—The late Greville Fennell, in 'The Field' of May 23rd, 1868, page 400, says:—"I have looked through my note-books and printed collections for the weights of Trout, and I find that Stephen Oliver, the younger, mentions one taken near Great Driffild, in September, 1832, which measured 32 in. in length, 21 in. in girth, and weighed 17 lbs. A notice was sent to the Linnean

Society of a Trout that was caught on Jan. 11th, 1822, in a little stream ten feet wide branching from the Avon, at the back of Castle Street, Salisbury. On being taken out of the water its weight was found to be 25 lbs. Mrs. Powell, at the bottom of whose garden the fish was first discovered, placed it in a pond, where it was fed and lived four months, but had decreased in weight at the time of its death to $21\frac{1}{2}$ lbs. In the neighbourhood of Downton, on Wiltshire Avon, a Trout was caught with the fly by a Mr. Bailey which weighed 14 lbs.; and in a small tributary of the Trent, at Drayton Manor, a fish was taken exceeding in weight 21 lbs. (*vide* 'Zoologist,' 1848)." In the 'Angler's Journal' of Dec. 20th, 1884, the editor remarks;—"The largest English Trout on record is believed to be that from Drayton Park, which weighed $22\frac{1}{2}$ lbs., the skeleton of which was presented to the College of Surgeons"—this fish probably being the same as that last referred to.

Importation of Salmon into London.—The following statistics, furnished by Messrs. William Forbes Stuart & Co., the well-known Salmon factors, show the enormous amount of Salmon received in the metropolis during a single week of last month, and, for the purpose of comparison, the figures are given for the corresponding week of last year:—

1895.		BOXES.	1896.		BOXES.
Monday,	July 22	648	Monday,	July 20	404
Tuesday,	" 23	309	Tuesday,	" 21	284
Wednesday,	" 24	437	Wednesday,	" 22	412
Thursday,	" 25	567	Thursday,	" 23	352
Friday,	" 26	604	Friday,	" 24	397
Saturday,	" 27	342	Saturday,	" 25	410
		<hr/>			<hr/>
		2907			2259
Scotch		2034	Scotch		1568
Irish		617	Irish		553
English		165	English		71
Berwick		90	Berwick		67
Norway		—	Norway		—
Sweden		—	Sweden		—
Dutch		1	Dutch		—
		<hr/>			<hr/>
		2907			2259

From this table it will be seen that during the week ending July 27th there was an increase of 648 in the number of boxes received.

INSECTS.

Curious Variety of the "Red Admiral."—A rather curious specimen of the "Red Admiral" butterfly (*Vanessa atalanta*) was shown to me by a friend, who had the specimen in his collection. If I remember rightly, it was caught not long ago in the New Forest. The red markings on the wings, instead of being of the normal colour, were pale buff. Never having seen such a variety before, I thought it might be worth recording.—C. B. HORSBRUGH (4, Richmond Hill, Bath).

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THE DUKE OF BEDFORD'S MENAGERIE AT
WOBURN ABBEY.

BY RICHARD LYDEKKEK, F.R.S., F.Z.S.

ZOOLOGICAL Gardens are excellent institutions, but, like nearly all excellent institutions, they have their imperfections. One of the disabilities under which they labour is the impossibility of giving sufficient space to the large herbivorous mammals, such as Deer and Antelopes; so that it is impossible to see these animals in anything approaching their natural haunts, and thus to learn something of their ways and mode of life. Even if the required space were available, it would of course be impracticable in an ordinary menagerie to turn out the animals in any sort of park where the public would be able to see them. What is thus difficult to accomplish in a public menagerie, however, is possible in a private park, if only the owner possesses sufficient means, and sufficient interest in zoological science to make the experiment.

Most readers are doubtless acquainted by name with Woburn Abbey, the ancestral seat of the Dukes of Bedford; but it is probably less well known that this extensive and beautifully-timbered domain contains at the present time a collection of wild animals which in this country can be rivalled only by the well-known gardens in the Regent's Park. Instead, however, of being cooped up within the narrow limits of small paddocks, such of the animals as exhibit an amenable disposition, and show

no tendency to quarrel with their imported fellows, or with the herds of Red and Fallow Deer for which Woburn has long been famed, are allowed to roam at their own sweet will over the entire Deer-park, although others are restricted to a smaller area.

Fortunately the park itself is most admirably adapted for the acclimatization of animals of all kinds. Not only is it, as already said, beautifully timbered, but it comprises an alternation of hill and dale with wide-spreading flats of open grass-land, and masses of bracken and other covert. Lakes, too, of different sizes and shapes are dotted here and there over the landscape; while, as some of the ridges are formed of dry sand and sandstone, and the flats consist of clayey beds, animals must be hard to please indeed if they cannot find localities suited to their particular disposition.

With such natural surroundings, and with the freedom accorded them, it is but natural that the Deer and Antelopes—which form the most attractive feature of the Woburn collection, so far as mammals are concerned—are in much better bodily condition than their relatives in the Regent's Park. Here, too, the naturalist can see them in many cases under conditions more or less resembling those of their native lands, although, of course, the vegetable surroundings are in some instances different. Perhaps the most marked and interesting instance is afforded by the Elk, of which there are several. On most days these huge ungainly ruminants may be seen standing belly-deep in one of the lakes, lazily cropping the water-plants that come within reach of their extensile lips. The naturalist is thus enabled at a glance to see at least one use of the excessively long limbs of the Elk, which enable it to wade into depths where most animals would be drowned outright. Of course he has read over and over again that such is the natural habit of the creature, but till he has actually seen it, the picture can never become fully impressed on his mind.

Another sight worth walking miles to behold was a party of three or four Sable Antelopes feeding among a mass of bracken in a secluded glen, and looking as much at home as if on their native veldt. Then, for the first time, one realised the full beauty of this fine Antelope, and appreciated Gordon Cumming's raptures when he first obtained a glimpse of a herd. Not less interesting are three magnificent specimens of Burchell's Zebra,

which are allowed to roam at large about the park, and appeared to be on most excellent terms with the various herds of Deer. Travellers in Africa tell us that the striped hide of these animals—so conspicuous at close quarters—at a distance fades completely away on background of the dry veldt. Hitherto one had to take this statement on trust; and it was a great pleasure to see it actually verified at Woburn, where the parched grass of a dry August not unfairly resembled an African plain. A fourth Zebra is also included in the collection, but as this animal runs up to all horses in sight, it is kept with some horses in an enclosure.

In another enclosure near by is a single example of the Kiang or Wild Ass of Tibet, a species which has, I believe, only once been exhibited in the Regent's Park Gardens, and that so far back as 1859. The Kiang at Woburn, I am told, is possessed of a very uncertain temper; and it is for this reason that it is not turned out in the park. This does not seem to be quite in accord with what occurs in the wild state, for in Ladak herds of Kiang will gallop in circles close round the traveller's pony, and thus often spoil the chance of obtaining a shot at more worthy game.

Another animal of great interest is the small Wild Ox of Celebes, known as the Anoa, of which there are two beautiful examples, so tame as to allow themselves to be approached and stroked. Very rarely is this Ox seen in menageries, only two examples having been exhibited in our Zoological Gardens up to the year 1883—the date when the last complete list of the animals there was published. It is somewhat remarkable to find species hailing from such widely different regions as the elevated dry plateau of Tibet—the habitat of the Kiang—and the moist tropical island of Celebes, but nevertheless both seemed equally flourishing in the Bedfordshire park. Indeed, I was informed that almost the only large ruminants that do not flourish well there are most kinds of Sheep, to which rocky upland ground seems essential to good health. Most of the Goats seem, on the other hand, to do well, and there are some Tahr (*Hemitragus jemlaicus*) in excellent condition, while an Aoudad (*Ovis tragelaphus*) seemed equally flourishing.

The Bhural—which breed in the Regent's Park—were, however, decidedly in poor condition; much the same might be said

of the Corsican Mouflon. Ibex are represented only by a half-breed, which has apparently become well accustomed to a lowland life. To return to the Anoa, the general appearance and ways of these pretty little animals gave a better idea than I had ever conceived before of their near affinity to the Buffaloes.

To give a complete list of the mammals now flourishing in this naturalist's paradise would be tedious to the reader, and remaining remarks must accordingly be restricted to some of those which especially attracted notice. Of the *Cervidæ*, in addition to fine herds of Red and Fallow Deer—among which were noticeable a white breed—the collection comprises some fine examples of the American Wapiti, one of which, at the time of our visit, had just grown a magnificent pair of antlers, and was "roaring" in grand style. More interesting still is a fine, although immature, bright bay Stag from Manchuria, which appears to indicate an undescribed species. Manchurian Deer (*Cervus manchuricus*), and their smaller ally, the pretty little Japanese Deer (*C. sika*), are abundantly represented, and go about with the Red Deer, with which they interbreed. And here it may be mentioned that, in the case of some of the rarer kinds, the noble owner preserves the shed antlers annually, by which means a series of specimens of extreme value to the naturalist will ere long be obtained. The condition of both the Manchurian and Japanese Deer is unrivalled, and shows the extreme beauty of their coloration to perfection. Equally beautiful is the herd of Indian Spotted Deer (*Cervus axis*), whose dappled hide glistened with a golden shimmer as bright as though they were cropping the herbage in a Bengal jungle. Of the Rusine Deer, the Indian Sambur (*C. unicolor*) is represented by some magnificent examples, while there are also many specimens of the allied species, or race, commonly known as the Equine Deer (*C. equinus*). More rare, and therefore more interesting than either of these, is a small herd of Père David's Deer (*C. davidianus*), of Northern China, among which one buck was conspicuous for the great development of the characteristic back-tine of his antlers. Next to the undescribed species, perhaps the most interesting of the Woburn Deer is, however, a specimen of the little-known Chinese Water Deer (*Hydropotes inermis*), which dwells in the same paddock as Père David's Deer.

Unfortunately, however, this little Deer is of a very shy and retiring disposition, and, as it will skulk behind a tussock of grass till almost trodden upon, it is extremely difficult to get a satisfactory view. A short time ago the collection also boasted of a specimen of Michie's Deer (*Elaphodus michianus*), likewise from the North of China; but that animal has unfortunately gone the way of all flesh, and its skin (mounted by Rowland Ward) now adorns the museum at the Abbey. In the same paddock with Père David's Deer are likewise several Himalayan Musk-Deer (*Moschus moschiferus*). To see these little Deer bounding away, with arched backs, like so many overgrown Hares, reminded us of old Kashmir days, when Musk-Deer soup used to be a dish in the camp *menu*. Here again it is curious to notice these Himalayan animals flourishing side by side with the Spotted Axis from the burning plains of Bengal. The Elk have been already alluded to; but it may be mentioned that, although Mule-Deer (*Cariacus macrotis*) and Pampas Deer (*C. campestris*) have been tried, neither can be said to flourish.

To pass on to the Antelopes: the small herd of Sable Antelope has already received brief mention. In one of the large paddocks may be found a small herd of Eland, mostly consisting of immature animals, although one bull is adult. None of these Eland are in the fat condition often attained by old bulls, as exemplified by the magnificent stuffed specimen, shot by Mr. Selous, in the Natural History Museum. Apparently, however, these animals thrive best when not too fat. Probably they will breed at Woburn, and, if so, a large herd may be looked for. It is, however, unlikely that Eland-beef will ever form a commodity in the English market, although visions of forming such a trade were once entertained. Very striking objects in the same paddock are three fine specimens of the North African Leucoryx (*Oryx leucoryx*), whose white and chestnut coloration forms a striking contrast to the hues of the other denizens of the same enclosure. On grass this coloration is conspicuous, but on the white sands of the African deserts it is in all probability invisible at a short distance. From the same region comes a specimen of the Bubal or Bubaline Hartebeest (*Bubalis mauritanica*), and although this creature, with its long face, has, like its kindred, a somewhat mournful and dejected appearance, it appears to be in excellent condition. Another African type is

represented by a small Rietbok (*Cervicapra*), which appears to be either the South African Lesser Rietbok (*C. lalandei*), or the East African Bohor (*C. bohor*). Without exact information as to locality, it is, however, somewhat difficult to determine these species apart from comparison in a museum. Although of small size, this Rietbok is apt to be somewhat too free with his antlers, and visitors should consequently keep at a respectful distance.

By far the prettiest sight in the same enclosure is to watch the members of a herd of Blackbuck (*Antilope cervicapra*) rush by in a long string, one after the other, taking at intervals enormous leaps into the air. This they always do when approached, and indeed appear the very incarnation of sportive delight. At times the old buck will approach strangers, with his horns thrown back, his nose in the air, and his facial glands dilated, walking in the peculiar mincing manner which is so characteristic of its kind. Gazelles do not form a strong point in the collection, although there is a pretty little pair of the Dorcas (*Gazella dorcas*). The buck of these is remarkable for the peculiarly forward curvature of the tips of his horns, a feature which, although by no means uncommon in the species, is but seldom so strongly developed. The list of Antelopes closes with a small herd of Indian Nilgai (*Boselaphus tragocamelus*), which are allowed to wander freely about the park. It is somewhat curious that nearly all of the species which are allowed to roam freely have particular favourite haunts, near which they are almost sure to be found. In winter they are allowed access to open sheds, where abundance of food is supplied, and where they can find shelter if so disposed.

The smaller mammals do not find especial favour at Woburn, where attention is paid particularly to the ruminants; but one paddock is tenanted by a number of Wallabies, which appear just as much at home as in their native Australian bush; while here and there in the same enclosure a Mara, or Patagonian Cavy (*Dolichotis patagonica*), may be observed slyly making its way with its peculiar "looping" gait.

To do justice to the collection of Game and Water Birds at Woburn would require the pen of a professed ornithologist. Among the latter an especial feature is the unique collection of Swans, which comprises representatives of all the known species save two, one of these missing species being of extreme rarity.

It is a beautiful sight to see the assemblage of these birds on the Swan-lake, the species ranging in size from the lordly Trumpeter (*Cygnus buccinator*) of North America to the diminutive Coscoroba Swan (*C. coscoroba*) of Patagonia; both these comparatively rare species being represented by a large number of specimens. Black Swans (*C. atratus*) are of course well to the fore, as is also the still handsomer Black-necked South American species (*C. nigricollis*). The various species of Ducks are far too numerous to mention, but a Snake-bird or Darter (*Plotus*) cannot be passed over without notice. To see this strange bird perched on a tree-stump, and craning and twisting in a manner which only a Darter can, is a spectacle seldom to be witnessed, save by travellers in far distant lands. Of the Game Birds the name is legion, ranging from the lovely Peacock to the diminutive Californian Quail. Wandering through the well-kept coverts, one may be startled by the flashing metallic tints of a cock Monal (*Lophophorus impeyanus*) as it dashes by in head-long flight; while the next moment a Tragopan (*Cerionis*) struts by in all the glory of its scarlet plumage and blue neck-frill. Pheasants of all kinds, from the gorgeous Soemmering's (*Phasianus soemmerringi*) and Reeves's Pheasant (*P. reevesi*) to the ordinary English species, are to be met with at every turn; while not only are there true-bred species, but likewise a host of hybrids, some of which are even more beautiful than their parents. Considering that the coverts are regularly shot, one wonders how all these lovely birds escape destruction; till one is told that those in which the exotic forms are chiefly kept are shot over only by the Duke and Duchess, who fire only at *Phasianus colchicus*. In the more open grounds are to be seen scores of Chukor (*Caccabis*), whose noisy chatter recalls days of Himalayan shikar.

In short, what with mammals and birds combined, a perfect paradise is opened to the observant naturalist at Woburn; and days and weeks might well be spent before half the information this splendid collection is capable of affording would be exhausted. That the ordinary public are not debarred from participating to a certain extent in the delights afforded to its owner by the collection is clear from the fact that on the August Bank Holiday the entire park and grounds are thrown open to all who care to come. Since, moreover, the park is

crossed by a public road, the pedestrian or cyclist has any day of the year an opportunity of seeing such of the animals as happen to be grazing or wandering within sight of that track.

THROUGH THE FOREST IN FINLAND.

BY HERBERT C. PLAYNE (Clifton College) AND A. F. R. WOLLASTON
(King's College, Cambridge).

THE days from August 6th to August 24th of this summer we spent in a part of Finland which stretches from the north of the Gulf of Bothnia to a short distance within the Arctic Circle. Our attention was chiefly directed to birds, and some account of what we saw may be of interest. August is by no means a favourable month, and it is especially difficult to get good views of birds when they are silent and disposed to hide themselves, in a country which is so thickly covered with forest; consequently the number of species met with is no doubt far short of what it might have been at another time of year. However, we were in some respects lucky, and saw and heard enough to make us anxious to make use of the first opportunity of revisiting the same country in the earlier part of the summer.

Briefly, our journey was as follows:—By road from Torneå, along the banks of the river Kemi to Rovaniemi, where we stayed a week. From Rovaniemi we walked a few miles further north up the river Ounas, and then struck across the forest to Alkula on the river Torneå, and so southwards again.

In our walk through the forest we went much of the way without paths, and with a compass only as our guide, and naturally in such thick forest as covers that part of the country we often heard birds we could not see, and saw strange birds which hid themselves before we could identify them with certainty. The following is a list of the species we were able to identify:—

REDWING, *Turdus iliacus*; FIELDFARE, *T. pilaris*. Several seen.

SONG THRUSH, *T. musicus*. We only saw one.

WHEATEAR, *Saxicola oenanthe*. Very abundant wherever the country is fairly clear of trees.

WHINCHAT, *Pratincola rubetra*. Fairly abundant in clearings by the side of the river.

REDSTART, *Ruticilla phœnicurus*. Numerous.

BLUETHROAT, *Cyanacula suecica*. One young bird near Rovaniemi.

LESSER WHITETHROAT, *Sylvia curruca*. A few near Rovaniemi.

WILLOW WREN, *Phylloscopus trochilus*. Abundant; occasionally to be heard singing.

GREAT TIT, *Parus major*. Only one seen.

MARSH TIT, *P. palustris*. Very abundant.

LAPP TIT, *P. cinctus*. Fairly abundant.

WAGTAILS, *Motacilla alba*. Very numerous. There were large parties of Yellow Wagtails consisting probably of *M. viridis* and *M. flava*. Several undoubtedly had no eye-stripe, and must have been *M. viridis*. Others had well-marked eye-stripes, and were not at all yellow on the crown.

TREE PIPIT, *Anthus trivialis*. Several seen.

MEADOW PIPIT, *A. pratensis*. Seen occasionally. A Pipit which was numerous in some of the swamps in the forest may have been *A. cervinus*, but we could not get a good view of it.

GREAT GREY SHRIKE, *Lanius excubitor*. Two were seen by the road near Rovaniemi.

WAXWING, *Ampelis garrulus*. We came upon a large party of these birds in the forest on the morning of the day on which we reached Alkula. They were very tame, and took up conspicuous perches on the pine trees all round us, uttering a curious little chattering sound. One was seen to dart off the top of a pine tree in chase of a dragonfly, as if in play.

SPOTTED FLYCATCHER, *Muscicapa grisola*. Abundant.

SWALLOW, *Hirundo rustica*. Numerous.

HOUSE MARTIN, *Chelidon urbica*. Numerous. A party of these birds, with a few Swallows, were seen flying southwards out of sight of land over the Gulf of Bothnia on August 31st.

SAND MARTIN, *Cotile riparia*. Numerous.

SISKIN, *Chrysomitris spinus*. Fairly abundant.

HOUSE SPARROW, *Passer domesticus*. Numerous.

CHAFFINCH, *Fringilla cœlebs*. Common.

LESSER REDPOLL, *Linota rufescens*. A few seen. Some other birds in the forest, which were probably *L. linaria*, were not identified with certainty.

YELLOW BUNTING, *Emberiza citrinella*. Very common.

REED BUNTING, *E. schoeniclus*. Common near the river.

SKY LARK, *Alauda arvensis*. Only seen once.

SIBERIAN JAY, *Perisoreus infaustus*. We met with this bird in parties of two or three on two or three occasions during our walk through the forest. They picked up worms from the ground close to us.

MAGPIE, *Pica rustica*. Very common.

HOODED CROW, *Corvus cornix*. Very common.

RAVEN, *C. corax*. Seen on one day only.

SWIFT, *Cypselus apus*. A party of three flew over Rovaniemi on August 13th.

GREAT BLACK WOODPECKER, *Picus martius*. Quite abundant; we saw several and heard others. It is a very noisy bird, and makes some most curious sounds. The forests of this part of the country must be a paradise for Woodpeckers, as the dead trees harbour numerous insects; but we only saw two species.

GREAT SPOTTED WOODPECKER, *Picus major*. Abundant.

OWLS. We saw Owls flying on three occasions, but could not determine their species. Many are to be seen nailed to doors of houses, often too much spoiled for identification. We saw *Syrnium aluco*, *S. lapponicum*, and *Nyctala tengmalmi* treated in this way.

ROUGH-LÉGGED BUZZARD, *Archibuteo lagopus*. Very abundant.

GOLDEN EAGLE, *Aquila chrysaëtus*. One came close to us near Rovaniemi pursued by two Rough-legged Buzzards.

SPARROWHAWK, *Accipiter nisus*. Fairly numerous.

MERLIN, *Falco æsalon*. One seen.

KESTREL, *F. tinnunculus*. Common.

OSPREY, *Pandion haliaëtus*. Quite abundant; we sat one day on a rock among some rapids while a pair of Ospreys were catching Grayling quite near to us. They carried the fish they caught far away over the forest, probably to feed young.

GREY-LAG GOOSE, *Anser cinereus*. On a small lake in the forest were thirteen Geese which seemed to be of this species, as far as we could see.

WILD DUCK, *Anas boscas*; TEAL, *A. crecca*. Common.

PINTAIL, *A. acuta*. Several at Rovaniemi.

GOLDENEYE, *Fuligula clangula*. Very numerous.

RED-BREASTED MERGANSER, *Mergus serrator*. Abundant.

The river at Rovaniemi was quite crowded with duck, and we only had to sit by the side of the rapids to see Ducks and Divers floating down stream within quite a short distance of us. When they reached the end of the rapid water they seemed to fly up stream and float down again.

WILLOW PTARMIGAN, *Lagopus albus*. Abundant.

CAPERCAILLIE, *Tetrao urogallus*. Several were seen in the forest.

COMMON SNIPE, *Gallinago cœlestis*. Put up occasionally in some of the swamps.

DUNLIN, *Tringa alpina*. One flock was seen on the river Torneå.

TEMMINCK'S STINT, *Tringa temmincki*. On an island near Rovaniemi we found three young birds of this species having a little down still showing on the back of the head and forehead. One of them let us stand well within six yards of it for some time, so we had no difficulty in identifying it.

COMMON SANDPIPER, *Totanus hypoleucus*. Numerous along the banks of the rivers.

REDSHANK, *T. calidris*. Seen occasionally.

GREENSHANK, *T. canescens*. One seen.

CURLEW, *Numenius arquata*. Abundant.

ARCTIC TERN, *Sterna macrura*. Several at Torneå.

COMMON GULL, *Larus canus*. A few seen at Torneå.

LESSER BLACK-BACKED GULL, *L. fuscus*. Numerous.

BLACK-THROATED DIVER, *Colymbus arcticus*. Several were to be seen on the river near Rovaniemi. It was interesting to compare their method of diving with that of the diving Ducks; the Diver seems to sink into the water, making scarcely a ripple.

When out of sight of land in the Gulf of Bothnia, on August 31st, several Wagtails, both White and Yellow, came on board the steamer and rested for a short time. The weather was fine, and there was scarcely any wind.

In the North Sea, on Sept. 4th and 5th, many birds came on board of the following species:—Sept. 4th, White Wagtail, Willow Wren; Sept. 5th, Wheatear, Kestrel, Whinchat, Oystercatcher, Redstart, Pied Flycatcher. Sept. 4th was a very bright day, with no wind, but on the 5th there was a good deal of rain and a little more wind. When the birds left the ship to continue their journey they often flew quite close to the water until out of sight.

CURIOUS EXPERIENCES IN BIRDS' NESTING.

BY DR. R. WILLIAMS
(Of Kingsland, Herefordshire.)

As I have resided for many years in a part of Herefordshire favourably situated for observing the nesting habits of our commoner birds, several curious instances have come under my personal observation which I think are worth recording.

In May, 1889, whilst strolling through a small wood with a keeper I discovered a Blackbird's nest situated in a depression in the ground, in just such a position as a Sky Lark's might occupy. The keeper remarked that he had found several other Blackbirds' nests in this wood in similar positions. Within a few hundred yards of the first nest we found two Thrushes' nests, also on the ground, the edge of the nests being level with the surface. The wood abounded in thickets and small fir trees; but these more favourable sites contained very few Blackbirds' or Thrushes' nests. On enquiry, I learnt that the proprietor, having found that this wood was a nesting stronghold of these species, had made systematic raids on their nests in consequence of the havoc made by the birds on his fruit. I think this fact suggests why these birds had departed from their usual habit in their choice of nesting sites. Profiting from experience, they had selected safer positions.

As regards the Common Sandpiper, I think the following facts will show that this species also profits by experience, and occasionally varies its choice of nesting sites. In May, 1886, just when these birds were commencing to sit, we had a very heavy rainfall, heavier than any remembered by my father, who is over eighty years of age. The land on each side of the river running near my house was under water. The Common Sandpiper usually nests on patches of gravel thrown up by the water, and more or less covered with docks and other weeds. These places being flooded, the nests were swept away and destroyed. On the subsidence of the flood, the Sandpipers built again on their old sites, only to find their nests swept away by another flood. In the nesting season of the following year (1887), wishing to secure a few clutches of Sandpipers' eggs, I searched in the usual places for a whole morning without success. But as I observed only single birds and no pairs, I concluded the hens were sitting

somewhere in the neighbourhood. The next day I accidentally came upon a Sandpiper's nest containing four eggs, the nest being placed at the foot of a willow fully 100 yards from the river. This discovery put me on the right track, and I found six more nests in various positions, all a long way from the river. Two were under bushes, two in grass fields, and in each instance on the highest part of the respective meadows. One was situated by a rack close to the keeper's house, some forty yards from the river. It was at least thirty feet above it, on the side of a very steep ascent. Another nest occupied a most curious position: the Sandpiper had built on the head of a pollard willow, and the nest was only discovered by an angler striking the tree and flushing the bird. From May, 1886, the date of these floods, until 1889 the Sandpipers continued to nest at some distance from the river. In my opinion this proves conclusively that the birds remembered former calamities, and made use of their dearly-bought experience by choosing positions inaccessible to the highest flood. In 1889, however, I found the birds had resumed their usual nesting sites close to the river.

I once saw a Wood Pigeon's nest placed in the branch of a tree resting on the ground, the nest being only raised a few inches from the ground, with the grass rising above it.

Moorhens often select odd nesting-places. Some years ago I found a nest in a hawthorn-bush near a pool, the nest being placed some ten feet from the ground. In August, 1889, I saw another nest placed in the middle of a large pool. The water was exceptionally low, being only some nine inches in depth. The bird had laid a foundation of sticks at the bottom, and built up the nest so that it stood at least a foot above the water's level. It was a very substantial structure and quite different from the usual nests built by these birds.

Towards the end of April, 1888, I had a curious experience with regard to a Carrion Crow's nest. Whilst strolling along the river Arrow I noticed a nest of this bird placed high up in a large poplar. The nest evidently contained well-fledged young birds, judging by the noise they made. These the parents were busily employed in feeding. Whilst passing the nest shortly afterwards I noticed that a Kestrel and the two parent Crows, evidently quarrelling, flew out of it. A fortnight later when repassing the nest I saw a Kestrel fly from the tree, and then I noticed that

there was a large nest in the same tree placed some twenty feet below that of the Crows. This I concluded was the Kestrel's nest. I was surprised to see nothing of the parent Crows, as it was too early for the young birds to have flown. The next day, however, the mystery was solved. I sent my groom up the tree to get the Kestrel's eggs; but on his climbing the tree we were surprised to see a Kestrel leave the higher nest. This was found to contain five very handsome Kestrel's eggs. My man had used the lining of the nest to pack the eggs in, and this I found to consist of the pen-feathers of the unfortunate young Crows. The Kestrel had not only annexed the Crows' nest, but had evidently eaten the young birds. Some three weeks later the female Kestrel was shot by the owner of the land. I sent my man to examine the nest again, and he found a second clutch of four eggs exactly resembling the first clutch. I have both clutches in my collection.

In 1892 a fact came under my observation tending to prove that Cuckoos hunt for nests wherein to deposit their eggs before they are ready to be laid. My son informed me one day that he knew where a Cuckoo was going to lay. He said he had seen a Cuckoo fly out of a hedge, which on examination he found to contain a Hedgesparrow's nest ready for eggs. The boy's expectation was realised. He visited the nest repeatedly, and one day announced that the Hedgesparrow had begun to lay. Three days later he brought me the contents of the nest, consisting of one Cuckoo's egg and the clutch of Hedgesparrow's eggs.

I have at various times met with eggs of different species in the same nest. I was once shown a Nuthatch's nest in a hole in an apple tree close to a cottage door. On opening the hole I found three Nuthatch's eggs, and four Coal Tit's eggs lying in the nest of the latter bird. Beneath this was lying the Nuthatch's nest consisting of the usual collection of leaves, bark, &c. The owner of the place said that a pair of Nuthatches had for years nested in this hole, but this year it was taken possession of by a pair of Coal Tits. Then the Nuthatches arrived and drove the Tits away, and had evidently commenced to lay, when, for some reason, the owner shot the female Nuthatch. The Tits then returned and reoccupied the nest they had already built.

In 1894 I found a Blue Tit's nest in a hole in an apple tree, the female bird lying dead beneath it. My son cut out the nest,

and found it contained ten Blue Tit's eggs and one Nuthatch's egg. Some little time afterwards I received six more Nuthatch's eggs from the same hole. The birds had finished laying in spite of the enlarged hole, which they had plastered up with mud.

In 1893 I found that a Stock Dove had taken possession of and laid one egg in a hole in a tree which had frequently been used as a nesting place by a Barn Owl. About a week later a Barn Owl flew out of the hole, and ten days later my son found that the Owl was sitting on four of her own eggs and that of the Stock Dove, having driven the latter away.

I have met with other curious combinations of eggs in the same nest, such as Jackdaws' with Starlings', Starlings' with Stock Doves', Robins' with Starlings' (the nest being in a hole in a tree), Great Tits' with Redstarts', Great Tits' with Tree Sparrows', Whitethroats' with Lesser Whitethroats', and Moorhens' with Coots'.

I once found a Coal Tit's snug nest built in an old Thrushes' nest.

A little girl once brought me a Whitethroat's nest containing a tiny egg about as big as a "caraway comfit." She said she had watched the nest for some time, and finding that no more eggs were laid, and that the bird continued to sit, she brought the nest away. Could this be the abortive attempt of a hen without a mate?

In 1890 I found a Kingfisher's nest under unusual conditions. The bank selected had been worn away by the river until it had come close to the footpath, and underneath this the nest had been placed. The eggs, which were hatching out, lay in the bare soil of the hole. This is the only example of the kind I have met with, as in my experience the Kingfisher always makes a lining of bones before commencing to lay.

The Wood Warbler usually makes a domed nest; but I once found a nest of this species the top of which was formed by the root of a tree.

In 1886 a keeper pointed out to me what he thought was a Jay's nest. His son climbed the tree to examine the nest, from which a large bird flew out. To our astonishment, he brought down five warm Pheasant's eggs, and it was undoubtedly the old Pheasant which had flown out. Later the keeper showed me some birds which were the offspring of a cock Pheasant and a

domestic hen. He then showed me a still more curious thing : taking me to a box, he lifted the lid, and here I saw a cat suckling some tiny blind Ferrets.

In 1890, whilst walking near the river Lugg, I heard a Carrion Crow making a great outcry in an adjoining field. On approaching the spot I found that the bird was making frantic darts at some object near her nest, which was placed in an elm at least sixty feet from the ground, and which, as I knew, contained young. Presently I saw something, which I eventually identified as a large Stoat, run down the trunk, pursued by the old bird. The Crow came out victorious in the encounter ; but I was astonished to find that a Stoat could climb to such a great height.

In the spring of this year (1896) my son went to a large rookery, containing at least five hundred nests, to get a few clutches of eggs. Curiously enough, the first nest he examined contained four eggs of the Tawny Owl.

Some years ago I found a Jay's nest in a very curious situation : in a small standard oak there was an old Squirrel's dray, and a foot above this was the nest of a Ring Dove. The Jay's nest was placed between the two, being built upon the Squirrel's dray, so that the Ring Dove's nest formed its roof.

NOTES AND QUERIES.

MAMMALIA.

Pine Marten in Lancashire.—On June 15th I was out bird-nesting in the larch woods on the hillside above Tilberthwaite Ghylls, Coniston, North Lancashire, when I came across a Pine Marten (*Martes sylvestris*). I gave chase to it, when it took to the trees, and leapt from branch to branch as nimbly as a Squirrel. The hill being steep I was unable to keep pace with it, and so lost sight of it altogether. On Sept. 10th I saw another on Lingmoor, above Elterwater, Westmoreland, and was shown on the same date the skin of a young one that had been trapped in August last by a shepherd in Langdale.—JOHN R. DENWOOD (Cockermouth).

