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P R E F A C E .

WITH the close of the year 1889 the thirteenth volume of the Third Series of 'The Zoologist' is completed, and with the issue of the title-page and contents in the present number, the Editor takes the opportunity of thanking both contributors and subscribers for their continued support.

He has on former occasions reminded them that 'The Zoologist' is what the contributors make it, and that it depends upon them to keep up the general standard of excellence, or at least of utility, which has characterized its existence for the past forty-six years.

Everyone who has undertaken to publish an account of the fauna of the county or district in which he resides will be ready to admit that he has obtained more materials for his work from 'The Zoologist' than from any other source of information, excepting of course the collected notes of such competent observers as may have assisted him within the area of his researches.

This of itself should operate as an encouragement to those who, having observed some interesting fact, hesitate to communicate it for fear it may be too well known to deserve publication.

It is sometimes as important to confirm an observation as it is to announce it for the first time, and on this

account the Editor is always glad to receive communications, however trivial they may perhaps appear to the contributor.

As a medium for the discussion of questions generally interesting to naturalists, 'The Zoologist' is especially useful; for coming as it does to the hands of so many practical out-door observers, the author of an enquiry may be very speedily supplied with facts.

But whether the object of a contributor be to seek information, or to impart it, the Editor trusts that in the forthcoming year he may be as favoured with communications from all sides as he has been in the past.



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NOTES ON A VOYAGE TO THE GREENLAND SEA IN 1888.

BY ROBERT GRAY.

[SINCE the publication of my notes on a voyage to the Greenland Sea in 1886 (*Zool.* 1887, pp. 48, 94, 121), I have twice visited the Arctic Seas, *viz.* in 1887, and during the present year. The 'Eclipse,' the vessel in which I sailed, is a full-rigged ship of 450 tons burden, fitted with auxiliary engines of 80 h. p., nominal. She carries eight whale-boats, and is manned by a crew of fifty-five, all told. She is still commanded by my father, Capt. David Gray, who has now completed his fortieth voyage as Master of a whaler to the Arctic Seas. As in 1886, the main object of our voyage was the capture of the Greenland-Right Whale, *Balæna mysticetus*, the price of whose whalebone has now made it at once the most valuable, and one of the rarest of all the Mammalia. In the following communication I propose giving a brief account of our voyage, a few extracts from my 'Log,' with occasional remarks and observations on some of the animals we met with, and the more important phenomena of the Greenland Sea.—R. G.]

LEAVING Peterhead on April 16th, the 'Eclipse,' having called at Lerwick, where twenty-five Shetland men were shipped, two days afterwards finally set sail for the Greenland Sea. From the Shetlands the whalers usually steer N.N.E. towards the island of Jan Mayen; but, owing to the strong easterly winds which prevailed, we were driven far to the westward, out of our course. On the 20th we weathered the Færoes, passed within 120 miles of Iceland on the 22nd, and on the 26th, in lat. 69° 20', long.

6° 29' W., southward from Jan Mayen about eighty miles, we met the first pack ice.

As far as I could discover, during our progress northward, there was a greater appearance of cetacean life than farther to the eastward along our usual route, more especially with regard to the Bottle-nose Whale, *Hyperoodon rostratus*; birds also were more numerous. The following are a few extracts from my 'Log' concerning this part of our voyage:—

April 19.—Position at noon, lat. 61° 43', long. 1° 10' W. Water clear and blue. Besides a solitary Gannet seen now and again throughout the day patiently seeking its food, a Raven appeared near the ship in the morning, and an Oystercatcher at noon. Kittiwakes and Mallemites were fairly numerous; of the latter we noticed the first about mid-day.

April 21.—Lat. 62° 49', long. 4° 6'. Water clear and colourless all day: temperature at the surface, 42°. Four Bottle-nose Whales were seen in the morning, and at night we passed a whaling brig which quite recently had killed some of these animals.

April 22.—Lat. 65° 2', long. 8° 17' W. The sea was green in the morning, but afterwards became blue and clear, the change being accompanied by a rise of temperature. Eight different herds of Bottle-nose Whales were seen during the day, all stationary and probably feeding, while three vessels which we saw were probably Bottle-nose whalers. Many Rotjes (Little Auks) seen, also two Snowflakes and a young Burgomaster.

April 23.—Lat. 66° 30', long. 7° 50' W. Spoke the s.s. 'Haardraada,' Norwegian sealer, Capt. Castberg, recently engaged in prosecuting the seal fishing, but now in search of Bottle-nose Whales. From Capt. Castberg we learnt the news of the young Saddle-sealing. The main body of seals were found west from Jan Mayen about ten miles, but owing to the open nature of the ice, the result of strong westerly winds, they were greatly scattered. Twenty-one Norwegian ships captured 38,200 seals, while three Scotch ships secured 1700, making a total of 39,900, which can far from pay the expense incurred in their capture, and which forms but a sad comparison with a total of over 400,000 killed in 1850.

April 25.—Lat. 68° 28', long. 5° W. Water clear and blue; temperature at the surface 35°. Bottle-nose Whales very

numerous, all more or less stationary, and evidently feeding. They appeared to be going deep for their food, judging by the length of time they remained under water, and by their heavy and prolonged expirations while lying at the surface. Several herds of these whales swam round and round the ship, sometimes passing quite close under the stern; once I noticed the sunlight glance upon the breath of one, a beautiful but transitory bow being formed. Concerning one which we killed I made the following notes:—

Sex.—Male.

Colour.—Greyish black on the sides, shaded above to black along the ridge of the back, as well as towards the extremities and margins of the fins; shaded below to greyish white along the surface of the throat and belly.

*Measurements.**—From a perpendicular erected at tip of jaw to base of beak, 1 ft.; to angle of mouth, 2 ft.; to "blowhole," 3 ft. 4 in.; to eye (centre of pupil), 3 ft. 6 in.; to auricular opening, 4 ft. 1 in.; to occipital condyles, 4 ft. 10 in.; to pectoral fins, 5 ft. 10 in.; length of pectoral fins, 2 ft. 4 in.; greatest breadth of ditto, 8 in.; to anterior end of base of dorsal fin, 13 ft. 10 in.; to posterior end of ditto, 15 ft. 6 in.; height of dorsal fin, 1 ft. 3 in.; to the most anterior part of the lobes of the tail, 20 ft. 10 in.; to the most posterior part of ditto medianally, 22 ft. 10 in.; to the centre of a line joining the lateral tips of caudal fin, 23 ft. 8 in.; extreme breadth of caudal fin, 5 ft. 10 in.; girth at the eyes, 8 ft. 3 in.; at the neck, 12 ft. 7 in.; at 3 ft. behind pectoral fins, 12 ft. 7 in.; thickness of blubber, 4 in.

Contents of Stomach.—An immense quantity of cuttle-fish remains, mostly beaks and crystalline lenses, but there were a few almost entire, which I recognised as *Gonotus fabricii*, a cephalopod which seems to be largely preyed on by this whale.

Parasites.—A few *Cyamus thompsoni* attached to the skin of the forehead, the angles of the mouth, and the upper surface of the lobes of the tail near their posterior margins.

After reaching the ice, we commenced working northwards along its margin, now steering eastwards along an outlying point, again crossing a deep "bight" in which the ice ran more to the westward. With reference to the whaling grounds which occupy a more or less central position, certain terms are used by the

* The measurements referring to any of the cetaceans throughout these notes are, unless otherwise stated, between vertical transverse planes supposed to pass through the parts mentioned.

whalers to designate the neighbouring ice. Thus the ice discharged from the Polar basin, and carried southward along the Greenland coast by the Arctic current, is called the "west ice," the ice which occasionally comes round the south end of Spitzbergen out of the Barentz Sea the "east ice," while the ice formed during severe frosts in an intermediate area of more or less still water "south-east pack." The "west ice," amongst which the capture of *Mysticetus* is solely carried on in these seas, is an ever-moving stream of ice coming from the northward, having its position mainly determined by the current which, flowing at an average velocity of about ten miles per day, carries the ice in its sinuous course, now to the eastward, now to the westward, forming a series of "points" and "bights" which, being remarkably constant in position, are well known to the whalers, several being designated by names. The ice, as it leaves the Polar basin, is mostly in the form of "floes," circular sheets of ice from ten to twenty miles in diameter, crumpled up round the edges owing to contact with one another, and varying considerably in thickness, ruggedness, &c. In its progress through the Greenland Sea, the ice is largely affected by the strength and direction of the winds. While northerly winds accelerate the drift of the ice, driving it southwards in compact masses at the rate of sometimes fifty miles a day, southerly winds have an opposite effect, greatly counteracting the drift, and spreading the ice outwards. Again, westerly winds, so much beloved by whalers, gradually spread the ice seawards, a series of open spaces of water alternating with strips of ice being formed, somewhat pleasing in appearance to the eye; while easterly winds, with their usual accompaniment "swell," soon convert the ice into a dismal and heaving pack of broken ice. The amount of ice in different years is subject to considerable variation, fluctuating between extreme limits with a certain periodicity, related either to the severity of the preceding winter or to the rate of the set or current, but probably mainly to the latter, as the amount of ice in any season has been observed to be inversely proportional to the drift of the ice itself. Finally, the amount of ice, having increased during the winter, and therefore at a maximum during the spring, gradually decreases during the summer, more especially in a season of easterly winds.

This year the position of the "west ice" was fairly normal, but from the presence of a "south-east pack," in so far, the season was remarkable. This body of ice, formed only in seasons of severe frost, occupies an east and west position generally to the northward of the parallel of lat. 76° ; it consists almost entirely of young or "bay" ice formed *in situ*, and seldom of great thickness. Lying in an area of more or less still water, unless in so far as affected by the winds, this ice remains almost stationary, gradually melting during the summer, and finally disappearing altogether. The "south-east pack," although delaying somewhat the progress of the ships northward, by preventing the swell from breaking up the ice on the whaling grounds, performs an important office to the whaler, and its presence accordingly is hailed as a good omen.

Meeting the "south-east pack" in lat. 75° , we at first endeavoured to continue our progress northward along the margin of the "west ice," which could still be easily distinguished by its greater thickness, but eventually we had to abandon this attempt, and, retracing our steps seawards, proceeded eastwards along the margin of the south-east ice. On May 11th, having reached lat. 77° and long. 3° E., and finding the ice farther east running to the southward, we entered the pack, and commenced forcing our way northward through the young ice. The sea immediately to the westward of Spitzbergen, which is usually open, we found, as we proceeded northward, entirely covered by ice, and it was not until the evening of the 15th, when, having reached lat. $80^{\circ} 13'$ we entered the "north water." The following are a few notes which I made during this part of our voyage:—

May 1.—Lat, $72^{\circ} 45'$, long. $4^{\circ} 46'$. Water clear and blue; temperature 30° at the surface. A few Saddle Seals, *Phoca grœnlandica*, lying on the ice. Several which we shot were at the age when known to the sealers as "Spots." These Seals are probably about six weeks old, having escaped the general slaughter at the young sealing about a month before. They are bluish grey in colour, shaded to dark blue on the back, to silvery grey on the belly, and marked over with black spots, especially on the sides (hence the name). One which I measured was 3 ft. 6 in. in length from the tip of the nose to the tip of the tail, and 2 ft. in girth at the shoulders. The stomachs of several

which I examined were empty. My father informs me that the capture of these "Spots" formed, until some twenty or thirty years ago, a fishery of considerable importance; and it is clear that if the Seals are allowed to multiply by an extension of the close time, the Saddle Seal fishing would, to a large extent, be restricted to their capture at this age. The "Spots" are found on the scattered pieces of ice at the pack edge, the fishing being carried on during the latter part of April and the beginning of May. The Seals take the ice early in the morning, on which they sleep during the day, entering the water again at night, probably to feed.

May 6.—Lat. $75^{\circ} 29'$, long. $5^{\circ} 13'$. Water alternately blue and green; temperature at the surface, 30° . In the green water I noticed a great abundance of minute organisms, just visible to the naked eye. They appeared to consist of a spherical mass of colourless, gelatinous matter, with collections of cells (probably diatoms) embedded in different parts of its matrix. I afterwards found that although these organisms were usually, they were not always, present in the green or diatom-stained water, while a few occurred occasionally in the blue unstained parts of the sea.

May 11 to 14.—During our progress northward through the S.E. pack the sea had an olive-green, and sometimes a brownish, colour, owing to the presence of Diatomaceæ. The ice I noticed, as the ship tore it up with her iron-shod stem, was in many places stained a yellowish brown colour. This is the condition sometimes known to the whalers as "rotten ice." I observed that when the ship came in contact with a piece of discoloured ice, it had a tendency to split along its plane of flotation into two horizontal halves, a deal of discolouring matter being exposed. So far then, the diatoms, appeared to be locked up in a central and horizontal stratum of the ice, agreeing with its plane of flotation, and this view I afterwards found was supported by making sections of the ice itself. Later on we frequently noticed pieces of ice with their margins, and especially the cavities, extending horizontally inwards, formed by the action of the sea along the line of flotation, stained yellowish brown with diatoms. Finally, the discoloration was almost entirely restricted to the "young" or "bay" ice of which the S.E. pack is formed, the much more permanent "heavy" or

"old" ice floating in ordinary circumstances in clear and unstained water.