Squirrel with Dark Tail in Autumn.—I have read with interest Mr. Ruskin Butterfield's communication on a Squirrel with dark tail in August. I was taking shelter from a shower on the 21st of this month (on this date I was also attracted by the congregation of Peewits) when quite close to me I saw a Squirrel run across the pathway, and, crouching

for awhile under a neighbouring tree, finally climbed up and hid among its foliage. I observed that its tail was quite black. Mr. Butterfield states that he has never seen a Squirrel of this appearance in August before. Are Squirrels' tails normally this colour at any particular period of the year? The Squirrel to which I now refer was in the avenue belonging to Brambridge House, on the road between Winchester and Botley.—G. W. SMITH (College, Winchester). [See Zool. 1895, pp. 103, 150.—ED.]

Present Status of the European Bison.—While the Bison of North America is on the point of extinction, the European Bison, which is still found in Russia and the Caucasus, is sensibly decreasing in numbers, in spite of the efforts made for its protection by the Imperial Government. Herr Buchener, in a memoir on the subject recently presented to the Imperial Academy of Sciences at St. Petersburg, regards it as likely soon to share the fate of its American relative. In the forest of Bialowicksa, in the province of Lithuania, a herd of these fine animals has long been preserved, and forty years ago, namely in 1856, numbered about 1900, but of late years this has dwindled down to less than 500, and there is no encouraging sign of any material increase. Herr Buchener attributes the cause of this to continued "in-breeding" and the comparatively restricted area in which the animals are confined. In 1894 a hunting expedition to the Kuban district of the Caucasus was organized by the Grand Duke Michael, Prince Demidoff, and one or two other Russian sportsmen, and they came across a few Bison there, one of which was killed. Through the courtesy of Prince Demidoff, a photograph of this animal is now before us. If the Russian Government would only give instructions to have some of the Caucasian Bison captured alive and transported to Lithuania for the purpose of resuscitating the herd there, no doubt in a few years a marked improvement might be effected. The enterprise would necessarily be attended with considerable difficulty and great expense, but in view of the scientific importance which would attach to the result of the experiment, it would be well worth undertaking.

North American Weasels.—Dr. Hart Merriam, of the United States Department of Agriculture, has recently published a synopsis of the Weasels of North America, illustrated with five plates. He recognises one species of Ferret and no less than twenty-two species of Weasel as being at present known to inhabit North America. The former he places in the subgenus *Putorius* and the latter in the subgenus *Ictis*. Exactly one half of the twenty-two species of Weasel are described as new or hitherto unrecognised, a remarkable fact when we consider how actively the North American Fauna has been investigated of late years.

The Age of a Horse.—We learn from our French contemporary, 'La Revue Scientifique,' that a mare belonging to a Monsieur de la Ferronnays

lately died at the age of thirty-seven years, and that another mare has just achieved a similar distinction by dying at the age of thirty-five years. Although Pliny supposed that a Horse would live sixty years, and Buffon has asserted that he saw one of fifty, the cases of longevity above referred to must be regarded as quite exceptional. One of the oldest Horses whose age was known for certain is reported to have belonged to an English Hussar regiment. It is said to have joined the service in 1833 at the age of seven years, and to have died in 1862, aged thirty-six.

The Fauna of the Arctic Regions.—The intense cold of the Polar regions forms an impenetrable barrier to the advance northward of animal life. None of the sailors of the 'Fram,' who got as far as 85° N., encountered any Whales, Seals, Walruses, or Bears between that and the 83rd degree of latitude, although they saw large Cuttle-fish as far as 85° N. During the three years of their expedition they managed to kill twenty-nine Bears, and these of course were most valuable to them, affording not only fresh meat, but at the same time warm clothing.

CETACEA.

Bottle-nosed Whale on Lincolnshire Coast.—A small specimen of the Bottle-nosed or Beaked Whale (*Hyperoodon rostratus*), about 15 ft. long, came ashore at Freeston, near Boston, towards the end of August last. Unfortunately the animal had been cut up and used for manure before I heard of it. I was, however, able to identify the species by means of a photograph which had been taken while the animal was fresh.—G. H. CATON HAIGH (Grainsby Hall, Great Grimsby).

Bottle-nosed Dolphin in the Esk.—An immature male of the Bottle-nosed Dolphin (*Delphinus tursio*) was killed in the Esk near Longtown about the 30th of July last. I obtained a photograph of the animal in the flesh, and preserved the skull for the Carlisle Museum.—H. A. MACPHERSON (Carlisle).

BIRDS.

Icterine Warbler in Norfolk.—On Sept. 7th I was fortunate enough to shoot an Icterine Warbler in the marram-bushes at Cley. It was too much damaged by the shot to determine the sex. The gizzard contained the remains of several earwigs. This makes the third specimen obtained in Norfolk.—ROBERT GURNEY (Sprowston Hall, Norwich).

Terns in Norfolk.—On August 21st, near Wells, I shot a specimen of the Black Tern (*Sterna nigra*). This I believe is the only specimen recorded this year of this graceful bird. On the same day I observed the Arctic, Sandwich, Lesser, and Common Terns in close company, and occasionally intermingling. Is it not rather unusual to see so many species of Tern within so small an area?—E. P. COOPER (Herne Hill).

Scandinavian Pipits.—The question raised by Mr. Cordeaux in his interesting remarks on Scandinavian Pipits, *viz.* whether the Alpine or Water Pipit (*Anthus spipoletta*) is found in Scandinavia or not, has often occurred to me. I am inclined to think that it is. The birds described by Seebohm as having the under parts scarcely differing from those of *A. spipoletta*, the streaks being nearly obsolete, and the colour of the breast pale chestnut-buff, were, I think, so much like *A. spipoletta*, that if they were not actually identical with that species, it would appear to be almost impossible to distinguish between *A. spipoletta* and some forms of *A. obscurus*, except by the colour of the outer tail-feathers—and even this seems to be not always a quite constant feature. Seebohm does not say precisely where his specimens were obtained, but we may gather that it was somewhere in Arctic Europe; and Mr. Cordeaux has found the same form of Pipit on the Varanger Fjord, and has described it more fully. Apart from the colour of the tail (doubtful), Mr. Cordeaux's birds agree exactly with the description of *A. spipoletta*, except that the under parts seem to have been a little paler. It is true that Seebohm says that his birds were connected by a series of intermediate examples with the typical form, and that the colour of the outer tail-feather remained quite typical; whereas the patch on the outer part of the outside tail-feather in *A. spipoletta* is white. But Seebohm treats the form of *A. obscurus* found in Great Britain as the typical one, and he makes no special mention of the form found on the Norwegian coast (birds in autumn almost exactly like ours do occur on the west coast of Norway), and known as *A. rupestris*; however, the birds Seebohm found, "together with the typical form, in the Varanger Fjord," which had "the ground colour of the under parts almost pure white," were doubtless *A. rupestris*, although this author says nothing of the greyness of the upper parts, and the more conspicuous light eye-stripe. The intermediate forms* which he refers to as connecting the typical *A. obscurus* with the form coloured very similarly to *A. spipoletta*, are apparently very rarely procured. A bird possibly of the form known as *A. rupestris*, killed on the Norfolk coast in February, now in my possession, has the crown, occiput, and cheeks changing to a decided clear grey, eye-stripe nearly white and conspicuous, back of a slightly greyer shade than our bird's, throat lighter, almost unmarked and with a warmer sandy tinge, under parts very slightly more distinctly marked. This is in comparison with a January-killed specimen from the east coast of Scotland. Seebohm concludes that the

* It is possible that these so-called intermediate examples were birds which, either from season or age, had not acquired their fully adult breeding dress. It should not be forgotten that *A. spipoletta* in winter has spotted under parts, and that remains of these spots are sometimes to be seen after the breeding dress has been assumed, and the ground colour of the under parts has become pinkish buff.

fully adult male of the Rock Pipit, like those of its very near allies the Water Pipit and the Pennsylvanian Pipit, has the under parts unspotted; but, from the rarity of such examples in collections, he was disposed to think that the fully adult plumage was only attained by very old birds in exceptionally sunny climes. But to me the rarity of these unspotted birds seems to be too great even to render the above solution a likely one; although we know that very old examples of *A. cervinus* have a tendency to lose the markings on the under parts. I made the following notes on *A. rupestris* in Norwegian Museums:—Christiania: Six examples in summer dress (June and July), adult, had under parts well spotted, though in one considerably and in another case a good deal less than ours, all a little less, and all with ground colour white. They are much greyer on upper parts than ours. No rufous tint. Three examples, autumn and winter, very like ours, though hardly as dusky on upper parts, lighter and less confusedly marked underneath. Trondhjem Museum: One, a grey bird; ground colour of under parts whiter than ours, but well marked; light eye-stripe apparent. Tromsø Museum: Adult female, Tromsø, July 31st, is a grey bird, white ground to under parts, fairly well and distinctly marked underneath and no vinous flush, light eye-stripe. These birds must surely represent the ordinary form of Rock Pipit found on the Norwegian coast. And it seems more reasonable to refer examples found on the north coast some way to the eastward (long. 30° 50' E.), agreeing in colour pretty closely with *A. spipoletta*, to the latter species. With regard to the colour of the outer tail-feathers, which presents the only difficulty, I may mention that I possess a skin of a Pipit, apparently *A. spipoletta*, labelled "Tiflis, May 15th, female," in which, while the patch on the outer tail-feather is very much lighter than that of *A. obscurus*, it is by no means pure white (as in south-western examples of *A. spipoletta*), but tinged, except at the extreme tip, with smoky brown. Wheelwright, who generally gave full and careful descriptions of the colours of birds the plumage of which had exceptional interest, does not help us much in the matter. He describes *A. rupestris* ('Ten Years in Sweden,' p. 322) thus:—"Colour above dark ash-grey, with dark brown spots, especially on the back; below whitish, with a rusty yellow tinge on the breast and belly, and grey-brown spots; only the outermost tail-feather with a whitish edge." He adds that it can always be distinguished from the British Rock Pipit thus: the spots on the breast in the latter are large and occupy one-half of the ground colour of the breast, while in *rupestris* they are more distinct, and very small, not occupying more than one-fourth of the ground colour; and moreover the ground plumage of *rupestris* is considerably richer. There is also a pale spot on the auriculars of *rupestris* not found in *obscurus*. Seebohm states truly that the Rock Pipit is little more than a coast form of the Water or Alpine Pipit. And while remarking that the European Alpine Pipit (*A. spipoletta*)

is a very local resident in most parts of mountainous Europe, but has not been recorded from Scandinavia or N.W. Russia, he expressly adds that the Alpine Pipit may almost be said to be a circumpolar bird, and that *A. spipoletta* var. *ludovicianus* breeds as far north as Alaska. The range of the intermediate eastern form (said to be common about Lake Baikal) has not perhaps been fully worked out. There is nothing improbable in a form which breeds in the Alps in Central Europe (I have seen *A. spipoletta* at an elevation of about 8000 ft.) turning up again on the coast beyond the Arctic Circle. On the contrary, it is not at all unlikely to do so—given suitable haunts. Would it be highly improper to consider that *A. spipoletta* of Europe is an alpine species, found also in summer in Eastern Arctic Scandinavia (as represented by the birds described by Seebohm, and found by Mr. Cordeaux on the Varanger Fjord), and that *A. obscurus* is a western coast form which in the northern part of its coast range approaches *A. spipoletta* more closely (*A. rupestris*, with a greyish head, a more distinct eye-stripe than the type, and with white ground colour to the under parts)? That Booth's birds, "found along the south coast [of England] from the second week in March till the latter part of April," were Arctic examples of *A. spipoletta* is very probable; but that they can properly be called Scandinavian Rock Pipits (*i. e.* examples of the form of Rock Pipit found commonly in Scandinavia) seems to me impossible. For it is granted that the unmarked breast and vinous under parts is rarely to be found in collections; I failed to find it in any of the three museums mentioned above, and it has only been observed in summer, as far as records go, pretty far to the eastward. Yet Booth wrote:—"Early in March I have shot several examples which plainly showed that its winter dress was identical [probably the white ground colour, which would certainly have been present even if the birds were only *A. rupestris*, was overlooked] with that bird [our own Rock Pipit], only a very few of the vinous feathers being visible at that time. As spring advances the vinous tint gradually spreads over the whole of the breast, and the back of the head and neck becomes a bluish grey." These birds, which Booth apparently found in fair numbers, could hardly have all been very old examples. Booth observed that they were in some seasons remarkably plentiful between Brighton and Worthing. They must have been common in the breeding haunt for which they were making. Where were they going to? Not to the Alps of Central Europe. Not to the west coast of Norway, for this is not the form of Rock Pipit found on that coast. Were they not more probably examples of the Arctic race of *A. spipoletta* going north to breed? One cannot now shoot (happily for some reasons) along the Sussex coast in March and April, or it would be worth while to try and get a few more examples. It is true that Booth failed to meet with them during his visits to the south coast for the three years immediately previous to publishing his catalogue, but he may have just

missed them ; and this is hardly sufficient reason for thinking the birds have entirely abandoned the route. These are merely suggestions, for sufficient material does not seem to be available at present for a settlement of the question. But some solution of the problem as that indicated above is, I think, more reasonable than that arrived at by Seebohm, or to be gathered from his conclusion, *viz.* that *A. obscurus* ranges all along the west and north coast of Scandinavia as a dusky bird, and, becoming almost white on the under parts (ground colour) in the north, suddenly, in the north-east, develops a plumage entirely different to what is generally accepted as the type of *A. obscurus*, but resembling *A. spipoletta* in all but the colour of the outer tail-feathers ; these examples being scarce, and found in summer actually on the same ground as the typical birds, with which they intergrade. My suggestion is to call these bright-coloured birds examples of an Arctic race of *A. spipoletta*, rather than of a Scandinavian form (it cannot be called *the* Scandinavian form) of *A. obscurus*. It would be quite as reasonable to do so, and, I venture to think, if not more correct, at least less confusing.—O. V. APLIN.

Honey Buzzard in Hertfordshire.—I have always understood that the Honey Buzzard, *Pernis apivorus*, is a rare bird, and as an immature specimen has been caught on my property here, it may be of interest to record the facts. On October 2nd my man, on going his rounds, came across a snared rabbit, of which the lower hind parts had been partly devoured. It was clear this was not the work of a Fox or a Pole-cat, and he baited a trap with the same rabbit at 6 p.m. He passed at 10 p.m., and the trap was as he left it. At 5.30 a.m., before the light was sufficient for him to discern what was in the trap, he found the bird. I mention the time of capture, for it seems strange that the bird should have been feeding between the hours named at this season. In the fourth edition of 'Yarrell's Birds' I see that there is a record of the Honey Buzzard having been taken "in a trap baited with a rabbit."—F. M. CAMPBELL (Rose Hill, Hoddesdon, Herts).

[The Honey Buzzard being a summer visitor to this country, Oct. 2nd seems an unusually late date at which to meet with it here.—ED.]

Rose-coloured Pastor in Hampshire.—Mr. W. Bradden, the well-known taxidermist of Guildford, informs me that a male specimen of this rare visitor was shot on May 4th in this year at Greatham, near Liss. It was found on an apple-tree.—JOHN BUCKNILL (Epsom).

Night Heron in Co. Cork.—During a visit this summer to my brother, who was stationed at Kilworth Camp for the manœuvres, I made the acquaintance of a Mr. F. Lucas. He very kindly presented me with the skin of an immature Night Heron (*Nycticorax griseus*). I regret to say he did not ascertain the sex when skinning it. He shot the bird in March, 1894, not far from the town of Fermoy, as it was feeding in

company with a Common Heron on the river Blackwater. My friend did not know what a rarity it was, and it was quite a chance that he had troubled himself to preserve it. It is a great pity that rare birds, in cases like this, should not be identified and properly preserved.—CHARLES BETHUNE HORSBRUGH (Richmond Hill, Bath).

Report on Migration.—At the recent meeting of the British Association, in the Zoological Section, presided over by Prof. E. B. Poulton, the Report of the Committee appointed for the purpose of drawing up a digest of the observations on the Migrations of Birds made at lighthouses along the British coast, was submitted. The Committee, which consisted of Professor Newton, Messrs. John Cordeaux, John A. Harvie-Brown, R. M. Barrington, W. Eagle Clarke, and Rev. E. P. Knubley, dealt, among other things, with the subject of intermigration between the south-east coast of England and the coast of western Europe, and pointed out that some entirely new facts had been ascertained in connection with this matter. It had been already shown that the more southern section of the eastern coast of England did not receive immigrants direct from northern Europe. There was, however, a considerable amount of migration of a particular description, and on the part of certain species, observed at the lightships and lighthouses between the Kentish coast and the Wash. During the autumn, day after day, a stream of migrants, often of great volume, was observed off the coast, flowing chiefly from the south-east to the north-west at the more northerly stations, and from east to west at the southerly ones, across the southernmost waters of the North Sea. From the stations off the mouth of the Thames as a centre, the birds either swept up the east coast, sometimes to and beyond the Tees, many proceeding inland as they went, or passed to the west along the southern shores of England. These important immigrations set in during the latter days of September, reached their maximum in October, and continued at intervals until November. They were renewed during winter on occasions of exceptionally severe cold, but the birds then passed to the westward along our southern shores. The Report also dealt with the meteorological aspect of the question, and stated that the importance attached to winds in connection with bird migration had hitherto been much overestimated. The conclusions to be drawn from a careful study of the subject were that the direction of the wind had no influence whatever as an incentive to migration, but that its force was certainly an important factor, inasmuch as it might make migration an impossibility, arrest to a greater or lesser degree its progress, or even blow birds out of their course.—An interesting discussion followed the reading of the Report.

Cuckoo: Mode of Feeding.—On June 13th I found a young Cuckoo (*Cuculus canorus*) in the nest of a Meadow Pipit on Silverhowe, Grasmere, Westmoreland. It was just able to fly, so I took it home and kept it for

about three weeks. I fed it chiefly on caterpillars, which it always killed by crushing them in its beak gradually from head to tail, then catching them by the middle again, with a backward jerk of the head, it swallowed them. This is a habit of which I have not found mention in any of the works on Ornithology that I am acquainted with.—J. R. DENWOOD (Cockermouth).

Great Snipe in Essex and Reeve in Hants.—On Sept. 3rd, when at Horham Hall, Thaxted, I secured a specimen of the Great Snipe (*Gallinago major*). It was flushed in a field of clover, and weighed precisely seven ounces. It is in the hands of Messrs. Williams, of Dublin, for preservation. They have informed me that the bird is an adult, and one of the most perfect specimens that has come under their observation. On Sept. 5th, at Hayling Island, I shot two Reeves from a flight of five, one adult and one bird of the year. The sex of the adult bird was unfortunately not ascertained, but in the opinion of Messrs. Williams (to whom I sent the skins only) the specimen is a male.—G. A. TEMPLER (Eldon Club, Lonsdale Chambers, Chancery Lane).

Ruff in Co. Sligo.—On Sept. 4th my friend Mr. C. Gallagher gave me a nice specimen of a male Ruff in the first year's plumage, which he had shot on a grouse-bog, a few miles from the town of Easky, Co. Sligo. It was a solitary bird, and so tame as to allow him to walk up within shot as it was standing on a little hillock in the bog. This is only the second specimen that I know of occurring in the county; the first (also a solitary bird) was shot by Mr. C. A. Little on his grouse-bog, five or six miles from the above-mentioned locality, and about the same date, in September, 1884. There appears to have been a small flight of Ruffs to Ireland this autumn, for Mr. E. Williams, of Dublin, had three specimens sent to him for preservation, and Mr. R. J. Ussher had two sent to him from Belmullet, Co. Mayo.—ROBERT WARREN (Moyview, Ballina).

Flight of Peewits.—On Sept. 29th I saw a congregation of Peewits that must have mustered quite 500 individuals. Their manœuvres were very interesting to watch; the flock divided into two parties, one flying south towards Southampton and the sea, the other alighting in a dense mass in a ploughed field. Once, without being disturbed, the whole of this party flew up a few feet into the air, wheeled and settled again in exactly the same spot. After watching them for half an hour, during which time they were joined by several birds from all quarters, I walked towards them, and it was not until I was within thirty or forty yards that they all arose screeching and followed the first party towards the sea. See "Notes from Hants," Zool. 1894, p. 296.—G. W. SMITH (College, Winchester).

Labrador Duck.—In the Museum at Amiens, in France, which at present is located in a temporary building, and visible only by ticket from

the mayor, there is a bird which is now nearly as valuable as the Great Auk—namely, a fine adult male of the extinct Labrador Duck (*Camptolaimus labradorius*). It was unknown to Mr. Deutscher when compiling his list of specimens ('The Auk,' vol. viii. p. 101), and will bring the number now known to be in existence to forty-two, having very likely been one of those sent to Europe by a birdstuffer at Brooklyn named John Akhurst (*op. cit.* x. p. 270). The faded ticket, so far as I could make out, contains no information beyond the bird's name; but the former denizen of St. Lawrence river is in excellent preservation.—J. H. GURNEY (Keswick, Norwich).

Sabine's Gull at Aberystwyth.—The late September gales brought an unusual visitation of this species. During the three days Sept. 24th to 26th six specimens were obtained a short distance to the south of this town, while two or three more were noted. All were in immature plumage, and passed into the possession of Mr. J. Hutchings, taxidermist, of this place.—J. H. SALTER (University College, Aberystwyth).

Little Gull on the Solway Firth.—On Sept. 16th a juvenile example of the Little Gull (*Larus minutus*) was brought to me by one of the Solway wildfowlers. He had shot it the previous afternoon, whilst hovering over the river Esk, in the immediate vicinity of the Solway Firth. On dissection it proved to be a male. The stomach contained a single beetle. The plumage of this specimen bears considerable resemblance to the nestling dress of the common Black-headed Gull (*L. ridibundus*). It is the fourth local specimen of *L. minutus* which I have had the pleasure of adding to the Carlisle Museum, and is a useful addition to our little series of this Gull.—H. A. MACPHERSON (Carlisle).

Manx Shearwater in Warwickshire.—Just before the commencement of the south-westerly gales, on Sept. 13th, an immature male *Puffinus anglorum* was shot at Earlswood Reservoir, Warwickshire. This, I think, is the second instance only on record of the occurrence of this bird in the Midlands, the only other instance of which I have any knowledge being one picked up exhausted in the Chandos Road, Edgbaston, within the boundaries of the city of Birmingham, on Sept. 5th, 1880.—F. CORBURN (7, Holloway Road, Birmingham).

White Stork in Warwickshire.—On Sept. 26th, the week of the furious south-westerly gales, a young male *Ciconia alba* was brought to me alive. It had been captured at Beacon Hill, near Coleshill, Warwickshire, by a labouring man, who stated that he saw two Storks in a field. His dog rushed towards them, when one flew away; the other defended itself from the attack of the dog, and while so engaged the man approached and seized the bird. He clumsily cut the primaries of one wing to prevent its escape. It was afterwards put into a dirty sack with a hole large enough for its head to come through, consigned to a carrier, and in this condition

poor *Ciconia alba* reached me nearly dead. It refused to take bread in any form. After a time, however, I induced it to take the bodies of small birds and strips of lean beef. Fat it did not like, and shook and munched a strip of meat which was half fat and lean until the fat was removed. It munched the bodies of birds between its mandibles, commencing always at the tail end and finishing at the head; when it seemed satisfied that it had broken all bones and killed its prey it was swallowed, always head first. It did not discover that a large basin contained water until I threw a bird's body in; the splash caused it instantly to seize at the body, but when it found its bill was in water it loosed the body and drank eagerly, expanding its gular sac and scooping the water down its throat. After satisfying its thirst it manifested its pleasure by standing in the basin on one leg, looking exceedingly droll. After it had become somewhat accustomed to me and its surroundings, and had had plenty of food, it became playful with some of the food I gave it, as a cat would play with a mouse, and while munching the body of a bird made a clattering noise with its bill. It seemed much puzzled at the number of stuffed birds in the cabinets by which it was surrounded, and seemed glad to get away from them. It particularly singled out and seemed frightened at a large Herring Gull which was on the ground floor of one of the cabinets. On the fourth day of its captivity I noticed that it was much out of condition, and next morning I found it dead. I am afraid there may have been something on some of the bodies from my work-rooms which did not agree with it. The *post mortem* revealed a shot-wound along the neck, which had torn the skin but not entered the flesh. On the same side of the bird a shot had struck at the base of the wing, but had not splintered the bone; the end of the same wing also appeared to have been struck by a shot. From these appearances I conclude that the bird had been shot at from below at a long range and struck, but not with sufficient force to bring it down at once. Eventually it alighted, and its companion would have remained with it until it regained full use of its wing, but they were discovered by the man who captured it. I do not think there is anything improbable in the man's story. Garner has recorded the occurrence of Storks in the neighbouring county of Stafford in his day; while Mr. Willis Bund has noticed their appearance in Worcestershire and Oxfordshire; this, however, is the first record for Warwickshire. The bird is quite a young one, with dull-coloured bill and legs, a frosty white appearance on the black feathers of the wings, and dark centres to the feathers of the back and scapulars.—F. COBURN (7, Holloway Road, Birmingham).

Red-necked Phalarope and Skuas near Hastings.—On Sept. 24th I had brought to me, in the flesh, an immature male Red-necked Phalarope (*Phalaropus hyperboreus*), shot while swimming in the sea at Pett Level; weight one ounce. It is almost exactly like the one I recorded in 'The

Zoologist' for October, 1895. On the same day an adult male Richardson's Skua (*Stercorarius crepidatus*) was picked up at Westfield, about five miles from Hastings. Its captor kept it alive for two days in a basket. It was in the moult, but had one long tail-feather. A Pomatorhine Skua was shot on the same day at Pett. Mr. Bristow, of St. Leonards, tells me he has had six or more Grey Phalaropes brought in to be set up, one of which came from Brightling, about fifteen or sixteen miles from the sea. I presume they would all have been driven there by the effects of the south-west gale on the 22nd inst. —G. W. BRADSHAW (Hastings).

Ornithological Notes from Scarborough. — On July 10th I had brought to me for identification an adult Hobby, which had been shot by a gamekeeper near Scarborough. I had not the opportunity of dissecting the specimen; but from the size of the bird I should say it was a female. It had the "hatching spot" on the abdomen strongly developed, and had apparently been sitting at no distant date. During the recent stormy weather a great migration of wading birds has taken place along the shore. Many flocks of Dunlin, Sanderling, Knot, Turnstone, Redshank, Golden, Green, Grey, and Ringed Plover were seen, some of them in great numbers. Oystercatchers, Whimbrels, and Curlews were also abundant, together with a few Bar-tailed Godwits. On August 27th I picked out of a bunch of Dunlin which had been shot on the North Shore a very nice Curlew Sandpiper, a bird of the year. On Sept. 1st an immature Little Stint was obtained, and two more, one an adult bird, were shot in company with Dunlin on Sept. 3rd. Another was obtained the following day, and a Greenshank was shot, and two others observed, on the same date. A Turtle Dove was obtained on the 7th, a bird which we do not usually see here. On the 23rd an adult male Grey Phalarope, in partial winter plumage, was shot while swimming in a quiet corner in Cayton Bay, about $2\frac{1}{2}$ miles to the south of Scarborough. On dissecting it I found the gullet and stomach crammed with small maggots. On the same day I had two unknown birds reported on Filey Brig, which were identified by the man who saw them as being of this species on seeing the specimen in my possession; whilst on the North Shore a "web-footed Sandpiper," which was shot and subsequently destroyed, probably also belonged to this species; not, however, having seen the birds, I should hesitate to record them definitely as Grey Phalaropes. On Sept. 26th a strange sea-swallow was brought to me by a shore-shooter, who had shot it on Scalby Ness, a little to the north of the town. It turned out to be an immature White-winged Black Tern, in very nice condition. On dissection the stomach proved to be full of large maggots; the sex was indistinguishable. There are at present very large numbers of Common and Arctic Terns in both North and South Bays, the Arctic species being much more abundant than the others.—W. J. CLARKE (44, Huntriss Row, Scarborough).

Note on the Starling.—During the nesting season of 1895 a pair of Starlings nested in the aperture left for the flagstaff to pass up through at the top of an obelisk standing a short distance from my residence. I presume they are the same pair of birds that have bred in the same place for a number of years. In the season I mention I noticed that there were three old birds tending the young brood; and while watching them I noticed that the third bird was a very unwelcome visitor, as two of them frequently arrived at the entrance either together or nearly so, and when they found the third bird near the place they at once joined in a most determined chase until the intruder was driven far away from their nursery; but again and again the would-be godmother returned to the nest. I took it to be a hen bird, and thought it very probable that it had lost a former nest or a late partner. In answer to many enquirers I may state that I have never known a pair of Starlings rear two broods in one season.—JAMES SUTTON (Durham).

[Although Starlings do not as a rule rear more than one brood in a season, instances of their doing so have been recorded.—ED.]

Penguin : Derivation of the Name.—On this subject Prof. Newton, in his 'Dictionary of Birds' (part iii. p. 703), has a very instructive footnote. He remarks that of the three derivations assigned to this name the first is by Drayton in 1613 (*Polyolbion*, Song 9), where it is said to be the Welsh *pen gwyn*, or white-head . . . in opposition to which hypothesis it has been urged (1) that there is no real evidence of any Welsh discovery of the bird, (2) that it is very unlikely for the Welsh, if they did discover it, to have been able to pass on their name to English navigators, and (3) that it had not a white head, but only a patch of white thereon. With regard to the other two derivations as suggested (*l. c.*), I am not now concerned; but as to that above quoted, it may be observed that in Howell's 'Familiar Letters' there is one dated "Westminster 9 Aug. 1630," addressed by the author to the Earl of Rutland (Book II. Letter lv.), in which the following remarks occur on Welsh words found in America, including the word *Pengwin*:—"There are some who have been curious in the comparison of tongues who believe that the *Irish* is but a dialect of the ancient *British*; and the learnedest of that nation, in a private discourse I happened to have with him, seemed to incline to this opinion. But this I can assure your lordship of, that at my being in that country I observed by a private collection which I made, that a great multitude of their radical words are the same with the *Welsh*, both for sense and sound; the tone also of both the nations is consonant. For when first I walked up and down Dublin Markets methought verily I was in Wales." [Howell, be it observed, was an educated Welshman, a clerk of the Privy Council.] He adds:—"But my lord you would think it strange that divers pure Welsh words should be found in the new found world in the West Indies yet it is verified by

some navigators, as *granado*, bark, *Nef*, Heaven, *Lluynog*, a fox, *pengwin*, a bird with a white head, with sundry others, which are pure British." This observation, confirmatory of Drayton's view (1613), was most likely made (1630) quite independently of it, and it is to be regretted that, for our present purpose, Howell did not quote the actual words of the navigators to whom he referred. I confess that I do not see anything improbable in the suggestion that the word *pen-gwin* may have come to us through the agency of Welsh sailors trading with Newfoundland. On the contrary, it seems not unlikely that when viewing for the first time a Great Auk or Garefowl in its winter plumage in Newfoundland seas, they would liken it to the Razorbill or Guillemot in similar plumage, with which, under the general term *pen-gwin*, they would be very familiar on the Welsh coast, where these birds are abundant. So in the case of the New World Crocodile, we get the word "alligator" from a corruption of the name bestowed by Spanish sailors on an animal which they likened to a large Lizard—*el lagarta*.—J. E. HARTING.

Migration of Swallows in Dorset.—On Sept. 30th, at Swanage, I found a remarkable migration of young Swallows going on. This was the only day during my stay on which the wind was not westerly and strong: it had changed to a moderate breeze from the north-east. Along the coast south and west of the little town an incessant stream of birds was passing eastwards in an almost direct flight; the vast majority were young Swallows, with a very few old ones here and there, and an occasional party of House Martins. The latter seemed to keep in small groups together: if my eye caught one, there were sure to be others passing at the same moment. I walked in this great stream of birds to the headland where the coast suddenly trends to the north, to see whether they would keep the coast-line or venture out to sea. The morning was misty, and the Isle of Wight was not visible; and every bird, so far as I could see, turned northwards with the coast. I followed them to Swanage Bay, and found them still keeping the same direction, *i. e.* crossing the town and skirting the bay, a few only taking a short cut across it towards Poole Harbour. As on previous occasions, I came to the conclusion that very few of these birds cross to the Continent at a point so far westward as this, though here they would have a natural inducement to do so in the sharp turn of the coast northwards, which would pull them up, as it were, and make them consider what to do next. The next morning, however, I did actually see two small parties go direct over the sea southwards at a much greater height than that at which the other birds were flying, and regretted that they were too far away for me to determine whether they were old birds, whose experience might have prompted them to do what the others could not or would not risk. Later on this second day, while walking back to Swanage under the downs from

the neighbourhood of Corfe, I was astonished to find large parties of young Swallows flying in what I may call the wrong direction, i. e. *westwards*, under the hills. It was hardly possible that they were making for a roosting-place; it was not late enough in the afternoon. It struck me as not unlikely that these young and inexperienced birds, or many of them, are turned out of their natural route along the coast by the high and steep ridge of down which fences in Swanage Bay to the north with perpendicular chalk cliffs, and separates the whole Isle of Purbeck from the low heathy district inland. Of course they would cross this ridge at any point if they chose to do so; but repeated observations on this coast have led me to believe that they find their way with great caution, and are easily deflected from their course by any natural obstacle. I was confirmed in my conjecture by noticing that numbers of the birds were passing through the only *gap* in this ridge which offers itself between Swanage and Corfe, *viz.* that through which the road runs to Studland. The more obvious one at Corfe would solve the difficulties of such travellers as chanced to miss this one. I wished to investigate the matter more closely, but unluckily for me the migration suddenly ceased, and I walked the next day along the ridge from Corfe to Lulworth without seeing a single Swallow. It is perhaps worth noting that the wind had changed in the night to the west, and was blowing with some strength.—W. WARDE FOWLER.

FISHES.

Sunfish at Filey.—On August 22nd a nice specimen of the Short Sunfish (*Orthogoriscus mola*) was captured floating on the surface of the water, two miles south of the Bell Buoy, Filey. It measured $27\frac{1}{2}$ inches from tip to tip of fins, and 22 inches total length. After being exhibited at Scarborough for a short time it was purchased for some museum, the name of which I have been unable to ascertain.—W. J. CLARKE (44, Huntriss Row, Scarborough).

Large Pike in Co. Mayo.—An unusually large Pike (*Esox lucius*) was taken with a spoon-bait in Lough Conn, by Mr. F. Roberts, of Windsor. It measured 49 in. in length, 23 in. in girth, and weighed 35 lbs. Naturally such a trophy as this was considered worth preserving, and it has accordingly been sent to Mr. Cooper, of Radnor Street, St. Luke's, E.C., who sustains his late father's reputation as the best preserver of fish in the metropolis.

MOLLUSCA.

Oysters attacked by Starfishes.—The question whether Starfishes are inimical to Oysters has long been disputed, but it would seem from recently published researches that the truth of the assertion has now been proved. Dr. P. Schiemenz, in an illustrated article on the subject in the

'Journal of the Marine Biological Association' (vol. iv. no. 3), after reviewing the literature of the subject, shows as the result of experiments made by him how Starfishes contrive to work their way into the shells of bivalve marine mollusca, for the purpose of preying upon the inhabitants. So fully convinced is he of the destructive habits of Starfishes in this direction that he advises the owners of Oyster-beds to destroy every Starfish that can be found in the beds.

INSECTS.

The Giant Wood Wasp (*Sirex gigas*).—In August last a friend brought me a fine lively specimen of the above insect, taken in his greenhouse in Durham. It proved to be a female, having an ovipositor 1 in. long; antennæ $\frac{3}{4}$ in. long; longest legs over 1 in. long; total over all full $2\frac{1}{4}$ in.; expanse of wings over $2\frac{1}{4}$ in. It is the first specimen of the insect that I have ever met with.—JAMES SUTTON (Durham).

[An article on British Sawflies, with illustrations, will be found in 'The Field' of Feb. 18th, 1893; and a List of Norfolk Sawflies has been published by Mr. Bridgman, Trans. Norfolk Nat. Soc. vol. iv. p. 523.—ED.]

Larvæ of Death's Head Moth.—During August and the early part of September the larvæ of the Death's Head Moth (*Acherontia atropos*) were unusually abundant around Scarborough. Between Aug. 21st and Sept. 5th I had brought to me eight larvæ and one imago, mostly taken on potatoes, but two were reported as feeding on "tea-tree" and one on beetroot, the latter being, I believe, a somewhat unusual food. All the specimens were nearly full-fed when discovered, and changed to the pupa state very shortly after their capture. I recollect about five years ago there was a similar abundance of this species, when I had many specimens brought for identification.—W. J. CLARKE (44, Huntriss Row, Scarborough).

Wasps and their Uses.—The Wasp is generally regarded as emblematical of irritability and petty malignity; but it plays a beneficial part in the work of nature, as a note in the 'Irish Naturalist' testifies. A number of Wasps were seen by Mr. R. M. Barrington, of Bray, buzzing about his cows. Closer inspection revealed that they were all busy catching flies, and pouncing, with the rapidity of hawks after birds, on the flies as they tried to settle or rest on some favourite part of the cow. One white cow drew more Wasps than any of the others, because the moment a fly alighted it was seen at once against the skin. When a Wasp catches a fly it immediately bites off both wings, sometimes a leg or two, and occasionally the head. Mr. Barrington saw some of the Wasps when laden with one fly catch another, without letting go the first, and then fly away with both. There was a constant stream of Wasps carrying away flies, probably to feed the

larvæ in their nests, and returning again to the cows to catch more. In about twenty minutes Mr. Barrington estimated that between 300 and 400 flies were caught on two cows lying close to where he stood.

NOTICES OF NEW BOOKS.

Text-book of Zoology. By DR. J. E. V. BOAS, Lecturer in Zoology, Royal College of Agriculture, Copenhagen. Translated by J. W. KIRKALDY and E. C. POLLARD. 8vo, pp. i—xviii; 1—558. With 427 figures. London: Sampson Low, Marston & Co. 1896.

THIS work appears to have met with considerable favour on the Continent, judging from the fact that two Danish and two German editions had been published before the present English translation was undertaken. From this we are led to expect something superior to the ordinary type of zoological text-book, and we may say at once that we are somewhat disappointed. It may seem absurd to suggest that the subject-matter in a volume which extends to 550 pages is too much condensed, yet such would appear to be the case when we look for information on any given point. The fact is that of late years the number of specialists who work at particular groups has increased enormously, and the result of their labours has been to put us in possession of such a multitude of details that the ordinary text-book fails to afford an adequate survey of the general subject. It may be said, of course, that such a text-book is not intended as a complete survey, but merely as an introduction, paving the way for a more comprehensive general treatise. In this case it seems to us very desirable to give references to the most useful books and papers which deal with different sections of the subject, special groups, or important topics, such as classification, embryology, flight, moulting, parasitism, phosphorescence, &c., so that the student may know where to look for fuller information on any point with which he may be more immediately concerned. The chief defect in most text-books is the unequal treatment of the different groups, and this we suppose must always be the case when such a work is attempted by an author single-handed.

To some extent this is noticeable in the volume before us, and the defect might have been remedied in the way suggested, namely, by giving references to such works as would supply the missing information.

The book is divided into a General Part (pp. 1–80) and a Special Part (pp. 83–340), with an Appendix to each, the former relating to the resemblances and differences between plants and animals; the latter dealing with the *Tunicata* or Sea-squirts, which were formerly classified with the Mollusca, but are now considered to be related to the Vertebrata, with which they agree in the possession of a notochord, and in the position of the central nervous system.

The divisions of the “General Part” are Cells and Tissues (Histology); Organs; Fundamental Form and External Configuration; Embryology or Ontogeny; Affinities of Animals; Classification; Doctrine of Descent; Biology; Geographical and Geological Distribution.

The “Special Part” deals with the various divisions of the Animal Kingdom, classified as follows:—Subkingdom I. PROTOZOA, or Unicellular Animals. Subkingdom II. METAZOA, or Multicellular Animals, divided into Cœlentera (*sic*) plus the Sponges; Echinoderma (*sic*); Platyhelminthia plus the Rotifera; Nemathelminthia; Annelida plus the Polyzoa and Brachiopoda; Arthropoda; Mollusca; and Vertebrata plus the Tunicata.”

In the translator’s Preface we are told that in the German edition lists of the more important forms belonging to the German fauna are appended to the descriptions of the several groups; and that these have been replaced by species met with in the British Islands; the translators expressing a hope that this will be of special service to naturalists. Such lists, no doubt, would have been useful enough had they been more carefully prepared, but, unfortunately, they are too short, and show omissions of typical and easily procurable species. Nor is the information which is given concerning the species mentioned always correct. For example, under the heading *Alcidæ* (p. 457) we find the following curious blunder:—“Only one species of Auk, the Little Auk, *Alca alle*, breeds in Great Britain; the Razorbill, *Alca torda* (misprinted *tonda*), breeds in colder countries, but is occasionally found in the North Sea in winter.”

Our ornithological readers will not need to be reminded that the Razorbill, during the nesting season, is one of the commonest of our cliff-haunting sea-fowl, and that the Little Auk, although familiar as a winter visitor, has never been known to breed anywhere within the limits of the British Islands.

We have failed to discover any proof of the statement in the Preface that "the needs of students of medicine, of veterinary surgery, and of forestry have been kept in view." On searching for information, for example, in regard to the internal parasites of Deer, and the treatment of park Deer thus affected, we could find no hints on the subject. The depredations of Hares, Rabbits, Squirrels, and Field-mice, in relation to forestry and agriculture, seemed to be a subject likely to be dealt with, according to the Preface, but in this also we were disappointed.

It would be easy, of course, to point out what this Text-book does not contain; but this would not be fair, either to the author or his translators; for the former has classified a large number of important facts likely to be useful to students of zoology, and the latter, by the preparation of a good translation, have earned the thanks of English readers who are unable to consult the original text.

A Geographical History of Mammals. By R. LYDEKKER, B.A., F.R.S. 8vo, pp. 400. With 82 illustrations. Cambridge University Press. 1896.

SINCE the publication (1876) of Dr. A. R. Wallace's two volumes on the Geographical Distribution of Animals in general, says Mr. Lydekker, in his Preface, the only works which have appeared relating to mammals from the same point of view are the small volume by Mr. Beddard,* and the series of papers by Mr. W. L. Selater, printed in the 'Manchester Science Lectures,' ser. 5 and 6 (1874), and the 'Geographical Journal' (1894-95). But he has forgotten the excellent volume by Prof. Heilprin, on 'The Geographical and Geological Distribution of Animals,' published in the "International Scientific Series"; and we might

* 'A Text-book of Zoo-geography.' Cambridge Natural Science Manual. 1895.

also mention Dr. Hart Merriam's important paper (Proc. Biol. Soc. Washington, vol. vii. 1892) "On the Geographical Distribution of Life in North America, with special reference to the Mammalia." We find both these, however, included in the useful bibliography given at the end of Mr. Lydekker's own volume, which may be said to be a summary, fairly up to date, of existing knowledge on the subject, and in one respect in advance of the contributions by Messrs. Beddard and W. L. Sclater, who admittedly take but little account of fossil forms.

In an introductory chapter Mr. Lydekker reviews the schemes of previous writers for the zoological divisions of the earth's surface, and after pointing out what he considers to be defects in the several proposals, concludes by adopting the following modification, in which his three "realms" correspond with what he regards as the "three great evolutionary centres of mammals."

- I. The Notogæic Realm.—1. Australian Region.
 " " 2. Polynesian "
 " " 3. Hawaiian "
 " " 4. Austro-Malayan Region.

II. The Neogæic Realm—Neotropical Region.

- III. The Arctogæic Realm.—1. Malagasy Region.
 " " 2. Ethiopian "
 " " 3. Oriental "
 " " 4. Holarctic "
 " " 5. Sonoran "

The term "Holarctic," it may be observed, was proposed by Dr. Heilprin, at the suggestion of Prof. Newton, to unite Dr. Sclater's Palæarctic and Nearctic Regions under a common title; while the term "Sonoran" is equivalent to Dr. Blanford's "Medio-Columbian" Region. Dealing with these different regions in the order named, Mr. Lydekker proceeds with a consideration of their distinctive features, and gives a brief account of the more characteristic mammals to be found therein. In the course of his remarks various interesting problems are discussed, as, for example, the former connection of particular land areas, now widely separated by sea.

With regard to the date of the separation of Ceylon from India, for instance, Mr. Lydekker writes :—

“The numerous species of mammals common to the two areas show that this must have taken place at a very recent date, comparatively speaking; although at a period when several of the mammals now inhabiting Southern India had not yet occupied that portion of their distributional area.

“When discussing the possibility of a former land connection across the Bay of Bengal, between Ceylon and Southern India on the one hand and the Malayan countries on the other, Dr. Blanford was careful to point out that the ocean-bed afforded no evidence in favour of such a line of communication. This feature, together with certain marked differences between the mammals of the two areas, appears to afford a conclusive argument that these countries have never been much more closely connected than they are at present. Had any more extensive connection existed, we should surely expect to find Antelopes, Gazelles, and perhaps Asses, in the more open districts of Upper Burma; while the Bay of Bengal would scarcely have formed such a sharp line limiting the eastward range of Wolves, Foxes, Hyænas, and other mammals, as it actually does. This is more evident if fossil forms are considered, and these circumstances, together with the depth of the sea in the Bay of Bengal, seem to disprove the suggestion of Dr. Wallace (*op. cit.* p. 359) that a continuous tract of land formerly connected Borneo and the rest of Malaysia with the central parts of Ceylon, and extended eastwards to Hainan.”

Mr. Lydekker does not attempt a detailed description of the mammalian fauna of the Malay Peninsula and Islands, but selects that of the Bornean Group as an example of what may be called the typical Malayan sub-region, as distinct from Java, which differs markedly in its fauna from Borneo and Sumatra. His chief reason for selecting Borneo is that its fauna has been carefully worked out by Messrs. Everett and Hose, on whose authority he gives a list of the Mammalia, omitting, of course, introduced species like the Buffalo.

Mr. Lydekker has crammed a great number of facts into his small volume, but on several points of interest on which we have looked for information touching the geographical distribution of

particular mammals we have failed to find it. Curious to know what he might have to tell concerning the present range of the Lion in India, we could find (p. 272) only the following bare statement:—"The range of the Lion in this (the Oriental) Region is limited to India, not extending to the eastward of the Bay of Bengal [not anything like so far]; and as this animal was widely distributed during the Pleistocene in Europe, while it ranges all over Africa [this is not quite correct], it may be regarded as essentially a western type, or exactly the opposite of the Tiger." In view of our recently published remarks on this subject (Zool. 1896, pp. 281), the information here given strikes us as being uncommonly meagre and disappointing.

Similar vagueness of expression is to be found in relation to other animals, as, for example, to the Saiga Antelope, which we are told (p. 324) "is now confined to the steppes of Western Asia and Eastern Europe, but during the Pleistocene Epoch extended as far westwards as Germany, France, and England." For fuller information concerning the present distribution of the Saiga, Mr. Lydekker might have referred the reader to his own chapter on this species in his 'Horns and Hoofs, or Chapters on Hoofed Animals,' published in 1893.

We are sorry to observe that in the "list of mammals known to have inhabited the British Islands within the historic period" (pp. 349, 350), Mr. Lydekker has sanctioned the use of the barbarous term "Assogue," which was proposed only last year for the Stoat of Ireland. On its first publication (Zool. 1895, pp. 124-129) we took occasion to protest against its introduction into zoological literature, and pointed out that the spelling of an Irish name "as pronounced" does not make it English. It still appears to us that there is no good reason for its adoption, and much to be said against it.

Wild Life of Scotland. By J. H. CRAWFORD, F.L.S. Illustrated by JOHN WILLIAMSON. 8vo, pp. 280. London: John Macqueen. 1896.

LOVE of fishing and a taste for out-of-door life have led the author of this little book into picturesque parts of Scotland, and he discourses pleasantly of his experiences. By the burn-side,

on the moor, by the loch-side, or on the North Sea, Mr. Crawford seems equally at home, prepared to appreciate to the fullest the beauties of Nature, and possessing the knack of imparting his good spirits to others. His agreeably written chapters cannot be said to abound in original observation, nor is there much that can be called new in relation either to fishing or natural history; nevertheless there are many pages that will repay perusal.

Commenting upon a quotation: "The Salmon's back is fenced with tiny blue slates like the miniature roof of a house. Could anything match more exactly the blue slates with which our rapid streams abound?" Mr. Crawford observes:—"Were it not truer to say that the 'new run' Salmon wears the double livery of the migrant, adapted to both spheres. The glory soon departs, and he takes the muddier hues of the fresh water. Sometimes he covers himself with red and black spots, like a gigantic Trout. The marine forms of the shadowless sea are silvery, with a darker shade on the back, and generally without slates. If river forms took to the salt water they would put off their spots as of no further use. Examples of the brook Trout have been found, on emigrating to the sea, as a rule, to which there are exceptions, to assume the brilliant silvery hues of the migrating *Salmonidæ*, as well as the cross-shaped black spots. Mr. Harvie Brown remarked, June 12th, 1852, on having caught at Durness several so-called sea Trout from a sea-pool, or first pool at the mouth of the river, fresh water at low tide, salt or brackish water at high tide. From their silvery appearance they are known as sea Trout, but are the river form, acclimatised to brackish water, or periodically visiting the same between tides."

Writing of bird-life in Scotland, Mr. Crawford makes the following remarks about the nesting habits of the Wheatear, a bird sufficiently familiar to most of us as one of the earliest of spring migrants to appear:—

"The Wheatear reaches the Scots moors—for it is a migrant—as early as March. The apology for a nest, with its faint blue—almost white—eggs will be in many of the disused holes of his comrade the rabbit. They are easily found, because of his slovenly habit of leaving chopped pieces of bracken round the opening. As in the case of most of our hardier migrants, a few may remain with us all the year round."

On the South Downs of Sussex and Hampshire, where no bracken happens to interrupt the rolling turf-land for many miles, the nest of the Wheatear frequently escapes detection, owing to the number of holes available, and the difficulty of discovering for certain the particular one selected by the bird.

Referring to the variation in the number of eggs laid by different species, Mr. Crawford writes:—

“Where the risks are great, the precautions for the preservation and continuance of the species are exceptional, and there is no better indication and gauge than the contents of the nest. Twelve eggs, roughly, signify double the danger of six. Keeping this in mind as we turn to the sea birds, we find that the number of eggs is very much smaller than in the case of the land-birds. This holds almost universally, with perhaps the exception of some of the Ducks, whose nesting habits expose them to considerable danger.

“A very common number is three. This holds throughout the Gulls and their immediate kindred. The Terns’ nests have three apiece. This is well-nigh the maximum. In the case of the Skuas it is reduced to two. The Divers also lay two.

“In the case of the Petrels a limit is reached, beyond which further diminution is impossible. Indeed, the unit is so frequent that it may almost be regarded as the typical number. The Guillemot, the Razorbill, the Little Auk, the Puffin, the Shearwater, the Solan Goose, all deposit and sit on one egg at a time; and they discharge the duty with more than the gravity of a sitting hen on her sixteen. The unit of production must be taken as representing the unit of danger, and means that the sea-birds have so little to fear that, in a majority of cases, one egg is sufficient to maintain or probably slightly increase the species. Five is the usual number found in a land-bird’s nest. Four is not uncommon. Three is very rare, occurring with some Owls and Hawks. Two is confined to the Swift and the Nightjar, whose nests are very seldom found; and the Pigeon, which builds out of reach of many enemies. And one [with land-birds] is unknown. Starting from five with the land-bird, the tendency is upward, not downward; starting from three with the sea-bird, the tendency is downward, not upward.”

Writing of the Merlin, a characteristic bird on many Scotch

moors, and one which would be much commoner were it not so remorselessly persecuted by gamekeepers, Mr. Crawford bears witness to its courage and pertinacity in sticking to its prey even when approached at very close quarters. He says:—

“A Merlin on the ground ahead allowed me to come within a few yards. When at length he rose he seemed to be attached to an object much larger than himself, and much too heavy to carry beyond a short distance. As often as I approached he retreated, never succeeding in rising above a foot or lifting his burden free from the ground. Under the impression that he was trapped, I hurried forward. When he could no longer avoid me he made a supreme effort, but, too eager to watch his direction, dropped into the lake; and not till he was in danger of being drowned would he consent to loose his hold. When fished ashore the object proved to be a large Mistle Thrush. He attempts bigger prey than that; but what struck me was his determination not to be driven away. I had heard that the bird was the maximum of spirit in the minimum of size; and here was an illustration. It was that indomitable pluck, together with a tractable disposition, that made this little falcon such an excellent hawker.”

Turning over the pages, we come upon the following remarks anent Starfishes:—

“To some scalps which I recently visited speedy destruction was threatened by the Starfish, than which there are no greater pests in the sea. On each rakeful there were twenty or thirty overfed fellows, and as an evidence of their activity nine out of ten of the shells were empty. Many of the raiders were at work. The stomach was exerted so as to wrap the mussel round and force it open, when its contents were sucked out, and the shell dropped.”

This to some extent confirms the views of Dr. Schiemenz on the subject of the damage caused by Starfishes to oyster-beds, as noted (p. 389) in the present number.

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THE SEASONAL CHANGES IN THE COMMON SQUIRREL.

By OLDFIELD THOMAS.

ALTHOUGH everyone has noticed the differences in colour shown by our Common Squirrel at different seasons in the year, no exact account has ever been published of the methods and dates of the various changes, and certainly, so far as I know, no one has been aware either of the regularity with which the changes occur, or of the peculiar manner in which different parts of the animal undergo their annual changes at different times of the year.

Thanks to the kindness of Mr. J. C. Mansel-Pleydell, of Whatcombe, near Blandford, Dorsetshire, the British Museum has obtained a large series of Squirrels from his estate, killed all round the year, and showing the changes so perfectly that I am enabled to make out the dates and methods of the variations with some approach to exactness. It may be noted that these specimens were obtained at intervals of six or seven weeks for a year, starting in April, 1894; and that then—two somewhat important gaps occurring in the series at the time of the spring and autumn moults—two specimens were sent every week from April 18th to May 25th, and again throughout October, 1895. In all the number of skins amounts to fifty-four.

Curiously enough, specimens killed in the fine and warm spring of 1894—on April 18th—are practically identical with others killed on the same day in 1895, in spite of the exceptional

severity of the spring of the latter year. Nor is the commencement of the long frost of January to March, 1895, in any way specially marked in its effects as compared to the mild autumn and early part of winter. No direct correlation between weather and fur can therefore be established.

In the large number of skins examined, nothing is more striking than the very small proportion which are of any material assistance in making out the chief facts, and it would appear that the actual changes are accomplished very quickly in any given individual, so that it is difficult just to catch them in the change. About seven or eight skins only of the fifty-four are really in a condition to show anything of importance; the others merely confirm the conclusions arrived at. Indeed, the fact of an autumn moult was overlooked and denied until one specimen received later than the rest conclusively proved its occurrence. This mistake could not, however, have been made had the general series come from a colder place than Dorsetshire, where, owing to the mild winters, little variation of colour is caused by the autumn change of fur.

It may also be noted that young individuals should be altogether ignored, for until after the first year they do not apparently settle down to the regular cycle of changes, but are quite erratic, and unlike the adults.

Before entering into details, I may first state briefly the conclusions to which this series of skins has led me.

I. There are two annual changes of fur in the Squirrel, so far as its body and limbs are concerned; but

II. The long hairs of the brush of the tail are only changed once, in the autumn, the spring change being practically suppressed.

III. The tail becomes regularly, and in all individuals, quite white in summer,* and this change is effected by the gradual bleaching of its long hairs, and not by their replacement.

The difference between the body and the tail in their fur changes is a most remarkable and unexpected fact, to which at present I know no parallel instance. It will, however, very

* It may be noted that a special name for the British Squirrel, based on this peculiarity, has been in existence for more than a century:—"Common Squirrel, beautiful variety with milk-white tail."—Pennant, *Hist. Quadr.* ii. p. 406, 1781. *Sciurus vulgaris leucurus*, Kerr, *Linn. An. K.* p. 256, 1792.

probably be found to occur in many other species, when equally detailed observations have been made on them.

To justify the above conclusions, the different parts of the body may best be considered separately, taking the most obvious first.

I. *Tail-hairs.*

In August and September there become visible on the tail, among and gradually displacing the ragged white hairs of the summer, a handsome set of long shining blackish-brown hairs, which have hardly attained their full length before they begin to lose their colour, fading gradually during the winter through various shades of brown, pale brown, dull yellowish brown, straw colour, and finally, by June, July, and August of the following year, becoming nearly or quite white.* Then in their turn they are displaced, in September, by the new blackish hairs of the succeeding coat.†

Although, as just stated, the long hairs only become visible on the shedding of the old ones in August and September, their extreme tips protrude from the skin much earlier, and may be occasionally found in July skins, forming a short blackish covering to the tail among the roots of the long white hairs of the previous year's coat.

In an intermediate condition, well represented by a skin dated Aug. 19th, the tail may be more or less piebald, with the middle third of its breadth black, fringed on each side with the ragged white hairs of the old coat.

† It will be observed that *red* is a colour not mentioned in the description of the tail, and it is a curious fact that as yet I have not seen a single adult red-tailed British Squirrel. Should any readers of 'The Zoologist' come across such specimens, which most people vaguely suppose to be in a majority, they are requested to send them in the flesh to the writer at the Natural History Museum. Mere reports of red-tailed Squirrels seen wild are of little use, as, owing to the deceptive appearance presented by the red flanks and constantly moving tail, many specimens seem in life to have red tails which after death prove to have nothing of the sort. Young specimens, however, often have red tails, and this would tend to show that, like their continental relatives, the British Squirrels were formerly red-tailed when adult.

* A similar case of colour bleaching during life was described by me in a Nyasa Squirrel (*Sciurus mutabilis*) in 1894 (P. Z. S. 1894, p. 140), not knowing how much nearer home the same phenomenon might be observed.

The bleaching of the colour of the tail takes place most rapidly at its tip, gradually proceeding bodywards. Naturally there is some variation between different individuals as to the degree of bleaching attained at any date, so that in the winter months some Squirrels may be seen with brown and others with whitish tails. But as every individual passes through the same series of changes, only varying the date, there is really far less true variability—that is, difference between one individual and another—than a casual observer would at first suppose.

Concurrently with their bleaching the hairs wear down or fall out, so that the brush gradually becomes thinner and poorer, until the new one attains its full length in September. The growth of the latter takes place from the body towards the tip, the terminal hairs being the last of the white summer coat to be superseded.

It will be noted that the bleaching takes place mainly in the winter and early spring, so that it cannot be assigned to the special action of the summer sun.

This description refers entirely to the long hairs of the tail, which are the only ones that affect its general colour, and which stay in place a full year before they are changed in correspondence with (though rather before) the autumn moult of the body-fur. Whether there is any regular growth of tail-hairs in correspondence with the development of the summer body-coat is doubtful. One skin, obtained on May 24th, seems to show that some short blackish hairs appear on the tail between the long ones just at the date of the spring body-moult, which hairs are not to be found a little later in full summer skins, and have perhaps been moulted as soon as developed. Further observation is needed on this point.

II. *Ear-tufts.*

The hairs of the ear-tufts follow very much in their changes those of the tail. The terminal hairs of the ear-tip, belonging, like the brush-hairs, to the autumn coat, lengthen and become noticeable in September, attaining their maximum about January. Like the tail-hairs, they steadily bleach all the time from their original dark brown colour, and get white, thin, and poor in May and June. In most specimens they have altogether disappeared by July, although in rare cases a few

straggling white hairs may remain in position even up to the time that in September the tips of the new tufts begin to show themselves. When tufts of fair size do persist into August, their pure white colour renders them very striking objects.

Such hairs as may grow on the ear-tips at the time of the spring body-moult only become visible on the fall of the long tufts, and always remain quite short. The short hairs may in fact be compared to the aborted summer tail-covering already referred to, just as the long tufts of the autumn suit correspond to the autumn brush-hairs of the tail.

III. *Head, Body, and Limbs.*

The head, body, and limbs, unlike the tail, instead of having the summer one of the two coats practically aborted, have two new and equally developed coats each year, the summer one rich rufous, and coarse in texture; the winter one greyish brown, long, soft, and warm.

So far as Mr. Mansel-Pleydell's specimens show, the whole spring change of coat is begun and completed during the six weeks following the 20th of April. Up to about this date no trace of the fresh coat can be seen, but then it begins to appear, first on the muzzle and tips of the fingers and toes. Spreading backwards from the first-named part, and bodywards from the others, the new coat gradually supersedes the old one throughout, the face, hands, and feet being the first to change, then the neck, flank, and sides, while the old fur remains last on the rump and backs of the thighs. A patch on the occiput, however, is often later than the back in changing; while, on the other hand, a small patch on the centre of the rump sometimes changes first of all. By May 24th the whole change may be finished, as is the case with one specimen; while in another, killed the same day, only the anterior half of the back has changed.

As to colour: the new coat, when first up, say in June, is at its richest and best—bright rufous on the face, withers, flanks, and limbs, but nearly always duller and greyer or brownish on the crown between the ears, and on the posterior back. There is, however, some individual variation in the relative proportions of the grey and rufous.

From a fully changed end of May specimen to one killed in September, no appreciable difference in the colour, quality, or

length of the fur can be perceived; but towards the end of October another complete change of fur takes place, but one which, owing to the very slight change of colour it involves, is most difficult to observe, and has been hitherto quite overlooked. The difficulty is also increased by the fur changing more uniformly all over the body, and not in the prominent patchy way characteristic of the spring moult. The exact course of the change, both for this reason and for want of specimens killed just at the right moments, cannot be described in detail.

The new coat, when fully up, is long and soft, and composed of hairs which are inconspicuously annulated with brown and dull white; so that, though the general tone is, in Dorsetshire at least, not so very unlike that of the summer coat, its constituents are essentially distinct, for the rufous summer hairs are quite unannulated.

This difference in the constitution of the colours involves a further interesting change, for while *red* (whether of summer coat or of continental Squirrels' tail and ear-tufts) is not apparently susceptible to bleaching, *blackish brown* (e. g. English Squirrels' tails and ear-tufts) is strikingly so; and we accordingly find that the winter coat, with its blackish brown basis, bleaches steadily throughout the winter, like the tail. As a result, in February and March skins, the whole animal, from nose to tip of tail (but not the *rufous* limbs), is bleached to one uniform dull yellowish or drab tint.

Then in May, while the tail goes on bleaching in the same direction to white, the corresponding change in the body-coat is arrested by the coat itself being abruptly changed for the new suit of rufous.

IV. *Palms and Soles.*

The palms of the hands and soles of the feet are in summer entirely naked, but about November they gradually become clothed between and behind the pads with short woolly hairs, which fall off again about April. The palms are on the whole much less thickly clothed than the soles, and in some specimens remain almost or quite unclothed through the winter.

The following calendar of changes will show in what state Squirrels may be expected to be found at any given time; but it cannot be too much insisted on that the whole of these

remarks are based on Squirrels from Dorsetshire, one of the mildest of English counties, and that no others have been examined for fear of complicating the results. Variations in the time of the changes may be expected to occur at other places, especially in the north, and there will also no doubt be some local variation in the colours themselves :—

January and February.—Ear-tufts long, brown. Body-coat long, soft, greyish rufous-brown. Limbs rufous. Tail grey-brown, like back, but bleaching, especially terminally, to whitish. Palms and soles hairy.

March and April.—As above, but the colour of ear-tufts, back, and tail more bleached.

May.—Bleached and ragged pelage of body and limbs changed for summer suit of rich rufous. Ear-tufts and tail continuing to bleach and become poorer.

June and July.—Summer dress: rufous head, body, and limbs; white thinly-haired tail; ear-tufts disappearing, white so long as they remain; palms and soles naked.

August and September.—New ear-tufts and tail-hairs, both blackish brown, appearing. Body-coat still rufous, but less rich in tone.

October.—Body-coat changed for winter suit. Ear-tufts lengthening. Tail commencing to bleach.

November and December.—Winter dress: brownish grey on head and body, limbs more or less rufous; fur long, thick, and soft, inconspicuously annulated. Ear-tufts long, brown. Tail blackish or brownish, scarcely beginning to bleach. Palms and soles hairy.

In conclusion, I may remark that the above wonderful changes in the British Squirrel are, both in effect and complexity, quite unparalleled throughout the mammals of the world, so far as I am aware. Had any such peculiarity occurred elsewhere it must have been noticed before, but being at our very doors no one has till now commenced any serious investigation; and the subject has been dismissed with a passing remark on the "variability" of our Common Squirrel.

ORNITHOLOGICAL NOTES FROM RYE.

BY BOYD ALEXANDER.

WITH the end of September migration practically came to an end. While the movement lasted the coast was filled with bird-voices familiar to the shore. At low water parties of Gulls, including both the Herring and Black-headed species, immature and adult, appeared on the sands, while, amongst all this predominant white plumage, the black backs of a few *Larus marinus* often riveted the eye; but the majority of the last-named kept out at sea, following in the wake of trawlers in expectation of seizing the small fry that were thrown overboard. And when the weather became warm and fine, and bits of rolling cloud threw bright nigrescent shadows upon the sands, and the sea was full of one limitless drowsy tone, the Gulls lined the water's edge in clustering hundreds, choosing for their large webbed feet the portion of the sand that was smooth and not freckled by many stones, in preference to that which it had become the mould of tiny ebbing waves. On a spot like this they stood for a long while motionless, looking all dazzling white—things of rare marble in the tide's ever-changing and varied gallery. Further inland on the sands the rattling cry of the Turnstone, the plaintive notes of the Ringed Plover, and the tremulous whistle of the Dunlin would fitfully strike the ear.