With these facts before us, we can have little difficulty in understanding the formation of "rotten ice," and its presence in the S.E. pack. That part of the Greenland Sea, consisting for the most part of an area of still water, and whose surface waters are usually so deeply stained with the characteristic colour of vegetable organisms, bounded on the east by the coast of Spitzbergen, and on the west by the ever-fluctuating eastern margin of the "west ice," known to the whalers as the "Spitzbergen land water," having during a period of severe frost become frozen over with sheets or "floes" of young ice, and this ice having become broken up by the action of swell into the form known as "pancake ice," and the "pans" having become separated, would, as already explained, become eaten into, and stained with diatoms round their line of flotation. We have next to suppose another spell of cold weather; the pieces of "pancake" ice, separated somewhat from one another, become reunited by the formation of additional ice, the whole forming a "congealed" pack, with here and there pieces of ice which, if crashed into by a ship or otherwise broken, would appear diatom-stained in the manner already described. With these conclusions the observations of Scoresby entirely agree, but from Dr. Robert Brown, who investigated the subject ('Trans. Bot. Soc. of Edinburgh,' vol. ix., pp. 244—252), I venture to differ. Dr. Brown, having found a number of pits on the under surface of the ice containing and formed by collections of diatoms, arrives at the conclusion that these minute organisms, by melting the ice, play an important part in the economy of these seas. Now, so far as I have observed, the discoloration is restricted to recently formed ice, occurring in parts of the sea usually open, the ocean, where permanently covered by ice, being always clear and blue, and unstained by diatoms; also the discolouring matter, when present, occupies a position round the margin of a horizontal stratum agreeing with the plane of flotation, and bounded in that plane by the outline of the ice.

May 15.—Lat. $79^{\circ} 50'$, long. $5^{\circ} 15' E$. Water dark green; temperature at the surface, 29° . Auks and Divers very numerous; also many Narwhals, floe Seals, and a few Bears. A male

Walrus which was shot measured 11 ft. from the tip of the nose to the extremity of the spine, and 9 ft. in girth. The stomach of this Walrus was filled with large pieces of Seal's skin, with the blubber attached, and also of pieces of liver. Last season we shot two, and both their stomachs were similarly filled; one of them, which was shot in the water, had a floe Seal in its mouth which it had just captured; so that the unfortunate floe Seals, persecuted on the ice by the Bears, are preyed upon by the Walrus while in the water.

At this point a few words might be said with regard to the distribution and migrations of *Mysticetus* in these seas. The facts known are not numerous. A line drawn icewards, at right angles to the sea margin, passes through the habitat of this animal. Following the course of such a line, the ice usually greatly broken up at the sea-edge owing to the action of the swell, would be found to consist of larger and larger pieces of ice, until finally the unbroken floes, as they left the Polar basin, would be found. *Mysticetus* would first be met with on losing the swell, and therefore a very variable distance through the ice, while beyond—a somewhat more sharply defined, but still more variable line—it would not be found. Between these ever-changing limits there is an area for the most part covered with floes and loose ice, which forms the habitat of the Greenland-Right Whale. With regard to their migrations two well-marked movements occur, *viz.*, the advance of the Whales northward in spring, and their retreat southward in the autumn or “fall.” These migrations are undoubtedly associated with the presence of “bay” or “young” ice. During winter the open spaces between the pieces of old or heavy ice become frozen over, the sea being uniformly covered with ice. With the advance of spring, and consequent rise of temperature, the “bay” ice, as it is termed, gradually melts or ceases to form on the open spaces of water which are continually breaking out amongst the ice. Following the progress of this event, the northward migration occurs, while on the re-formation of the “bay” ice, in the Fall, the Whales again return south. From this it follows that the area inhabited by *Mysticetus* might be represented by a band of variable breadth running parallel to the edge of the ice, the animal being most usually present where the temperature of the water is just above the freezing point. In the Greenland

Sea these Whales usually reach lat. 73° early in April, 75° about the end of the same month, and 78° in the middle of May. The young Whales are generally in advance, the older animals—especially the males—lagging behind.

(To be continued.)

ORNITHOLOGICAL NOTES FROM THE NORFOLK COAST.

BY OLIVER V. APLIN.

HAVING, with my brothers Mr. F. C. and the Rev. B. D'O. Aplin, spent a few days (Sept 17th to 26th) at Cley, on the Norfolk coast, I send you some notes on the birds which we met with.

Our visit being paid some seventeen days earlier than last year (October 4th to 15th), it was interesting to note the difference in the avifauna of the marsh, which on this occasion partook more of a summer, or early autumn, than a winter nature.

The following summer visitors, or early migrants, unseen last year, were noticed:—Redstart, Willow Wren, Tree Pipit, Ray's Wagtail, Common Sandpiper, Little Stint, Whimbrel, and Common Tern; while Wheatears, Pigmy Curlews, Godwit and Turnstones were decidedly more numerous. Swallows and Martins were present in varying numbers each day, but I could not detect any migratory movement taking place. On the other hand, Rock Pipits, Grey Crows, and Twites, seen last year on October 4th and 5th, did not put in an appearance; the place of the second being taken by some Black Crows in the marsh on the 17th, the first I had seen in North Norfolk.

News having reached us of the capture of a Bluethroat and a Barred Warbler the week before our arrival, we sanguinely hoped to meet with some rare Warblers. But, owing possibly to the unfavourable quarter from which the wind blew during our stay, small birds (with the exception of a number of Willow Wrens one morning) were very scarce in the scrub. We were informed that a *north-west* wind was the most favourable for bringing in small birds, and during the time we were at Cley the wind was from E. to N.N.E.

Sept. 17.—Wind N.N.E., light. Walked down the marsh for

a couple of hours. A Redstart in the scrub, and many Wheatears about the drier ground. Two Common Sandpipers on the mud edge, and another in the creeks. Big flock of Lapwings on the wing, and several Grey Plovers seen. Larks and Meadow Pipits numerous. A good many Black Crows* in the marsh.

Sept. 18.—Wind N.E., light. Two or three Redstarts in the scrub, and a great many Willow Wrens: of three of the latter shot, one was a large light-coloured bird, very yellow; the other two were small and colder in colour. Crows gone; fewer Wheatears; many Meadow Pipits. A Peregrine Falcon about the sand-hills, also a Merlin; the latter we watched for some time in pursuit of a Wheatear. A fair show of waders: four or five Whimbrel, Curlew, a good many Bar-tailed Godwit, Knot, Ringed Plover, one lot of Golden Plover, Grey Plover, two Ruff flying over, five Oystercatchers on the sands below Stiffkey “freshes,” numerous Turnstones (as many as five together on the pebbly flats towards Stiffkey), three or four Curlew Sandpipers, Redshanks, Dunlin, a couple of Herons, and a big drove of Lapwings. Some Mallard about the harbour, and two Terns. A Stock Dove, was sitting on a squab, a few days old, and an addled egg in a hole in the sand-hills.

Sept. 19.—Wind N.E., moderate, fresher in afternoon; bright and hot. A Ray's Wagtail with some Pied Wagtails at the top of the marsh close to Cley. No Warblers in the scrub; a few Wheatears, and a little flock of Linnets. One or two bunches of Knot, and some odd birds: these must be the remains of the large flocks which arrived early in the season. Whimbrel pretty numerous, some Godwit, and a flock of fourteen or fifteen Curlew Sandpipers on the soft mud opposite Blakeney. Nine Sanderlings, unusually wild, on the sands at the Point. A Cormorant at the harbour mouth. A duck which passed our boat, flying up the harbour, and was knocked over by my brother, proved to be a drake Pintail, still in “eclipse” dress. As this duck, according to Mr. J. H. Gurney, jun., “is chiefly known at the present day as a winter visitant, and rather a scarce one” in Norfolk (Trans. Norfolk and Norwich Nat. Soc., vol. iv., p. 423), it may be worth mentioning that among some wildfowl received from Cley, on the

* These possibly may have been young Rooks. The Carrion Crow (*Corvus corone*) is a rare bird in Norfolk.—Ed.

12th November, were two Pintails. I heard that a small flock of drakes put in an appearance there last March, and several were shot; two of these, which I saw stuffed, were in very fine plumage. A Greenshank was shot on the marsh to-day.

Sept. 20.—Wind due E., fresh in morning; bright and hot. A Robin in the scrub at evening. Fair-sized bunch of Knot, some Godwit and Whimbrel, six Herons, and a single Golden Plover, flying with a Redshank and a Dunlin, which came to call. Grey Plover numerous on the Aster-grown mud-flats between Blakeney and Morston creeks. The Pigmy Curlews again in the same place. Four Scaup, one an adult male, in Stiffkey freshes.

Sept. 21.—Wind E., light; bright and hot. A Redstart in the scrub, adult over the autumn moult; also a Reed Bunting. Some Wheatears; apparently a continuous flow of these, as they were seen in varying numbers all the time we were there. Peregrine seen again, and the Merlin, hard hit a day or two before, secured. A large flock of Dunlin and many Ringed Plover,—the first day that any numbers of either were seen; an adult of the former still retained the greater part of the black breast of summer. Five Little Stints on the mud-edge in the upper part of the channel. Some tame Turnstones on the pebble banks. All those examined were in the spotted dress of the young. A few Whimbrel; and eight Curlew, coming off the land, flying down the harbour at sundown. One bunch of Knot, and a party of fifteen Golden Plover. Still some Godwit. A Snipe at the mouth of Morston Creek. Four Common Terns playing about the harbour by the Watch-house. A flock of Gulls, many Greater Black-backed ones among them. A Wigeon was shot to-day.

Sept. 22.—Wind E.N.E., light; dull morning, becoming brighter later in the day. Not many waders about. One Tern in the harbour. As we ran up to Cley, on the late tide, a beautiful calm grey evening, a Ruff passed overhead, uttering its sharp clear whistle, *fu-whit*.

Sept. 23.—Wind E.N.E., light; thick haze and falling mist. Visited, by kind permission of the owner, the fields frequented by the Sand Grouse, and saw three.

Sept. 24.—Wind E.N.E., backing to N.E., light to fresh in afternoon; some local showers at mid-day. Two Kestrels round the ricks inside the beach, which moved off eastwards along the

coast. Put out to sea about a mile and a half in the morning, and fell in with a school of porpoises. A short distance from land two Golden Plovers came round the boat from seawards, and when about half a mile off, parties of four and six Larks and a Wheatear passed us, travelling steadily S.S.W. Several small lots of Scoter, and some half-a-dozen Divers (apparently Red-throated), singly, flying E., at perhaps a mile from shore. Six Mallard and four Teal were also flying towards the land. A couple of tame Golden Plovers which my brother fell in with on the beach in the afternoon, and some Teal flushed from the creeks, were probably those seen coming in in the morning. A few Black Crows on Salthouse banks. One Whimbrel seen. Strong wind at night, and heavy rain up to 6 o'clock next morning.

Sept. 25.—Wind N.E., strong and cold in morning, dropping later. Evidently a small immigration of ducks, thrushes, and some small birds last night. Two Song Thrushes and a Black-bird in the scrub, which was not beaten until late in the afternoon; also some large Pipits, which rose silently, and proved to be *A. trivialis*. A single old Snow Bunting on the beach, rather an early arrival; also some Wheatears and Larks. A good bunch of Knots on the mud, and a few odd birds. Many waders in the marsh between Morston and Blakeney creeks; Grey Plover numerous, two or three Godwits, and a Ruff. The last-named, on rising from the mud, settled far out on the sands near the channel, where it was put up by a passing boat while I was endeavouring to creep up to it, and, though it came round to the call, would not come down. Two more Greenshanks were shot on the marsh to-day. A bunch of eleven Wigeon, also two and three, about the harbour; two Teal came off the sea in the afternoon.

Sept. 26.—Bright and hot. Down to the beach before breakfast. Many Meadow Pipits in the marsh, and several little parties of Larks on the beach, inclined to move eastwards along the coast.

A Honey Buzzard in the first year's plumage, now in Mr. F. C. Aplin's collection, was shot at Thurgarton, near Cromer, on the 13th September last.

ORNITHOLOGICAL NOTES FROM NORFOLK.

BY J. H. GURNEY, JUN., F. L. S., F. Z. S.,

President of the Norwich Naturalists' Society.

IN sending you a first instalment of Notes for 1888, from the county with which the name of Henry Stevenson has been so long associated, I cannot refrain from adding my personal tribute to his attainments as an ornithologist. He had a genuine love of Nature, and as one of the pioneers of the Norwich Naturalists' Society he helped to imbue many residents in this county with a taste for Natural History and outdoor observation. The influence exerted through his writings, however, was felt far beyond his own county, and readers of 'The Zoologist' especially will miss his periodical contributions to the pages of this widely-read Journal.

In compliance with the editorial request for information concerning the reported breeding of the Green Sandpiper in Norfolk (Zool. 1888, p. 306) I communicated with Mr. W. E. Baker, who readily answered all my queries, but nothing more was elicited than has already been furnished by Col. Butler, and the matter must therefore remain doubtful, since nobody saw the nest referred to, and the young Sandpiper which Mr. Baker thought was only a few hours old, might have been the young of some other species.

January, prevailing wind W. and E. Some Wood Pigeons nest very late: I have a note of shooting a young one, which still retained some of the yellow filaments, as late as December 23rd, only about two-thirds grown, and remember seeing another in November which had just left the nest, and could do no more than flutter. Among some Wood Pigeons taken out of a net on January 17th last was one in immature plumage. Wood Pigeons may be taken with acorns soaked in *Cocculus indicus*: although ranked as a poison, it is used by brewers, and pigeons which have been killed with it are none the worse for eating. Acorns soaked in spirit have no effect at all, the Wood Pigeons eating them with avidity, and evidently without the slightest ill effects. The best way of obtaining them is by lying in wait for them in the plantations, and shooting them as they come into roost: on January 24th forty birds were obtained in

this way by one gun, in a small plantation at Keswick, but a repetition of this once or twice makes them shy.

There is no more favourite locality in Norfolk for the Great Crested Grebe than Ranworth Broad, from which, however, it is always absent in winter. On Feb. 23rd there was not one to be seen there, and apparently these birds do not return before March. This is a favourite broad also for ducks. The annual visits of the Tufted Duck in March have been before alluded to (Zool. 1881, p. 330), but they are to be found all through February. On Feb. 23rd a flock of about twenty-five allowed themselves to be driven over a neck of land, when a volley from our barrels accounted for four of them, after which the others left the broad.

On Feb. 29th two male Cirl Buntings were netted on Breydon marshes; snow on the ground, and 17 degrees of frost that night, indicating that they were fresh arrivals, most likely from the interior. Mr. Pycraft exhibited them a few days later, while still in the flesh, at a meeting of the Norwich Naturalists' Society. The Cirl Bunting is rare in Norfolk; an example, hitherto unrecorded, was seen some years ago at Hempstead, by Messrs. Farn and Standen. Yet, so far as is known, this and Mr. Pycraft's pair bring up the number of authentic occurrences to five only.