Again, further inland still, beyond the sea-wall, the Lydd Beach became for a brief time the resting station of many Curlews, whose cries were more persistent and noisy than those of all the other shore birds put together. The thick and dark nights, consequent on bad weather experienced throughout September, rendered observation of the migration flights southward of many species impossible, and it was only by the occurrence of stragglers that any idea of the progress and order of these flights could be arrived at.

I take the following notes, which may be of interest, from my diary during my stay this autumn on the Rye coast:—

Aug. 24th. Strong south-westerly wind. Three big flocks of Curlew, each numbering on an average 200 birds, have come to the Lydd Beach. They appeared from the north-eastward.

Aug. 25th. Light westerly wind, showery. The flocks of

Dunlin on the shore are considerably augmented. They frequent spots where the sand is of a muddy nature, retiring at high tide to the stretches of sea-pink near the harbour, and to brackish pools. Many of these Dunlin are still far from completing their moult. Large numbers of Linnets invade the poor pieces of land near the coast. The majority are young birds in a moulting condition, the breasts of many being marked with the chocolate colour of first youth.

Aug. 26th. Light westerly wind, fine. Three immature Green-shanks were obtained at the harbour to-day, and a pair of Wood Sandpipers (*Totanus glareola*), along one of the dykes. The occurrence of the last-named species, locally known as "Autumn Snipe," is very irregular. The course of their migration seems hardly to touch this part of the coast. During the autumn one or two stragglers are the most that appear along the dykes. As opposed to "Autumn Snipe," the Common Snipe is known here as "Full Snipe."

Aug. 27th. North-westerly wind, fair. At eight o'clock this morning two fine male Ruffs were shot on a small reed-girt pond. When first seen they were making in a south-westerly direction. Two large flocks of Sanderlings (*Calidris arenaria*) have arrived on the shore. Next to the Dunlins they are by far the most numerous of the shore birds here. Like the Purple Sandpiper, these birds choose rather as a time for feeding when the tide is coming in. At such times they are to be seen racing along the edge of the incoming water, making it often very hard to gain on them and difficult to distinguish them from the fragments of the swift-sliding surf through which they pursue their way. For the first time this autumn I flushed to-day from a small reed-bed three Green Sandpipers (*Totanus ochropus*). These birds on migration fly at a considerable altitude, pitching almost vertically down to their feeding-grounds, when towards sunset they become very noisy with their sharp "wheet-wheet, wheet-wheet" cries. Sheltered ditches whose banks are bordered with mud and rushes are now favourite resorts. The same kind of spots are also visited by the Wood Sandpiper. The reed-beds are full of young Reed and Sedge Warblers, as well as Reed Buntings, the majority of the latter adults, the males being in a state of losing the black on head and throat. This motley crew flitted low in front of me, the Reed Buntings making with their slender long-shaped bodies

tiny crosses of the waving reed-stems, while in higher strata coursed countless numbers of young Swallows. Single Whinchats, invariably young females, are in the pasture fields near the coast. In the Cranbrook neighbourhood this species is found on migration in autumn, but even then very irregular in its appearances. On Aug. 20th a small flock of six birds (the first since 1893) appeared in a fallow field near the town. They caught their prey after the manner of Flycatchers, being very busy just at dusk in obtaining it, retiring for the night to a neighbouring turnip-field. All of these birds were young males, a fact which I have found to be the case on several former occasions. The rule with this species on migration seems, therefore, to be that the males go together, while the females keep separate. An extraordinary influx of Yellow Wagtails took place this evening: the bean and stubble fields were literally alive with them, while many perched, after the manner of Swallows, on the telegraph wire near the seawall. Just now the males of this species are very quarrelsome, and may constantly be seen fighting among themselves.

Aug. 27th. Light north-westerly wind. The Yellow Wagtails are edging eastward. Towards evening large numbers had concentrated around Dungeness, prior no doubt to crossing the Channel.

From Aug. 28th to Sept. 25th flocks of Starlings peopled the vicinity of the coast. I watched them daily increasing till they assumed immense proportions. From early morning to evening, especially when the weather was bad and a strong south-west wind blowing, wonderful and fascinating flights were executed by these flocks, which had the appearance of mottled aërial monsters swimming high above the ground in devious courses through the air—now close—now far distant, seeming mere bits of driven smoke toned with constant changing lights like those on wind-waved ripples, but always edging to the northward. These flights form an interesting study. I have found that they are invariably resorted to when on migration and on nearing the coast, when the country generally presents an open and unenclosed view for many miles. They are undertaken to provide beacons of safety to the numerous stragglers that must necessarily lose their way during bad weather. On the other hand, where the country is close and woody, the voice rather than flight is far more resorted to as a means of attraction. On an autumn evening, when a flock betakes

itself to roost in some well-conditioned plantation, or before starting on migration, a few leading birds will station themselves on a lofty tree-top and there commence singing at the top of their voices, starting with long-drawn whistles. Every minute stragglers keep dropping in, and then, when the flocks become formed, a general advance is executed.

Aug. 29th. Light westerly wind. A large number of Black-headed Gulls (*Larus ridibundus*) of the year came to the sands early this morning. No doubt these birds belong to the colony at the Hoppen Petts, near Lydd. I am told that these pieces of water are deserted by them every autumn with marked regularity. There is a saying down here that the "Crocker," as this Gull is locally called, leaves the Hoppen Petts on Romney Fair-day, which falls on August 21st.

Aug. 21st. Several Common Sandpipers (*Tringa hypoleucus*) appeared to-day, and a Black-tailed Godwit (*Limosa egocephala*), immature male, was shot.

Sept. 2nd. A Broad-billed Sandpiper (*Tringa platyrhyncha*), immature male, was obtained at the harbour out of a flock of Dunlin. This specimen, together with the female of this species obtained at the same place, and under similar circumstances, last December (Zool. 1895, p. 449), brings the recorded Sussex-killed specimens up to five.

Sept. 6th. Young Swallows and Martins are in great strength, skimming to and fro over brackish pieces of water, or basking on the sands at low tide. Towards evening these large bands had moved eastward along the coast and were within two miles of Dungeness Point. Lapwings have put in an appearance, for the first time since the breeding season, invading the fallow fields in large numbers. The Lapwing is now very silent, and it is only at night, when disturbed, that he gives vent to a few random crack-toned notes, bearing a striking contrast to the clear ones uttered during the breeding season, when he seems plainly to be telling the intruder within his nesting circle to "gō tō, gō tō, gō tō." Another Broad-billed Sandpiper (*Tringa platyrhyncha*), immature female, was shot at Littlestone out of a flock of Dunlin. This, I believe, is the first instance on record of this species having been obtained in Kent.

Sept. 7th. A Little Stint (*Tringa minuta*), female, from a flock of Dunlin. Not very often met with here, and still less during

the passage northward in spring. I have a pair in perfect summer plumage shot at the harbour in April, 1890. A few Grey Plovers (*Squatarola helvetica*) along the shore where the sand is muddy. This morning my dog caught a Moorhen amongst some rushes of a pond. The bird was unable to fly, both wings being in a complete state of moult. A similar instance in the case of the Landrail was cited at a recent meeting of the British Ornithologists' Club.

Sept. 8th. Light south-westerly wind, fine. Several young Knots have come.

Sept. 9th. Whimbrel (*Numenius phaeopus*) on the Lydd Beach for the first time. Numbers of Meadow Pipits (*Anthus pratensis*) are invading the dykes and shallow pieces of water. Golden Plover, in excellent condition, have also arrived. A Wryneck, adult male, on shore, and a few Lesser Terns beating round the mouth of the harbour. A small flock of Redstarts, two of which sang fitfully throughout the day. Their songs were of a short duration, and not unlike the commencement of the Robin's autumn song.

Sept. 10th. Wind south-westerly; very rainy. The large flocks of Lapwings already about have become greatly increased. A small flock of Kentish Plovers (*Ægialitis cantiana*) on the beach bank near the harbour. I have never found the Kentish Plover amongst the flocks of Dunlin unless numbers of Ringed Plovers are present; otherwise it keeps by itself. During autumn this bird exhibits none of that restlessness and timidity so marked in these other two species. It will sit dozingly for a long period on a spot where the beach has silted up, and there wait patiently for the tide to reveal new-born things; not so the greedy and restless Dunlin, who hurries off from his station amongst the sea-pink ere the tide has had time to turn, all eager to gather the first fruits. On the shore-line, where food is plentiful and easily obtained, the Dunlins are wide-awake and restless in the extreme; but when a spring-tide covers the sand they resort to brackish pools possessing scanty food, and here the preoccupation they display in searching for it renders a close approach easy; and interesting it is to watch their quaint movements, now sidling along almost knee-deep in the water, then stopping for a moment motionless, with humped backs, like so many little aged creatures, then arching their wings to the full extent above their bodies, as

if practising for a ready flight, then resuming their labours in search of food, totally immersing at times their heads in the still water.

Sept. 11th. Stormy; south-westerly wind. A single male Blackcap Warbler secured. The plumage of this specimen struck me as being somewhat different to the plumage of those I have taken in summer. The mantle and shoulders possessed a distinctly olive-green tinge, while the central feathers of the belly were of a rich cream colour. Numbers of young Swallows, and with them a few Sand Martins.

Sept. 12th. Cloudy; south-westerly wind. Large numbers of Sand Martins, both old and young. Twenty Godwits were seen to-day in company with Curlews.

Sept. 15th. Strong south-westerly wind. The majority of Swallows and Sand Martins have left.

Sept. 20th. A pair of Black-tailed Godwits. The night clear and beautiful, with full harvest-moon. Between 9 p.m. and midnight a large flock of Starlings, three small companies of Green Sandpipers, two considerable flocks of Golden Plover, and a small one of the Grey Plover, passed over. From the sound of their voices a south-westerly direction was taken.

Sept. 21st. Strong south-westerly wind and rainy. A single Curlew Sandpiper (*Tringa subarquata*) (female) was obtained to-day, while two Grey Phalaropes (*Phalaropus lobatus*) were seen on the midrips.* Small parties of Redshanks (*Totanus calidris*) arrived. They included both adults and immature birds; moult almost completed. I obtained to-day a young male of the small race of Dunlin, and also, out of the same flock, one of the larger race. The former had the following measurements:—Length 7 in., culmen 1.1 in., wing 4.4 in., weight $1\frac{1}{4}$ oz. The latter bird was an adult with winter dress almost assumed. Length 8.75 in., culmen 1.45 in., wing 4.5 in., weight 2 oz. The plumage of the former altogether darker than the ordinary form of Dunlin, while the markings on breast and flanks brighter and more condensed. I have observed that this small race is much later than the majority in arriving on the coast during autumn, and fonder of obtaining food near brackish water and on oozy flats than on the shore-line. Among the large flocks of Dunlin now on the sands,

* A name given to shallow pieces of water on the Lydd Beach.

I frequently come across birds which have a great amount of rufous tinge in their plumage, especially on the head and breast, quite distinct, in my opinion, from that assumed by the bird of the year; and I have met with the former still more frequently throughout the summer. These, no doubt, are one-year-old birds that will assume next spring the nuptial dress. Therefore, strictly speaking, the Dunlin passes through three well-defined stages in variation of plumage before maturity is reached—that put on by the bird of the year, which has little or no rufous tinge; that having the rufous tinge in a marked degree, which comes after the first spring; and, lastly, the nuptial dress itself, when this rufous colouring is to a great extent lost.

Sept. 22nd. Very stormy; a stiff gale from the south-west.

Sept. 23rd. Strong westerly wind. Two more Curlew Sandpipers (males). Several Green Sandpipers about. The majority of Yellow Wagtails have disappeared.

Sept. 24th. Strong south-westerly wind. A pair of Wood Sandpipers along one of the dykes, while a Grey Wagtail was observed for the first time to-day. A number of Kingfishers close to the shore. Four Black Terns (immature) appeared. They kept hawking over a grass-field all day long. These birds are seldom met with on this part of the coast.

Sept. 25th. Very rainy; a strong south-westerly gale. The Black Terns are still about. Another Curlew Sandpiper (female). This and the preceding specimens were all obtained on a grass-plot where chickens feed. A number of Kestrels are on the Lydd Beach. A pair of Grey Phalaropes (immature), secured; the female the smallest I have yet come across. It weighed exactly $1\frac{1}{8}$ oz., the male $1\frac{1}{4}$ oz.

Sept. 26th. Squally. A Grey Phalarope on the midrips. Another was picked up on the sands with one wing torn off. It had evidently flown against the telegraph wire along the sea-wall. A further influx of young Swallows and Sand Martins has taken place. The Swallows seemed tired; many squatted motionless on the grass, now and again hovering over it, after the manner of Kestrels. The Sand Martins were by far the most active. Their flight appeared steady and strong. During the last two weeks Sky Larks have sung at fitful intervals. Their songs now rarely exceed a minute. This morning, however, a Lark, full of exuberant spirits, sang for a period of three and half minutes, in

spite of a chilly south-west wind. Small flocks of Wigeon have begun to steal in to the shallow brackish sheets of water near the shore on soft sibilant pinions. With them have come small "bunches" of Teal, these birds making further inland to sheltered ponds, which have become asylums of the straight-jacketed reeds, and now likewise for them.

Sept. 27th. Strong south-westerly wind; rainy. A Grey Phalarope on the midrips.

Sept. 29th. Fine. A flock of Black-headed Gulls, chiefly adults, on the sands, and with them a few individuals of *Larus canus*, the latter species by no means common here. This community kept separate from the other "gull" companies, which have been greatly swelled of late by the immature *Larus marinus*. On a calm evening, after that large yellow everlasting flower—the sun—has drooped to rest, the Gulls, their supper finished, troop out to sea to seek for places where the lolling swell would rock them to sleep. In bad weather they go far inland for the night, and are on the wing again, flying seaward to the water's edge, ere dawn has come. As shadows of the morning dusk, they pass over the cold brown fields of plough, then high above the village of Lydd, asleep and watched over by her lamps, which become each moment less brilliant, their lights paling with the fog of morning. As grey shadows of dawn they pass over the sand-hills; then, shelving on to the watery sand, they yelp loudly with their hard-throated voices.

Oct. 4th. Very rainy; strong south-westerly wind. Another Phalarope on the midrips, and three Grey Plover on the sands. Five Lesser Terns in company with a flock of Dunlin.

Oct. 7th. Strong south-easterly wind and rainy. Large numbers of Pied Wagtails along the dykes. They are making eastward. Several adult Knots on the Lydd Beach.

Oct. 10th. A very handsome male Fire-crested Wren was shot to-day on a tall apple-tree in a garden near Lydd.

Oct. 12th. The main body of the late broods of House Martins appeared on the coast this morning. They attached themselves in parties to cottages and farm-buildings, in front of which they hovered and circled in a sluggish manner. Several were found perished on the window-sills, while not a few lacked tail-feathers, looking in this state, as they flitted to and fro, more like little bats than anything else. It would not have been

difficult to knock many over with a stick, so weary did they seem, barely possessing enough strength to fly up to the eaves, where they clung, to peer and search in vain for tiny mud-beaded houses wherein to rest, like those they had left only a few weeks back. At length they appeared to realize that the aspect of things had changed, for they took to the tiles, where they huddled together and remained motionless for a time. I pitied these little travellers from the bottom of my heart.

When September was passed, and October had come, migrants became scarce, and silence for the most part reigned throughout this sparsely stone-studded shore. In the neighbouring reed-beds it was now and again broken by a mischief-making wind that sowed discord amongst the waving reeds.

AN ORNITHOLOGICAL TOUR IN NORWAY.

BY O. V. APLIN, F.L.S.

A TOUR in Norway, made during the past summer and here described, extended casually over almost the entire length of a country nearly 1086 miles long, and lying between $57^{\circ} 57'$ and $71^{\circ} 12'$ N. latitude. I have therefore thought it desirable, at the risk of a little repetition, to divide the localities in which my observations were made and the birds seen therein into three sections, grouped respectively in Southern, Middle, and Arctic Norway.

I.—SOUTHERN NORWAY.

After a rough passage across the North Sea, with a painful "corkscrew" motion, we were in Christiansand early on the morning of May 31st, 1896. It was Sunday, and the steamer was detained until late in the afternoon, so we had a long walk ashore through wooded country to Ravnedal and Eg. Pied Flycatchers at once arrested our attention on landing. Several were singing gaily in the poplar and other trees in the gardens close to the quay. The tame Magpies, so remarkable in Norway, flying about the town and even perched on the principal buildings, presented a curious sight to a new-comer accustomed to frequent failures in stalking and slaying this shy and wary egg-stealer.

The next morning we reached Christiania, where, thanks to

the kindness of Professor Collett, I was able to spend a considerable time among the excellent and interesting collection of birds in the University Museum. On June 2nd we left for Hamar, on the shores of the Lake Mjösen, where we spent the next day. On the return journey we were in Christiania from June 30th to July 3rd. I treat the country covered so far as Southern Norway, and in these localities I noticed the following birds:—

Turdus merula.—At Christiansand.

T. pilaris.—A pair in the pine woods on the shores of Lake Mjösen were very noisy. One sat on a pine-top chacking as they do here in winter.

Saxicola œnanthe.—On the shores of Mjösen on June 3rd. On July 1st there was a brood of young just out of the nest on the shores of Maridvals Vand, near Christiania. I got very close to them; they had the head tinged with grey, wings and mantle warm dark buff, breast and under parts generally pale buff, darkest on breast and marked on this with dusky.

Pratincola rubetra.—Several at Hamar.

Ruticilla phœnicurus.—Common. Seen at Christiansand and Hamar. At Christiania it is a tame and conspicuous bird about the palace-grounds and public gardens. The young broods were out of the nest on our return, and were wonderfully tame. During a heavy shower I was taking shelter under a tree, when a young Redstart came hopping along to do the same; presently it confidently hopped up and took advantage of my umbrella.

Erithacus rubecula.—Not common, but seen at Christiansand and Christiania.

Sylvia cinerea.—At Hamar and Christiania; a few.

S. curruca.—One at Christiania on return journey, in song.

S. atricapilla.—Fairly common at Christiania; to be heard in the palace grounds.

S. hortensis.—Quite as common as the last-named at Christiania, and three noticed at Hamar.

Regulus cristatus.—Pine woods at Hamar.

Phylloscopus rufus.—At Christiansand. Several were in song near Christiania in the first days of July.

P. trochilus.—Very common at Christiansand, and some at Hamar. The distribution of this bird in Norway is rather curious. On July 1st only a few were noted (more Chiffchaffs)

at Christiania; but they might have been chiefly silent then, for they cease singing in England earlier than the Chiffchaff.

P. sibilatrix.—I heard distinctly the call-note of a male in thick woodland at Eg, near Christiansand, but could not see the bird. According to the list of Norwegian birds in Professor Collett's 'Bird Life in Arctic Norway,' the Wood Wren is only a rare breeder in Norway.

Hypolais icterina.—I hoped to have heard a good deal of the song of the Icterine Warbler, but partly perhaps on account of our limited stay on our way north, and the bad weather we encountered when coming south, I was disappointed. But I cannot think that it was as common as usual in Norway in 1896. At the end of June and in early July I made two long searches for it in suitable localities, and lost no opportunity of listening for it in the well-planted ornamental grounds in Christiania and Trondhjem. Professor Collett told me that it was to be heard in the shrubs at the back of the Museum, but that June 1st (when we were there) was full early for it; we could not hear it on our return, however. Nevertheless, I heard enough of the bird's song to show me that I was probably justified in surmising (Zool. 1896, p. 125) that the birds I found spending the breeding season in North Africa were less imbued with spirit and energy than those which go further north in spring. At Eg, on May 31st, two Icterine Warblers, fighting among some trees, attracted my attention by their loud angry twanging notes of "ty-ink," "ty-yink." One of them presently flew to some low trees and sang, and I wrote down the following note. It was still the same running harsh song that I knew last year, with a "ti-op ti-op ti-op" to start with sometimes. But certainly it was more vigorous, and the bird *did* give vent to some extraordinary and astonishing sounds; whistles, musical repetitions of an Owl's "kee-wak," and one sound well described by the Rev. C. Benson as Parrot-like. Yet, apart from this, I could not call it a fine song, and it had nothing of the Nightingale's song about it.

Parus major.—Feeding young in nest at Christiansand, May 31st. Very common about Christiania, in the town gardens and neighbourhood. Feeding brancher young in early July.

P. palustris.—Small brown examples seen at Christiansand were, I suppose, the typical species, which is included in the list of the birds of Norway. But a specimen so labelled in the

Museum at Christiania, with light brownish back and big black cap, was as big as *P. borealis*, the black cap of which was hardly any larger.

P. borealis.—At Hamar, and in pine woods (July) near Christiania; brownish birds, pale brown rather than grey backs.

Motacilla alba.—Very common; seen in all three localities. At Christiansand, on May 31st, one took food to a nest in a hole in a tiled roof. They were common and wonderfully tame in the public gardens at Christiania. Early in July numbers of young birds (which struck me as browner and more dingy and dusky than those I saw in Switzerland) were to be seen. They perched freely in trees. One evening I saw several fly into some big trees on the ramparts. A male was in song on July 2nd. I satisfied myself that the adult female, as a rule, has no black on the crown or occiput; in some cases there is a little on the latter part. But I propose to enlarge upon this subject, which I touched upon some years ago, in a future article, as I have been able to get together a good deal of information relating to it.

Anthus trivialis. In song at Christiansand.

Lanius collurio.—A male on the telegraph-wires on the outskirts of Christiania on July 1st.

Muscicapa atricapilla.—Singing gaily in the poplars and gardens of Christiansand; common, and in the country also. Common also at Christiania, in the public gardens, notably those of St. Hanshaughen. The bold, bright, and sweet song had usually the Coal Tit-like beginning, "if-he if-he if-he," but I noticed one bird which used only one syllable, "if if if," and followed it up with the usual "che le wah wah." In July Pied Flycatchers were feeding brancher young in these gardens. I examined these at very close quarters. They were of a brownish grey above, mottled; under parts dirty white, well marked with vermiculations; there was buffy white on the wing and outside of the tail. We saw several adults among the old stunted black and white birches along the shores of Lake Mjösen. The Pied Flycatcher has the same way of flirting its wings as the Spotted Flycatcher.

M. grisola.—Inhabited the hotel-yard at Christiania, where the only vegetation consisted of some plants in boxes, and was, I believe, breeding there. One morning I watched from a second-floor window a Flycatcher very busy tackling a medium-sized

bumble-bee on part of the roof below. For a minute or so the Flycatcher contented itself with giving the bee bites and dropping it; then it took the bee up and banged it against the leads, and finally, after knocking the life out of it, got the bee with some difficulty into its beak, and flew off with it to a higher part of the roof, where doubtless it had its nest. The same day (July 2nd) Flycatchers were feeding brancher young in the botanic garden.

Hirundo rustica.—Certainly not abundant. Noticed at Hamar, but there were a few only about Christiania in July.

Chelidon urbica.—Seen over the Svart-tjern at Ravnedal, near Christiansand, on May 31st. Some nests were built under the eaves of wooden houses on the outskirts of Christiania.

Cotile riparia.—Breeding in sand-pit at Maridvals Vand, Christiania.

Ligurinus chloris.—Only twice seen in Norway, at Christiania. One bird, in a row of trees near the ramparts, had a remarkably fine song, especially the twittering notes, which were quite rich.

Passer domesticus.—Very abundant in Christiania. I expect these birds benefit considerably by the sheaves of corn put out on poles by the people at Christmas.

P. montanus.—I saw two or three about some big trees in the botanic garden at Christiania.

Fringilla cœlebs.—Common birds, especially at Christiansand, where they were very tame, and gave good opportunities of seeing their bright rich colours as they picked insects from the pine-branches. The song seemed slightly different, although the difference is not easy to describe.

Linota cannabina.—A few by the shores of the lake at Hamar.

Emberiza citrinella.—Common. Near Christiansand I noticed them near the edge of, but in, thin deciduous wood, where a female was already carrying food on May 31st.

E. hortulana.—The evening we arrived at Hamar we went for a walk along the shores of Lake Mjösen. In some places the shore was lined with deciduous trees, noticeably a shiny-leaved, white-barked poplar, rowans, and an abundance of bird-cherry just then in full blossom. At other points the pine woods come down to the lake edge. We were collecting plants on a little promontory running out into the lake, and had just renewed acquaintance with the alpine globe-flower, when I caught the song of a bird which was new to me, though I guessed at once

what the singer was. Two birds were singing from a group of pines and other trees on the backbone of the promontory, and it was not difficult to localize their position roughly. But the difficulty of exactly localizing a monotonous and more or less highly pitched sound is notorious. My wife took one bird in hand and I the other, but so closely did they sit that I should think for five minutes or more I could not see mine. At last he left his perch, apparently from the very spot I had been looking at, and flew down into a weedy stubble not yet ploughed. I flushed him, and he went back to his old perch; and then in a few minutes I made out a male Ortolan, his chestnut under-parts conspicuous in the clear light. Meanwhile my wife had found the other. They were both perched on a pine branchlet near the top of the tree, and were quite exposed; and it seemed surprising that they were not seen at once. But their habit of sitting quite still is their protection. The next day we saw a good many, and they are evidently quite common in that district, though I saw none anywhere else in Norway. The song, usually delivered from a bough near the top of a tree, but sometimes from the top of one of the tall upright fence-posts, is sweet, leisurely, and mellow. It consists of about four notes, "che che che che" (sweet and high), and then a soft, low "twoh." Sometimes, however, it is varied thus: "Twee twee twee" (low), "chi chi" (high), and then the soft "twoh." I have noticed that in different individual Yellow Buntings their song is varied in much the same way, *i. e.* some birds sing the first part high and the second low, and others *vice versa*. But, so far as I have noticed, the individual Yellow Buntings are consistent, *i. e.* one bird sings in one way only, whereas one of the Ortolan I listened to sang both variations. Each time the Ortolan sings its strain it lifts its head up. The Ortolan is a very sluggish bird, and wherever it may choose its perch, there it will sit and sing its song over and over again; if disturbed it will often return to the exact spot. The song is thoroughly characteristic of the bird—sleepy, soothing, and rather melancholy; but it is a sweet song, and the most melodious Bunting's song I have heard, save that of the Saharan Bunting.

Sturnus vulgaris.—At Christiansand. Fairly common, but not so noticeable as in places further north.

Pica rustica.—Absurdly tame. At Christiansand they were

flying about the town, and settling on the principal buildings—fine stone houses erected since the fire. In the gardens of St. Hanshaughen, Christiania, they hopped and walked about as tame as Sparrows. Near Hamar they were nesting in low trees in the gardens and little yards round the farmhouses and cottages.

Corvus monedula.—At Hamar.

C. cornix.—Common, and generally very tame. Commonly seen about ploughed ground, sometimes several together. At Hamar I noticed quite a number in one field. Near Christiania, in July, I got close to three birds which were insecting among the rows of potatoes.

C. frugilegus.—I saw one among a lot of Grey Crows at Hamar. In Prof. Collett's list it is stated that the Rook breeds only in limited numbers in Norway.

Alauda arvensis.—Seen and heard at Hamar, where there is a large amount of arable land.

Cypselus apus.—At Christiansand, and many at Hamar. At Christiania they were screaming round the palace in a blue sky almost fit for Italy, though not quite deep enough in colour.

Cuculus canorus.—Christiansand, May 31st, and at Hamar.

Crex pratensis.—Two heard at Christiansand, May 31st, and one at Hamar.

Totanus hypoleucus.—Two or three along the shores of Lake Mjösen.

Larus canus and *L. argentatus*.—About the landing-stage at Christiansand.

In the University Museum at Christiania I was especially interested in Norwegian examples of *Turdus atrigularis* and *T. fuscatus* (three), and in examples, in nest-dress, of *Cyanecula suecica*, *Otocorys alpestris*, and *Phylloscopus borealis*, descriptions of which one is glad of the opportunity of taking down. The young Shore Larks were so curious that I reproduce my note of their colours: Very dark (nearly black) on the mantle, speckled with white and buff. A band across the breast marked with dusky, leaving a whitish collar from the sides of the neck round to the front.

II.—MIDDLE NORWAY.

On the morning of the 3rd we left by train for Tönset, in Osterdalen. The railway ascends the valley of the Glommen, and passes through some fine forest scenery. I noticed a wood of by

far the finest birch trees I have ever seen—magnificent tall, straight silver trunks. Tönset, some 220 kilometres from Hamar, was reached at midnight, when it was quite light enough to see the place, and we took up our quarters in a sufficiently comfortable, though rather primitive little hotel, built in the usual style of roughly squared logs. Tönset is 1617 feet above the sea, and at that date the birch trees, except in sheltered spots, were bare, though the leaves expanded rapidly during the next few days. The banks and islets of the Glommen, clothed with birch and willows, were partly flooded, as the second or summer flood was coming down. Tönset is situated at the confluence of the Tönna with the Glommen, and there is a large extent of meadow land in the valley. The sides of the valley are clothed at first with pine-woods, with hummocky ground underfoot, covered with sphagnum, yellow moss, reindeer-moss and other lichens. These woods were at that date almost devoid of birds, save for a few Pied Flycatchers, Tree Pipits, Redstarts, Grey Crows, and Willow Wrens. Higher up, on both sides of the valley, are extensive fir forests; the mountains rise sufficiently high for you to pass beyond the coniferous zone into that of the birch, and out on to the bare fjeld, at that time still heavily blazed with snow-drifts. The fir forests are as a rule far from rich in bird-life, except when you chance upon a colony of breeding Fieldfares, round which the other woodland species always seem to gather. We pushed through the forest on the one side to the fjeld rising nearly 3000 feet on the S.W. bank of the Tönna, and to the Tronfjeld, somewhat higher, on the east bank of the Glommen. The highest peak of the Tronfjeld (5700 feet), a fine rounded pyramid, appeared to us almost entirely snow-clad. There is a fair amount of cultivated ground close to Tönset, chiefly on a low rounded hill lying in the apex formed by the two rivers.

The fir forests are very lovely and fascinating. For they are wild forests, not cared for like the Swiss forests, but ill used, dotted with new and ancient moss-grown tree stumps, and old felled trunks; with trees of all ages and little clearings. The ground, too, is brilliant underfoot with a bright yellow moss, which makes the forest gleam in a curious way. Many of the trees are festooned with streamers of black hairy lichen, perhaps the beard lichen (*Usnea barbata*).

Unfortunately the weather was very wet during our stay here,

and the dull weather and heavy atmosphere had the usual depressing effect on the birds, many of which escaped notice on this account, I have no doubt.

At midnight on the 9th we left for Trondhjem, about 200 kilometres due north, where we stayed two days. The scenery on the way was remarkably fine, especially on the watershed between the Glommen and the Gula, where the line reached a height of upwards of 2900 feet.

Although its position on the warm west coast has given Trondhjem a much milder climate and a far more luxuriant vegetation than Tönset, while its lower situation has, despite its more northern position, given it a slightly different avifauna, I have thought it possible to include the two localities under the same heading. We returned to Trondhjem from Arctic Norway on June 26th, and spent three or four days there. After only fifteen days in the north, it was pleasant to be once more among trees (other than birch) and flowers. Summer was then in its beauty and full luxuriance, like the English summer in mid-June. But instead of the leisurely succession of leafing and flowering which we enjoy, here in the north the time is so short that many of the things that go to make up our procession are crowded in together. This is hardly so remarkable in the very far north, where, although the time is shorter still, there is so much less to happen. At Trondhjem when we returned, while the lilacs in full bloom, the laburnums and the waning rowans reminded us of our mid-May, there were peonies to take us further, and the deep rich crops of flowery meadow hay—some already cut and hanging on the fences erected for it—to tell us it was the end of June.

Turdus musicus.—We met with three or four in the fir forests, at a considerable elevation, singing. Here, as in Switzerland, the Song Thrush is a shy and retiring forest bird.

T. iliacus.—In these forests we became acquainted with the full song of the Redwing. It starts gaily with about five sweet full notes in a descending scale (but not always so, for sometimes the scale is upwards), then goes off into a low running chattering song, after the manner of a Swallow, and not unlike that bird's song; but there are some notes resembling those of a Linnet. This chattering song can only be heard at close quarters, and in nine cases out of ten—perhaps nineteen out of twenty—the run of whistles alone is heard. The Redwing is an extremely shy and

wary bird, and very quiet in its ways in the breeding season, except when it has young hatched.

T. pilaris.—Occasional pairs were to be found in the fir forests, and we came across one fairly large colony some way up the hill-side, where there were a good many young firs, while a clearing close at hand and a rill of water afforded a convenient feeding ground. We came upon the colony in the evening of June 4th, and found the birds very noisy, some of them fairly screaming. They were still building, and we saw a pair outside the forest picking up mud. Two or three nests, possibly old ones, were about fifteen feet from the ground in slender firs. A completed nest, in a young fir not quite six feet from the ground, was very bulky, with thick walls of dead grass and dirty bog-moss, with a lining of mud, still damp, and a very thick inner lining of dead grass. Another half-finished nest, of the same outer materials, was not more than five feet from the ground in the top of a broken birch. The song of the Fieldfare is very rarely heard, at this season, at all events; I only heard it two or three times, and it then consisted of two or three whistling notes, poor in quality, followed by some low, harsh, squeaky, running notes. Near Trondhjem we saw an occasional pair. On the way to the Lerfossen falls a pair attacked and drove off a Grey Crow with angry cries, striking at it again and again. I sometimes saw a pair of Fieldfares feeding out in the little pastures outside the woods. Hewitson wrote:—"Our attention was attracted by the harsh cries of several birds, which we at first supposed must be Shrikes, but which afterwards proved to be Fieldfares, anxiously watching over their newly established dwellings." But I do not think that anybody else who knew the Fieldfare in winter would make such a mistake for a moment. It was this remark of Hewitson's which inclined me to doubt the correctness of his estimation of the song of the Icterine Warbler.