On March 5th, Mr. Smith wrote, "the Wigeon at Yarmouth were leading off to sea in huge numbers," and the next day the frost broke up. On the 12th there were over five hundred Wigeon on Breydon Broad, three Pintails, two Wild Swans, and a Scoter. Few remembered such a continuance of severe weather, which affected all kinds of animals by cutting off the food supplies.

On the 7th six Scoters were offered for sale in Norwich Market, —an unusual sight. Scoters have been either more numerous or more sought after than for some years, in fact since 1870. They were abundant during the winter in the Wash, where sixty-two were shot off Hunstanton, on November 17th, by one gun. Mr. Tuck has remarked on their abundance at this place (Zool. 1888, p. 148), where the practice is to anchor wooden decoys on a still day, and shoot the Scoters when they come to them. Velvet Ducks and Long-tails also fall victims, and a good many of both were obtained last winter, as I learn from correspondents on the coast. At Hickling five Pintails were reported on the 18th, five

Sheld-ducks on the 20th, and six Shovellers on the 22nd, by Joshua Nudd.

During the greater part of February and March we had snow on the ground. Prior to this there had not been more than one or two Fieldfares in the parish of Keswick, but simultaneously with the snow they appeared. The largest flock, consisting of at least sixty, settled on a grass field which had been lately used for ewes, where a good many Swede turnips, mostly entire and quite uneaten, had been left. Into these they at once proceeded to drill holes, selecting any soft or rotten spot there might be to begin upon. For five weeks these poor birds fed on nothing else, and, from having been plump and shy, they soon became tame and thin, dropping in weight to $2\frac{1}{4}$ oz., and Redwings to $1\frac{1}{2}$ oz. When the snow cleared away, around each Swede turnip might be seen a circle of the flakes they had pecked off, and really it was incredible how much they had got off, many of the turnips being reduced to mere shells. Nor was any of this damage done by Wood Pigeons, which prefer turnips growing in a field where they can settle in a flock in the middle of the ridges. Here they peck holes, and let in the frost, doing more harm in this respect than the Fieldfares. At Northrepps the Partridges attacked the broccoli which was just above the snow, and took the hearts completely out of some—a charge I do not remember to have heard brought against them before, though I believe Wood Pigeons are guilty of it. Some of the hungriest Rooks fed with my Chinese Geese, eating maize, and even scraps of bread and potato; and a Hooded Crow was so intent on enjoying a meal on a large mussel, on Brancaster beach, that he got caught by the beak and was made a prisoner! As usual during severe frost, Dabchicks had a hard time of it, and sometimes four or five were to be seen at Harford Bridge, below which the Yare widens a little, making the most of the water while they had it. A Puffin and a Guillemot, probably starved, were washed up at Overstrand.

On March 19th 2000 Canaries were sent from Norwich to the United States, notwithstanding the bad weather, when many would most likely die on the voyage, New York being snowed up about that time. This is what a Norwich writer says about them:—"Although the weather was piercingly cold [and a bitter *east* wind] while the waggon-load of live stock was being conveyed to the station, the singing from the birds could be heard in the

streets at a considerable distance. So great has been the demand for our Norwich Canaries this season, that we learn over 14,000 have left the hands of Messrs. Mackley, since October last, for America alone, having consumed about £100 worth of seed, eggs, and Cayenne pepper." Many of our Norwich Canaries are most beautifully coloured, and the prices put upon them are quite astonishing: unfortunately, owing to the artificial system of feeding necessary to attain their bright hue, the number which die before they have fully attained it is very large. Moreover, it is said that if they are exported in warm weather they lose much of their voice and plumage, and are consequently less saleable. The Germans import a considerable number into New York, which it is said are bred in the Hartz Mountains, and sing much better than English ones.

In April the prevailing direction of the wind was N.E. On the 2nd, notwithstanding the provision of the Sea-Birds Preservation Act, a Little Gull, with a pure black head, was shot at Hickling; all the white part of its plumage was richly suffused with roseate, extending even to the tail. On the 6th an old male Goldeneye appeared on Fritton Lake, which, though in Suffolk, belongs geographically to Norfolk, and, though keeping by himself apart from the other fowl was tamer, than any of them, and I got a very good look at him. This famous lake has long been noted for its decoys, and is one of the few places in England where they may still be seen at work, but not many kinds besides Duck and Teal are taken. The lake is $2\frac{1}{2}$ miles long, with an average width of 300 yards. Two decoys are worked, one by Sir Savile Crossley, the other by Col. Butler.

The take of wildfowl at Sir Savile Crossley's during the winter, as supplied by Mr. Southwell, is as follows:—

		Duck.	Teal.	Wigeon.	Shoveller.
October, 1887	....	41	17	0	0
November, ,,	....	198	14	0	0
December, ,,	...	176	2	0	1
January, 1888	....	121	2	2	0
February, ,,	....	133	0	0	0
March, ,,	....	6	1	5	0
		<hr/>	<hr/>	<hr/>	<hr/>
Total	....	675	66	7	1

This falls very short of the total which was reached in the season of 1884-5, an exceptionally good winter, when 2056 fowl were captured. In Colonel Butler's decoy on the south-west side of the lake, where no decoy-dog is used, sixty-one Ducks and Mallards, and two Wigeons, were taken. The decoy-men consider that the Wigeon remained later than usual last spring, or rather appeared on passage later. Although we only observed one, Col. Butler saw a hundred on April 9th within gun-shot of the bank. On April 19th a Water Rail, *Ballus aquaticus*, was picked up on the shore at Overstrand, and a Buzzard was seen at Northrepps. On the 23rd a Black Stork, *Ciconia nigra*, retaining a few immature feathers on the breast, but otherwise adult, was obtained at Salthouse. On the 24th two White Wagtails, *Motacilla alba*, were shot at Yarmouth, as already recorded (Zool. 1888, p. 229), the first authenticated examples killed in Norfolk.

In May the prevailing direction of the wind was W. and N. On the 1st an adult male White Wagtail was brought to Mr. Pycraft from the River Bure, near Yarmouth, the light grey colour extending over the whole of the back to the root of the tail. On the 9th a Dotterel, *Eudromias morinellus*, was picked up under the telegraph-wires at Northrepps, and taken to my father, with whom it became wonderfully tame, eating worms greedily, but lived only ten days after capture. On the 16th a Greenshank, *Totanus glottis*, was picked up dead at Scoulton, thirty miles from the sea. On the 20th an adult male Honey Buzzard, *Pernis apivorus*, was brought to my father from Thorpe Market, probably the same bird which had been seen by the keeper at Northrepps the day before. Grey-cheeked adult birds of this species are not common. On the 29th a female Montagu's Harrier, *Circus cineraceus*, was shot on Kelling Heath, and three days afterwards the male was massacred: they probably had a nest, for when Mr. Pashley skinned the hen bird he found an egg, full size, ready for exclusion. A few days afterwards another female of this species was brought into Norwich, as I learn from Mr. Southwell; this bird also contained an egg with the shell formed. These Harriers would nest regularly in many places if permitted. A pair bred at or near Ranworth, and the young in this case were reared, with one exception. On the 29th a female Crane was shot at Halvergate, near Yarmouth, and mounted by Mr. Pycraft, who found that it turned the scale

at 7 lbs. 7 oz. I did not see it until it was set up, but it struck me as being rather a small bird: some years ago I weighed one, which was shot in Lincolnshire, and it turned the scale at 11 lbs. 2 oz.

ON THE HABITS OF THE GREAT CRESTED GREBE,
PODICEPS CRISTATUS.

BY C. R. GAWEN, F.Z.S.

THE breeding places of this interesting bird in Britain are, I believe, from their size and surroundings, rather unfavourable to the acquirement of minuter details respecting their breeding habits. Having been favoured by circumstances which rendered observation easy, I think the following notes on the habits of this species may, perhaps, be interesting to readers of 'The Zoologist.'

A pool on which a pair of Great Crested Grebes has, for the past two years nested, is about twenty-five acres in extent; as there is no marginal growth of reeds or sedges, the surface is open and exposed, insomuch that by hiding behind a tree, or even by remaining motionless on the open bank, I have, with the aid of a pair of binoculars, been able to witness much that was interesting in the domestic life of these birds.

For many years previous to 1887, a solitary Great Crested Grebe had made its appearance upon this pool in spring, but made no long stay, owing, I believe, to the presence with his harem of that persistent bully, the domestic gander.

In April, 1887 (the geese having been exiled), two Grebes came to our pool; the male arriving on the 7th of that month, the female ten days later on the 17th. These birds were not, presumably, already paired, and they occupied their time chiefly in courtship; not finally deciding upon a nesting-site until May 17th, nor laying eggs until the second week in June. A nest was begun earlier than this, but abandoned for some reason or other.

During the period of courtship, the Grebes were seldom far apart from each other; their favourite mode of flirtation or salutation consisted in facing one another at a distance of one or two feet, and shaking their crested heads rapidly from side to side. Viewed from behind, this pretty gesture had the appearance of the birds sparring or fencing with their bills. Once, when I suppose

they were at play, I saw both dive, and presently re-appear simultaneously, breast to breast, the splash of their impact being distinctly audible at some little distance.

After a while, a strange male disturbed their honeymoon, and was persistently chased hither and thither by the bird in possession, who was stimulated to doughty deeds by the constantly repeated and duck-like "kek, kek," of his mate. Having endured persecution for several days, the rival departed; I saw no actual collision between him and the paired bird, whose warlike operations seemed to be singularly futile.

In 1888, the first Grebe appeared on the 18th, and the second on the 25th of March. No preliminary courtship took place, nidification commenced about the 1st of April, and the first egg was laid on the 13th of the same month. So far as I could judge, the nest was built in exactly the same place as in 1887. This, with the absence of courtship in 1888, renders it probable that these birds pair for life, or at any rate for more than one season.

The situation chosen for the nest was the edge of a patch of lake weed, within twenty feet or so of a small island; in neither year was a second, or look-out platform made, that purpose being served, perhaps, by the island or some alder-roots out-growing from it. Except on the side covered by the island, the nest, with the sitting bird, was perfectly visible from the water's edge; indeed, the lake weed in 1888 did not attain its full growth until after the young had been hatched. It is possible that, being new to the place, and fearful of being disturbed, the Grebes in 1887 waited for the growth of the weed before they seriously began to build.

The nest was a solid structure, composed chiefly of dead sticks and stalks of lakeweed, with dead leaves, and a few old flower vessels of the Spanish chestnut. Both sexes took part in nidification, the male while I watched them being the more energetic of the pair. He would bring stalks of weed in quick succession, and, laying them on the side of the nest, leave the female to arrange them. But he not only performed what I may call mere manual labour; I have also observed him assist his mate in shaping the nest, going round and round it, pushing here and tugging there, until the result was satisfactory. Once he amused me much by his frantic and ultimately successful efforts to bring

in a large stick as part of the structure—a stick so long that he had to push it in front of him to the nest. While bringing nesting materials, the Grebes swam very low in the water, very swiftly, and with necks much outstretched. When they wished to get up to the nest, they would go close to it so that they leaned, or appeared to lean, against it, and then jumped on as easily as may be. For a moment or two an upright position would be maintained, in which the bird looked very comical.

Incubation also was shared by both sexes. I have repeatedly seen the male performing this duty while the female has been occupied in fishing, or preening herself in another part of the pool. On one occasion, I watched the male jump upon the nest which his mate had left, and remain there for over an hour, not even vacating his post when she returned to the vicinity of the nest. Usually, when the female Grebe (the shyest of the pair), in alarm at being watched, slipped off the nest, hastily and imperfectly covering the eggs, the male, after carefully covering them, would take her place. I have observed him dive several times for leaves with which to cover the eggs. Whether the female removed the covering I am unable to say; her mate certainly incubated the eggs while covered up.

Incubation commenced at once. Thus on April 13th, 1888, the first egg was laid, and on that day I observed the female sitting. On May 21st, I saw one or more young; but as I had been absent from home, the one I actually saw may have been hatched some time; from its small size it could not have been more than a week old. According to this, incubation probably lasts twenty-eight days or thirty-five at the outside.

The young was at first assiduously cared for by both parents, but after it was half-grown, the old male ceased to pay it any attention, frequented another part of the water, and was often absent altogether. For some time after it was hatched, the favourite seat of the little bird was its mother's back, usually partially concealed by her scapulars, not unfrequently quite exposed to view. When rather more than three parts grown it used to catch fish for itself. The old Grebes would always shake the fish carefully before presenting it to the young, and I have seen the latter decline to take it until it had been shaken a little more. But with old or young Grebes, the direction, "before taken to be well shaken," seems to be carefully followed.

Although these Grebes incubated two eggs (having laid three) in 1887, and three (out of four) in 1888, they only succeeded in rearing one young bird each year. The presence in the pool of a number of large pike probably accounts for their ill success in this respect. The Great Crested Grebe has a variety of notes; one of these, the alarm-note as I think, which is most frequently uttered at dusk, is rather crow-like, and, to my ear, is well syllabled by Mr. Seebohm as "*croix*." Before incubation, the birds constantly utter a monotonous call-note, which resembles "kek," or "chek"; this note is sometimes repeated at the nest very rapidly and loudly, so that it then becomes a chatter analogous to the cry of the Dabchick. Lastly, there is the sonorous love-note of the male, which is, I think, an amplification of the note "*croix*;" and which, to my ear, resembles the syllables, "Gaw-oo-oorr," pronounced while drawing in the breath, and with the final R well rattled. In uttering this peculiar cry the Grebe erects his crest and tippet, and inflates his œsophagus, presenting to human eyes a very ludicrous appearance. I believe that this note is confined to the male bird. The young bird utters a plaintive, cheeping note.

No bird of my acquaintance preens itself so assiduously and frequently as the Great Crested Grebe, and this even when incubation is not going on.* I have often wondered whether this habit is to be attributed to personal vanity or to the presence of parasites. Sitting upon a wet nest is, of course, a very dirtying occupation, and it is amusing to watch the bird after a spell of it, lie on its side, in order better to preen the feathers that have been spoiled by the nest, and turn slowly round like a teetotum on the axis of the leg which remains in the water. The head and upper neck are kept in order by the feet, towards which they are bent backward along the centre of the back, the tarsus being turned upward, apparently over the back in a forward direction. Sometimes this bird gives its leg an indescribable flourish along or over the back, and almost at right

* We have several times found in the stomachs of Grebes which we have dissected (*i.e.* in *P. cristatus*, *rubricollis*, and *auritus*) agglutinated oval masses of their own feathers, evidently swallowed during the process of preening, and similar to the well-known pellets ejected by hawks and owls. These, in all probability, would have been cast up in due time had the birds not been shot.—ED.

angles to the line of the body, a feat which it requires an acrobat to explain.

These Grebes appear to rest a good deal during the day-time, either tucking their heads away in the scapular feathers, or inserting them up to the forehead in the feathers of the upper breast. While they are thus resting, a strong breeze will often bring them close in to the banks. The colour of their backs is wonderfully protective, and when there is a ripple, the birds are almost invisible, unless a glimpse is caught of their white satin breasts.

The Great Crested Grebe is one of the most ornamental of water-fowl; and also, what so many gaily-coloured ducks are not, a most interesting and amusing bird to watch. At the same time, although three fish running is the most I have seen them take, one would rather be excused from having a pair on a pond which contained yearling trout, or other valuable fish of small size.

NOTES AND QUERIES.

Natural History Notes on Board Ship.—On my recent voyage home from America, in the White Star Liner 'Germanie,' an unusual number of small land birds came on board. The weather was cold, the average temperature of the day being only $43\frac{1}{2}$ degrees, or no less than 25 degrees colder than on the corresponding day last year, and there was a strong north-west wind blowing. On the 10th of October we left the wharf at 8.30 a.m. It was fine and clear, but rather cold, with a light westerly breeze. We were out of sight of land soon after noon. There were no sea-birds of any kind to be seen. A Cedar Waxwing, *Ampelis cedrorum*, and an English Sparrow were flying about the vessel till dark. Whilst the sun was strong, an Archippus butterfly, *Danais Archippus*, was sailing lazily about the deck, cleverly avoiding its would-be captors; it was bright and fresh, and apparently not long evolved. This butterfly is a strong flyer, and may often be seen soaring about in the air, a hundred feet from the ground, even in the midst of violent rain-storms, in California in winter. No doubt it has often been introduced to Europe by the agency of the mail steamers. Next day, the 11th, there were hundreds of small birds round the vessel. The air seemed full of them, and they appeared flying to the vessel from all quarters. I distinguished amongst them the Golden-crested Wren, *Regulus satrapa*, Yellow-rumped Warbler, *Dendroica coro-*

nata, and Snow Bird, *Juncus hiemalis*, in numbers; and several Yellow Warblers, *Dendraca æstiva*, and White-throated Crested Sparrows, *Zonotrichia albicollis*. There was also one Carolina Nuthatch, *Sitta Carolinensis*, climbing about the boats; a large entirely brown Grosbeak; and a black and orange Warbler like *Dendraca Blackburnia*. Many of these birds were so tame that they pitched fearlessly on the heads and shoulders of the passengers on deck; they seemed almost perishing with cold and hunger. The only sea-birds seen were a Petrel and a Gull. At noon we were 378 miles from Sandy Hook. The wind was north to north-west, and the weather was fine and clear in the early morning but cloudy afterwards, the breeze freshening in the evening. On the 12th only one or two birds were about the vessel. One, I think, was a *Liurus auricapillus*. At noon we were 734 miles from Sandy Hook, in lat. 42° 27' N. and long. 58° 04' W. After this no more land-birds and extremely few sea-birds were observed till we reached Queenstown, on the morning of the 18th, when we were soon surrounded by the usual crowd of Kittiwakes, and Black-headed, Common, and Herring Gulls. At this place, on the 23rd of February last, on the outward voyage, I saw two individuals of the Little Gull hovering about the screw-steamer 'Republic,' with the other commoner species. The first Dolphins seen on the voyage home were about 300 miles from Ireland.—W. S. M. D'URBAN (10, Claremont Terrace, Exmouth).

MAMMALIA.

Badgers and Otters in Surrey.—In the last week of October the "Old Surrey" hounds ran into, and unfortunately killed, before it could be rescued from them, a full-grown Badger. Ockley Wood, the scene of this catastrophe, used in former days to be a favourite resort for Badgers, and the older residents have many stories of moonlight Badger-hunts there, as well as of Badger-baitings in the neighbourhood. In a house near here there is a stuffed white Badger which was killed forty years ago in Ockley Wood. I hardly think that the animal lately killed by the hounds could have been a descendant of the former inhabitants of the wood, as the last few years have seen the springing up of so many houses in the neighbourhood as to render it unlikely for the Badger to have remained with us. It may have been a wanderer from a distant and less inhabited part of the county, or it may have been one recently turned down. In the spring of this year a half-grown male Badger was trapped in Gatton Park, but this was thought to have strayed from a neighbouring park where a pair (one of which was afterwards found dead) had been turned out. The animal lately killed, being full grown in October, could not, I suppose, have been the same animal which weighed 15 lbs. (I weighed it myself) in April. About four years ago a male Otter met with his death at Betchworth, about four miles from here, by being run over by a train: the body of this Otter,

frightfully mangled, was brought for sale to a local bird-stuffer, who purchased it and set it up; its weight was 28 lbs.—E. P. LARKEN (Gatton Tower, Reigate).

The Acclimatisation of Red-deer in New Zealand.—Judging by the distance Englishmen travel to obtain sport, I think it would be worth while to draw the attention of sportsmen to the New Zealand Red-deer, now thoroughly acclimatised on the Nelson Hills—indeed, so numerous, that an open season is annually proclaimed by the Acclimatisation Society—this year extending from February 18th to the end of March—free to all on payment of a license fee of £1. By way of explanation, I may mention that to the north and east of Nelson, a wide area of bush-fern and grass-hills extend for some forty miles in either direction; these contain many open valleys, giades, perpetual streams, and several small rivers. This wide track is now stocked with deer, and lately has been made more accessible by a good coach-road, which passes one or more village settlements, where comfortable accommodation can be obtained. Here, in the loveliest and most invigorating of weather—the end of the New Zealand summer and the commencement of autumn—the sportsman can stalk deer to his heart's content, thoroughly enjoy life, live with comfort in a cotton tent, and eat, if so disposed the products of his gun. The history of the Nelson deer does not extend far back. Somewhere about 1850 the Hon. Mr. Peters—then a Nelson settler—presented a pair to the province. These were turned out in an adjoining valley which forms the source of the river passing through the town, and called, like the valley, the Maitai. Here for some time they remained undisturbed until a too-keen sportsman, evidently intent on again tasting venison, cruelly stalked one, leaving the survivor unmated. His Royal Highness Prince Albert, hearing of the matter, kindly sent out a second pair. These were turned out in the same valley, and within a few years had increased and multiplied so that travellers reported seeing young deer. This was eventually corroborated in the most indisputable way, by predatory visits from herds of deer into the adjacent gardens, and causing no small discomfiture to the owners. With their rapid increase and constantly renewed depredations, the settlers commenced driving them back, and so persistently, that they were eventually distributed over an area equal in extent to the half of Scotland, now offering good sport for more guns than are likely to be brought to New Zealand in the present century. The deer are not only numerous, but large in size, often weighing, when cleaned, 4 cwt. One of my sons shot his first stag, which drew the scale at 4½ cwt.—H. B. HUDDLESTON, C.E. (Blenheim, Marlborough, N. Z.).

BIRDS.

Food of the Manx Shearwater.—With reference to Mr. H. A. Macpherson's note (Zool. 1888, p. 470), I should like to say that if, how-

ever unintentionally, I drew an inference from his words which was likely to mislead, I much regret it. What I wished to express was the opinion that his observations as worded in his article (pp. 373, 374) did not, as he claimed, suffice to establish as a fact that the Manx Shearwater feeds largely on shoals of fish. As to the power of the bill in this species, I would ask whether the Manx Shearwater is known to burrow, as does the Sand Martin, in strata harder than loose dry soil or vegetable mould, and, if this be so, whether it follows that the bill is strong *quoad* grasping struggling fish? In Mr. Warren's interesting and conclusive note (*tom. cit.* p. 470) there is one point which perhaps he would kindly clear up. I refer to the possibility that the sprats disgorged by his Shearwater may, as well as the entrails, have been thrown from one of the fishing-boats to which he alludes, and thereby have become offal, as I understand the word. It is remarkable that, with the thousands of fishes in the sea, the hundreds of Manx Shearwaters flying, as they must do, within a few feet of them, and the scores of human eyes which have watched with keen attention the movements of these birds, no one seems to have seen, or recorded that he has seen, a Manx Shearwater actually catch and swallow a fish.—C. R. GAWEN (Chetwynd Park, Newport, Salop).

Little Gull in Glamorganshire.—I am glad to report another addition to the avifauna of this county, *i. e.* the Little Gull, *Larus minutus*, an example of which was shot, on the 30th November last, near the Low Water Pier, at Cardiff. Mr. Storrie, the Curator of the Cardiff Museum, who informed me of the occurrence, states that it was one of a small flock of eight which had been seen about Penarth as well as near the pier-head at Cardiff. The example obtained is a male in full plumage, and Mr. Storrie has succeeded in securing it for the Cardiff Museum.—DIGBY S. W. NICHOLL (The Ham, Cowbridge).

The Diving Powers of Gannets.—Can any of your readers furnish me with a few reliable particulars of the depth to which Gannets dive for their food? In Thompson's 'Natural History of Ireland' are some extraordinary accounts of the depth from which Gannets have been brought up in nets. He states that Gannets are "very commonly" caught in nets sunk from "nine to twenty, but sometimes to the depth of thirty fathoms (not feet!), just as the fish (herrings) are lying." He also mentions that one hundred and twenty-eight Gannets were caught in one net, and such was the buoyancy of their numbers that they raised the net, with its "sinkers and fish," to the surface. Does the Gannet dive obliquely or perpendicularly? Thompson states that "intelligent" fishermen regulate the depth of their nets according to the height from which they see the Gannets diving. Does the bird seize only one fish in its dive, or does it follow up the fish in the water and take several before coming to the surface?—J. L. COLLISON-MORLEY.

Nesting Habits of the Black-eyebrowed and Wandering Albatrosses.—The following particulars, forwarded by Mr. J. L. Collison-Morley, are extracted from an account sent to the 'Southland Times' of New Zealand by Mr. W. Dougall. Every six months the New Zealand Government send a steamer to the following uninhabited South Pacific Islands,—Stewart, Snares, Auckland, Campbell, Antipodes, and Bounty Islands, the last-named 415 miles south-east of New Zealand,—to overhaul and replenish food depôts maintained for those who may unfortunately be shipwrecked upon them, and the observations given below were made by Mr. W. Dougall when accompanying one of these trips, chiefly to take photographs on these islands:—"Returning to Monumental Head (Auckland Island), we picked up our hunters, laden with Albatrosses (*Diomedea melanophrys* and *D. exulans*), living and dead, and Albatross eggs in abundance. I ascended one of the highest hills, Mount Honey, 1866 feet (Campbell Island), amidst hundreds of nests of the Wandering Albatross, *Diomedea exulans*, surrounded by tussocks, ferns and ti-tree scrub. We came on the first Albatross at about 800 feet above sea-level, and after reaching the crown of the hill, 1000 feet, they were sitting on their nests, and flying about close to the ground in hundreds. Apparently the Albatross lays but one egg each year, but one of the parties found two nests containing two eggs each. It was suggested that this was only a freak of nature, although it is known that the Gannet of New Zealand lays two eggs. All up the sides of the hills wild parsley was growing luxuriantly, often two feet high, while everlasting daisies clothed the ground like a carpet. The cotton-wood plant, in full bloom, was also plentiful. As the top—1866 feet—is reached, variety of vegetation ends, and travelling becomes easier, as there is no growth to impede progress, but diminutive tussocks, among which are the Albatross-nests and their tenants. These nests are built up of moss and earth about four inches above the surface of the ground. The material to form the nest is so taken from the soil as to leave a trench all round it, and this keeps things dry for the important object in view. The female never leaves the nest during incubation, a period of about sixty days, and is fed by her mate, who hunts for food for both. If by chance the nest is left unguarded for a moment, the egg is pounced upon by the Sea-hawk (*Lestris*), which is here in thousands. The Albatross is a stupid bird; it will sit, whether hatching or not, till you kick it over with your foot. Nevertheless it will resent such liberties, and should it succeed in getting a hold, it will take the piece out of trousers, hose, and skin. The best way to catch one is to make a feint at its head with the left hand, which distracts the bird's attention, and then quickly seize it by the bill with the right; but be sure you got the grip, for they turn very quickly, and would snap your fingers off if they get a proper hold. They build on the flat plateau of the hills, and, so far as we have seen, never lower down than 700 feet from

sea-level. The hatching was much farther advanced than at the Auckland Islands. On January 31st the day broke beautifully, and the bay was like a mirror, but the glass was still low. As the day advanced, we were enveloped for half-an-hour in one of those dense mists characteristic of this part of the world, and when it passed, the hills were covered with snow. The height of the island (Antipodes) is marked on the chart at 600 feet; but this is an error, as the principal hill, Mount Galloway, is 1200 feet above the sea level. From seaward this hill looks conical or dome-shaped, but on reaching the summit a beautiful clear lake, covering an area of thirteen or fourteen acres, is found—a lake which, a little later in the season than the time of our visit, is much frequented by the Albatross, being virtually surrounded by thousands of their nests. We moved on northwards (Stewart Island), and came on a perfect cemetery of dead Penguins lying rotting amidst black sand—thousands upon thousands—evidently cut off by some epidemic.”