T. torquatus.—At a height of perhaps 600 feet above Tönset, where the firs had given place to the birch, we saw a pair and an odd male. This bird was singing from the top of an outlying fir. The song was a clear, sweet, wild whistle:—"way way way way" or "way-tay way-tay way-tay," followed by two or three stifled, confused, grating notes.

Saxicola œnanthe.—Several at Tönset. Some were pairing.

Pratincola rubetra.—A good many at Tönset and Trondhjem.

Ruticilla phœnicurus.—A good many at Tönset, about the village and lower pine woods. On the 6th, in a bleak wood of low leafless birch trees, on the edge of the fjeld, and at least 2500 feet above sea-level, I found the Redstart; patches of snow still lay on the ground near at hand. At Trondhjem the Redstart was a common bird in gardens about the town.

Erithacus rubecula.—I saw only one, in the luxuriant valley of the Nid, between the two falls, Lille Lerfos and Store Lerfos.

Cyanecula suecica.—Met with only on the Tronfjeld. On June 6th, as we came out of the last of the wood of stunted birches, on exceedingly steep ground, very wet from snow-melt, and emerged on to the fjeld, we passed a great drift of melting snow. All around was bare ground sweeping up to the rounded tops, and undulating a little. The ground was clothed with hummocks of yellow moss, grey lichen, and reindeer moss (*Cladonia*), with here and there some crowberry (*Empetrum nigrum*) and white-flowered cloudberry (*Rubus chamæmorus*), and the thin wiry stems of the creeping arctic birch (*Betula nana*), its rounded leaves just bursting from the buds. Grey rocks and bits of white quartz cropped up at intervals. But in a little hollow, holding yet some snow, there was some growth of dwarf willow, and a few stunted birches (both leafless, but their buds bursting) were dotted about among a thick growth of creeping birch. The clouds came flying along, and wrapped us in misty sheets; the wind was cold and searching, and snow patches gleamed coldly. In this dreary spot the Bluethroat chose to pass the summer. We saw this day a pair and a single male. The bright pure notes of the Bluethroat's song drew my attention to a bird sitting in one of the naked weird black-and-white skeleton birches. I had long looked forward to the pleasure of hearing the song, and I was not disappointed with it; it is wonderful. Well may the Laps call the bird "Saddan Kiellinen," or hundred tongues ('Ten Years in Sweden'). The song is very sweet, and its only fault is that it is a little thin and shrill (the same thing may often be noticed in the Robin's notes). Except that it lacks the fulness and richness of tone, it approaches the Nightingale's very closely in some of its parts. The Bluethroat sings too in the fashion of a Nightingale and of a Thrush; that is to say, it repeats a phrase at a time, and gives you time to enjoy each, sometimes repeating it once or twice, and then going off into

another. In the song there is a Nightingale-like high long note repeated several times in the same pitch; then the song goes off into a little "jug." Then we have "wee wee wee wee wee wee," ascending, or "wirreee wirreee wirreee wirreee," ascending also. Then a Thrush-like "wee-choy wee-choy wee-choy" (high and low), and so on with variations; and every now and then the little metallic "ting ting ting ting," which has earned for the Bluethroat the name of "bell-bird." Now and then the bird flew up into the air for a little way and descended, Pipit-like, with set wings and outspread tail (showing the rufous-chestnut colour), singing brightly the "wirreee" or the "weee." Presently, as I watched him, the male of the pair sang in an ecstasy, for his plain-coloured mate, which I could see, was creeping and hopping about among the growth of arctic birch close to where he settled, and he was performing like a Robin. His head and neck were stretched up, and his bill pointed nearly upwards; his tail was flirited up and down, or held at rather less than a right angle with his body, and his wings were drooped. So he sang until she moved away, and he dashed after her. The next evening, after a wet day, we made our way again to the fjeld, and found another Bluethroat singing in a similar hollow. They had no companions in the bird way up here, save some Meadow Pipits (which always like a dreary scene), Golden Plover, Ptarmigan, and Curlew.

Sylvia cinerea.—Not uncommon at Trondhjem.

S. curruca.—One heard and seen in a clearing dotted with bushes, in the fir forest, some 300 feet above Tönset.

S. atricapilla.—Several in full and rich song in the Nid valley, Trondjhem.

S. hortensis.—One in song in the same locality.

Phylloscopus rufus.—Not observed at Tönset. But, going down to Trondhjem, we fell in with it at Storen; and in and about Trondhjem it was fairly common and more numerous than the Willow Wren, both at the beginning and end of June.

P. trochilus.—Very common at Tönset, almost the only small bird to be seen in the low-lying thickets along the river; some in the fir forests. A few only at Trondhjem.

Parus major.—Not seen at Tönset. Numerous at and near Trondhjem; it is the common Tit there.

P. cinctus, Bodd.—We saw two or three at the upper edge of

the fir forests above Tönset, flitting about some old ragged firs and birches, just where the latter tree began to predominate. The Lapland Tit is a fine plump fluffy-looking bird. The only note I heard was a "schar schar schar."

P. borealis.—The Northern Marsh Tit was occasionally to be seen about Tönset in the fir forest—light grey birds. About Trondhjem, where we saw some in the pine woods on the way to Lerfossen, they were not so white as the birds seen north of the Arctic Circle, or those at Tönset; some of them approached *P. palustris* in colour of the back, but *P. borealis* always seems to be a much bigger bird, with a considerably more extensive black cap.

Motacilla alba.—Very common about the village of Tönset; as only males were to be seen in early June, it is probable that the females were sitting. On the 7th a male was singing beautifully in the intervals of feeding on the midden outside the cowshed; it was singing even in the rain, which fell nearly all day, and made us glad of a fire of birch logs in the stove. It was a louder and better song than I ever heard from a Pied Wagtail; at times there were quite full, resonant notes, some of them as sweet as a Sky Lark's, and the song was continuous for perhaps ten or fifteen seconds. I often heard the song in Norway, but none so fine as this. The White Wagtail was common at Trondhjem, and the young birds had left the nest on our return at the end of June.

Anthus trivialis.—A few in the lower pine woods at Tönset, also high up, where the birch began to predominate, and two pairs in the high-lying birch wood mentioned in the note on the Redstart. I do not remember seeing the Tree Pipit actually in the fir forest, but this may have been an oversight. At Trondhjem also.

A. pratensis.—Only on the dreary moor-like fjelds, covered with bog-moss, reindeer moss, crowberry, cloudberry, and deep springy moss-beds, made elastic by the stems of the creeping arctic birch; on both sides of the valley. Here it was singing.

Muscicapa atricapilla.—Lower woods at Tönset, and here and there in all the woods, even the highest lying straggling birch wood among the fjelds at a height of about 2500 feet.

M. grisola.—A pair in the fir forest at about 400 feet above Tönset, and others at about 200 feet, but not seen about the

village; and I have no note or recollection of seeing it at Trondhjem.

Hirundo rustica.—A few at Tönset and Trondhjem.

Chelidon urbica.—A good many flying round the house and other houses at Tönset, outnumbering the Swallows. Only a few of either species at Trondhjem.

Cotile riparia.—At Trondhjem, flying over the Nid, and near the town, on both our visits.

Passer domesticus.—Some at Tönset, where a good deal of barley is grown. The people were putting in their seed in the first week in June, and the crop would be ripe in about three months, by which time the autumn snows are near at hand. Many at Trondhjem.

Fringilla cœlebs.—Curiously enough, there were no Chaffinches about the village of Tönset or in the lowest woods; but here and there in the fir forests we came across one or a pair, at a height of about one to four hundred feet above the village perhaps. They were pretty common about Trondhjem, and were singing a fine rich song.

F. montifringilla.—A few pairs about the fir forests at Tönset, especially where the colony of Fieldfares were breeding; for here, as with colonies elsewhere, most of the woodland birds had assembled. The males were in beautiful plumage, and sang their creaking “weeech” after the manner of a Greenfinch’s “tweeee,” but more metallic, twanging, and harsh.

Emberiza citrinella.—Lower ground at Tönset; a good many outside Trondhjem.

E. schœniclus.—Several on banks of the Glommen at Tönset. Seen on high ground outside Trondhjem, among low pines, firs, juniper, &c., but not far from some swampy ground.

Sturnus vulgaris.—Common about Tönset village, where boxes are put up for their accommodation, some being arranged in the apex of the gable when the house or shed was put up; in these the birds were nesting in the first week in June. Most of the houses in Tönset were built of roughly squared logs, notched within six inches or a foot of their ends so as to fit into one another at the house corners. There were a few frame-houses. The roofs were chiefly covered with either shingles or turf; on the latter a good crop of grass and weeds was growing. The Starling was pretty common at Trondhjem also.

Garrulus glandarius.—The only evidence of its presence at Tönset was a blue wing-feather picked up in the lower part of the forest.

Pica rustica.—At Tönset hardly ever seen far from the houses and farms, where they hop about on the turf-roofs as tame as town Sparrows. How the people rear any poultry here is a wonder, what with the Crows and the Magpies. But you see few fowls running about, and I think they are kept shut up a good deal, as eggs were fairly plentiful, though until we had lowered the stock they were often uneatably stale. The Magpies here struck me—seen at a few yards distance—as having already more white about them on the wing, and the long white flank-feathers showed more. To be seen even in Trondhjem, and I noticed some big nests in the poplars.

Corvus cornix.—The Grey Crows of Tönset did not go far afield, but sat about on the houses, cowsheds, and in the little yards. I have seen from my bedroom window three at the same time in the grassy enclosure round the hotel, within a few yards of the house. They chiefly seem to breed in a little fir wood at the back of the village. When passing through this we were received very angrily by some birds. It is odd to see a Grey Crow sitting on a fir tree, croaking angrily because you will not go away. I think the Grey Crow's croak is usually a little more highly pitched than the Carrion Crow's, and that when the Grey Crow croaks in a low tone his croak has rather less fulness and volume. In this wood I saw four nests, from one of which a bird flew. Three were about fifteen or twenty feet from the ground, the other about twelve feet. All were in thin-stemmed slippery trees, branchless for some distance, and I could only get up to the lowest. It was a huge mass of sticks, twigs, dead grass, moss, and feathers, but was apparently not quite finished. I have seen the Grey Crow in Trondhjem, perched on a poplar close to the Cathedral.

Cypselus apus.—At Tönset. Good many at Trondhjem. On the 10th they were screaming between eleven and twelve p.m.

Gecinus canus.—Only recognized by its deep note, in the fir forest at Tönset.

Cuculus canorus.—At Tönset.

Anser erythropus, Linn.—As I emerged from a thicket on the banks of the Glommen, near Tönset, I saw, not far off, a Lesser

White-fronted Goose standing in a wet meadow. It was a small dark bird, with conspicuous white front, and some dark colour on the under parts, but not clearly marked. Its head was up, and it rose in a few seconds and went up the river. This is the species which breeds freely in the interior of Finmarken. *A. albifrons* is only a non-breeding visitor to Norway (*vide* 'Bird Life in Arctic Norway').

Lagopus albus.—Happened to flush only three; two of them in upper part of forest,—one of them indeed outside the trees, among some dwarf willow and birch growing by a big snow-drift. This was a warm-coloured male. The other was duller in colour, and had still some white on the back. The third bird, flushed from a similar spot near the edge of the birch wood, was a male, and had the back still splashed with white.

L. mutus.—Flushed one twice at close quarters on the Tronfjeld. On rising the first time, almost at our feet, it uttered a very low "ug ug." There was still a dash or two of white on its grey back. It just matched the grey rocks splashed with quartz. And indeed it was not unlike the snow-banded fjeld, though this had a yellower tint, derived from the yellow moss mingled with the reindeer-moss, &c. Of Reindeer we saw only signs—fresh signs—and in the forest too. The inhabitants of Tönset like to decorate their gables with a pair of bleached antlers.

Charadrius pluvialis.—A soft clear mellow whistle drew attention to a remarkably tame pair on the Tronfjeld. One sat until we got close to it; the other slipped quietly away. We could not find the nest, and it was too miserably wet and cold to lie down and wait. Another single bird was equally tame. They were in splendid plumage.

Vanellus cristatus.—On the evening of the 4th a flock of twenty were wheeling over the flooded Glommen, and settled at last on some ploughed ground.

Totanus hypoleucus.—Two by the Glommen at Tönset, and on the banks of the Nid near Trondhjem.

T. calidris.—Very noisy about the islets in the Glommen.

Numenius arquata.—Heard in the mist on Trondfjeld, and a feather picked up. A pair, noisy with sweet rippling whistles, appeared to be breeding in some open lush grass-fields near Trondhjem.

Sterna fluviatilis.—I saw what I believed to be some of these Terns about Trondhjem Harbour.

S. macrura.—A little party of these were sitting on the big stones of the breakwater at Trondhjem.

Larus canus. *L. argentatus*. *L. fuscus*.

Rissa tridactyla.—A few of these about the harbour; more of the Lesser Black-backed Gull than of the others.

(To be continued.)

NOTES AND QUERIES.

MAMMALIA.

The Stoat: Change of Colour in Winter.—Mr. George B. Corbin's statement in the July issue of this Journal (p. 254) in regard to Hampshire, that the change of colour of the Stoat "takes place in a greater or less degree every winter," is true also of Sussex. Pure white examples are rarely met with, there being almost always some of the ordinary colour remaining, especially about the head: a fact which Mr. Borrer tells me he also has noticed,—W. RUSKIN BUTTERFIELD (St. Leonards-on-Sea).

[See Zool. 1884, p. 102; and 1888, p. 141.—ED.]

Dark-tailed Squirrels.—It is not so unusual to meet with dark-tailed Squirrels in August as might appear from the observations of Mr. Oldfield Thomas (Zool. 1895, pp. 103, 150) and of myself (*supra*, p. 349). At the time of writing I did not bear in mind what Mr. Thomas had written on the subject, or I should have added that although the example I recorded was the earliest to assume the dark tail that I have seen alive, yet I know of many others being killed in Sussex in that month.—W. RUSKIN BUTTERFIELD (St. Leonards). [See p. 401.—ED.]

On the Breeding of *Sorex araneus*.—Bell, in his 'British Quadrupeds, which is still the standard work on the subject, states that the Common Shrew brings forth from five to seven young ones in the spring. I am, however, inclined to believe that it breeds two or three times during the year. I found a nest on July 9th, in a depression in the ground in a hayfield, over which the reaper had passed without injuring it. The nest was made of pieces of dry grass and oak-leaves, and inside were finer bits of grass and pieces of oak-leaves, all of which had evidently been bitten into small pieces by the Shrew itself. The young were eight in number, and three-parts grown. Again, on Oct. 1st, when out shooting in a second crop of clover, a round ball of grass caught my eye, and on stooping down to examine it I found that it was a Shrew's nest, built in a tuft of the common dog's-tail grass (*Cynosurus cristatus*), and formed by bending the pieces of grass of which the tuft was composed, and twisting them round

into a most compact ball, in which I could discover no hole for ingress and egress. The number of young was five; they were about half grown, and eventually got off safely. The young in the first nest I preserved, and I noticed that three out of the four had white tips to their tails. This peculiarity also obtains in the adult Shrew, but not in nearly so great a proportion, at least that is the case in the adult specimens that I have examined, though of course it may be permanent and last through life.—OXLEY GRABHAM, M.A. (Flaxton, York).

Greater Horseshoe Bat in Merionethshire.—I have to record the occurrence in Merionethshire of the Greater Horseshoe Bat (*Rhinolophus ferrum-equinum*), on the authority of Mr. Oxley Grabham, who informs me that he took a specimen of this species from a disused mine in the neighbourhood of Penmaenpool. I have failed to meet with this Bat myself, though I have paid much attention to the small mammals of the county referred to.—G. H. CATON HAIGH (Grainsby Hall, Great Grimsby).

BIRDS.

Macqueen's Bustard in Holderness.—On the 17th Oct. last an example of this Eastern Bustard, *Otis Macqueeni*, a resident in the Aralo-Caspian regions, and from the Caspian to Yarkand and Altai Mountains, was seen in a vetch-stubble behind the warren-house at Kilnsea, near the Spurn. Colonel White, who rents the house as a shooting-box, fired at it, but, apparently, without in any way injuring the bird. On the following morning it was killed in a wheat-stubble in the parish of Easington, by Mr. G. E. Clubley, a farmer of Kilnsea. Mr. H. B. Hewetson, of Leeds, and I, saw the bird a few minutes after it was shot and while yet warm. I then took the following notes:—Length, 28½ in. Flexure, 16 in.; tarsus, 4½ in. Iris, very light straw-colour (not brown, as stated by some authors). Tarsi and feet nearly the same colour (not olive-green). Bill, blackish or slaty, with base of lower mandible yellow; palate black; tongue whitish. A peculiarity of the plumage was that the base of the feathers on the back and breast was for about a fourth of their length salmon-pink; also the down. In a subsequent examination the weight was found to be 3 lb. 11 oz. The feathers on the scapulars and nape are shaded cinnamon and buff, vermiculated, and have very conspicuous broken bands of black, one on the latter, and two or three on the former. The three bars on the tail are greyish black, and the tips of the feathers white. Regarding the habits and appearance of the bird, I am indebted to two of our party, Mr. Wm. Eagle Clarke and Mr. Harry F. Witherby, of Blackheath, who were out for a walk, for the following notes, taken with the aid of powerful binoculars, at the distance of about one hundred and fifty yards. On the wing it looked like a big Owl, and was pursued by small birds; and when it alighted behind a high bank, the Grey Crows hovered above it and

marked the place for its pursuers. It flew low and slowly, just skimming the land. In colour it looked isabelline in body, and conspicuously black and white in wing. In walking it carried the head and neck like a feeding Pheasant, and appeared to spend its time in feeding, washing and preening itself. It walked in a stately fashion, but not with head erect, though sometimes, when alarmed, it stood with neck and head erect, and on the alert, the long black feathers on each side of the neck being very conspicuous. It was fired at several times, and on being flushed never went to any great distance, flying leisurely and heavily to about one hundred yards and then alighting. An examination of the bones on dissection proved it a young bird, and a male; it was very fat. The crest-feathers were not fully developed, white at the base and then black. The stomach was filled with vegetable matter, chiefly the heads (buds and flowers) of rag-wort (*Senecio aquaticus*) and fragments of beetles of the genus *Carabus*. Mr. Clarke and I dined off the body; the flesh was very dark and tender, and we came to the conclusion that it tasted like Wild Goose with a savour of Grouse. Macqueen's Bustard has occurred three times in England, all on the East coast, and in October. The first in 1847, on the wold near Kirton-in-Lindsey, Lincolnshire; again, on Oct. 5th, 1892, near Marske, N.E. Yorkshire ('Naturalist,' 1892, p. 373; Zool. 1893, p. 21); and, lastly, the subject of this notice. The bird is at present in possession of Mr. Philip Loten, of Easington, by whom it has been admirably set up.—JOHN CORDEAUX (Easington, Oct. 20).

Purple Gallinule in Hants.—A specimen of the green-backed species of *Porphyrio* was killed on the banks of the Avon on Sept. 15th, no doubt an escaped bird, for the man who killed it remarked that it appeared to be very tame, and one of its wings showed signs of scissors having been used upon it, although it was said that his shots had cut the feathers off. I am not aware that any such water-fowl are kept in this immediate neighbourhood, and yet I do not think the bird could have got upon the wing to have flown here.—G. B. CORBIN (Ringwood, Hants). [See Zool. 1894, p. 427.—E.D.]

Cream-coloured Courser in Wilts.—I beg to record a recent instance of the occurrence of *Cursorius isabellinus* in Wiltshire. It was shot by Mr. George Bovill on October 10th, on the downs above Earlestone, that is to say, on the north-western edge of Salisbury Plain, and within a very short distance of the spot where Mr. Langton killed another specimen at Elston, near Tilshead, on October 2nd, 1855 (see 'Zoologist' for 1855, p. 4913). Mr. Bovill obligingly informs me that the bird was running along the down, but got up and flew as he approached it, when he shot it on the wing. It seemed tired, as if after a long flight, and it is probable that it had been blown across by the heavy gales which prevailed from the south-west for two days previously. It is singular that a second Wiltshire specimen of so rare a visitor to our shores should be met with in the same locality as

its forerunner in 1855. It is also strange that almost all the occurrences of this bird within the British Isles have been in the month of October, when boisterous winds so often prevail from the south-west, whereas the home of the "Cream-coloured Courser" is essentially the east and the south (see Seebohm's 'British Birds,' vol. iii. pp. 63-4); but I am afraid we are still very far from a knowledge of the causes which bring unexpected stragglers to our shores.—ALFRED CHARLES SMITH (Old Park, Devizes).

[The bird above referred to was forwarded for preservation to Messrs. Rowland Ward & Co. of 166, Piccadilly, who obligingly sent it while still unskinned for our inspection. On placing it in the scales we found it to weigh a trifle over $4\frac{1}{2}$ oz., or the average weight of a Common Snipe.—ED.]

Cream-coloured Courser in Jersey.—When examining, while still unskinned, the Courser which was shot in Wiltshire, as above mentioned, on Oct. 10th last, I little anticipated the subsequent and speedy announcement that another had been obtained in Jersey. I am credibly informed, however, that on Oct. 19th a Cream-coloured Courser was shot in Bouley Bay, Jersey, and was taken to the resident taxidermist there, Mr. Caplin, of Halkett Street, for preservation. These two birds probably left their summer haunts in company, and, encountering the south-western gales which lately prevailed, got blown out of their course and separated *en route*.—J. E. HARTING.

Common Buzzard in Montgomeryshire.—In 'The Zoologist' for October (p. 382) appeared a note on the supposed occurrence of the Honey Buzzard in Hertfordshire. As a matter of fact, the bird in question was obtained on my property in Montgomeryshire, whence I wrote, and not in the neighbourhood of my residence in Hertfordshire. As regards the species, the bird was too hastily identified as the Honey Buzzard, for on more careful examination it has proved to be an example of the so-called Common Buzzard. I will therefore ask you to correct the mistake, which I regret should have been made in print.—F. M. CAMPBELL (Rose Hill, Hoddesdon, Herts).

Changes in Nesting Habits of Birds.—It may possibly interest Dr. R. Williams and readers of his article upon "Curious Experiences in Birds' Nesting" (p. 372) to peruse Mr. Charles A. Keeler's "Evolution of the Colours of North American Land Birds" (Occasional Papers of the California Academy of Sciences, iii. (San Francisco, Jan. 1893, p. 39), in which most interesting treatise references are made to the subject *loc. cit.* Many similar instances of these changes could be given; and I think a carefully accumulated collection of such as are ascertained facts would prove valuable as an aid to study of the theory which has been advanced of "*inheritance of acquired characters*." A starting point might be made by Dr. Williams or others of your correspondents (or by yourself, Mr. Editor, if you think it of sufficient interest), by publishing a series of quotations

from authors touching upon it, and a bibliography of the subject.—J. A. HARVIE BROWN (Dunipace, Larbert, N.B.).

Nansen's Discovery of the Breeding Haunts of Ross's Gull.—The 'Daily Chronicle' during the past few days has given us the first connected narrative from the pen of the "Hero of the White North." This account of the greatest adventure of the century, or perhaps of all time, in the fields of Polar research contains information long desired by ornithologists. To wit, the discovery of a breeding station for the rare circumpolar Gull, *Rhodostethia rosea*, Macgillivray. The small group of islands where Nansen discovered Ross's Gull in considerable numbers and evidently breeding, lies by his observation in $81^{\circ} 38'$ N. lat. and 63° E. long. Reference to the map at the commencement of vol. ii., 'New Lands within the Arctic Circle,' by the celebrated explorer Julius Payer, shows that the group, named Hirtenland by Nansen, is situated about thirty-two geographical miles due east of Freedom Island, the latitude of which is doubtless accurately determined by Payer, who during his memorable sledge-journey up Austria Sound passed within eight miles of it. Apparently the Hirtenland group of Nansen occupies a position within an area laid down by Payer as Wilczek Land,—proof of the difficulty in charting untrodden lands in the Polar Regions. In this instance, a supposed continuous coast-line, laid down by so experienced and careful an observer as Payer, on closer acquaintance resolves itself into groups of glacier-covered islands. Mistakes in the determination of land by optical vision may easily be made in those fog- and snow-obscured regions. It seems to me not improbable that the members of the Jackson-Harmsworth Expedition may attempt to reach the Hirtenland group next spring, so that it is within the bounds of possibility that next year we may see for the first time the eggs and young of one of the rarest, and in its distribution one of the most remarkable, of birds.—H. W. FEILDEN (Wells, Norfolk).

Occurrence of *Phylloscopus viridanus* in Lincolnshire.—During the afternoon of Sept. 5th I shot a specimen of *Phylloscopus viridanus* in a hedge near the sea-bank at North Cotes, on the Lincolnshire coast. According to Herr Gätke, this species has appeared three times on the island of Heligoland, but has not occurred elsewhere in Europe. It is a native of Central Asia, breeding in Turkestan and wintering in India. In general appearance it closely resembles our common Willow Wren, but has a conspicuous wing-bar formed by the yellowish buff tips of the greater wing-coverts. It is also somewhat greener on the upper parts, and less yellow beneath. It further differs in the proportionate lengths of the wing-feathers, and in the colour of the legs, which are almost as dark as in the Chiffchaff. The specimen obtained by me proved to be a female, and, I believe, adult. The weather prevailing at the time of its appearance was such as usually results in a great immigration of small birds. The wind

backing to the east on the night of Sept. 3rd, and blowing a fresh breeze from that quarter on the 4th and 5th, with heavy rain commencing to fall on the afternoon of the 4th, and lasting without intermission for twenty-four hours. On the 5th all the hedges near the coast were full of small birds, including Pied Flycatchers in considerable number, Redstarts, White-throats, Garden Warblers, &c. I have only to add that Mr. Howard Saunders and Dr. R. B. Sharpe kindly examined and identified the bird for me, and it was subsequently exhibited at a meeting of the British Ornithologists' Club on Oct. 21st.—G. H. CATON HAIGH (Grainsby Hall, Great Grimsby).

MOLLUSCA.

Distribution of Worm-eating Slugs.—I am desirous of obtaining living specimens of worm-eating slugs (*Testacellæ*), so as to add to the records I have of the distribution of these animals in the British Isles, and which I hope to be soon in a position to publish. I take this opportunity of thanking correspondents for the trouble they have taken in procuring examples of slugs, and of expressing my gratitude to those editors who so kindly made known my wants last year.—WILFRED MARK WEBB ("Ellerie," Crescent Road, Brentwood, Essex).

 SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

Nov. 5th, 1896.—Dr. GÜNTHER, M.A., F.R.S., President, in the chair. Messrs. A. B. Freeman Mitford and William Tyson were elected, and Messrs. Vernon H. Blackman and Percy Groom were admitted, Fellows of the Society.

Dr. Morris, C.M.G., exhibited specimens and slides illustrating the occurrence of raphides in the bulbs of the common hyacinth of gardens (*Hyacinthus orientalis* and varieties). Forms of eczema were said to have been produced while handling and cleaning these bulbs. Although the fact was familiar to gardeners, the cause did not appear to have been clearly traced. Experiments and observations at the Jodrell Laboratory at Kew, had shown that both dry and moist scales were capable of producing considerable irritation in certain cases when applied directly to the skin. There was little doubt that the raphides were the prime agents. These needle-shaped crystals (composed of oxalate of lime) varied from $\frac{1}{100}$ th to $\frac{1}{200}$ th of an inch in length, and were arranged in close bundles, easily dispersed by rubbing the dry scales. In the growing plants they were doubtless protective, as snails, for instance, avoided hyacinth bulbs, but attacked others growing close by. Roman hyacinths (var. *albulus*) were understood to cause greater irritation than other varieties.

Dr. D. H. Scott described some experiments which he had tried, tending to confirm the conclusion that the irritation of the skin produced by contact with the bulb-scales of hyacinths is due immediately to puncture by the numerous raphides.

On behalf of Dr. H. B. Hewetson, of Leeds, Mr. Harting exhibited photographs of a specimen of Macqueen's Bustard (*Otis Macqueeni*), which had been shot at Easington, in Holderness, on Oct. 17th last, and gave a brief account of the species, which had now been met with in England for the third time; the first instance of its occurrence having been noticed in Lincolnshire in October, 1847, and the second at Marske, N.E. Yorkshire, in October, 1892.

Mr. Hugh Warrand exhibited a remarkable bird which was believed at first to be a hybrid between the Red Grouse and Ptarmigan, but which, in the opinion of Mr. Ogilvie Grant, Mr. Millais, and Mr. Harting, could only be regarded as an abnormally pale-coloured Grouse. Only one possible instance had been recorded of such a hybrid as was suggested, *viz.* in the case of a bird which was exhibited some years ago by Prof. Newton to the Zoological Society (P. Z. S. 1878, p. 793), and had since been figured by Mr. Millais in his work on Game Birds (pp. 181, 182). See also Chamberlain, Zool. 1892, p. 41.

A specimen of the Cream-coloured Courser (*Cursorius isabellinus*), an extremely rare visitor to this country from North Africa (probably *via* Spain), which had been shot on Salisbury Plain, at Earlstoke, on Oct. 10th last, was exhibited by Mr. Harting, who gave particulars of the occurrence, and stated that another example of this bird had since been obtained in Bouley Bay, Jersey. (*Vide antea*, p. 435.)

A paper by Mr. A. W. Waters, F.L.S., on Mediterranean Bryozoa, was then read on his behalf by the Zoological Secretary. Dealing in the first place with some *Cellulariida* and other Bryozoa from Rapallo, the paper was to some extent a revision of a work already published on Mediterranean Bryozoa. Stress was laid upon the importance of noting the position from which the radicle-tube grows, and this was found to be a character of specific value. The way in which articulation takes place is another character of importance, and it was shown that there are two distinct kinds of articulation in the *Cellulariida* which might be used in establishing generic divisions. The complicated stalk of *Childonia Cordierii*, Aud., was described, and comparisons made with the stalks of *Stirparia*. Ovicells on the top of the "erect tube" of *Aetea* were recorded for the first time, and as a "tribus" Inovicellata had been created for the *Aeteida*, it was shown how precarious it is to base classification upon the absence of a character.

Dr. S. Schönland communicated a paper on some new species of *Crassula* from South Africa, which he had obtained from localities which

had been very rarely visited by botanical collectors, and which were believed to be undescribed.

A revisionary Monograph of the New Zealand Holothurians, by Prof. A. Dendy, D. Sc., F.L.S., of Christchurch, N.Z., was read. New species of the genera *Cucumaria*, *Colochirus*, and *Psolus* were described. *Echinocyamus alba* (Hutton) and *Thyone brevidentis* (Hutton) were shown to be referable to *Colochirus*. *Thyone caudata* (Hutton) and *Thyonidium rugosum* (Théel) were shown to be identical with *Thyone* [*Pentadactyla*] *longidentis* (Hutton), and *Stichopus sordidus* (Théel) was shown to be *Holothuria mollis* (Hutton), which is in reality a *Stichopus*. Seventeen species were in all admitted, four being doubtful, and four provided with overlapping plates. The general anatomy was described wherever desirable. The cœlomic fluid of *Candina coriacea* was shown to contain two distinct types of colourless corpuscles, and in addition numerous brownish red corpuscles, akin to those observed by Howell in a *Thyonella*. A "dichotomously foliaceous" order of spicule, apparently of the type recorded by Bell for *Cucumaria inconspicua*, was found to exist in various degrees of modification in *Stichopus mollis*; and details were given of the growth processes of the "wheel" in *Chirodota dunedinensis*, having interesting bearings upon the observations of Ludwig, Chun, Kishinouye, and others.

The Rev. J. Whitmee made some remarks on the Trepanng fishery in Samoa, where several edible species of Holothurians are gathered and prepared for the market, and called attention to what he conceived to be a little-known fact, that a small fish of the genus *Fierasfer* lives parasitically in the body of the Holothurian. Some further account of the fish was given by the President.

ENTOMOLOGICAL SOCIETY OF LONDON.

October 21st, 1896.—Prof. MELDOLA, F.R.S., President, in the chair.

Mr. J. J. Walker, R.N., exhibited a specimen of *Emus hirtus*, L., taken at Gore Court Park, Sittingbourne, Kent, on May 30th last.

Mr. W. B. Spence sent, from Florence, for exhibition, some specimens of a cricket, *Gryllus campestris*, in small wire cages, which he stated were, in accordance with an ancient custom, sold by the Italians on Ascension-day.

Mr. F. Enock exhibited a specimen of the curious aquatic Hymenopteron *Prestwichia aquatica*, female, which Sir John Lubbock first captured in 1862, but which had not been recorded since that date until its rediscovery in May, 1896. Mr. Enock said that the male had remained unknown until June last, when he captured several swimming about in a pond at Epping. The male was micropterous, and, like the female, used its legs for propelling itself through the water.

Mr. Tutt exhibited a beautiful aberration of *Tephrosia bistortata* (*crepuscularia*), in which the ochreous ground colour was much intensified, and the

transverse shade between the median and subterminal line was developed into a brown band; the transverse basal, median and subterminal lines on the fore wings, and the median and subterminal lines on the hind wings, being strongly marked in dark brown. It was taken by Mr. J. Mason at Clevedon in March, 1893. Mr. Tutt also exhibited the cocoons, pupal-skin, and aberrations of the imago of *Zygæna exulans*. The cocoons were spun upon one another, five in a cluster, and Mr. Tutt stated that the species was exceedingly abundant in the pupal and imaginal stages during the first week of August on the mountain slopes above Le Lautaret, in the Dauphiné Alps, at from 7000 to 9000 feet elevation.

Dr. Sharp exhibited a lepidopterous insect that had been alluded to in the 'Entomologist's Monthly Magazine,' Sept. 1896, p. 201. It was a caterpillar which had received the eggs of a parasite on the anterior part of the body; the abdomen, nevertheless, went on to the pupal metamorphosis, while the head and thorax remained attached to it in the caterpillar stage. He also called attention to some peculiarities in the pupa of *Plusia moneta*, pointed out to him by Mr. Fleet; in this species the pigmentation varies greatly in extent, and is sometimes entirely absent.

Mr. Blandford called attention to the recent discoveries relating to the Tsetse fly, made by Surgeon-Major Bruce in Zululand, which proved that this insect affected animals by infecting them with a parasitic Protozoon. The parasite was communicated from wild animals to domestic animals, and was probably more widely distributed than was generally believed, it or a closely allied form having been found in India and England in sewer rats. Surgeon-Major Bruce had proved that the Tsetse fly was pupiparous, which was of importance as affecting the classification of the Diptera.

Mr. C. G. Barrett exhibited the pupa-skin, cocoon, and eggs of *Hesperia comma*, L., found on chalk hills near Reading by Mr. A. H. Hamm. He also exhibited a series of both forms of *Tephrosia crepuscularia* and *T. biundularia*, showing an unbroken line of variation from brown to white and also to grey and black. In addition he showed several second-brood specimens of both forms obtained in the past summer by Mrs. Bazett, of Reading.

Mr. Tutt read a paper "On the specific identity of *Cænonympha iphis* and *C. satyrion*," and exhibited a long series of specimens.

The Rev. T. A. Marshall communicated a paper entitled "A Monograph of British Braconidæ. Part VII."

Mr. T. D. A. Cockerell communicated a paper entitled "New Hymenoptera from the Mesilla Valley, New Mexico."

Mr. E. Meyrick contributed a paper "On Lepidoptera from the Malay Archipelago."

Dr. Sharp read a paper, by Mr. G. D. Haviland and himself, entitled "Termites in Captivity in England."—H. GOSS and W. W. FOWLER, Hon. Secretaries.

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AN ORNITHOLOGICAL TOUR IN NORWAY.

By O. V. APLIN, F.L.S.

(Concluded from p. 432.)

III. ARCTIC NORWAY.

June 11th, we sailed on board the Norwegian mail steamer, 'Erling Jarl,' a fast and very comfortable boat. In the Trondhjem fjord were Eiders, a Raven, Black Guillemots, and a few Scoters. A drake Eider is very conspicuous, and has the appearance of a duck flying upside down, the usual arrangement of colours, dark above and light below, being reversed. At and near Rörvik, in the evening, were a good many Black Guillemots (which fly fast like a Quail), Eiders, Arctic Terns, Kittiwakes, and an adult Richardson's Skua attending some of the last named; throughout our journey Eiders and Black Guillemots were frequently seen. The latter are remarkably neat little fellows, their red legs conspicuous as a passing bird swerves at close quarters. In a small cove near Rörvik a colony of Lesser Black-backed Gulls were sitting close together on shore. On the 12th we crossed the Arctic Circle near Hestmandö early in the morning, and about 11.30 came into Bodö. We had half an hour on shore, but saw only a Raven flying over the little wooden town, uttering short deep hollow croaks; whence perhaps the Swedish name "korp." Outside, besides other birds already mentioned, there had been Common Gulls, Cormorants, Shags, and some Oystercatchers on rocky holms. Bodö, backed with mountains still heavily

snow-covered, presented a most wintry appearance. The captain of the 'Erling Jarl' told me the season was about a month later than usual in the north. Eiders' eggs were for sale in some of the little shops. We had them for lunch on board, hard-boiled; the yolk is pinkish, and the white semi-transparent. I was greatly struck with the pretty appearance of the Eiders sitting sunning themselves on the rocky holms at the water's edge. From Bodö our course lay across the Vest Fjord. The view on the nearer approach to the Lofoten Islands was very grand in its sombre way—its cold hard beauty. Rugged, jagged-edged, barren, snow-capped, and snow-lined almost to the sea-level, the islands rose from a cold, dark steely-blue, white-flecked sea. Under a brilliant sun and in the clearest air, the scene was thoroughly arctic. The north wind was icy cold, but it had a bracing freshness that I had never quite experienced before. We ran through extraordinarily narrow but deep channels into Svolvær, on the island of Vaagö, a collection of wooden houses, chiefly built on piles, and redolent of drying cod-fish. Even as we lay there it seemed impossible for a big steamer to have come in so close among the rocky islets. A Magpie flitted about, impudently tame, near a big high wooden house—goods-warehouse, booking-office, and 'Lofoten Hotel' all in one. It had formed a bulky nest (the materials for which it must have collected at great pains) on one of the beams supporting the wide eaves. As we were passing along the islands south of Ost Vaagö, we saw both Cormorants and Shags sitting on the rocky islets. Harstad-havn, on the island of Hindö, was reached at 1.20 a.m. We were timed to stay there about two hours, and in a case like this the benefit of the midnight sun is felt, for we were able to start off for a walk. The pastures down by the shore were green and gay in places with marsh marigold, the low birch trees had their leaves half-opened, and willows were only just bursting into leaf. House Sparrows were chirping from the sheds, but Willow Wrens (there were many of them) were already abroad and singing. One is apt to imagine that in perpetual daylight (often perpetual sunshine) birds would hardly know when to go to roost, but they certainly do go to sleep for a few hours. We found a bunch of Starlings—always late risers—still at roost in a willow. Later on, one sitting on a roof-ridge imitated a Gull's "mee-ew." Starlings were pretty common here, and boxes have been put up on some

of the houses for them to nest in. But they were the last we saw on our way north. We noticed the Cuckoo (in song), Meadow Pipits, Wheatears (one singing from a roof-ridge), Grey Crows, a Magpie (which had a nest in a birch tree), an Arctic Tern at roost on a boat's gunwale, a Mallard, and a pair of Grey-lag Geese, which flew over "honking" loudly. We got to Tromsö on the morning of the 13th, and remained there until the 23rd.

Tromsö is a low green island lying in the Tromsö Fjord, and (the fjord on the east and west is very narrow, and in places reduced to a sound not more than 500 yards across) has the appearance of being surrounded by snow-clad mountains. It is about ten kilometres long by about four at its widest point. The low ground along the shores, consisting of pastures and a few cultivated patches, is very narrow, except on the west side, where two large green points bulge out; a good deal of their surface is covered with willow swamps and open bogs. Inland the island is covered with birch woods, except the north end, which rises rather higher than the rest, the top of which is broken ground, without trees, the ground being clothed with ling, *Empetrum*, moss, lichen, &c. The sides of this north end are for some reason drier than those of the other parts of the island, and the snow melts from them more quickly, perhaps because they are more open and less thickly wooded. They abound with dry heathery banks, and, naturally, the Willow Grouse is more abundant at this end of the island. On June 14th, along a little bend in the coast facing due north, a huge snow-drift still lay unmelted at the sea-level. When we arrived on the 13th the birch-woods were still much encumbered with snow-drifts, and it was not easy to get about in them. The birch-trees (about 8 to 10 ft. high on the barer parts, and perhaps 25 ft. high elsewhere) were then only just bursting into leaf, or had their leaves half-opened in sheltered places; the dwarf willows were in the same condition. Under foot in the woods were mosses, lichens, and some few taller plants shooting up; in other places the dead birch-leaves lay thick, pressed flat by the weight of winter snow. For about four feet up, the stems of the birches were bare and white; above that height they were garnished with a good deal of dark lichen. This produced a curious effect in the woods, the trees having a bare-legged appearance. Five days later the trees had come on considerably, and the birch-woods were beautifully green, with a delicate fresh colour; and I

never saw a brighter green than that of the tiny meadows and clearings. The people were still putting in some barley, but some was up, and about three inches high on the 18th. The woods, however, were still encumbered with snow-drifts. But the snow was melting fast on the surrounding mountains, and torrents roared all around in the mountains of Kvalö and the mainland.

We enjoyed some lovely hot sunny days, and by the time we left, on the 23rd, the beautiful short arctic summer had come. Cow-bells tinkled all about the pastures and drier bogs and the low woods. The people at the little farms sat outside, sewing, in the warm still afternoons, and wild flowers were everywhere coming into bloom. We found the Globe-flower (*Trollius europæus*), *Andromeda*, *Pyrola*, *Primula farinosa*, a bright yellow *Viola*, and many other showy species, and the air was sweet with the honeyed scent of the catkins of shiny-leaved and downy-leaved willows. In its wonderful fresh greenness of early summer, the island presented a lovely scene, belted with a narrow ribbon of fjord, and hemmed in by jagged, rugged, snowy mountains. On the 22nd a small dusky *Pieris* was on the wing, and *Erebia* (*Maniola*) *manto* was very plentiful.

The various species of woodland birds breed, for the most part, together in colonies. These are found near the edge of the woods. When you get deep into the woods, you see hardly any birds; a few Willow Wrens in the more open spaces, perhaps, and here and there a pair of Fieldfares or Bramblings (but these are seldom quite in the deepest parts of the woods), and very occasionally a Grey Crow, attracted probably by the loud cries of the Fieldfares. But on the outskirts of the birch-woods Fieldfares are common, and we used to find several nests in every walk we took; the birds were tame and noisy. Bramblings also were abundant, and Mealy Redpolls.

We visited the island of Grindö in the fjord, to the S.W., about two hours' row from the town of Tromsö. It is a low green island of a few hundred acres in extent, with some pastures round the eastern shores, and rising a little inland, where it is partly covered with birch-wood and partly with bog and semi-bog. Some crowberry covered the hillocks, and there was a fine growth of cloudberry in full bloom. Some low bluffs on the west side grown with *Empetrum nigrum*, *Vaccinium uliginosum*, &c., are favourite haunts of the Eiders in the breeding season.

Turdus pilaris.—We found pairs of birds and nests here and there in the birch-woods in various parts of the island; but for the most part the birds breed in colonies, though these sometimes consist of only a few scattered pairs. The first nest I saw, on the 13th, was some twenty feet up in a slender birch, against the trunk in the fork of the branches; the bird flew off, though sometimes they sit close, and on the 20th a Fieldfare, though she could see me, only came off the nest (with a great fuss and chatter) when I touched her tail with my umbrella. On the 14th I found a nest at the north end of the island, where the trees were small, in the fork of a low birch not more than two or three feet from the ground; but I never saw another nest on Tromsø at anything like so low an elevation. It was formed of two or three heather twigs, a little long grey lichen in the foundation, and a quantity of dead grass, and was well lined with mud mixed with vegetable substance, and then a very thick inner lining (half to three-quarters of an inch thick) of dead grass. The bird came off (between 3 and 4 p.m.), but had not then laid. On the 16th we saw a considerable colony on Tromsø, with nests in slender birches about fifteen feet up. This was near the edge of the woods close to some clearings, a position always preferred by the birds on account of facilities for feeding. The largest colony we visited was on the mainland, in the Tromsdal. Here we saw about fifty nests, chiefly about fifteen or twenty feet up in slender birches of about thirty feet in height; but some nests in lower trees were not more than ten or twelve feet from the ground. The nest is almost always (in a normal tree) placed in the main fork of the branches from the trunk. Of the nests I got up to, some were still empty, three had eggs—four, five, and six (the last “hard sat”)—and one young birds, four or five days old. All the nests had very thick inner linings of grass, from half to three-quarters of an inch thick within the mud, and in some cases a thin layer of mud divided from the mud lining by a stratum of grass. One egg in each nest differed from the rest of the clutch, being boldly spotted on a clear ground-colour. Some birds sat so closely that twice I touched one with a long stick before it would leave the nest. They are brave, too, and attacked a Grey Crow, and also, but less persistently, a Merlin. Fieldfares are very noisy when you invade their colony, but do not mob you, and soon withdraw to a little distance, that is to say, the individual pairs whose nests are closely

approached retire. We heard no song from Fieldfares in Tromsö. As usual, numbers of other birds were collected round and among the Fieldfares. We noticed many Bramblings and Mealy Redpolls, a pair of Redwings, some Willow Wrens, and, most curious of all, a pair of Merlins nesting in the midst of the colony; these, with a few Willow Grouse, made up the bird-life in the wood, which just at that part was alive with birds; elsewhere in the dale birds were scarce. There were some Fieldfares on Grindö when we visited it on the 17th, and a clutch of six eggs was brought to us by a son of the man living on the island.

T. iliacus.—We sometimes used to hear the Redwing's run of sweet whistling notes, and saw a few pairs of this shy, quiet bird. A pair had a nest amidst a colony of Fieldfares on Tromsö, about fifteen feet up on a slender birch. The pair nesting in the Tromsdal had young, for one bird was carrying food, but we could not trace this shy bird to its nest. The Redwing in summer uses the usual winter alarm-note "quip," and also an angry quick rattling cry, somewhat like a Song Thrush's; I only heard this from the last-mentioned pair.

Saxicola œnanthe.—Several on Tromsö; some on Grindö, and also quite at the top of the Floöfjeld on the mainland (about 2500 feet). Some of the males were of a beautifully clear grey, were cleanly marked, and had the black very distinct; the females were dark in colour. The Wheatears here perched freely on roofs, and on birch trees, &c.

Ruticilla phœnicurus.—Not uncommon about the clearings round the houses, and the edges of woods and of willow swamps along the shores.

Cyanecula suecica.—Bluethroats were fairly common in the willow-swamps, where on warm days mosquitos made careful watching rather irksome. I have been bitten by the mosquitos of three continents, and have met with some more poisonous than those of Arctic Europe; but for downright savageness and strength of apparatus I give the palm to the last named; they think nothing of biting you through your clothes where they fit closely. These bogs were clothed in places with a thick growth of willow scrub of three species, one with downy and two with smooth leaves. In the middle of June the catkins were golden and the leaves half expanded—flowering and leafing going on at the same time here, as the time is short. The catkins smelt very

sweet, and were the chief food of the numerous bumble-bees. There was much growth of arctic creeping birch, and stretches of moss, crowberry, cloudberry, &c. Here and there on higher banks a few birches reared their heads above the willows. The top of one of these birches is a favourite perch for a Bluethroat to sing from. But it does not court observation, is easily alarmed, and it is seldom long before it drops down into the concealment of the willows. Of the wonderful variety of the song I had further proof, and though the song once heard is easily recognized again, the variation in the notes of different individuals is remarkable. The following description of the song of a good singer which I took down, while agreeing with it in the main points, shows a considerable variation from that given of the song of a bird at Tönset (*vide supra*, p. 427). The Tromsö bird sang "chow chow chow chow," like a Thrush, then produced castanet sounds, then sounds of two castanets at once, then "chee chee chee chee chee" (a high pipe), "do-it do-it do-it do-it" (soft and mellow), "tip tip tip tip tip," "clit-ee clit-ee clit-ee clit-ee," rising all along; every now and then came the metallic "ting ting ting." This bird sang, in fact, a rather sharper song; "weee" was changed into "chee" and "wirreee" into "clit-ee."

Phylloscopus trochilus.—Very abundant, and in full rich song. It was the most numerous bird in Tromsö, and was found everywhere on the island, except on a small piece of bare hill-top at the north end; even in the interior of the birch woods, where the paucity of bird-life was remarkable, a few Willow Wrens were generally to be seen about any little open space. We noticed many on Grindö, and in the wooded parts of the Tromsdal. From the much greater abundance of the Willow Wren in Tromsö than in those localities in southern and middle Norway which we visited, it seems possible that most of the Tromsö Willow Wrens, like some other migratory Passeres, arrive there by the eastern route (*cf.* Prof. Collett's 'Bird Life in Arctic Norway,' p. 13). On the 18th I found an unfinished nest by the lake side; the same day a bird in the willow swamps was building and wrestling with a big white feather, which proved too much for it; and another nest also, quite exposed in the side of a ditch by a road track, was unfinished, and lined partly with white grouse-feathers.

Acrocephalus phragmitis.—Abundant, and singing with great

energy, in the willow swamps and among the willow scrub along the shores. Not seen on Grindö. Prof. Collett writes, "With us it inhabits almost exclusively the regions north of the Arctic Circle" ('Bird Life in Arctic Norway').

Parus borealis.—Not uncommon in the birch woods, and seen on Grindö. It is a large fluffy bird, evidently well clothed; the back is of a very pale grey, the under parts are nearly white, and the large black cap extends on to the mantle. I found a nest on the 14th in a hole (apparently originally the work of a Woodpecker) in a rather rotten birch-stump, about four feet from the ground. The nest was slight, and consisted of little more than lining, formed of a little thin birch bark, less moss, some Lemming fur, and a good lot of white Willow Grouse feathers. It contained ten hard-set eggs, decidedly bigger than those of *P. palustris*. The birds were very tame. I had to break away part of the rotten bark to get at the nest, and wished to repair the damage; but the pieces would not remain when I replaced them, so I was driven to the clumsy expedient of tying a flexible birch-bough round the stump and fitting the pieces of bark in behind it. I made such a bad job of it that I was more than doubtful about the birds taking to the nest again. However, as I stood within two or three yards of the stump watching these beautiful Tits flitting about close to me, one came nearer and actually perched on the projecting end of my birch-bough; in a few seconds it hopped to the entrance of the hole, and after peering in for a few more it went in, and, to my relief, stayed there.

Motacilla alba.—We did not see many on Tromsö, and there were none on Grindö; a pair were carrying food on the 13th.

Budytes borealis (Sundevall).—This northern Yellow Wagtail was present on Tromsö when we arrived on the 13th, and was not uncommon among the willows and birches along the shores, and about the small clearings and meadows. It was, I think, even more common on Grindö. I found a nest there on the 17th, placed in a clump of *Empetrum nigrum*, and close to the nest of an Eider Duck. It was formed of fine grass, well lined with white cow-hair, and contained six nearly fresh eggs. This bird perches freely on birches and willows. It sings a bright wagtail-like strain; the call-note is a "wich-ee," like that of *B. rayi*, but perhaps stronger, which is very likely to be the case, as the bird is more robust than our common species. The crown and nape of this species is dark

slate-grey mixed with black; the feathers from the base of the beak to the eye, over the eye, and on the ear-coverts are black. An indistinct dusky crescent, caused by the presence of black and blackish feathers on the breast, is sometimes apparent. This is a very different looking bird in life from the Mediterranean *Budytes cinereo-capilla*, which, with the exception of its darker ear-coverts and the small size, or absence, of the white eye-stripe, hardly differs on the upper parts from *B. flava*.

Anthus pratensis.—After the Willow Wren, this was the commonest bird on Tromsö. It was common on Grindö, and we saw some in the barer parts of the Tromsdal before reaching the snow-fields at the upper end, and a few on the top of the Flöifjeld. They constantly perch on willows and birches; and they sing in this position the sitting song, “twee twee twee twee” or “chee chee chee chee.”

A. cervinus.—Not at all common on Tromsö, but I met with a few in the bogs, and one near the lake. On Grindö I saw two or three, including one with a very fine red throat and upper breast. At this season the Red-throated Pipit is a very dark-coloured bird, and looks quite blackish-brown on the back at a little distance. The call-note is louder and fuller than that of *A. pratensis*. It was some time before I could make out the song satisfactorily, though on the first visit I paid to the bogs I heard the song of a Pipit which was new to me. The song is less rapid, fuller, and more musical and melodious than that of *A. pratensis*; some of the notes even approach those of the Tree Pipit pretty closely. On Grindö a boy took me to a nest which I believe belonged to this species, but the bird was not on, nor when I went back to it later; but I saw a Red-throated Pipit sitting in a birch close to the nest. The nest was placed in a raised clump of *Empetrum nigrum*; it was formed of dry, fine grass, lined with the same and a very little hair, and contained six eggs, mostly with hair-like dark lines about them.

A. obscurus rupestris.—I saw a pair on Grindö, on a rocky shore. They were grey birds, especially as to the head; the ground colour of the under parts approached white, and the under parts were well marked, the markings showing distinctly. I had a good view also of a pair some way up the Tromsdal, and at some little distance from the coast of the fjord. They were on the banks of the river, which just there are high and rocky, with

rugged boulders banked up steeply, but did not form cliffs. The description of them which I took down agrees with that of the Grindö birds, but I have noted that the head was a lighter shade than the back. In neither pair could I detect any signs of a rufous or pink shade on the under parts. The song of this form resembles that of our *A. obscurus*. I was able shortly afterwards to confirm my remembrance of the song of the latter bird, as I was on Flamborough Head, where it is common, in the first week in July.

Passer domesticus.—I saw a male in Tromsö town on the 19th, and two birds the next day. Herr Schneider (of the Tromsö Museum) told me that the House Sparrow arrived when the brewery was built, fifteen years ago; but I am sure they are still very scarce. The male mentioned above had a chirp deeper in tone than usual, and it looked rather dusky; the latter peculiarity might have been the effect of the rain, but a local male in the Museum bears out the observation, being very dusky, especially on the cheeks.

Fringilla montifringilla. — Abundant, but generally in the colonies, near the edge of the birch-woods and about the trees round outlying houses. We saw some on Grindö. But almost everywhere on Tromsö where there were birch-trees, except in the deeper parts of the woods, you could hear the loud, long-drawn, metallic, twanging "tweeee" or "weeeech"; but this is not always twanging, merely harsh and creaking in some cases. The bird has a modified Chaffinch's "whit"; the call-note is a sharp "kip," and there is also a Canary-like "chee-wee." Very occasionally I heard a few sweet twittering notes. The male is a most striking bird in summer dress; the female looks remarkably grey in hers. In the Tromsdal we found many Bramblings in the Fieldfare colony, and found three nests, all in slender birches, some twenty feet from the ground in a fork of a branch from the trunk, or in the fork of the main stem. One that I took down was formed of fibrous grass and the silky fur of the White Hare felted together. Outside this was a quantity of bright green moss (this is always apparent) worked up with a little fur and some grey lichen on the outside. In the fabric were some dead birch-leaves, a bit of Lemming's fur, and some white Grouse-feathers; the nest was thickly lined with these last, with the addition of a few horse-hairs. It was a thick-walled, bulky nest, and contained two

fresh eggs, with the ground colour greener than the eggs of the Chaffinch and sparingly spotted, save in a distinct zone at the big end. The next day we found Bramblings common about a colony of Fieldfares on Tromsö, and took a nest from the main fork of a birch about fifteen feet from the ground. As usual, the outside was chiefly formed of beautifully green moss, worked up with willow-down, shreds of dead plants (very fine and thin), and a few feathers. In the walls were a few bits of cotton-rag and yarn (there was a farmhouse not far off), and on the outside a very few bits of lichen. The inside was finished and rounded off with some bents. The lining was chiefly of cow-hair, with a few horse-hairs and some feathers of the Willow Grouse, Fieldfare, &c. Its thick walls make the nest of the Brambling a good deal broader than it is high. This nest contained six fresh eggs, not unlike some eggs of the Chaffinch, not so blue in ground colour as those in the other nest, and marked all over with indistinct suffused cloudings of light vinous colour, and with a very few scattered brown spots, hardly any of which are to be seen at the big end of the eggs. The Brambling sits very close; on the 18th I found one of the usual bulky bright green nests high up in a birch; the bird was on; usually they will fly off if you tap the tree, but the only response this bird made to tapping was to raise her head.

Linota linaria.—The Mealy Redpole was very common on Tromsö, and was usually more abundant in those parts of the birch-woods frequented by other species. But pairs were often seen in any part of the island where there were birches or willows. Some of the males had lovely rosy under-parts, while others showed no rose-colour underneath. They are lively, merry birds, and a pair never failed to attract attention. The males have a way of flying round and round in the air, uttering a note like “che-che-che-che.” Other sounds uttered commonly by them are “zeeeeee” or “chzeeeeee” or “chizzzzz.” As with Linnets in spring in England, I several times saw three birds together; I can never make out the reason of this. The Mealy Redpoll was pretty common on Grindö. In the Tromsdal we found many about the Fieldfare colony, and found two nests. One was about fifteen feet up in a birch; the bird sat until I tapped the tree, and then fluttered down to the ground and went as though wounded across the dead birch-leaves; she soon came back and went on to the nest again. The other nest was in an alder in the lower and

very wet part of the wood, some eight feet from the ground. The bird sat until my fingers were within an inch of her, and I should have touched her had not the alder-stem swayed so with my weight, for the nest was just out of reach from the ground. The nest was formed of dead grass and little else, with a thick lining of white Willow Grouse feathers. The young were hatched, and a day or two old.

Emberiza citrinella.—Not common, but seen near Tromsö town.

E. schæniclus.—Not uncommon about the willow bogs, &c.

Pica rustica.—Often seen about the houses; looking whiter on the wing than our birds. I saw some large domed nests in birch trees close to the houses, and an enormous nest on the top of one of the tall pyramidal piles of fencing or fish-drying posts, so commonly seen in North Norway.

Corvus corax.—This bird is occasionally seen about Tromsö. On the 19th no fewer than nine rose together from a bit of cultivated ground along the shore. We saw several on the Flöifjeld. I bought in Tromsö a very richly-marked Raven's egg. It is a much more handsome egg than any figured in the works of Meyer, Hewitson, or Seeböhm. It is of the type shown in the lower figure in Hewitson's plate (1st edit.) and the right-hand figure of Seeböhm's, but the surface-markings are bolder and much darker, of a black-brown indeed.

C. cornix.—Fairly plentiful.

Cuculus canorus.—Fairly common, and in good song.

Buteo lagopus.—When on the Flöifjeld (about 2500 feet) across the Sound on the mainland, we saw a pair of Rough-legged Buzzards several times flying above and below us. Once I came upon one of them sitting on a rock; when it rose it flew straight at me and passed overhead. These fine birds have a shrill, loud cry—"me-kow." All the under parts appeared white at some distance, except the dusky or dark brown tips of the wings, a reddish spot in the middle of them, and a patch of the same colour on the lower breast or belly. The upper parts were rather light coloured.

Falco æsalon.—In the midst of the Fieldfares' colony in the Tromsdal we found a pair of Merlins breeding. They had a nest (an old Crow's nest, I believe, made of rather big sticks) in a birch some thirty feet from the ground. As I came down hill

through the wood I saw the hen bird on the nest, and had to tap the tree before she would come off. Then she started off with angry cries, but settled again almost instantly, clinging to the side of the nest and uttering loud rapid angry cries, not unlike those of a Kestrel. Then she flew off and wheeled quickly round and round just over the tree-tops, with ringing cries. I moved away and sat down on a stump not far off, when she settled in a tree near the nest. But, finding that we did not go away, she flew up again and was joined by her mate for a short time. There was a Fieldfare's nest in a tree not more than half a dozen yards from the Hawk's nest; and a Mealy Redpoll sat on a tree close to the Hawk. Yet when she was flying round she was pursued and mobbed by the enraged Fieldfares, and the small birds were much excited. Let us hope the pair got most of their food from the fjeld side, whither the male soon departed. The female now remained flying round high up, coming lower occasionally. I had, very reluctantly, to forgo examining the nest, as it was beyond my powers to climb the tall slender smooth trunk of the birch. The female was a cold-brown bird; her mate bluish, and more distinctly marked beneath, but had no warm tints on the under parts.

Tinnunculus alaudarius.—The only Kestrel I saw in Norway was on the Flöifjeld; a very pale-coloured male, as seen from above. The great scarcity of diurnal birds of prey in Norway has been noticed by other writers. I believe head-money has been paid by the Government. The Government would have done better to pay head-money for Grey Crows, which are often painfully common. Magpies are so domestic in their habits, that they probably do much less damage to the eggs of wild birds.

Phalacrocorax carbo.—Occasionally seen; on Grindö, &c. I noticed a Cormorant one day at low tide sitting on a bank just above water among some other birds, hanging its wings out to dry.

P. graculus.—Occasionally seen; on Grindö, &c.

Anser cinereus.—I met with Grey-lag Geese several times on the west side of Tromsö, where they are said to breed. Twice I put up single birds at no great distance. On the 18th a pair flying round passed close to us low down; and on the 22nd I saw a string of six flying up the fjord. The light-coloured bill and grey on the wings are very noticeable. They "honked" and "gaggled"

loudly like domestic Geese, but the sounds are more highly pitched. I afterwards noticed this in the case of a pinioned Grey-lag kept in an hotel yard at Trondhjem. I should have liked very much to bring this bird away with me; it might have been bought for a trifle, for the landlady's daughter complained that it had been palmed off on her as a domestic Goose!

Anas boscas.—I saw a Mallard on Tromsö on one occasion only.

Dafila acuta.—A freshly-killed drake was hanging on the wall of a farm-house on the west coast of Tromsö.

Somateria mollissima.—Eiders were common on the coast of Tromsö. On one occasion I saw about forty together. There were a good many on Grindö, and we saw four nests (one egg taken was fresh). Two were on the *Empetrum*-grown bluffs, merely depressions, with a good deal of down; one was in some rocks, with less down; the fourth was placed against the walls of a shed, adjoining the one house on the island, under a bunch of fishing-line floats. The old bird was on, and sparred with her wings at the man's foot. We saw some dark brown downy young, three or four days old. The Eiders have, or would have, five or six young. The Eider on the wing has a Dutch-built appearance; the feet, which are stretched out behind, show on each side of the tail, and the bird flies heavily, though it goes fast when it has way on. They are noisy birds. The alarm-note is "go-gooo" or "oh-ooo." The call-note of the male is "oh-ooo-ow" (last part drawn out in some cases), uttered with head raised and bill pointing rather upwards. The female cries "ga-ga-ga."

[*Somateria spectabilis.*—To judge from the skins in a curiosity shop, the King Eider is not uncommon here.]

Mergus merganser.—Saw a female, or young male, off a seaweed-covered point on the west side of Tromsö. On Grindö we saw either on the shore at the edge, or just off shore, two single adult males, a pair of adults, and an adult male with two females or immature males. The old males were grand birds, with beautiful salmon-coloured under parts; we watched one asleep with his head turned back over his shoulder.

M. serrator.—On Grindö we saw a pair, two single drakes, and a single female. Seen in life, the female, to my mind, has little or no resemblance to a female Goosander; it is a more dusky bird.

Lagopus albus. — Abundant on the heather and crowberry-covered hilly ground, clothed with thin birch wood, at the N.E. end of Tromsö, and occasionally seen in other parts. The males look particularly handsome when standing on a hillock and crowing their "gap gap garararr," the red comb, bright chestnut head and neck, and white body showing up very well. It was curious to find at that date the males with their body-feathers still white, while the hens were brown; but this is evidently a provision of nature for the safety of the latter. I saw a great many birds on June 14th; all the cocks that I saw had only the head and neck and a few feathers on the back coloured; the females (there were three I felt quite sure of) had all the upper parts brown, of a much darker and duller shade than the cocks. On the 15th we saw a few in the Tromsdal, all cocks, and all with white backs, save for a splash or two of colour.