Birds in the London Parks.—It is a pleasure to be able to report the increase of any wild bird in the London Parks, as has been done by Mr. W. H. Tuck in ‘The Zoologist’ for October last (p. 389). I can corroborate his remarks regarding the Wood Pigeon in several particulars. I noticed the coming of the first pair some five years ago, and have watched their gradual increase up to the present year, when about ten pairs must have bred. One pair had two nests in an elm tree in St. James’s Park, close to Birdcage Walk. The first pair that came to town made their nest in Buckingham Palace Gardens, in a chestnut tree overhanging Grosvenor Road. I have often seen from forty to fifty feeding on the lawn to the north of Rotten Row; but I was both astonished and delighted one day to count no less than sixty on the ground at one time. Since then the bulk have gone out of town for the winter, but a few may be seen about, more particularly in St. James’s Park. Let us hope that their immunity from danger in London may not be followed by their destruction in the country, and that they may return in the spring to breed again in the Metropolis. On the other hand, I am sorry to have to report the decrease or disappearance of other interesting species. In the first place, the Rook—so common twenty years ago in the West End of London—is now all but extinct. I remember three rookeries in Kensington Gardens, one in Hyde Park, small ones in Mayfair and Marylebone Road, and a substantial one in Holland Park, all of which are now things of the past. The only rookery I was able to find in the West End last summer was one consisting of five nests in Stanhope Place; only one of the five pairs, I believe, succeeded in rearing a brood. This is to be regretted; but the total disappearance of a colony of Martins which had defied the interruptions of the house-painters for many years past at the south end of Westbourne Terrace is equally to be deplored. Last, but not least, is to be noted the absence—for the first time during twenty-

six years of almost daily acquaintance with Hyde Park and Kensington Gardens—of the Spotted Flycatcher. This bird has bred, I believe, in this neighbourhood every year, and in 1887 I saw a pair feeding their young in Cleveland Gardens, Hyde Park; but last summer I did not observe a single one. It is much to be regretted that more attention is not paid to the subject of attracting birds, in the mode of planting our public parks and gardens. I have no hesitation in saying that with the exercise of a little judgment and trouble, many pleasing songsters, such as the Nightingale, Blackcap, Whitethroat, and others which visit us on migration, might easily be induced to spend the summer in the parks. Some years ago a laurel plantation was made in Kensington Gardens, and during the summer the song of the Blackcap was always to be heard there; but the laurels disappeared one day, and I have not heard it since. A good nut-grove by the side of the Long Water would, I am quite sure, soon attract a pair of Nightingales; and what would be more delightful to Londoners than to sit and listen to the prince of songsters! The Lesser Whitethroat has on several occasions frequented Kensington Gardens and Hyde Park; and were suitable places available, the Common Whitethroat would sojourn here, as would also the Chiffchaff, Willow Wren, Wood Wren, and many other birds of like interest.—J. YOUNG (64, Hereford Road, Bayswater).

Rare Birds in the Isle of Wight.—I have to record the shooting, early in November, of a Greylag Goose, out of a flock of twelve that were met with on the coast near Blackgang. This species has not before been met with in the island. A Quail was shot in the Undercliff in November; whether any of these birds winter here is doubtful. Mr. Smith, the bird-stuffer, of Newport, informs me that he saw in June last a Blue-throated Warbler. This is the fifth recorded appearance of this rare bird in the island: two were observed, as announced at the time, at Bouchurch; one, an old male in perfect plumage and in full song; the other a young bird, the breast only partially blue; the third was seen at Shanklin; the fourth was shot at Steephill. Both this bird and the Hoopoe (which is to be met with here in most years) might probably breed in the Undercliff, if protected. Both Swallows and Martins are decreasing year by year, and few of either species now nest here; nor were many observed last summer in the North of England or in Wales. The Starling, now a common bird, was rarely met with sixty years ago in the Undercliff. I am informed by Mr. Henry Rogers, of Freshwater, that the following species have been procured there last autumn:—Pallas's Sand Grouse, Black Guillemot, Bulwer's Petrel, Glaucous Gull, Little Tern, and Sandwich Tern. Mr. Smith, of Newport, informs me that he has received the following birds for preservation:—On Jan. 14th, 1887, a Bohemian Waxwing; on the 18th, a Hawfinch; and on March 3d, a Rook, which, strange to say, is new to the island fauna; on April 26th, a Pied Flycatcher, and on the 30th another, bird of the same

species. A Thick-knee, *Edicnemus crepitans*, on April 28th, and another on Nov. 7th; two Dotterels, *Eudromias morinellus*, were brought in on Sept. 11th—the first seen during the twenty-eight years he has carried on the business of a birdstuffer; on Oct. 27th, a Great Grey Shrike, a Raven, and a cream-coloured Blackbird were received.—HENRY HADFIELD (Ventnor, Isle of Wight).

Notes on Birds in Norfolk and Cambridgeshire.—A short time ago, hearing of some “English wild Canaries” at a birdstuffer’s at Saffron Walden, I went to see what they might be, and here give a description of them. One, which was living in a cage with some Redpolls and a Twite, looked almost exactly like a hen Siskin, except that it had a very short and stout beak, almost like that of a Bullfinch. A light yellow stripe over the eye was very conspicuous. This bird was caught near Saffron Walden. The others (there were two more) were stuffed, and the owner told me that one of them was caught near London, and had been living in the Zoo. This was a much more gaily-coloured bird than the living one. The forehead, throat, sides of neck just behind the auriculars, and breast being bright greenish yellow, with a few dark streaks on the flanks. The back was much greyer than a cock Siskin’s, with dark streak down centre of each feather, getting yellowish green lower down, and tail-coverts the same colour as the back; top of head plain greyish green. I suppose they were cock and hen Serin Finch; but as I have never before seen a specimen of this bird, I am not certain about them. In June last I went to the same shop to see some Sand Grouse. The birdstuffer, Mr. Travis, had several in the flesh, two of which I saw weighed; the male was $11\frac{1}{2}$ oz., and the female 11 oz., and they were both very fat. I cannot help thinking that, if they are not all killed, but are given a chance until next breeding season, they will have become so far acclimatised that they will certainly breed. While staying in Norfolk for the partridge season, we were continually hearing of Sand Grouse in the neighbourhood, and many were shot on the sand-hills. But we did not come across them until October 24th, when we saw a large flock of them get up from a field of white turnips, which afforded very thin cover. We were out partridge-hawking with a cast of tiercels, and had just got a covey marked down, and were proceeding to put up one of the tiercels, when these Sand Grouse got up, very wild, about 200 yards off. I should say that there were considerably over one hundred of them; they flew very fast, and kept rising and falling in deep undulating curves, at one time fifty feet up in the air, and anon shooting down and skimming close to the ground. They uttered a peculiar bubbling whistle. My friend Mr. T. J. Mann, with whom I was staying, had about this time acquired a pair alive, one of which was injured against telegraph wires, and the other was shot, one pellet grazing the top of its head and stunning it. There were three found at the same time under the telegraph-wires,

one being killed, and the other dying the same day. I was told the one which was found dead had its crop crammed with wheat. Mr. Mann's two birds were alive and well in November, the male bird in beautiful plumage; the female, unfortunately, has lost the use of one eye. They are fed on wheat, barley, hemp, millet, buckwheat, and turnip-seed. I have frequently heard these birds utter a very low clucking sort of a note. The cock bird is much tamer than the hen, which frequently rises and flies against the wire of their aviary on the too near approach of people. This I have never seen the cock bird do. One which I had recently sent to me in the flesh, had in its crop barley, wheat, and some seeds which I am not botanist enough to identify. The stomach was crammed with coarse grains of sand; this bird was very fat. Harking back to Mr. Travis's shop, I saw there, also, a fine male Golden Oriole, which was obtained in the parish of Elmdon. I heard that it was captured by some labourers who saw it striving to make headway against a strong wind. It was blown under the hedge, and they effected its capture. I saw, too, a good specimen of a Scops Owl, which was shot at Littlebury, in Essex, of which I read an interesting account in the 'Transactions of the Essex Field Club' (1888, p. 111). While rook-hawking in Cambridgeshire in the spring we came across a Kestrel's nest, or rather a Kestrel's egg, in a wheat-stack. The egg was placed in a good-sized hole under the thatching of the stack. (Last year we heard that six eggs of a Kestrel were found on a stack in the same place, while it was being thrashed). It was disturbed or destroyed soon after we saw it, and the old birds (probably the same ones, at any rate) laid in an old Rook's nest in a small clump of tall trees, about half a mile distant from the first site. I saw three fledged young ones outside the nest on June 26th. This part of the country is very bare and devoid of trees, but there are trees and woods within a mile of the stacks in every direction; so it is curious that the hawks should have chosen so unusual a place as a stack in which to lay their eggs. Kestrels are not the only hawks which hover; other hawks do so to a certain extent. A wild Peregrine-tiercel which we saw on several occasions in Norfolk, appeared one day over our garden, and there it hovered for a few seconds, exactly like a Kestrel. It was not more than about twenty yards from us, and we could plainly see its head, looking down and peering about on the ground underneath. Not many days after this I saw a wild Merlin hunting a Lark over the sand-hills. The hawk forced the lark to take the air until they were up a good height, the Lark ringing and the Merlin mounting much straighter, quickly flapping its wings the whole time. The Lark threw itself away very cleverly every time the Merlin stooped at it, and the Merlin never had any difficulty in getting above its quarry again after every unsuccessful stoop. At last the Lark made great haste down to the sand-hills, and, evading several more stoops of the Merlin, dropped like a stone among the long grass. The

disappointed Merlin hovered for several seconds a few feet above the grass, looking in vain for its hiding quarry, and then was fain to fly off to seek a meal elsewhere. We heard of a large hawk in the neighbourhood, which had been seen eating a wasp's nest; this must evidently have been a Honey Buzzard. I saw the first Hooded Crow on October 3rd. Woodcocks seem to have come very sparingly to Norfolk this year; we heard of very few being about up to November; the wind during the greater part of October was more or less west, which may perhaps account for it. There was also at that date a great dearth of Snipe. Partridges in North Norfolk, as in most other places, came to grief at hatching time, many of the old hens succumbing to the inclement weather with their chicks. The consequence of this was that the majority of the birds bagged were old cocks. Needless to say, they were very wild. On one occasion, while out shooting, we saw two Partridges get up a dozen yards apart, and, converging to the same spot, come into collision. One bird fell a couple of feet, but recovering itself flew off all right. The sound of the collision was plainly audible.—G. E. LODGE (5, Verulam Buildings, Gray's Inn).

Golden Eagles in Co. Galway.—A large specimen of the Golden Eagle was killed by a gamekeeper of Mr. Mitchell Henry, Kylemore Castle, Co. Galway, during the month of October last. It measured seven feet three inches from tip to tip of expanded wings; three feet from tip of beak to end of tail; and weighed twelve pounds and a half. A second,—a male bird,—forwarded from the same district during the second week of November, is a much smaller bird.—EDWARD WILLIAMS (2, Dame Street, Dublin).

[It is very much to be regretted that protection is not afforded to these grand birds. Eagles are now becoming so scarce that we should have thought most people would be delighted to give orders for their preservation in districts where they still breed.—ED.]

Rare Birds in Hants.—The gales of November last caused a great number of Geese and other wildfowl to take shelter in Christchurch Harbour. Amongst them were two birds of some interest. A curious variety of the Guillemot, *Lomvia troile*, which has all the upper plumage of a very pale isabelline, the primaries very light, legs and toes pale yellow; bill light horn-colour. On the 10th of November, a male Osprey, *Pandion haliaëtus*: length, 24 in.; alar extent, 5 ft. 6½ in. One cannot but regret that this bird should have been killed, its visits not being so frequent as formerly. The examples procured are invariably killed in the early morning as they come from their roost to the water; always taking the same course each day, the gunners soon know where to lie in wait. They either select the trees at High Cliff, or those on Ramsdown Hill as their roosting-place.—EDWARD HART (Christchurch).

Surf Scoter in Ireland.—Mr. George Dunleavy, light-keeper of the Fastnet Rock Lighthouse, shot a duck on Nov. 5th in Crookhaven Harbour, Co. Cork, and forwarded it to me. It proves to be a Surf Scoter, *Ædemia perspicillata*, and I think a young male; but as I have been unable to compare it with any skin or stuffed specimen, it is possible it may be a female. The sex was not ascertained by the birdstuffer. Only two specimens have previously been recorded from Ireland:—one, an adult male, Belfast Bay, September 9th, 1846 (Thompson, vol. iii. p. 118). Another (sex not given), Clontarf, Co. Dublin, October, 1880 (Payne-Gallwey, 'Fowler in Ireland,' p. 113). The distinguishing features of the head in the various Scoters is well shown in Baird, Brewer, and Ridgeway's 'North-American Birds.'—RICHARD M. BARRINGTON (Fassaroe, Bray, Co. Wicklow).

Nesting of the Hobby in Scotland.—Mr. Howard Saunders, in his 'Illustrated Manual of British Birds,' writing of the Hobby, states (p. 337) that "in Scotland it . . . has never been known to nest." On the 29th August, 1887, I saw at Kinnaird House,—a small shooting belonging to the Duke of Athole on the right bank of the Tay, and about half-way between Dunkeld and Grandtully,—nailed to the keeper's "larder," an unfortunate old Hobby and three young ones nearly full-grown and fledged, but with the down still hanging on their heads and backs. The keeper told me he had got them that summer from a nest in a tree on the other side of the river, and on my remarking that they were not likely to kill his game, he answered he knew they fed chiefly on insects, but still they were "harks," and that was enough for him. There were also several Tawny Owls, a few Kestrels, a Sparrowhawk, and a Raven among these and other victims.—EDWARD NEWTON (Lowestoft).

Rare Birds in Gloucester and Somerset.—Mr. Charbonnier, a naturalist, who lives here, showed me recently the following birds, which had been sent to him for preservation:—A female Sand Grouse, which had been shot at Hambrook, in Gloucestershire, some time in the month of June last. I could not ascertain whether it had appeared alone or in company with others of its congeners. A Little Gull, procured at Clevedon about the end of October or beginning of November, in immature plumage, but in good condition. About the same time a female Eider Duck was shot on the reservoir of the Waterworks at Barrow, in Somersetshire, a few miles from here.—MARCUS S. C. RICKARDS (12, West Mall, Clifton).