Eudromias morinellus. — After waiting patiently for the snow to melt a little, we went up the Flöifjeld on June 21st, and managed to reach the top after a hard and troublesome climb. The height is about 2500 feet. The chief difficulty was encountered about half-way up, in the shape of broad bands of snow, —slipping, melting, and rotten,—lying on or at the foot of steep places. These were quite impassable, and we had continually to alter our course, until we found some narrow place, or some spot where an open torrent had burst through. We reached the shoulders at last, after passing some very steep ground, and found uncovered ground sloping easily, rocky, or stony in places, and in others covered with last year's yellow grass, creeping birch lying as close to the ground as ivy, lichen, a little *Empetrum* and *Vaccinium*, and patches of brilliant purple *Saxifraga oppositifolia*. After this we were cut off from the top by large snow-fields, some too much undermined in places to be safe. But by crossing three or four long slopes of hard snow, carefully choosing our route, and taking advantage of some ridges of ground peeping out, we got to the top at last, and were rewarded by a magnificent view. We looked across the fjord and the islands, spread out like a map, and down the bending Tromsö Fjord and the Rys-trömmen, along which the 'Erling Jarl' was steaming southwards. Beyond was a waste of snowy mountains, the rugged peaks of Bensjordfjeld being especially fine. White cloud-bars were wreathed along the mountains, showing up as well against

the blue-shaded distant ones, as against those darker ones nearer at hand. We saw one Lemming (*Myodus lemmus*), and a dead one. A few days before we had found them abundant near the head of the Tromsdal, which skirts the Flöifjeld. We saw also three Arctic Hares (*Lepus variabilis*). One was of a pale whitish grey, head and ears darker and brownish; the second was french-grey, with white under parts; the third much the same as the first. Two were in rocky places, and both took up hill. The other we were much interested in watching as it crossed a broad snow-field below us (it was coming up). We had crossed it just before, and the Hare passed to leeward of our tracks. As she got parallel to them she became suspicious and sat, then went on a little, when she got our wind, and, changing from the lopping gallop, went on at a rare pace, but even then was not extended *ventre à terre* like our Hare. I examined her tracks; the fore feet were set down more nearly parallel than those of our Hare, but not quite parallel; the foot-prints were more than twice as big as our Hare's, the toes were spread out, and each one was marked distinctly in the snow. I picked up a foot and leg on a fjeld on the west side of the Osterdal near Tönset; the stiff hairs on the foot between the toes were very long. There were some Ravens at the top, and a few Wheatears and Meadow Pipits. My wife saw a Snow Bunting, but I did not; subsequent experience on Hammerfest, where we met with several, confirmed the observation. As we were climbing to the top I saw above us a Plover, so I made a detour, and came on a pair from behind some rocks, on a level with and close to them. They were Dotterel, and on rising uttered a single "whree" once or twice as they flew. They were in a little shallow hollow clothed with the usual plants, brightened with a beautiful patch of purple *Saxifraga oppositifolia*, and sheltered from the north by rocks. Here no doubt they intended to breed, but as they both went right away, I suppose they had not begun nesting. I found *Helix arbustorum* on the lowest (wooded) slopes of this fjeld, and at the foot the most brilliant little blue gentian I ever saw.

Ægialitis hiaticula.—Not uncommon round the shores of Tromsö; and on Grindö.

Charadrius pluvialis.—A little flock of nine at Grindö were, with the exception of two or three (very fair plumage, nearly perfect), in poor summer dress. On the 22nd we saw three very

tame birds on a grassy spot on the shores of Tromsö. They were in poor summer dress; middle of belly black, with a white feather or two, throat and face brownish. Perhaps birds of the previous year.

Hematopus ostralegus.—Not uncommon around the shores of Tromsö, where their shrill piping, and sharp cry of "my feet" when on the wing, might often be heard. I found, on the 14th, on a narrow beach below the straggling birch woods, a nest with two eggs on the point of hatching. The nest was on a narrow belt of fine shingle (sometimes covered by a very high tide, for bladder-wrack lay further inland) about fifteen yards from low, and ten from the ordinary high, water mark. The nest was neatly lined with small stones, and bits of cockle, scallop, and mussel shells; the lining did not match the eggs in colour, for the shingle there was slate-grey and white. There is a rocky point at the north end of Grindö, with some beach of broken shells (cockle, whelk, bright red *Pecten*, &c.) and a little turf, where a good many birds breed. Here we found two nests placed where the rock and turf were mixed up. They contained only one egg each (one was fairly fresh), and had probably been robbed. One nest was lined with small stones, bits of hard dead wood, and a fragment or two of shell; the other was lined chiefly with broken shells.

Streptilas interpres.—A pair on this rocky point were, from their movements and tameness, probably nesting. A sharp single note was uttered by the bird on rising.

Phalaropus hyperboreus.—On the high ground at the back of Tromsö town there is a small lake or tarn, surrounded except at one end, where some boggy ground merges into it, with birch woods. Two grassy islands, besides minute islets, break its surface at the marshy end. On the 18th we found two pairs of Red-necked Phalaropes here; we had not noticed them before, and upon our first visit to the lake on the 13th it was chiefly frozen and snowed up. The little birds were wonderfully tame, floating high like ducks, or swimming rapidly, snapping eagerly from side to side at the insects on the water, along the shores of the islets. They often visited a patch of floating wood and weeds close to us, on which they occasionally landed. But what interested me most was the very evident play or display made by the females (or at least by the finer, brighter birds of the pairs,

which I took to be the females). This play consisted in the female spinning round rather rapidly on her own axis on the water, the wish to display and show off before her duller mate being very evident. Prof. Collett has told us that in this species it is the plainly-coloured male which is the weaker sex, and must wholly and entirely undertake the hatching of the eggs and the bringing up of the young. But that the female should go in for the play so remarkable in the males of some species at the beginning of the breeding season, was an exercise of rights for which I was hardly prepared. Although Prof. Collett writes that the trait of the male bringing up the young is more or less conspicuous with most of the arctic waders of the Stint and Sandpiper families, the female Red-necked Phalarope must surely be the typical "new woman" among them all. The Red-necked Phalarope swims fast. The ordinary notes uttered by the birds when on the water were a short "quut" or "quit," and a "chirra chirra chirra." On the pair rising and flying one after the other, we heard a rapid "ket-ket-ket-ket," and then, when they had settled again, a short "kyow" or two; perhaps this is the spring pairing note.

Gallinago major.—On the 16th I heard a bird in a bog, surrounded and partly overgrown by low willow-scrub two or three feet high, calling "ik-kak" (emphasis on first syllable), and, following up the sound, flushed a Great Snipe, which rose silently, flew a short distance with Owl-like flappings, and pitched again, when I flushed it a second time. Meanwhile a Snipe was wheeling round high up in the sky and drumming. The sound seemed deeper in tone than that made by the Common Snipe, but the bird was at a great height, and it was quite wonderful that the sound reached me at all. I do not know if this was the male.

G. cœlestis. — Occasionally seen in the bogs and by the lake, and heard drumming and calling "whit-tuk."

Tringa temmincki.—On a bluff overgrown with crowberry, close to the shore, I came suddenly right on to a pair of these dusky grey birds; one rising just under my feet, uttered a sharp, quick note. Four days later I watched one feeding on some mud uncovered by the tide below a high bank; while I was sheltered by a bush, it fed up to within a few yards of me. It finally flew off in the direction of some bogs close at hand. I saw one other.

T. striata.—I saw a pair on a group of shelving rocks on the shores of Grindö. From their movements and tameness I should think they were breeding, but I could not find the nest. The man living on the island said they never found the eggs; but he said the same of the Turnstone, and the truth is, these people only search for the eggs of the larger birds.

Totanus hypoleucus.—One in the lower part of the river in the Tromsødal.

T. calidris.—Very common and noisy along the shores of Tromsø and Grindö, and there were some in the bogs and about the lake. But there were none at the lake when we visited it first on the 13th, as it was still nearly all frozen and snow-covered. On the 18th, however, all was changed. Two islands covered with yellow grass had appeared, and about and over these we saw Redshanks, and heard them calling from the grass. They swam along the edge of the islands sometimes, and occasionally perched on a stump. They were very melodious, crying “too-ey too-ey too-ey” from the ground, and “tooo-tooo” on the wing. When on the ground, too, a shrill trill is uttered, with raised and quivering wings. I was surprised to see how very brown their summer dress was.

Numenius arquata.—To be seen about the bogs; very noisy.

N. phaeopus.—A few only in the bogs.

Sterna macrura.—Two or three pairs on the shell-bank on Grindö; note a sharp “kik.”

Larus canus.—A good many about. When walking along the shore, and once when on high ground, I was annoyed by Gulls following me, and every now and then uttering a warning cry. I saw one settle on a dead birch tree about fifteen feet or so high. There were a few pairs breeding on the rocky promontory on Grindö, and one pair on another group of flat rocks. We found six nests, each containing one egg (doubtless they had been robbed), and all in the flat rocks, made substantially of seaweed, dead grass, and some moss.

L. argentatus.—Occasionally seen. I procured in Tromsø an egg of the variety which has the ground colour white, and is marked with light red marks. They showed me a stuffed Herring Gull as the bird which lays these eggs. The particular individual which lays them is called the “Kongen-maag,” and the people say that among a colony of Gulls breeding on an island, only one

pair produces these eggs, of the rarity of which they are fully aware, as Herr Schneider told me they usually asked five kröner for them. There are four of these eggs in the Tromsö Museum (some others were exhibited at a meeting of the B. O. Club last season), but Herr Schneider told me he had never seen one so slightly marked as the one I bought; it was taken on Tüsö, an island four or five Norwegian miles west of Tromsö. I was informed in Tromsö that *Larus marinus* had also been known to lay these red-and-white eggs.

L. fuscus.—Occasionally seen.

L. marinus.—A pair and a couple of single birds, all adult, on Grindö.

Rissa tridactyla.—Occasionally seen.

Uria grylle.—Adults occasionally seen in the fjord.

Colymbus glacialis.—A large grey Diver seen in the fjord on the 13th, was probably of this species.

[*C. adamsi*.—This Diver cannot be very uncommon here. Besides seven examples in the Museum, I found four (three of them in full plumage) in a shop in Tromsö. I was glad to have the opportunity of making a careful study of plumage and shape of this very distinct species; the shape and size of the bill alone would, I think, always be sufficient to identify it by.]

C. arcticus.—A pair inhabited a little lake on high ground at the south end of Tromsö, near the town, which is nearly surrounded by birch woods. When we visited it for the first time on the 13th it was still chiefly frozen up, and covered with wet and frozen snow, while clean snow lay in drifts along the shores. The only open water was in the middle, where there was a low islet covered with yellow grass. On the open water floated a Black-throated Diver in splendid plumage. It swam with neck arched and the body nearly all out of the water, until I partly alarmed it by demonstrations, when it sank lower, but soon came up again; presently (how we did not see) it was joined by another. The Black-throated Diver in breeding dress is a most distinct and striking bird; at a little distance the white markings on the scapulars appear confluent. But summer was advancing apace, and by the 18th the lake was transformed into a sheet of glassy water, surrounded by green birch woods; all the ice and frozen snow were gone, and the snow at the edge was all melted, save one or two drifts. There were then two islands covered with

yellow grass, about which Redshanks were calling. We made out one of the Divers lying (on her nest?) at the edge of one of the islands, while the other bird floated on a distant part of the water. Some hours later, in the evening, we passed the lake again, and as the sitting bird was still in the same position, we had no doubt it was on its nest. We sat down at the edge of the wood on the shore to watch the birds and enjoy the lovely scene. It was a very clear and calm evening; the blue sky, dappled with white clouds, the snow-capped and snow-lined mountains, the birch woods, the shore, a wooden barn, and even the Diver at the edge of the island, were all reflected in the water, and as clearly defined and coloured as the originals. A visitor from the south can hardly realize how greatly the people up here must long for, and enjoy their short but beautiful summer. On the 19th and 22nd also, we saw the Diver on her nest.

C. septentrionalis.—On the 14th a pair in the Sound were making a most unearthly noise, and another bird was wailing on the west side of the island. On the 22nd, near the same place, I saw one making shallow dives in shallow water close in shore; the tide was running very fast.

The Museum at Tromsö contains a most interesting collection of northern birds. Among the best things are three *Pagophila eburnea* in down, from Spitzbergen (unfortunately the eggs of this species had been mislaid, and I could not see them); hybrids between *Tetrao tetrix* and *Lagopus albus*; six or seven examples of *Colymbus adamsi*; a pure white example of *Uria troile*, with light-coloured beak and legs; and a white *Tetrao tetrix*, with a few black feathers.

We left Tromsö on the 23rd on board the 'Vesteraalen,' intending to pay a hurried visit to Hammerfest. About two hours out we had a good view of a "Springhval" or "Springer," about fifteen feet long, which takes a curious pleasure in projecting itself in an upright position from the water, and falling on its back or side. Just before passing the point Brynilen, the boundary of Finmarken, the southern point of an islet was seen simply white with Gulls. To judge by those passing us they were *L. argentatus*. And about that point we identified Razorbills (*Alca torda*). We reached Hammerfest about 11 p.m., and found the place already *en fête* for Midsummer-eve. Bonfires were looking rather foolish in the bright sunshine, but cannons were banging

off at intervals, and our four brass guns made a welcome addition to the noise. Near the Meridian Monument we saw a Magpie and its huge domed nest on the top of a stack of piled poles; there was another nearer the town. Their presence seems to be tolerated, but it is doubtful if they keep their pilfering beaks from the drying codfish, which hung in rows upon rows from a rough scaffolding, and made the place odorous with a full rich smell. Mounting the hill at the back of the town, where most of the inhabitants were foregathered, we turned our backs on the crowd, and made our way over the moor-like ground sloping upwards, boggy in places, and rocky and stony in others, and perhaps 200 to 300 feet above the sea. It was treeless, but some creeping arctic birch trailed over the ground here and there, while thin grass, *Empetrum nigrum*, moss, and lichen covered the soil. The arctic flora was making a gay show, and the ground was brightened with a yellow *Viola*, *Armeria maritima*, *Dryas octopetala*, *Rubus Chamæmorus*, an *Arabis*, a *Stellaria*, and fine patches of purple *Saxifraga oppositifolia*. But the snow had not entirely melted, and still lay in large drifts in the hollows. Close to one of these drifts I saw a Purple Sandpiper, running like a mouse along a band of snow, in and out among the peaty hummocks of *Empetrum*, moss, &c. It was very tame, and when flushed would not go far from the spot; its note when flushed was "tree" or "chree." Probably this bird, which exhibited the summer dress very well, had a nest or young. But I could not devote much time to looking for it, for there was still one bird whose acquaintance I had not yet made in the north, and I was determined to devote these last hours I should have on shore in Arctic Norway to a search for it. Presently, as I made my way over a rocky ridge, I caught the sound of a remarkably sweet song; it was only a few notes, but enough to inspire me with hope. I followed up the sound, and in a short time made out the bird. There on a grey rock, in the brilliant sunshine of the arctic night, sat a black-and-white male Snow Bunting (*Plectophanes nivalis*). A very pretty plate which appeared in 'The Zoologist' for 1881 was instantly recalled to my mind, although I had not the luck to find a Snow Bunting's nest. The Snow Bunting sits in an upright position, but looks as if he had his shoulders up to his ears—a natural attitude for a bird accustomed to cold winds and chilly mists. I crept nearer and nearer, and at last got within a few yards of the

bird. I then saw the brownish female creeping about the stones, or running quickly over the moss and low plants among some piled-up rocks on the rather steep slope the birds inhabited. This pair were very tame, and no doubt had a nest in some cleft or hollow in the rocks. The male presently dropped down and joined the female in her search for food, and at last, when I had pressed them too closely, they flew a short distance. But they were evidently attached to the spot, and would not leave it; and when we passed later on, the male sat on a lump of light grey rock singing again. Another male, which I saw, was answering him at some little distance, for sounds carried far in that clear air; and another sang from the hillside low down and just above the town. The Snow Bunting's song is gentle, sweet, and joyous, but not merry. Usually the strain is "a chee tee tee a wee a." But we had to think about rejoining our boat, and reluctantly turned our backs on that charming moorland. The sun shone brilliantly over the tops of the low snow-banded mountains, and struck quite hot, for Hammerfest, from its position, has a very mild climate. It was difficult to believe it was then about 1 a.m. The people were getting pretty merry as we descended the unprotected zigzag path to the shore, and one man we met seemed to have doubts as to his ability to weather us. Luckily he had sense enough to take the wall, for as he passed he fell helplessly on his side; as it was he merely rolled in a snow-drift. One of the few tiny pasture fields at the foot of the hill consisted almost entirely of *Alchemilla*.

On our way south the steamer stopped for a few minutes off Gibostad in Senjen. Here were immense numbers of Arctic Terns. I noticed three flocks, in one of which the birds were as thick as snowflakes, and the air was full of shrill cries of "krie" and "kik." With them, very busy, were four Richardson's Skuas—three dark and one light-bellied bird. At noon on the 25th we were at Bodö, and again saw a Raven. Just after leaving this we passed some rocky holms, and saw hundreds of Eiders, chiefly immature males in varied dress. About five o'clock we had a good view of a prolonged struggle between a dark Richardson's Skua and an adult Lesser Black-backed Gull. It lasted two or three minutes, and the birds kept close to the boat, going backwards and forwards; possibly the Gull claimed protection. Up into the air, and down to the water they went, over and over again.

Every time the Skua came down on to the Gull the former dropped its legs, and we could see them extended on each side of its tail. So far as I could see, it struck with its feet or foot; and it struck with effect, for several times it made small light feathers fly. The poor Gull screamed, and met each swoop by dropping its tail and bending up its neck and head backwards, so as to direct its beak upwards, at the same time opening its beak wide and threateningly. Either the Gull had nothing to give up, or was very obstinate, but the Skua took nothing, and just as two or three other Gulls came up, it made off, flying low over the water, and looking, with its long pointed wings, just like a black pirate. At 8 p.m., as we approached Sandnesöen, near the big island of Dönnö, eleven Grey-lag Geese flew past us. On the 26th, outside the Trondhjem fjord, we saw a Red-throated Diver, and a good many Oystercatchers, whose shrill, rapid, rattling cries often attract attention when the steamer passes close to the low rocky islets so common along this coast.

Correction.—In justice to Norwegian railways, I may state that “morning” (p. 422, third line from the bottom) should be “evening.”

NOTES AND QUERIES.

MAMMALIA.

The Alleged Cruelty of Stag-hunting.—The following letter has been sent to the Marquess of Salisbury:—

“My Lord Marquess,—In view of the strong objections which have now for several years been finding utterance privately and publicly against the continuance of tame Deer hunting by her Majesty’s Buckhounds, we, the undersigned, hereby express our deep regret to learn that another season’s sport has been inaugurated. There is little need to point out the unworthy nature of the park Stag hunt, for it has been repeatedly shown that the sport involves unfair treatment of the quarry and merciless riding of horses in the effort to save the Deer for another day. We think that such a pastime is the reverse of creditable to those who indulge in it, and that it is calculated to check the growth of humane feeling in all who witness it, particularly the young. If the sport were carried on by a private pack it would exercise this influence; much more then must this be the effect of the sport when it is conducted in the Queen’s name, and at the

cost of the nation. With such sentiments we venture to approach your Lordship on what we regard as an important subject. As it is now fully understood that the abolition of the Royal Buckhounds is a question for her Majesty's Ministers to deal with, we earnestly hope that the Government, of which your Lordship is the head, will take action in doing away with the establishment, or converting it into a national drag hunt."

The letter bears the signature of the following gentlemen:—The Lord Archbishop-Designate of Canterbury, Dr. Kitchin (Dean of Durham), Dr. Stephens (Dean of Winchester), Mr. Justin MacCarthy, M.P., Rev. Dr. James (Head Master of Rugby), Lord Coleridge, Q.C., the Bishop of Hereford, Sir William Wedderburn, M.P., Canon Barnett, Mr. Frederic Harrison, Rev. Dr. Clifford, and Sir W. H. Flower.

In answer to this memorial the following letters have been addressed to the editor of 'The Times,' by the Earl of Coventry, Master of the Royal Buckhounds, and by Mr. Henry Simpson, for twenty-five years Veterinary Surgeon to the Royal Hunt. They are published in 'The Times' of November 25th:—

"Sir,—My attention has been drawn to a letter condemning in general terms the cruelty which it is alleged is practised with the Queen's Hounds. There are now living five ex-masters of her Majesty's Hounds—the Earls of Cork and Hardwicke, Lords Colville of Culross, Suffield, and Ribblesdale. All of these gentlemen are well-known sportsmen who would never have tolerated, if it had been brought to their knowledge, any act of cruelty in the chase. It seems to me a matter for regret that gentlemen of high position, who are not themselves sportsmen, should have signed a document conveying offensive imputations which, in my experience, have no foundation.—COVENTRY. Croome, Nov. 24."

"Sir,—In the autumn of 1892 petitions for the abolition of her Majesty's Buckhounds were presented to her Majesty, on the ground of cruelty to the deer. The letter to Lord Salisbury on the same subject, just published, mentions also cruelty to horses, which are alleged to be mercilessly ridden in pursuit of the deer by the hunt servants. In my report this morning to Lord Coventry, the Master of Her Majesty's Buckhounds, I have been able to assure his lordship that during the twenty-five years I have had the honour of being veterinary surgeon to the Royal Hunt, not a single case of cruelty of any kind to the horses of the establishment has been brought home to any of the hunt servants, nor, indeed, has any complaint of such ever been made to me. I am authorized and requested by Lord Coventry to ask that you will be so good as to publish this fact. It is unnecessary to say more to refute the charge of cruelty to the deer than to remind the public that this question was thoroughly gone into in 1892. After a most searching enquiry, a petition signed by 15,000 responsible persons, comprising landowners, farmers, masters of hounds, and followers of the Royal pack, was presented to her Majesty, praying that stag-hunting

be permitted as heretofore, the petitioners stating as follows:—' We beg to deny most emphatically that cruelty can be justly attributed to stag-hunting with the Royal pack.' The answer to the petition for abolition and the counter-petition for continuance of stag-hunting was the adoption of the latter course.—HENRY SIMPSON. Gordon House, Windsor, Nov. 24."

These letters should be a sufficient answer to those who share the views of the Memorialists, but whose very proper feelings of humanity have been unnecessarily aroused by a misapprehension of the details of a sport with which they have evidently no personal acquaintance.

Death of the Sea Lion at the Zoological Gardens.—The Patagonian Sea Lion (*Otaria jubata*), which was presented to the Society by Mr. F. E. Cobb, in May, 1879, and had consequently lived in confinement for more than seventeen years, has recently died. It is just thirty years since these great marine carnivores became known in Europe in a living state. The first example was brought home by François Lecomte, a French seaman, who succeeded in taming the animal, which was acquired by the Zoological Society, whose service Lecomte entered. This specimen unfortunately died in the same year, and Lecomte was sent out to procure others; but of the four with which he started from Port Stanley only one reached England alive. Since then till the present time the Society has always had one or two specimens on view. The feeding of the Sea Lion was invariably the signal for a large crowd of spectators to gather round the pond in which the creature was kept, to witness the performance. This consisted in the Sea Lion mounting a chair on a platform in the centre, and catching fish thrown to it by the keeper, diving from a platform erected at the side of the pond, and coming at call to take fish from the keeper's hand. The whole was an excellent example of the influence man can establish over the lower animals by kindness and patient persistence. Some little time since the creature's sight failed, and it was necessary to forgo for awhile the feeding in public, which, however, was afterwards resumed. But it was evident that failure of sight was not the only trouble, and the Sea Lions' pond has now no occupant.

BIRDS.

Occurrence of *Phylloscopus proregulus* in Norfolk.—In the November number of 'The Zoologist,' Mr. Caton Haigh recorded the occurrence of *Phylloscopus viridanus* on the Lincolnshire coast, and I have now the pleasure of adding yet another rarity, killed this time on the adjoining coast of Norfolk, to the already remarkable list of continental wanderers which have been recorded for this section of the east coast. The past autumn has been exceptionally productive of these "East and West" immigrants, and already the Great Spotted Cuckoo, Aquatic Warbler, and Black-breasted Dipper had been met with (all of which will doubtless be duly recorded by Mr. Gurney in his usual Norfolk notes), when Mr. Pashley,

of Cley-next-the-Sea, sent me for determination a pretty little warbler which Mr. Gurney and I recognized as *Phylloscopus proregulus*, a finding which Mr. Dresser was subsequently kind enough to confirm; the latter gentleman also exhibited the little stranger at the meeting of the Zoological Society on December 1st. The bird, which was killed at Cley on October 31st last, is in perfect condition, and, I imagine, adult plumage. *P. proregulus* may readily be distinguished from *P. superciliosus*, which it somewhat resembles (which latter species has already been killed in Norfolk), by the pale mesial line on the crown, also by the conspicuous pale yellow of the rump. Mr. Dresser figures this species in part ii. of the Supplement to his 'Birds of Europe.' Seebohm (Brit. Mus. Cat. v. p. 73) states that "Pallas's Barred Warbler breeds in the subalpine districts of the Himalayas from Cashmere to Burma, passing through North China on migration, and winters in South China, Burma, and Bengal." Mr. Gätke met with it once in Heligoland, but preserved only a wing; he is of opinion that there is a difference in the respective lengths of the flight-feathers in the Siberian and the Indian examples of this bird; but Mr. Dresser, after a careful examination, is unable to separate the birds from the two localities; if such difference existed, the Norfolk specimen, he says, certainly belongs to the Siberian form. One can hardly conceive of this and other equally delicate Warblers straying such an immense distance from their native haunts, and how they can survive such a journey across the whole of Europe, finishing with the North Sea.—THOMAS SOUTHWELL (Norwich).

A Robin in Bath Abbey.—Having read a notice in one of the Bath papers concerning a Robin which was reported to be seen daily in the Abbey, I went there on Sunday, Oct. 18th, to see how far the report was true. Soon after the service had commenced the Robin began to sing, and could be heard distinctly above the peals of the organ. On looking up I discovered that it was perched on a huge corona which hung from the roof. It sang prettily for a long while, and appeared quite unconcerned at its unusual surroundings. It finally disappeared, after flying about for a short time before the sermon began. Some friends informed me that this Robin first came inside the building more than a fortnight ago. One often hears of Robins and other birds entering buildings, but I am surprised at the length of time which this bird has been accustomed to do so, and I thought the fact might be worth recording.—C. B. HORSBRUGH (Richmond Hill, Bath).

Flight of Swift.—Mr. Howard Saunders, in his 'Manual of British Birds,' p. 251, writes of the Common Swift:—"Contrary to the popular belief, the birds are able to raise themselves from the ground." I always thought, too, that the "popular belief" was a pure superstition, but have recently been slightly shaken in my scepticism by the positive assertion of a friend of mine that a Swift which had been caught, on being placed, quite

uninjured, on a grass lawn, was utterly unable to rise and fly away. Is there really any foundation for the idea?—H. BRINSLEY BROOKE (33, Egerton Gardens, S.W.).

Kingfisher taking small Pike.—I have often watched a Kingfisher perched on an alder overhanging the river, and keenly eyeing the shoals of Minnows, some of which, with hover and dash, it eventually captured; but I had no idea that this bird sometimes takes fish much larger than Minnows or Sticklebacks. A few days ago a boy brought me a Kingfisher he had knocked down with a stone. I noticed a number of small scales upon the beak of the bird, and something protruding from its throat; and on withdrawal this proved to be a small Pike, which when alive must have been at least five inches in length, for the remains of it measured almost that, although the head had nearly disappeared by digestion, and the mutilated little fish weighed over half an ounce. It seemed extraordinary how such a large mouthful could be swallowed and then accommodated in the small stomach of such a bird, for very little was visible except the caudal fin when I first saw it. Both the capture and swallowing of such large prey seem unusual for so small a bird; but the elongated form of a young Pike would be better adapted to be swallowed than a more robust species, for example, a Perch of the same weight.—G. B. CORBIN (Ringwood, Hants).

On the Change of Plumage in some Exotic Finches.—Just now (Oct. 29th) I have in my aviary some young Gouldian Finches in the middle of their change from nestling to adult plumage. It must be warm work, for the new feathers come over the old, which do not drop out at the time. One died on Oct. 28th, and I sent it on to Sir William Flower for the Natural History Museum, as it is very interesting to see how it is done. A few of the feathers at the union of the violently contrasting colours seem to alter in tint, the colour growing in the feather itself. This is known to be the case in the crimson colouring of the variety *Porphyra mirabilis*, which when it first acquires its adult plumage closely resembles *P. gouldiæ*, but subsequently the black feathers of the head become rusty, red-brown, and finally crimson. The little Indian Amaduvade is always changing—I should think it must have half-a-dozen plumages in a year, but it only moults once. The Fire-Weavers (*Pyromelana*) only moult the flank feathers and upper tail-coverts, so far as I can judge, at the assumption of the breeding plumage; these feathers being replaced by long soft plumes which cover the short tail: all the other feathers change very gradually at first, and then rapidly, the full colour appearing first along the centre of the shaft and spreading forwards and laterally: I have not examined any of the moulted breeding-feathers recently; but so far as I can remember the colouring does not extend to the extreme base. The change is very irregular, some feathers colouring much sooner than others, so that at first the bird looks absurdly patchy. The change in the Wagtails (*Motacillidæ*) is similar: I have kept

some for years, both in cages and aviary, but never found a feather at the adoption of breeding-plumage. Their spring moult is a myth.—A. G. BUTLER.

Starlings rearing Two Broods in one Season.—Referring to Mr. Sutton's note on this subject (p. 388), I may remark that a second brood of Starlings is no very great rarity, at least in Hampshire. In 1872 I recorded an instance of this in the neighbourhood of Ringwood, and my friend (the late) Rev. H. G. W. Aubrey confirmed the observation by a record of a double if not triple brood in his own neighbourhood, about eleven miles from here (Zool. 1872-73). But to mention a more recent date: in the roof of a house almost opposite my own, two broods have been reared during the past summer, and now (Oct. 29th) the old birds are apparently repairing the nest for a third venture. During the exceptionally mild weather of last winter, a pair of Starlings might have been seen, especially in the early morning, on the corner of the house near the nesting-holes, or on the chimney at no great distance, uttering their well-known plaintive note, and very early in the year—(I unfortunately did not take the dates)—a brood was hatched, and as soon as they were able to fly the old birds drove them off and began a second nidification. On several occasions I was much amused to see the squabbles which took place between the old dark-coloured birds and their greyer-looking young. The latter were continually trying to enter the nesting-hole, which they sometimes succeeded in doing and were at once ruthlessly expelled by their parents. At first there were four young ones, but eventually the number was reduced to a single bird, which still clung to its old home until the second brood was hatched early in August, and so far as I could make out it assisted its parents to feed its younger relatives. It certainly carried something in its beak and entered the nesting-hole without molestation from the old birds, if they happened to return at the time. It is somewhat strange that, except in the early morning, the birds were scarcely seen at all in the neighbourhood; this may partly arise from the nesting-site being in the street. The second brood seem all to have disappeared suddenly, as I have not seen one of them for several mornings past; but while I am writing (Oct. 29th) I can see the two old birds perched on the slates near their favourite nursery, one of them whistling, whilst the survivor of the first family sits in a disconsolate attitude on the chimney-top, notwithstanding that the slates are covered with hoar-frost. Is it a well-known trait in the character of the Starling that often in the fine days of autumn it will soar to a considerable height, and hawk for flies in the bright sunlight after the manner of a Swallow? I have often seen them do so, but their soaring is not long continued.—G. B. CORBIN (Ringwood, Hants).

[As to Starlings hawking flies, we find on reference to an old note-book that we commented upon this habit of the bird in a note contributed to the Natural History columns of 'The Field,' Oct. 14th, 1871.—ED.]