Pectoral Sandpiper in Ireland.—A bird of this species (*Tringa maculata*, Vieillot) was obtained in the Dublin market in the middle of October last. Upon making enquiries, I was informed that it had been

forwarded from Portumna along with a lot of Snipe. It was extremely fat, and in regard to weight differed considerably from that given in the last edition of Yarrell's 'British Birds,' for it almost turned the scales at 8 oz. It proved on dissection to be a male.—EDWARD WILLIAMS (2, Dame Street, Dublin).

The Smew in Perthshire.—On the 20th November last a female Smew, *Mergus albellus*, was shot on one of the salmon-breeding ponds at Stormontfield, feasting on the young Salmon. It disgorged four about two inches long, and had in its stomach a number more or less digested. It is a rare bird in Perthshire, and its occurrence is therefore worth recording. I may also mention that a few Razorbills and Guillemots have made their appearance on the Tay in this neighbourhood; they are common on the estuary of the Tay, but seldom find their way so far inland.—THOMAS MARSHALL (The Store, Stanley).

Roller at Rainham.—The recent occurrence of the Roller, *Coracias garrula*, one of our rarest continental visitors, is I think worth reporting. When first seen, on Nov. 8th, it was sitting upon the end of a mangold-wurzel clump, where my labourers were at work. As it appeared to be very weak, they gave chase over the hedge, and finally captured the bird alive on our Rainham Marsh. It was very thin in condition, dying soon after being caught, its death being probably hastened by the effects of a very cold day.—W. PRENTIS (Rainham),

Solitary Snipe and Sabine's Snipe in Ireland.—The second specimen of the Solitary Snipe, *Gallinago major*, which has come under my notice was shot by Mr. W. H. Reese, of Glenerd, Co. Galway, on October 12th. The so-called "Solitary Snipes" that sportsmen meet with in Ireland are generally very large individuals of the common bird. I have received at least a dozen, forwarded for preservation under the belief that they were the rarer species. A good specimen of Sabine's Snipe—now generally regarded as a variety of the Common Snipe—was obtained by Mr. J. Law, of Burt House, Londonderry, in September last. In this bird, as in several others of the same variety which have passed through my hands, the dark marks are continued right across the under parts, which are always white in the Common Snipe.—EDWARD WILLIAMS (2, Dame Street, Dublin).

Night Heron in Lincolnshire.—A specimen of the Night Heron, *Nycticorax griscus*, in immature plumage, was shot on November 26th on the foreshore at Tetney, by one of the wild-fowlers who was engaged in plover-netting. The bird measured twenty-four inches in length; wing, twelve inches. The irides were bright red, bare skin round the eyes greenish yellow, and legs and feet green, with a shade of yellow. When first flushed it only flew a short distance and settled again.—G. H. CATON HAIGH (Grainsby Hall, Great Grimsby).

An unrecorded Squacco Heron.—The Squacco Heron, *Ardea ralloides*, occurs so rarely in this country that every visit is of interest, especially to those who are working out the avifauna of their county. On writing to Sir Percy F. Shelley, asking him for particulars of one that was formerly in the collection of the late Mr. Berkley, he very kindly replied as follows:—"The bird you have I gave to Mr. Berkley. It was shot by my keeper at the Warnham Ponds, Sussex, about two miles from Horsham, on the hottest day of a very hot summer, 1849. In its stomach were fourteen small roach (without their heads, however); the Warnham Ponds are full of these fish."—EDWARD HART (Christchurch).

Crane near Colchester.—On November 9th a Crane, *Grus cinerea*, was shot in a field at Elmstead, near Colchester, and has now come into my possession. It appears to be a bird of the year, as its wing-feathers (tertiaries) are not fully developed. Its rarity, and its being probably the first known to have been captured in Essex, makes it worth recording in 'The Zoologist.'—HENRY LAVER (Head Street, Colchester).

The Avocet in North Devon.—On a recent visit to Mr. Rowe, taxidermist, of this town, I saw a female specimen of the Avocet, *Recurvirostra avocetta*, which was killed near the mouth of the river Taw, on Nov. 13th. This bird, I believe, is now very rare in the British Islands, and more particularly in the south-west of England. Perhaps the fact of one being killed so recently is worth recording, and will interest many of your readers.—J. G. HAMLING (The Close, Barnstaple).

[Another was shot in the same estuary the following day, and was taken for preservation to Mr. Frayne, taxidermist, of Barnstaple. A fortnight previously two Avocets were shot at Exmouth.—ED.]

Pallas's Sand Grouse in Co. Clare.—A beautiful adult male of this species was exposed for sale in the Dublin market during the second week of November last. It was shot in the Co. Clare, and £2 10s. was asked for it.—EDWARD WILLIAMS (2, Dame Street, Dublin).

Pallas's Sand Grouse in Lincolnshire.—Since the publication of my notes (Zool. 1888, p. 419) on the Sand Grouse in this county I have met with two occurrences of more recent date:—October 23rd. A flock of twenty, recorded in 'The Field' of Oct. 27th by Mr. T. W. Harrison, was seen in the parish of Goxhill, near the Humber, and one was shot. Nov. 8th. A flock of forty seen at Grainthorpe, near the sea-coast, by the son of Mr. Stubbs, the wildfowl shooter.—JOHN CORDEAUX (Great Cotes, Ulceby).

Fulmar and Spotted Redshank in Co. Sligo.—On the 5th of October last, when walking along the Enniscrone Sands, I found a Fulmar Petrel thrown up by the surf at high-water mark; it was perfectly fresh and in fine

plumage. I picked it up on the same part of the sands where I have previously found several others, the tides affected by high northerly gales bringing the water-logged birds ashore. On October 20th, when in my shooting punt, I came across a Spotted Redshank on the Scurmores Strand, but, not distinguishing it in time from the Common Redshanks about, I lost my chance of shooting it before it made off.—ROBERT WARREN (Moyview, Ballina).

Unusual site for a Sedge Warbler's Nest.—A case of the Sedge Warbler, *Acrocephalus phragmitis*, building at a height from the ground came under my observation last June. The nest was supported between the stem and one or two boughs of a young larch in a plantation of the same trees, and was placed at between seven and eight feet from the ground, or about three-quarters up the tree. There were five eggs, which were hatched off safely.—L. W. WIGLESWORTH (Castlethorpe, Bucks).

Materials in Nest of Hooded Crow.—Although I often see mention of curious nesting-places, I do not think many observers send notes of strange materials used in the construction of nests. I have looked through 'The Zoologist' for the last eleven years, and can only find a short note on this subject by Mr. Booth (Zool. 1887, p. 389), in which he describes the materials he has found in Cormorants' nests—such odd things as "children's whips and spades, a gentleman's light cane, and part of the handle of a parasol, all of which (he supposes) the birds had picked up floating at sea." Let me tell you of a Hooded Crow's nest which was built not far from here last year (1887), and which was found to contain bits of blue china, glass, a few small stones, and a very old half-crown! Could the birds have appropriated a Magpie's old nest, after first dismantling the outworks? Or, do Hooded Crows occasionally follow the bad example of the Jackdaw of Rheims?—WILLIAM W. FLEMING (Clonegam Rectory, Portlaw, County Waterford).

A White Snipe.—A white Snipe was shot at Throphile, on this estate, in September. The colour is not dead-white, but a very pale grey, on which the dark bars and markings are visible. This bird is in the possession of Col. Osbaldeston Mitford. I send the dimensions in case this specimen may be a variety:—Length, bill to tail, ten inches, of which the bill is two inches and seven-tenths; tarsus, one inch and three-tenths.—E. L. MITFORD (Mitford Hall, Morpeth).

Ring Ouzel breeding in Orkney.—In the useful 'Manual of British Birds,' by Mr. Howard Saunders, which Messrs. Gurney and Jackson are now publishing in parts, it is stated (p. 15) with regard to the Ring Ouzel, *Turdus torquatus*, that it breeds "in the greater part of Scotland, including most of the islands which present suitable features, *except the Orkneys and Shetlands*, to which it is comparatively a rare visitor." In former years I

was well acquainted with the birds of Orkney, more especially with those of the parish of Harray on the mainland (or Pomona, as it is called by geographers, but not by Orcadians). This parish is separated from the sea by hills almost all round. The Ring Ouzel, though not so often seen in the more level portions of the parish, was not rare in the glens or dales amongst the hills; and in one of these glens I once found a nest with four eggs, one of which I took, and still have in my possession as a proof that this bird does breed in Orkney.—J. W. H. TRAIL (71, High Street, Old Aberdeen).

FISHES.

Food of the Haddock.—In the stomach of a Haddock recently purchased alive at Hartlepool, were found fourteen young whiting, from four to five inches long, and a small crab, with hard carapace, about one inch in diameter, all quite fresh and digestion barely commencing. The Haddock was seventeen inches long, and weighed, when gutted, twenty-six ounces. The weight of the young fry and crab was six and a half ounces, or almost one quarter of the weight of the fish.

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

December 6, 1888.—W. CARRUTHERS, F.R.S., President, in the chair.

The following were elected Fellows:—H. E. D'Alton, of Victoria; P. Goyen, of Otago, N. Z.; G. A. Grierson, Lecturer in Botany, Sheffield School of Pharmacy; Maurice Holtze, Superintendent Botanic Garden, Port Darwin; R. W. Hullett, Singapore; J. C. Lisboa, M.D., Fellow Bombay University; J. H. Lace, Forest Department of India; Professor J. B. L. Mackay, Director School of Mines, Sandhurst, Australia; E. W. Mayhew, Freemantle, W. Australia; Digby S. W. Nicholl, Cowbridge, Glamorganshire; D. T. Playfair, M.D.; D. Prain, M.B.; Clement Reid, F.G.S.; A. B. Rendle, B.A., B.Sc.; and Peter Yates, M.D.

Mr. W. H. Beeby exhibited, and made some remarks on, specimens of *Valeriana mikanii* and *sambucifolia*, and a series of *Potamogeton fluitans*.

Mr. F. W. Oliver described the nature and growth of leaf emergences in *Eriospermum folioliferum*.

Mr. E. M. Holmes exhibited specimens of a new assafoetida plant, *Ferula fetidissima*, and a monstrosity of *Zea mays*.

Mr. J. G. Baker exhibited a curious variety of *Vicia sepium* found in North Yorkshire.

Mr. T. Christy exhibited specimens of an undetermined species of *Echium* received from Persia, and employed medicinally as a good alterative.

The first paper read was one by Dr. Costerus on malformations in *Fuchsia globosa*, upon which Prof. Bower offered some critical remarks.

The next paper was by Mr. B. T. Lowne, who gave an admirable demonstration of the mode of development of the egg and blastoderm of the Blow-fly. His conclusions were criticised by Prof. Stewart, Prof. Howes, and Mr. A. R. Hammond.

In continuation of the Reports on the collection made by Mr. Ridley in Fernando Noronha, a paper was read, on behalf of Mr. Boulenger, enumerating the Fishes and Reptiles which had been identified by him.

The meeting then adjourned until Dec. 20th.

ZOOLOGICAL SOCIETY OF LONDON.

November 20, 1888.—Prof. FLOWER, 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 June, July, August, September, and October, 1888, and called attention to the acquisition of three specimens of Pallas's Sand Grouse, *Syrrhaptes paradoxus*, captured in Scotland.

A letter was read from Prof. J. B. Steere, giving a preliminary account of the "Tamaron," a Bovine animal found in the island of Mindoro, Philippines, which he believed to be allied to the Anoa of Celebes.

Mr. Edgar Thurston exhibited, and made remarks upon, a collection of corals from the Gulf of Manar, Madras Presidency.

Mr. H. Seebohm exhibited, and made remarks on, a specimen of a new species of Pheasant, *Phasianus tarimensis*, obtained by General Prejevalsky at Lob Nor, Central Asia. Mr. Seebohm also exhibited a specimen of a species of Plover new to the British Islands, *Vanellus gregarius*, which had been shot in Lancashire about twenty-five years ago, and had been previously supposed to be a Cream-coloured Courser. [See Zool. 1888, p. 389.]

Mr. J. W. Hulke read a paper on the skeletal anatomy of the Mesozoic Crocodiles, based on fossil remains from the clays near Peterborough, in the collection of Mr. A. Leids, of Eyebury.

Mr. Oldfield Thomas read a paper on a collection of small Mammals obtained by Mr. William Taylor in Duval County, South Texas. The collection contained examples of one new species and a new geographical variety, besides adding no less than six species to the National Collection of Mammalia.

A communication was read from M. L. Taczanowski, containing a supplementary list of the birds collected in Corea by Mr. Jean Kalinowski.

Dec. 4.—Prof. FLOWER, C.B., LL.D., F.R.S., President, in the chair.

Mr. Howard Saunders exhibited, and made remarks on, an adult male of the American Green-winged Teal, *Querquedula carolinensis*, shot in Devonshire in November, 1879. [This bird was noticed at the time in 'The Zoologist' (1880, p. 70), where, on the same page, another is mentioned which was shot forty years previously, at Hurstbourne Park, Hants.—ED.]

Mr. Oldfield Thomas gave an account of the Mammals obtained by Mr. C. M. Woodford during his second expedition to the Solomon Islands. The total number of species now known from the Solomons was twenty-two, of which no less than eight had been discovered by Mr. Woodford. There were also two new genera of Bats to be added to the one previously described.

Mr. F. E. Beddard read a paper upon the genus *Clitellio*, which had been recently investigated by him at the Marine Biological Station at Plymouth. The paper contained an account of the anatomy of two species, *Clitellio arenarius* and *C. ater*; the most important fact referred to was the presence of an oviduct, which had only lately been found in the *Tubificidæ* (in the genus *Psammoryctis*). The paper also contained some remarks upon the synonymy of the two species, particularly of *C. ater*, which was probably identical with d'Udekem's *Tubifex benedii* and with Zeuger's *Peloryctis inquilina*. It was also pointed out that *C. ater* is not congeneric with *C. arenarius*, but probably belongs to Eisen's genus *Hemitubifex*.