Ornithological Notes from the Isle of Man.—During the last two years I have again had various opportunities of observing the Chough (*Pyrrhocorax graculus*) on the Manx coast. On April 15th, 1895, Mr. F. S. Graves and I visited an old haunt of the bird. This is a large cave, accessible from the beach at low water only, but piercing so far inland that its head is never reached by the sea. Finding the tide too far turned to admit of our getting in by land, we obtained, with some difficulty, a boat from a neighbouring strand, and rowed to the place. While trying to reach it by shore we had heard the Choughs' cries, but we had been some time in the cave before they appeared about the entrance, flying and calling, which they did intermittently while we remained there. Toward the mouth of the cavern, about thirty feet up, in an inaccessible crevice under its vaulting, we could see the nest, a conspicuous mass of sticks. On May 10th I found another nesting place in a part of the island where I should not have suspected the present existence of the Chough—in a stretch of low but much broken rocky coast, where the cliffs were probably never more than fifty feet high. A few Herring Gulls were nesting on flattish places among these rocks, and heathery and ferny ground, varied by some little "orchards" or patches of trees, came down to their edges. Near at hand was a burn-foot with a shingly beach, and the place commanded a wide view of the headlands and sea and the opposite mainland mountains. The nesting place was a rough gully, with sides so close together, and in places so overhanging, as almost to form a cave; the water never leaves its mouth, and its interior is blocked by great boulders wedged between slippery tide-washed ledges; altogether as inaccessible a spot as could be found in so low a coast. The nest was evidently among the crevices in the dry upper part of the gully, which was here very narrow, but so dark and ragged-edged that, though I several times visited the place, and frequently saw one or both birds come out of the chasm, I could never make out its exact situation, either from the top of the cliff or the bottom of the gully. The hen bird, after being roused from the nest, sat on a wooden fencing on the brow above, uttering, with opened wings and shaking body, its wild explosive cry of "kee-aw." This year I again saw the birds in the same locality, but am not able to say if they nested. On the cliffs in this neighbourhood, between Laxey and Dhoom, the "Caaig," as it was called, is said by elderly men to have been quite common within their recollection. It is now protected by Manx law all the year round, and, though probably nowhere numerous, I should consider it by no means yet on the verge of extinction. One of the immemorial sites of the Peregrine Falcon (*Falco peregrinus*) on our east coast was occupied both in 1895 and 1896. This year one of the young birds was caught on the rocks before it was well able to fly. On the cliff where this nesting place is situate are the remains of three large nests, probably Ravens', but none of these have been lately occupied. There is a small colony of Martins (*Chelidon urbica*) in a

cavernous place close by. On April 29th I found on the rocks a nest of the Hooded Crow (*Corvus cornix*), only some ten feet above the high-water mark of a little creek. It was built of sticks, chiefly gorse from the brows above; the cup in the centre very neat, lined with wool, moss, leaves of *Luzula*, and rags, with a bit of printed paper and an end of rope. The flat top of the low cliff, some fifteen feet high, on which the nest rested, was strewn with empty limpet-shells. So far as I have seen, the "Grey-back" shows very little solicitude when its nest is approached, strongly contrasting with the Raven in this respect. It is in this district far from sagacious in its choice of a nesting site. A pair built last year in a very accessible and frequented spot just to the north of Laxey Harbour, where I am told the nest was several times robbed and at last destroyed. On June 3rd, in company with Mr. Graves, I found a small breeding colony of Cormorants (*Phalacrocorax carbo*) on our west coast. There were about six nests, on rather broad ledges, just where a very steep hillside merges into a lofty perpendicular cliff. The nests were great structures laid on the flat ledges, and whitened all over; most of the birds showed white thigh-spots. Although, out of the breeding season, the Cormorant is commonly met all round the Manx coast, and is the species usually seen about the harbours, and on isolated stacks and on reefs, as, for instance, Conister in Douglas Bay, where quite a flock may sometimes be observed, yet as a breeding species it must (except perhaps on the Calf and the end of the island immediately opposite, of which I cannot speak with certainty in this respect) be decidedly rare; while the Shag in the nesting season is well distributed, and often numerous, but seems to scatter less in winter. The Black Guillemot (*Uria grylle*) is still to be found in certain localities; at one in some numbers, at others sparingly. At one of the latter I saw, on Feb. 27th this year, a little party of five already assembled, and swimming off their apparently breeding haunt, which a few continued to frequent through the summer. Though so few in number, they are well known in the neighbourhood in connection with that particular spot, and a cliff with a few cavernous recesses, which at high tide are filled with water. The low piping cry, well described by Capt. Feilden (Seebohm's 'Brit. Birds,' iii. 385) as a "plaintive whine," is sometimes very constantly repeated, and I have heard it uttered while the party was on the wing; it strikes me as a sound peculiarly dreary and cheerless. On July 6th, 1896, I visited a colony of Terns, perhaps the only one known to exist in Man. I am not aware that it has been determined whether the species is the Common (*Sternus hirundo*) or the Arctic (*S. arctica*). I saw perhaps fifty birds, which were very shy, and kept at a great height in the air while I was in the neighbourhood of their station. The nesting place was a ridge of large coarse gravel just above high-water mark; the nests were in many cases placed very close to each other. Most were quite unlined; one contained some straws of the sea-reed. The variety and richness of colouring of the eggs,

and the largeness of their markings, pointed, if books of reference are to be trusted, to the Arctic rather than the Common Tern.—P. RALFE (Laxey, Isle of Man).

On a Chocolate-coloured Variety of *Perdix cinerea*.—I have just mounted a very curious variation of the Common Grey Partridge. The major portion of the plumage, so far as it is moulted, is of a rich chocolate-brown and black. The general appearance of the bird at first suggests the possibility of its being a hybrid between a Red Grouse or Bantam Cock and a Partridge, as suggested by the gentleman who shot it. But a careful examination of the legs, bill, wings, and tail, show them to be those of a Partridge, without any other admixture. The only variation is in the colour of the plumage, and the bird is perhaps an extreme phase of the varietal form known as the Mountain Partridge, and named *Perdix montana*. I have met with a somewhat similar variety once before. Two birds were shot from a covey on the Cotswold Hills, about twenty-five years ago. The owner believes them to be a cross between a Red Grouse and Partridge, and it is difficult to persuade him otherwise. They are much paler in colour than the bird I now have, which is quite immature, but has nearly assumed the second plumage; the head, neck, portion of breast where the "horse-shoe" comes, edge of flanks, and sides of rump, still retain the nestling feathers, but these are all of a much paler type than in an ordinary Partridge. All the new feathers, as they are appearing, are of a rich brown, and if the change had been completed the bird would have been of a rich mahogany colour, deepening into a darker mahogany on the back and scapulars, with whitish centres and tips to the latter. The entire head and neck would have been of a light sandy buff, like the throat and sides of face in the Common Partridge, as these feathers were starting to come on the top of the head. As the bird is before me now, the new feathers from the upper breast downwards are of a deep mahogany-brown, shaded in their centres with darker. The back is a darker mahogany-brown, with a yellowish streak down centre and a whitish tip to some of the feathers; the rump is relieved with a pale reddish mahogany. The central upper tail coverts commence with a pale buff, gradually becoming of a richer tint and marbled with dark brown, and very broadly margined with dark chocolate brown; some of the outer ones have whitish tips, fringes and centres. The central rectrices are buff, margined, speckled, and marbled with dark chocolate. Outer tail-feathers light brown, shaded on ends and along inner necks with darker. Hinder tail-coverts mahogany, tipped and fringed with whitish. Scapulars blackish mahogany—they might be called black—with a tip, fringe, and central streak of whitish; the longest scapulars are a pale brown, the ends boldly marbled with yellowish white. The same applies to the outer secondaries. Wing-coverts blackish mahogany, with lighter shadings, and fringed and

centered with whitish and buff. Primaries hair-brown, slightly marbled with paler. Secondaries darker, with pale brown in the outer portion; fringed on ends, and mottled at base with pale buff. Hinder wing-coverts creamy white, edged and dabbled with pale brown. Axillaries also creamy white, thickly dabbled towards end with hair-brown and light brown. Legs and toes a drab tinge of yellow ochre; nails horn-brown. Bill slaty horn-brown. Irides brownish hazel. Length 14 in.; height $12\frac{1}{2}$ in. Thus showing it to be a heavy bird for a "cheeper." It was shot in Shropshire, on Sept. 8th, and was singled out from a covey of eight; all the others were said to be of the normal colour.—F. COBURN (Holloway Head, Birmingham).

Notes from Hampshire.—It may be of interest to readers of 'The Zoologist' to hear of some of the more noteworthy captures in the Winchester district, zoologically rich, during the past year. I am indebted to Mr. Chalkley for this list: the dates appended refer to those on which the specimens were sent to him for preservation:—A Hen Harrier (*Circus cyaneus*), shot by a keeper at Stockbridge on Nov. 23rd, 1895. Jan. 10th, 1896, Peregrine Falcon shot at Bramdean. Feb. 5th, Peregrine Falcon, shot at Whitchurch. Feb. 18th, Peregrine Falcon, shot at Micheldever. Feb. 27th, Otter (*Lutra vulgaris*), killed at Swathling, weighing $24\frac{1}{2}$ lbs. This animal is much rarer here now than formerly. March 6th, a Curlew (*Numenius arquatus*), shot at Shoeburyness. May 23rd, a Hobby (*Falco subbuteo*), shot at Warnford. Aug. 14th, a Hobby, shot at Avington Park. Sept. 15th, a Grey Phalarope, shot at Avington Park. Mr. Chalkley has several examples of this bird in his own collection which were shot near Winchester. Oct. 10th, Mr. Chalkley called my attention to a communication in a local paper in the Isle of Wight, recording, "that a Yellow-billed Cuckoo was found dead at Ventnor." This is quoted on the authority of a birdstuffer out there, a Mr. Smith, I believe. Several Herons have been sent to him at various dates, and one Skua Gull. I regret to state that an unusual number of Kingfishers have been shot this year in Hampshire.—G. W. SMITH (The College, Winchester).

Variety of Barn Owl.—On the 12th of August last, I saw an Owl which, unfortunately, had been shot the previous evening. Its dorsal plumage was darker than usual, and it had a deep buff band across the breast, the lower parts of the belly being white and spotted, a variation not unusual. But about the 8th of September I saw another, much darker than any previous specimen I had seen. The upper plumage was much darker than usual, and the whole under parts were of a warm, unspotted buff; sex, male. This specimen is not so dark perhaps as one described by Mr. Gurney (Zool. 1894, p. 226), or of one or two others recorded in previous volumes, yet its appearance amongst others of the more ordinary type is rather conspicuous. I may state that its face was white, with the

rust-colour spots near the eyes very plain and bright, and the feathers forming the facial disk were tipped with a very dark brown, especially below the ears.—G. B. CORBIN (Ringwood, Hants).

Sea Eagle in Notts.—On Nov. 8th my brother, Mr. George Musters, shot a specimen of this Eagle (*Haliaeetus albicilla*) on the Park Farm here. It measured 7 ft. 1 in. across the wings, and weighed 9½ lb. It was in immature plumage, but not a bird of the year, probably three or four years old. It was feeding on a dead rabbit, and was first seen on Nov. 5th.—J. P. CHAWORTH MUSTERS (Annesley Park, Notts).

Unusual Abundance of *Larus canus* in Hampshire.—The Common Gull has visited us this year in such unusual numbers, and with such regularity, that a short note on the point may be worth insertion. Strong winds do not necessarily bring these birds; but on still, foggy, close days they stream down into the water-meads like leaves in autumn, uttering their curious sharp cries, and performing the most curious antics on the wing, irresistibly reminding me of Swallows darting hither and thither in pursuit of flies. On Nov. 22nd the weather was very close, with a heavy mist obscuring sun and landscape, and I observed three separate flights of Gulls. The first I computed at fifteen, the second at thirty or forty, and the last at quite fifty individuals; these arrived between ten and one o'clock. The first company joined some of their fellows in the water-meads that have been here since Nov. 17th. They were scattered among a flock of feeding Rooks when I came up with them; but a Herring Gull (*Larus argentatus*)—I have seen seven of this species here this autumn—disturbed them, and singled out one of them and chased it out of sight. There has been a continual stream of Gulls flying inland from almost due east until to-day, when the mist having cleared and a cold north wind blowing (Nov. 24th), a large migration has taken place of birds flying due south, towards Southampton and the sea. Of these flights I have kept a record: between 12 and 1 o'clock a flock of some eighty or ninety birds flying high; between 2 and 4 o'clock, six large flights, numbering fifty, thirty, forty, eighty, sixty, and forty respectively. There are still some Gulls left in water-meads which have not joined the seaward migration; these birds must have been with us for the last seven nights; they choose for their resting-place a wooden bridge that has a convenient kind of banister on which they perch. I have never seen these birds feeding, although I have observed them at almost all hours of the day; I hope, however, to have an opportunity of examining the crop of one of these birds. Some of your readers may have noticed an article in the 'Standard' on Gulls on the Thames. They are certainly far more abundant this year than hitherto as remarked by Mr. Chalkley, who has lived here over thirty years. Dec. 3rd, the Gulls are still with us, and will probably remain permanently throughout the winter. A flock of some hundred individuals was feeding

in a ploughed field on the side of St. Catherine's Hills this morning with a large company of Starlings.—G. W. SMITH (The College, Winchester).

Eared Grebe in Kent and Stone Curlew in Sussex.—On Nov. 14th I had brought to me a male Eared Grebe (*Podiceps nigricollis*), shot on the sea about a mile east of Dungeness, Kent; weight 9 oz.; contents of gizzard a little moss; eyes yellow. Mr. G. Dowker, in his work on the 'Birds of East Kent,' tabulates it as "very rare," but probably, as Mr. Booth suggests in his 'Rough Notes,' it may perhaps be overlooked on account of its similarity in winter plumage to the Slavonian Grebe, its slightly turned-up beak and white primaries, however, distinguishing it. Mr. Bristow had a very light-coloured Stone Curlew sent to him on Nov. 14th, which had been caught at Battle, Sussex. A Storm Petrel was also picked up alive on the sea-shore in front of the Grand Parade, St. Leonards, on Nov. 13th. The adult Richardson's Skua recorded by me about a month or two ago was a female (by dissection), and not a male, as I thought. The Osprey brought to me in September I found, on going to see the spot where it was shot while being mobbed by Rooks, was at Pett, about two miles nearer Hastings than Winchelsea, though still close to the Military Canal, which runs from there to Cliff End.—G. W. BRADSHAW (Hastings).

Purple Gallinule in Surrey.—Referring to Mr. Corbin's note on the occurrence of a Purple Gallinule in Hampshire (p. 434), it may be of interest to state, that as my nephew Mr. John Blackburne was walking by the side of the lake at Bury Hill, near Dorking, in September, 1894, he frequently saw a Purple Gallinule, *Porphyrio cærulea*, standing on a hillock by the lake busily preening its feathers. He never saw it on the open water, but often disturbed it in the thickest part of the rushes or on the bank, when it would fly over to a thick bed of reeds, just skimming the surface of the water, and in February, 1895, he found it dead by the side of the lake. On examining it he found no signs of its having been shot, and it was in good plumage and condition. He sent it to be stuffed, and afterwards brought it to show me. It is now in the possession of Miss Barclay, of Bury Hill, Dorking. I think this is the fifth time a specimen of this bird has been obtained in Britain.—WM. BORRER (Cowfold, Horsham).

Pomatorhine Skua and Peregrine Falcon in Sussex.—A Pomatorhine Skua (*Stercorarius pomatorhinus*) was shot at Pett, near Hastings, at the end of September last. The bird, a young male, was sent for preservation to Messrs. Bristow and Sons, naturalists, of Silchester Road, St. Leonards-on-Sea, who inform me that a Peregrine (*Falco peregrinus*) is now in their hands, which was shot at Guestling, near Hastings, in the last week of October.—THOMAS PARKIN (High Wickham, Hastings).

Sabine's Gull in Cornwall.—It may interest your readers to know that I lately procured, at the little fishing-village of Porthgwarra, in Cornwall,

a specimen of Sabine's Gull in full breeding plumage. I discovered the bird—which was thought to be the Black-headed Gull—mounted in a case along with a Puffin and Guillemot. On making enquiries, the owner, Mr. John Jackson, informed me that it had been procured near the Wolfe Rock Lighthouse in September, 1894. According to Mr. Saunders, in the fourth edition of Yarrell's 'British Birds,' only two specimens in full summer plumage had occurred in the British Islands at the time of publication.—ARCHIBALD THORBURN (88, Fellows Road, South Hampstead).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

Nov. 19th, 1896.—Mr. A. D. MICHAEL, Vice-President, in the chair.

Messrs. John Farrah and A. H. Pawson were elected Fellows of the Society.

Dr. D. Morris exhibited from the Royal Gardens, Kew, the inflorescence of *Pterisanthes polita*, a singular species of the Vine order (*Ampelideæ*), received in 1894 from Mr. H. N. Ridley, of Singapore, and now in flower for the first time in Europe. It is a slender plant, climbing 15 to 20 ft. over trees, native of the Malay Peninsula, Sumatra, and North Borneo.

Dr. Morris also exhibited dried flower-stems of the Australasian twin-leaved Sundew (*Drosera binata*, Labill.), received at Kew from the Sheffield Botanic Garden. In this instance the stems were 3 ft. 6 in. high, bearing about thirty to fifty large pure white flowers, nearly one inch across.

Mr. W. G. Ridewood read a paper on the "Structure and Development of the Hyobranchial Skeleton and Larynx in *Xenopus* and *Pipa*." He showed that the hyoglossal foramen in these genera owes its presence to the secondary union of the anterior or hyodean cornua, and that the great wings of the hyobranchial skeleton are secondary extensions of the hyobranchial cartilage, and not persistent branchial arches of the larva. The hyoidean cornua of *Pipa* are present in the embryo, but disappear during metamorphosis. Attention was drawn to sexual differences in the larynx, and the same seven muscles were shown to be present in relation with the larynx in the two genera. The thyrohyals and the greater part of the basal plate, which in the adults of *Pipa* and *Xenopus* are intimately associated with the larynx proper, were shown to remain free from it until metamorphosis is complete; and it was shown that previously to this the larynx is simple and resembles that of the adult *Bombinator* or *Discoglossus*. The conclusions were drawn that *Pipa* and *Xenopus* are descended from tongue-bearing ancestors, and that in spite of the anatomical differences between the two

genera, the suborder *Aglossa* is a natural one. The paper was illustrated by lantern-slides; and was commented on by the President, Prof. Mivart, and Prof. Howes.

A paper was then read by the Rev. T. R. Stebbing, "On the Collection of Amphipoda in the Copenhagen Museum." Some of the more striking rarities were described, together with a few of a less uncommon type. The collection being cosmopolitan, the opportunity was taken of bringing into notice certain other new or insufficiently known forms received from Prof. Haswell, of Sydney, N.S.W., and from Mr. G. M. Thompson, of Dunedin, N.Z. The range of the various specimens described extends from Cuba to Ceylon; from the North Atlantic to the South Pacific; from the western coast of Scotland to the eastern coast of Australia and New Zealand. Nine genera and ten species were discussed, six of each being new. The new genera comprised *Parhyale* (near to *Hyale*, but with palp of first maxilla one-jointed, and with a minute inner branch to the third uropoda), *Andaniotes*, *Pontharpinia* (combining characters of *Haustorius*, *Urothoe*, and *Harpinia*, and founded on *Urothoe pinguis*, Haswell), *Anamixis*, *Eudiropsis*, and *Suncho*, the type of which is *S. platynotus*, from Port Jackson, Australia. The paper was illustrated with lantern-slides.

ZOOLOGICAL SOCIETY OF LONDON.

Nov. 17th, 1896. — Dr. ST. GEORGE MIVART, F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie between May and October, 1896; and gave an account of some of the more interesting animals observed by him during a visit to the Gardens of Antwerp, Cologne, Dusseldorf, Hanover, Amsterdam, the Hague, and Rotterdam in June last.

Mr. Chalmers Mitchell made remarks on a supposed case of Telegony exhibited by a Fox-Terrier in showing peculiarities due to a previous impregnation by a Dachshund. A discussion followed, in which Sir Everett Millais, Mr. Tegetmeier, and others took part, and expressed opinions generally unfavourable to the theory of Telegony.

Dr. Leonard Hill made some remarks on supposed cases of the inheritance of acquired characters as shown by breeding Guinea-pigs.

Mr. Sclater exhibited, on behalf of the Hon. H. S. Littleton, a coloured life-sized model of the Australian Lung-fish (*Ceratodus forsteri*).

Mr. Blanford exhibited, on behalf of Major C. S. Cumberland, some heads of *Ovis ammon* shot by him on the Altai Mountains in Central Asia. These heads were figured in 'The Field' of October last, in illustration of an article by Major Cumberland describing how, when, and where they were obtained.

Mr. Oldfield Thomas read a paper "On Further Collections from Nyasaland," being a continuation of three previous papers on the Mammals of that country. The specimens referred to had been collected and sent home by Sir Harry Johnston, Consul Alfred Sharpe, Dr. Percy Rendall, and Mr. Alexander Whyte. Two species were described as new: a peculiar hoary-coloured Baboon from Fort Johnston, proposed to be called *Papio pruinosus*, and a Steinbok with white streaks in its fur characteristic of the Grysbok. The latter had been obtained by Mr. Sharpe in Southern Angoni-land, and was proposed to be called *Raphiceros sharpei*.

Mr. W. E. de Winton read a paper on some Rodents from Mashonaland and Matabeleland, British South Africa, collected by Mr. J. Ffolliott Darling and Mr. F. C. Selous. This memoir contained descriptions of six species and two subspecies of rodents new to science. Amongst these were a Dormouse very much smaller than *Graphiurus murinus*, to which the name *G. nanus* was given; a Pouched Rat, which was called *Saccostomus mashonæ*; and a Mole-rat, proposed to be called *Georychus nimrodi*.

A communication was read from Mr. Alfred E. Pease containing notes on the Antelopes of the Aures and Eastern Algerian Sahara.

Communications were read from Dr. A. G. Butler on two collections of Lepidoptera made by Mr. R. Crawshay in Nyasaland; and on a collection of Lepidoptera from Nyasaland, collected by Mr. J. B. Yule.

A communication was read from Mr. Joseph I. S. Whitaker, containing field-notes on the Gazelles of Tunisia.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

November 4th.—Professor MELDOLA, F.R.S., President, in the chair.

Mr. McLachlan exhibited a collection of the cast nymph-skins of more than one-third of the species of European dragonflies from the Département de l'Indre, France, sent to him by Mons. René Martin. Two or three of the species had been reared in an aquarium, but most of them were identified by finding the imago drying its wings near the cast skin.

Mr. R. Adkin exhibited a series of *Acidalia marginepunctata* taken on the coast at Eastbourne, during the past eight summers. The series included a bone-coloured form with pale transverse markings; others much dusted with black scales, giving a deep grey tone with well-developed markings; and sundry forms intermediate between the two; also three taken this year, in which the whole of the wings, with the exception of a pale submarginal line, are densely covered with black scales, presenting a similar appearance to the so-called "black" forms of *Boarmia* and *Tephrosia*.

Mr. Donisthorpe exhibited a female specimen of *Dytiscus circum-*

cinctus, Ahr., with elytra resembling in form those of the male, taken in Wicken Fen in August last.

Mr. Tutt exhibited a specimen of *Mellinia ocellaris* recently taken near Southend, together with a specimen of *M. gilvago* for comparison; also four specimens of *Argyresthia atmoriella*, taken by Mr. Atmore last June, at Lynn, Norfolk. Mr. Tutt also exhibited a long series of a *Melampias* which he had captured at Le Lautaret, in the Dauphiné Alps, at an elevation of 7000 to 8000 feet. He observed that the specimens exhibited were peculiar in some important particulars, combining some of the characteristics of *Erebia* (*Melampias*) *melampus* and *M. pharte*. His attention had been first drawn to this form by some fine examples captured by Dr. Chapman and himself on Mont de la Saxe in 1895. Compared with the Tyrolean examples of *M. melampus*, this form showed a tendency to a lengthening of the fore wings, and to an obsolescence of the black dots, thus approaching *M. pharte*, but the females presented none of the typical characters of the female of *M. pharte*. On the whole, he felt satisfied that the Mont de la Saxe specimens were a form of *M. melampus*. Mr. Elwes observed that though all the continental butterflies had been so long studied by European entomologists, he did not think the form exhibited by Mr. Tutt had been hitherto noticed. He agreed in the conclusion at which he had arrived.

Mr. E. Ernest Green exhibited a typical specimen of *Ephyra omicronaria*, together with what he believed to be a remarkable melanic variety of the same species, taken by Dr. Dudley Wright at Pegwell Bay, near Ramsgate, in September last. Some of the Fellows present, after an examination of the specimen, expressed an opinion that it was a variety of an *Acidalia*, and not of *Ephyra omicronaria*.

Mr. Goss stated that Mr. Harry Fisher, the botanist to the Jackson-Harmsworth expedition, had returned to England. He hoped that he would have been present at the meeting, to exhibit a few minute Diptera and other insects which he had collected in Franz Josef Land. Mr. McLachlan made some remarks on insects and flowers in high latitudes, and Mr. Elwes, Sir George Hampson, and Professor Meldola also commented on the subject.—H. Goss, *Hon. Secretary*.

Nov. 18th, 1896.—Prof. MELDOLA, F.R.S., President, in the chair.

Messrs. Malcolm Burr, G. H. Gale, and A. E. Wileman, were elected Fellows of the Society.

Mr. Tutt exhibited a series of the ochreous form of *Tephrosia bistortata*, Goetze, known as ab. *abietaria*, Haw., captured by Mr. Mason, near Clevedon, Somerset; and second broods of the same species (ab. *consonaria*, St.), bred from ova laid by the first-mentioned specimens. He also exhibited a series of *Tephrosia crepuscularia*, taken at Doncaster; a variety

of *Hipparchia semele*, captured near Ramsey, Isle of Man, and a series of *Plusia bractea*, bred from ova laid in July last. The eggs and larvæ had been subjected to forcing treatment, with the result that the moths emerged in October.

Dr. Sharp called attention to Mr. Ernest Green's plates of the *Coccidæ* of Ceylon, which were exhibited on a screen in the room, and said that he was inclined to consider the *Coccidæ* as a distinct order of insects, though at present the evidence was hardly sufficient to warrant this. He asked if Mr. Green could give any information with regard to the development of the wings in the male. Mr. Green stated that in the males of the *Coccidæ* the wings first appeared in the penultimate stage as small projections on the sides of the thorax. These wing-pads grew to a certain extent without any further ecdysis. Though the insect was then quite inactive, and took no food during this stage, the rudimentary wings and legs were free from the body, and were capable of some slight movement. After the final ecdysis the wings of the imago were fully expanded, and assumed their natural position before the insect left the sac, or puparium, in which the resting stage had been passed. Mr. McLachlan and others continued the discussion.

Mr. Bethune-Baker exhibited a yellow spider from Orotava, which was of the exact colour of the flowers that it usually rested upon, and which had been observed to catch *Vanessæ* which settled on these flowers. Mr. Barrett said he had noticed a spider with the same habit on the ox-eye daisy in Surrey.

Professor Meldola stated that it had been of late found difficult to store bristles in the city, owing to the ravages of a moth, of which he exhibited living specimens of the larvæ and pupæ. Mr. Barrett said the moth was *Tinea biselliella*. Mr. Blandford stated that the bisulphide of carbon treatment might be found of advantage if it were practicable, but more would have to be ascertained with regard to the extent and character of the ravages before anything could be determined upon. Mr. Merrifield, Mr. Green, and others took part in the discussion which followed.

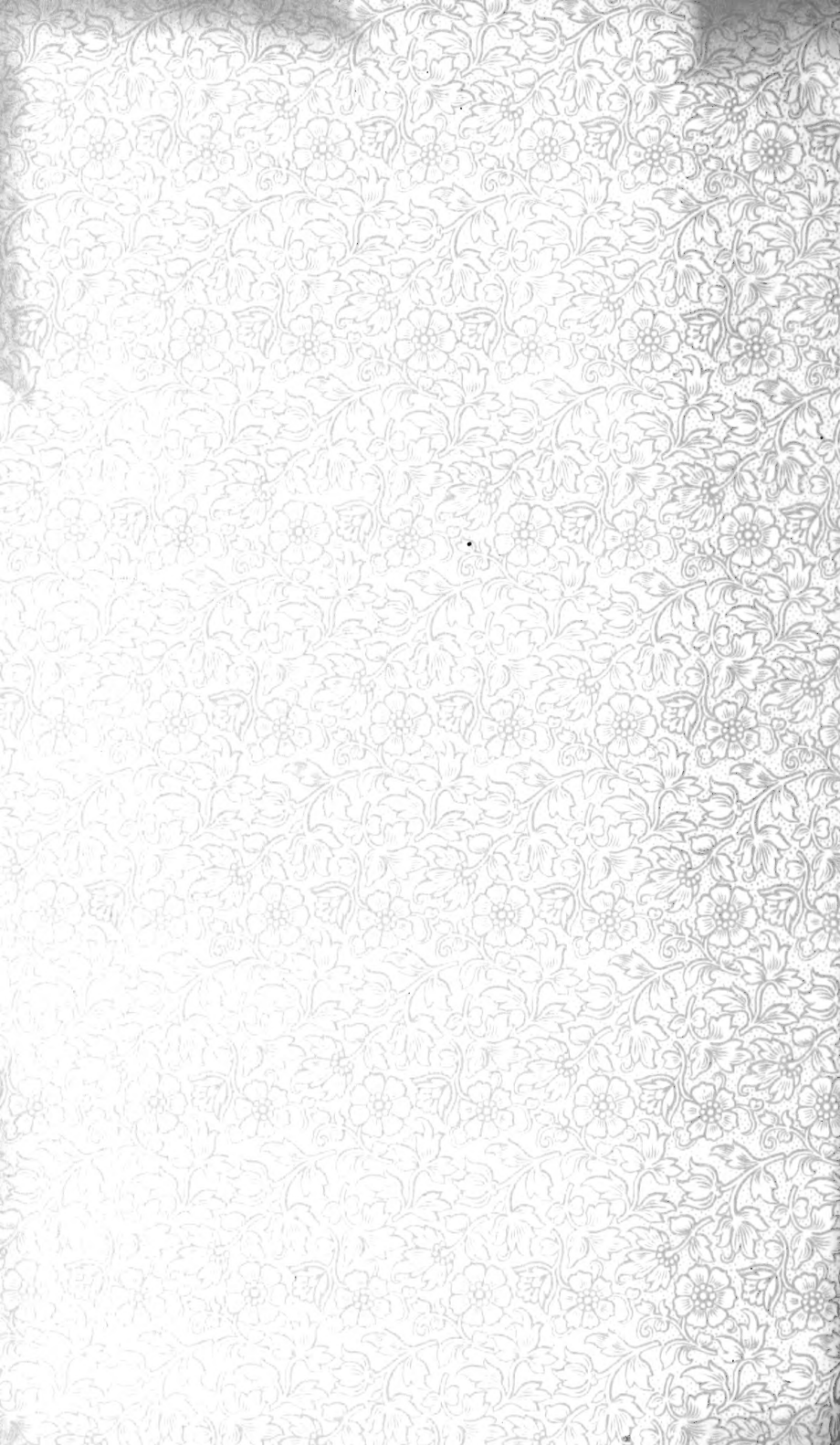
Mr. Blandford called attention to the use of formalin as a preventive of mould, and said that it would probably be found of use in insect collections; an object once sprayed with this substance never became mouldy afterwards. Professor Meldola said that formalin was another name for a solution of formic aldehyde: it is now much used in the colour industry and is, therefore, produced on a large scale.

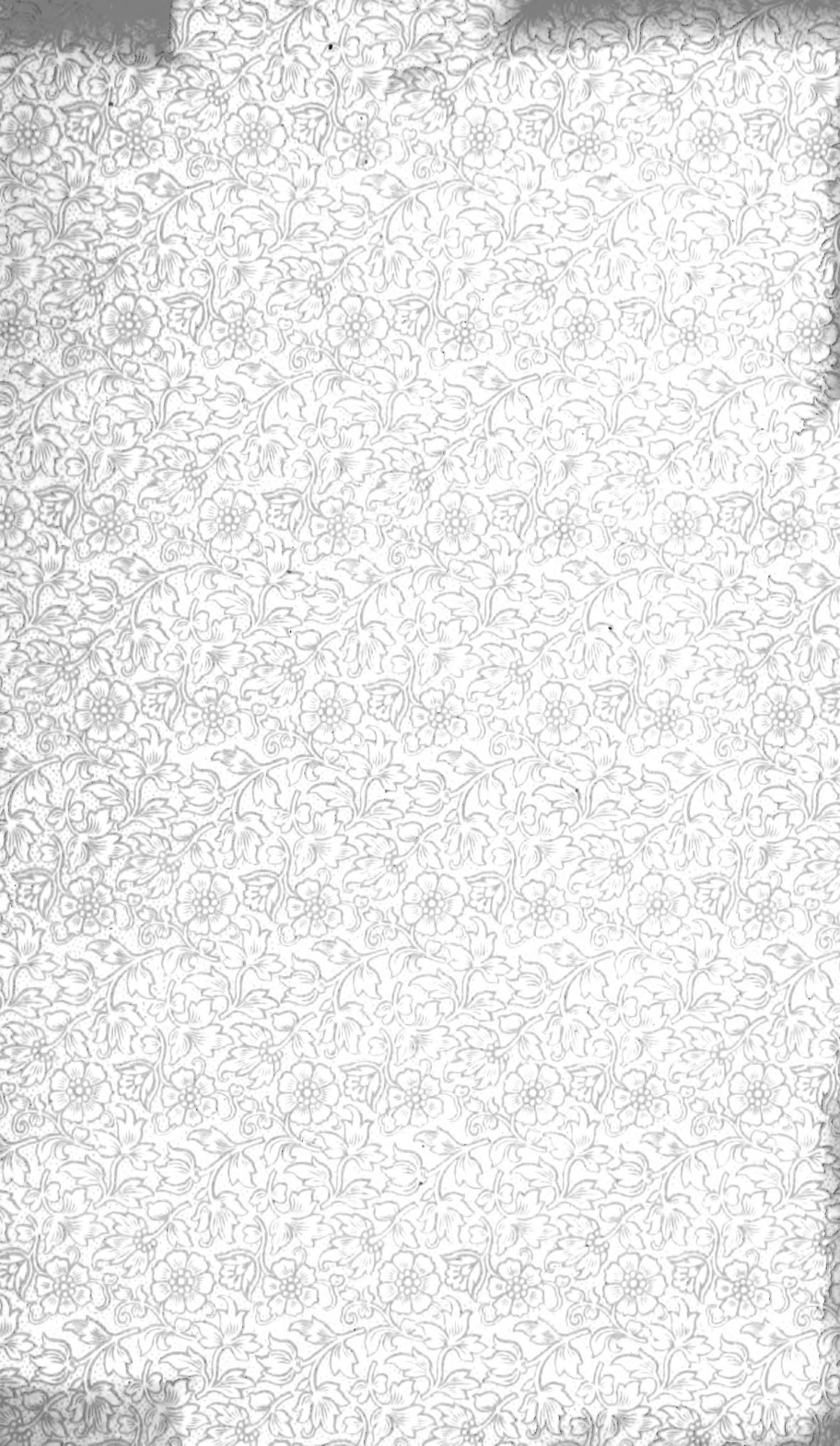
Mr. Newstead communicated a paper entitled "New *Coccidæ* collected by the Rev. A. E. Eaton in Algeria."—H. GOSS and W. W. FOWLER, *Hon. Secretaries.*











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