Prof. Howes and Mr. Davies read a paper on the distribution and morphology of the supernumerary phalanges in the Anurous Batrachians. The authors described for the first time the primary mode of development of a supernumerary phalanx. They concluded that the same is in the Anura identical with the interphalangeal syndesmoses, and that the syndesmoses and phalanges are derivatives of a common blastema. In its fully differentiated condition the structure in question was shown to be functional in receiving the direct thrust under the weight of the falling body in saltation; all the variations in structure being readily intelligible on that view. The authors discussed the bearings of the facts upon classification and upon the broader question of the morphology of supernumerary phalanges in general. They showed that the facts of development indicated a probable intercalary origin of the latter from the inter-articular syndesmoses; and that the numerical increase of the phalanges in the Cetacea may have been associated with the loss of ungues, somewhat similarly to the way in which the multiplication of segments of the cartilaginous rays in the paired fins of the Batoidei would appear to have been connected with the disappearance of horny fin-rays. The authors also showed that the *Discoglossidæ* alone among the Anura retained for life the undifferentiated syndesmoses, and that this feature testified more forcibly than anything else to their low affinities. They also described a community of structure between the

modified syndesmoses in certain Anura and the apparatus of the knee-joint in Mammals, and urged that the facts were such as to necessitate a reconsideration of the morphological value of the latter.

A communication was read from Mr. J. J. Lister, giving a general account of the Natural History of Christmas Island, in the Indian Ocean, which he had visited in 1887 as naturalist to H.M. surveying-vessel 'Egeria.' Mr. Lister gave a detailed account of the birds obtained in Christmas Island. Of these seven were land-birds, all of which belonged to species peculiar to the island, though some of them approached their allies in the Indian Archipelago very closely.

Mr. Oldfield Thomas read a paper on the Mammals of Christmas Island, obtained by Mr. Lister during the same expedition. This was followed by reports on the Reptiles, by Mr. G. Boulenger; on the Terrestrial Mollusks, by Mr. Edgar A. Smith; on the Coleoptera, by Mr. C. J. Gahan; on the Lepidoptera, by Mr. A. G. Butler; on the other Insects, by Mr. Kirby; and on the Annelida, Myriapoda, and Land-Crustacea, by Mr. R. I. Pocock.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

December 5, 1888.—Dr. D. SHARP, F.L.S., President, in the chair.

Mr. B. A. Bower, of Eltham, Kent, was elected a Fellow of the Society.

Mr. W. F. Kirby exhibited, for the Rev. Dr. Walker, a variety of the female of *Ornithoptera Brookiana*; he also exhibited, for Major Partridge, an undetermined species of the genus *Hadena*, captured last summer in the isle of Portland.

Mr. R. South exhibited a series of specimens of *Tortrix piceana*, L., from a pine wood in Surrey; also melanic forms of *Tortrix podana*, S., from St. John's Wood.

Prof. Meldola exhibited, for Dr. Laver, a melanic specimen of *Catocala nupta*, taken last September at Colchester.

Mr. E. B. Poulton exhibited preserved larvæ of *Sphinx convolvuli*, showing the extreme dark and light forms of the species.

Mr. M'Lachlan called attention to a plate, representing species of the genus *Agrotis*, executed by photography, illustrating a memoir by Dr. Max Standfuss, in the Correspondenz-Blatt, Verein 'Iris,' in Dresden, 1888. He considered it was the best example of photography as adapted for entomological purposes he had ever seen, especially as regarded its stereoscopic effect.

The Rev. Canon Fowler exhibited a specimen of *Mycterus curculionoides*, L., sent to him by Mr. Olliff, and taken by Mr. Gunning near Oxford about 1882.

Mr. W. Nicholson exhibited several melanic varieties of *Argynnis niobe* and *A. pales*, collected by himself last summer in the Engadine.

Mr. J. H. Leech exhibited a small collection of Lepidoptera formed last year by Mr. Pratt at Kiukiang, Central China. It included several new species, also specimens of a variety of *Papilio sarpedon* and other interesting forms.

Mons. A. Wailly exhibited a collection of Lepidoptera lately received from Assam, containing upwards of thirty-five species of *Papilio*, *Ornithoptera*, *Charaxes*, *Diadema*, *Cyrestis*, and other genera.

Mr. Meyer-Darcis exhibited specimens of *Sternocera tricolor*, Kerr, and *S. variabilis*, Kerr, from Lake Tanganyika; also two new species of *Julodis* from Syria.

Mr. F. Merrifield exhibited, and made remarks on, a long series of *Selenia illustraria*, *S. illunaria*, and *E. abniaria*, in illustration of his paper on "Pedigree Moth-breeding."

Lord Walsingham exhibited, and made remarks on, a series of species representing the genera *Suellenia*, Wlsm., *Ædematopoda*, Z., and *Eretmocera*, Z.

The Rev. T. A. Marshall communicated a paper entitled "A Monograph of British *Braconidæ*. Part III."

The Rev. Dr. Walker communicated a paper entitled "Description of a variety of the female of *Ornithoptera Brookiana*."

Lord Walsingham read a paper entitled "A Monograph of the genera connecting *Tinageria*, Wlk., with *Eretmocera*, Z." A discussion ensued, in which Mr. Stainton, Dr. Sharp, and others took part.

Mr. Merrifield read a paper entitled "Incidental Observations in Pedigree Moth-breeding." This paper contained a detailed account of experiments with *Selenia illustraria*, *S. illunaria*, and *E. abniaria*, which, so far as they had yet proceeded, indicated that retardation of development in the growing stages of the larvæ, as well as in the pupal stage, was the cause of the darkening of colour in the perfect insects; that a low temperature had the effect of causing such retardation; and that growing the larvæ at a forcing temperature tended to produce a warmer and yellower tint in the colouring of the moths. Lord Walsingham, Mr. Poulton, Prof. Meldola, Mr. White, and Mr. Merrifield took part in the discussion which ensued.

Mr. J. H. Leech read a paper "On a small collection of Lepidoptera from Kiukiang." Mr. Elwes said he had examined this collection with very great interest, and was struck with the similarity of many of the species to those from Sikkim.—H. GOSS & W. W. FOWLER, *Hon. Secretaries*.



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NOTES ON A VOYAGE TO THE GREENLAND SEA IN 1888.

BY ROBERT GRAY.

(Continued from p. 9.)

MAY 21.—Lat. $79^{\circ} 16'$, long. $4^{\circ} 46'$ E. Temperature at the surface, 30° ; water slightly green. The wind fresh from the westward, blowing the young ice away from the floes, a narrow intermediate strip of water being formed, along which we sailed in a south-westerly direction. In the morning a small Greenland Whale passed near the ship, going N.N.W. towards a well-known part of the whaling-grounds, at present covered with ice. *Mysticetus*, when on a passage, is not to be mistaken. With the upper jaw above water and the back just covered, the animal while at the surface moves steadily along; a slight disturbance of the surface-water, in the form of a series of circles, breaking out in its rear, marking the action of the caudal fin.

May 24.—Lat. $78^{\circ} 54'$, long. 1° W. Water slightly green; temperature at the surface, 29° . Experienced a slight swell from the southward in the morning, which broke up at the "floes" in the vicinity; on proceeding to the westward, however, we lost it, being sheltered by a point of ice to the southward. A large Whale appeared near the ship at night, evidently feeding.

May 25.—Lat. $78^{\circ} 21'$, long. 2° W. Water green, but clear; temperature at the surface, 29° . Cruised under canvas in a small

space of open water surrounded by "pack" or broken-up ice on all sides. Blowing hard from the northward, with showers of snow, the sea torn into a sheet of foam, the short sharp waves breaking high along the face of the lee-ice. There were many Whales about, but the boats being unable to pull to windward we did not succeed in making any captures. As may be supposed, the drift of the ice under the influence of such a strong wind was very great, and this being so it seemed somewhat remarkable that while the ocean on all sides should be covered with drifting-ice, one small space should remain open. I noticed, however, that the open space became smaller and smaller, until finally, owing to the closing of the ice, we had to quit it altogether and force our way northward against wind and current towards another open space which had in the mean time broken out. This open space shared a similar fate, but not before another and similar space had formed, also to the northward; in fact, a series of open spaces were forming and reforming, and being covered with ice. Perhaps the current was performing a vorticoso movement, a series of vortices being formed, with the water welling up in the centre.

May 26.—Lat. $78^{\circ} 13'$, long. $3^{\circ} 15'$. Water green, but clear; temperature at the surface, 29° . Many Whales about, but otherwise very little appearance of life. The Whales were mostly coming out of the "pack" ice to the southward, crossing the open water and entering the ice to the northward, but some of them seemed inclined to sport about in the open water, returning again to the shelter of the ice. One which we harpooned made off into the "pack," but the men being able to run over the ice with lances, we eventually secured it after some trouble. In the evening we chased several other Whales, but without success; the 'Hope,' however, made a capture. Concerning the Whale which we killed I took the following scanty notes:—

Sex.—Female.

Colour.—Sooty black, with the exception of a few feet of white extending backwards from the symphises along the under surface of the lower jaw.

Measurements.—From tip of lower jaw to eye, 14 ft.; to umbilicus, 20 ft. 6 in.; to anterior end of vulva, 26 ft.; to posterior end of vulva, 27 ft. 6 in.; to median cleft of caudal fin, 42 ft. 6 in. Thickness of blubber, 8 in.

Whalebone.—The total number of plates of sufficient size to be considered marketable was 569; of these the largest measured 7 ft. 6 in. in length. Towards the extremities of the series of plates attached to each side of the upper jaw the whalebone-plates diminish in length, as also does the width of the interspaces, the latter decreasing from .615 in. to .384 in. Having already shown that the number of the whalebone-plates does not vary with growth, but remains constant (Zool. 1887, p. 136), and having found the width of the interspaces, where greatest, in a full-grown Whale we killed last year to be .92 in., it is very evident that with growth and consequent increase in the length of the upper jaw the whalebone-plates become farther and farther apart.

Palate.—From sections which I made I found the palate about the middle of the jaw, where narrowest, to be only 3 in. in breadth, convex, and flesh-coloured, with irregular bluish grey markings. Immediately external to the palate the whalebone-plates are found, at first in the form of hairs, but altering gradually to the large functional plates situated most externally.

Hind Limbs.—These interesting rudiments I found could be most easily cut out by marking out a rectangular area of skin about three feet square, with the opening of the vulva included in its centre; by then cutting inwards at right angles to the surface, through the blubber, and through the muscles of the abdominal wall, the whole mass may be speedily removed, and the bones dissected out at leisure.

Valves.—The presence of automatic valves closing the natural openings, and thereby preventing the ingress of water while under pressure, has long been known to exist in *Mysticetus*. On making sections of the external auditory meatus as it passed through the blubber, I found it provided with a valve in the form of a conical outgrowth of adipose tissue, the apex of which is directed outwards.* A somewhat similar but larger structure, attached to the opening of the vagina, evidently acted in the same way with regard to the opening of the throat, as also did another which on a previous occasion I examined, attached to the base of the tongue, but which probably represents the epiglottis.

Fæces.—According to the general opinion of whalers, the fæces of the Greenland Whale is usually of a reddish colour, and this view was supported by what I observed, the colour while floating in the water being vermilion, and as it exuded from the vent chocolate-brown. Under the microscope, it is seen to consist in great part of crustacean remains, but what the species is it is impossible to determine.

May 27.—Lat. 77° 49', long. 4° W. Water clear and blue in the morning; temperature, 29°; but after working northwards

* See 'Journal of Anatomy and Physiology,' vol. xxiii. p. 300.

we again found it discoloured at night. The diatom-stained water, so far as we observed, lay to the north-eastwards, its western outline agreeing with the margin of the heavy ice, and its southern, for some distance eastwards from the ice-edge, with the parallel of lat. 78° . The first Whales we saw were in lat. 79° , and we continued seeing them as we drifted southwards until the colour of the water became blue. In this case, then, the discoloured water and the Whales also were maintaining their position, while we ourselves, along with the ice, were being drifted southwards with the wind. Moreover, I observed a few days afterwards, while lying in the blue clear water to the southward of the discoloured water, that many of the pieces of ice had their margins tinged with an orange-yellow, showing that while drifting southwards they had encountered an abundance of diatoms floating in the water. Only one Whale seen to-day; it rose close under the bows, but, hearing the ship, made off immediately into the ice.

May 28.—Lat. $77^{\circ} 58'$, long. $2^{\circ} 21'$. Water slightly green; temperature at the surface, 29° . In the morning a Whale was reported coming up from the southward, towards the open space of water in which we were lying. Two boats, which lowered away from the ship, took up positions and awaited the appearance of the animal, continuing, however, to pull slowly to windward to keep their ground. As ill luck would have it, one of the boats happened to be pulling just over the place where the Whale intended to rise, and the animal, alarmed evidently by the movement of the oars, "smothered its blast," as whalers say (*i. e.*, discharged, while under water, a large volume of air which it probably had intended to expire), and then set off into the ice without ever rising to the surface.

May 30.—Lat. $78^{\circ} 5'$, long. $3^{\circ} 30' W$. Water slightly green; temperature at the surface, 29° . Two Blue Fin-Whales, *Balænoptera Sibbaldii*, appeared near the ship during the day, the ice evidently having already opened out sufficiently to enable these animals to find their way on to the rich feeding-grounds in the neighbourhood. The appearance of "Finnners," as these Whales are called, on the whaling-grounds, heralding, as it does, the speedy departure of *Mysticetus* icewards to less accessible regions, is not regarded with much favour by the whalers. So intimately related geographically as these animals undoubtedly

are, inhabiting the same localities, and feeding in a manner so similar, that many forms must necessarily be common to both as their food, I cannot but suppose that previous to the commencement of the fishery, when the Greenland Whale was infinitely more numerous and less retiring in its habits, the relative distribution of the two animals must have been very different. The area of the feeding-grounds remaining constant, the struggle all along has been one of a slow swimmer with long whalebone plates *versus* a swift and active animal with short plates, with this qualification, however, that *Mysticetus* has become specialised to inhabit those parts of the feeding-grounds covered by ice, its congener to occupy rather the open ocean. The prolonged prosecution of the Whale fishery, and the consequent reduction in numbers of the Greenland Whale, has favoured a corresponding increase in the abundance of the Blue Whale, at the same time permitting its intrusion upon the habitat of *Mysticetus*, and hence its frequent appearance amongst the ice, where for weeks the ships now search vainly for the Greenland Right Whale. Furthermore (and a similar argument applies to the case of the Saddle Seals), if the capture of *Mysticetus* was to cease henceforward, ages probably would elapse before it would arrive at its former abundance, having to compete with intruders on its feeding-grounds. During the last twenty years the average number of Whales killed yearly has been only about ten: now this small number cannot amount to much in the same seas where in ten years the Dutch killed no less than 10,019 Whales. Far, however, from the animal becoming more abundant, it appears to become every year more rare.

May 31.—Lat. $78^{\circ} 24'$, long. $0^{\circ} 25'$ E. A strange bird was seen to-day in company with several Snow Birds. From the description I received, it may have been Ross's Gull, *Rhodostethia rosea*.

June 3.—Lat. $79^{\circ} 8'$, long. $0^{\circ} 23'$ W. The ice to the westward having opened out with the recent westerly winds, we sailed in that direction into a large water surrounded by floes. The water was clear and blue, with a total absence of animal life. This is a good example of the fact that, when the ice drifts off any part of the ocean, upon which for some time it has been previously lying, there is always a complete absence of vegetable life at the surface. Darkness must obtain beneath the fields of ice, and

hence the absence of diatoms. The absence of animal life proves that in the ocean, as well as upon the land, independent of plant-life animals cannot flourish.

June 8.—Lat. $77^{\circ} 38'$, long. $0^{\circ} 7'$ E. Shot a Turnstone, *Streptilas interpres*, the first straggler of the kind I have ever met with on the whaling-grounds.

June 10.—Lat. $78^{\circ} 10'$, N., long. 2° W. It so happens that we are in the same position as on May 25th, when we were lying in the open space of water amongst the ice, as described. The formation of the ice still remains the same, and the surface water continues deeply discoloured with diatoms. The position remaining the same, it is interesting to note the different kinds of ice which have been drifted southwards over the ground during the interval. On the first occasion of our visiting the locality the sea was covered with broken-up bay ice; this, however, was soon replaced by bay floes, these in turn by newly broken-up fields of heavy ice, and finally large floes appeared and covered the ground. Subsequent to the appearance of the latter we saw no more Whales, and I have little doubt they retreated southwards, whence they came, before the large fields of ice.

June 14.—Lat. $77^{\circ} 30'$, long. $0^{\circ} 3'$ W. Owing to our not having seen any Whales since May 28th, and swell having come in from the S.E. and broken up all the floes, we made the best of our way out to sea, and then shaped our course south-westwards along the ice, for the South Greenland whaling-grounds.

June 16.—Lat. $75^{\circ} 50'$, long. $6^{\circ} 9'$ W. Water dark blue and clear; temperature at the surface, 31° . At a depth of about forty fathoms, with a tow-net, I secured a large quantity of the Copepod, *Calanus finmarchicus*, with their alimentary canals filled with diatoms. This would seem to show that (even when the water at the surface is blue and clear) diatoms may exist in abundance at a trifling depth.

June 17.—Lat. $75^{\circ} 30'$, long. $10^{\circ} 30'$ W. The water remains blue and clear, the temperature being 30° . About noon we approached the first field of ice, behind which a Whale was discovered feeding. Two boats left the ship and pulled towards it. The water being very clear, the Whale must have seen the boats at the surface, for it was observed to approach them very cautiously, as if conscious of danger, and with the intention evidently of examining them. At first only the eddy or swirl

caused by the action of its caudal fin appeared at the surface, but soon afterwards the animal itself—although still under water—became visible; moving towards one of the boats, immediately under which, at the depth of only a few feet, it afterwards for some time lay motionless, one of its eyes being directed upwards. Finally, raising the tip of its upper jaw a few inches above the surface, with its body depending downwards and its soft and unprotected back under water, it moved slowly round the boat at the distance of only a few feet from its side. When opposite the boat's bow it suddenly raised its back above the surface and descended: before it disappeared, however, it was harpooned. The animal undoubtedly had seen the harpooner directing the harpoon-gun towards it, and, taking alarm, had endeavoured to escape. In the course of an hour or so this Whale was duly killed, and, the ship having been anchored to a field of ice, was afterwards flenched. The following are a few notes which I made:—

Sex.—Male.

Colour.—A deep velvety black throughout, with the exception of a little white on the under surface of the lower jaw extending backwards from the tip, and a greyish appearance at the rump where the lobes of the tail commence to expand outwards.

Measurements.—From tip of lower jaw to articulation of condyles, 13 ft. 6 in.; to umbilicus, 22 ft.; to preputial orifice, anterior end, 22 ft. 6 in.—posterior end, 26 ft.; to anus, 28 ft. 6 in.; to median cleft of caudal fin, 40 ft. 6 in. Breadth across the under surface of lower jaw, 8 ft.; between the fins, 7 ft. 3 in. Length of pectoral fin, 6 ft.; breadth, 3 ft. 8 in. Length of longest plate of whalebone, 8 ft. 4 in.; breadth at the base, 10 ft. Number of plates of whalebone, 579.

The opening of the ear, which is somewhat difficult to discover, and which I have sometimes searched for in vain, was in this Whale 16" behind and slightly below the posterior canthus of the eye,—a minute opening, as in other Cetaceans. I did not succeed in examining the stomach, but the intestine I found contained reddish matter, similar in appearance to the fœces I obtained from the last Whale we killed. By comparing the measurements just given with those of the female Whale killed on May 26th, it will be seen that there is no marked proportionate difference in the length of the head with relation to the extreme length of the body between the two sexes. In both Whales the

head measured, as nearly as possible, one-third of the length of the whole body.

From the 18th to the 29th we were engaged in cruising south-westwards, over the best and usually the most productive parts of the South Greenland fishing-grounds, between lat. 72° and 73° and long. 15° W. The coast of Greenland was frequently in sight, the tops of the mountains dipping on the western horizon. The ice, which was mostly in the form of large floes, was only newly opening out, and hence the colour of the water, which was everywhere uniformly clear and blue. In accordance with the scarcity of vegetable life there was a general want of animals, a solitary "Finner" and an occasional school of Narwhals being the only representatives of the Cetaceans. A few notes which I made concerning the habits of the Blue Fin-whale,* *Balænoptera Sibbaldi*, may be of interest:—

Several of these Whales were observed feeding at the edges of the floes. When feeding under such circumstances a sinuous course is pursued, the animal being alternately under the ice, in search of its food, and outside the edge of the floe, where it approaches the surface for the purpose of breathing. The period under water in one instance was eight minutes, during which the Whale had moved along the edge of the ice about a quarter of a mile before again appearing at the surface to breathe, while the period at or near the surface was about three and a half minutes, during which it rose to the surface at regular intervals of twenty-six seconds, blowing once on each occasion. While feeding in this manner, owing to the distance performed horizontally, the depth to which the animal descends must be trifling; in fact, the animal is probably obtaining its food immediately under the surface of the ice. This view is supported by several facts. On several occasions I have noticed an immense number of Crustaceans, of the genus *Gammari*, collected under the surface of the ice; in the case of a piece of ice being displaced, by contact with the ship, they are frequently exposed. Again, a field of ice having become broken by the action of swell and intersected by narrow cracks, great numbers of small fishes, belonging to the

* To this animal, the Blue Whale of the Norwegians (see Mr. Cock's remarks), the general term "Finner" is applied by Scotch writers without any restriction. The terms might be advantageously combined. I propose the name adopted in the text, "Blue Fin-whale."

species *Gadus fabricii*, are found frequenting the cracks. From these several facts it seems probable that those forms preyed upon by the Whalebone Whales collect under the ice, where, in the darkness necessarily prevailing, the retreat is rendered more secure. It must be remembered that the ice, being acted on by the wind, may be drifting through the water, so that while the forms collected under its surface receive the maximum amount of safety, a supply of food is provided in the form of vegetable organisms contained in the ever-changing water. The Blue Fin-whales appeared to have entered the ice from the S.W., several being observed coming up from that direction. One, which passed near the ship, was going N.E. towards a floe, a corner of which lay across its path. I was anxious to notice whether it would pass under the ice which was only about one mile broad, and so reach the water on the other side without swerving from its path, —a feat which could easily have been performed by *Mysticetus*. Continuing its course to the eastward, this Whale dipped below the ice, heading towards the open water on the other side. After an interval of eight minutes the animal again appeared, on the same side of the floe, but half a mile farther to the eastward, having found it necessary to swerve to the right in order to regain the open water. After blowing eleven times it again turned to the N.E., and by this time, having rounded the point of the floe, continued its course in that direction. Meeting with no indication of the presence of *Mysticetus* we retraced our steps northward, and on reaching the ice in lat. 75° we again fell in with Whales in the same locality as before. The following extracts from my Log may assist in explaining our proceedings:—

June 28.—Lat. $75^{\circ} 14'$, long. $9^{\circ} 28' W$. Water clear and blue; temperature 33° . Several "Finners" seen in the morning, evidently feeding, reappearing at intervals of about twelve minutes, without shifting ground. On proceeding westwards for a few miles towards the floes, where the ice was closer, we encountered great numbers of Narwhals and also two Greenland Whales. The latter were both moving north-eastwards; the first was only seen once, while the second was chased by our boats for five hours. Partly owing to the clearness of the water, and partly owing to the smoothness of the sea, the weather being calm, the boats could not succeed in approaching it, and so the chase terminated unsuccessfully. It was interesting to notice how, on the near approach of the boats, its blowing became more audible

and was sent higher into the air, its speed at the same time becoming accelerated; how when, being evidently alarmed by the noise of the oars, the animal sought shelter amongst closer ice, until being freed of its pursuers it again ventured into open water, and, reaching a body of compact ice, finally disappeared from view.

July 1.—Lat. $74^{\circ} 37'$, long. $11^{\circ} 00'$. Clear blue water all day; temperature, 33° . A great abundance of animal life. several "Finners" and "Whales" being seen; also many Bears and great numbers of Narwhals. Two large Whales were seen, and chased with most unfortunate results. When discovered from the Crow's Nest, one was feeding in open water, the other at the edge of an adjoining floe, in the same manner as the Blue Fin-whale already described, remaining, however, under water for a period of twenty-five minutes. The Whale feeding in open water, seeing one of the boats approaching, immediately became alarmed and made off towards the floe where the other Whale was feeding; we could see it all the while, swimming a few feet under water, with one of its eyes directed upwards, and the eddy caused by the action of its tail breaking out at the surface. Meeting the other Whale, it also became alarmed, and both set off together towards the N.E., swimming with great rapidity. The boats, on returning on-board, reported a quantity of blood-red crustaceans at the surface, near where the Whales were feeding, presenting, one of my informants said, a remarkably striking appearance when viewed against the submerged parts of the ice. I received two specimens, one of which was still alive; it was about an inch in length, exclusive of the antennæ, which were remarkably long and delicate.* Notwithstanding the clearness of the water, and the evident absence of vegetable life in the surface waters, Narwhals were very numerous, and, these animals being stationary and evidently feeding, it followed that those forms constituting their food were also abundant. The stomachs of two females which we killed contained cuttlefish remains, most probably *Gonatus fabricii*, a cephalopod about a foot or so in length, of a bleached or etiolated appearance, rarely or never found at the surface, hence probably living at a consider-

* Through the kindness of Mr. John Murray, of the 'Challenger' Commission, Prof. Sars has identified this crustacean as *Hymnourdora glacialis*, Bach., which he regards as a semipelagic form.

able depth. Besides cuttlefish remains, I found an abundance of blood-red crustaceans, mostly *Pasiphaë tarda*, but also a few belonging to the same species as those just mentioned as being found at the surface (*Hymnourora glacialis*). These crustaceans, especially *Pasiphaë*, have been present in nearly all the Narwhals' stomachs I have examined, along with the cephalopod *Gonatus*. The blood-red colour of the crustaceans, characteristic of abyssal forms,—the fact of their being found in the Narwhal's stomach along with *Gonati*, which, as I have already said, seem to live at a considerable depth,—all tend towards the conclusion that the Narwhal penetrates to a considerable depth for its food. The occurrence of blood-red crustaceans at the surface, I may add, is very unusual in these seas. Of the two Narwhals, one was non-gravid, while from the other I removed a fœtus measuring 5 ft. 2 in. in length, probably mature.

July 4.—Lat. 74° 50', long. 12° 9' W. Water clear and blue; temperature at the surface, 32°. In the morning a large Greenland Whale was discovered in a "bight" formed by the floes. Several Blue Fin-whales were feeding near, their movements forming a marked contrast with the graceful but less active movements of their congener. This Whale, the last we saw during the season, was eventually harpooned, but, after some 400 fathoms of line had been drawn out, the harpoon drew.

(To be continued.)

NOTES ON THE OCCURRENCE OF PALLAS'S SAND GROUSE IN LANCASHIRE.

BY ROBERT J. HOWARD,
Member of the British Ornithologists' Union.

IN 1888, as in 1863, Lancashire was favoured with a visit from this interesting species; the second invasion, however, was on a larger scale, with a correspondingly heavier death-roll than that of twenty-five years ago. The first arrival of the birds, at almost the same date as in 1863 (as regards Lancashire, within two days of the same date), is remarkable. In this report I propose to deal with occurrences which have come within my own knowledge in the county of Lancashire, excepting the Furness district, which the Rev. H. A. Macpherson has included

in his report on the subject, published in the 'Transactions of the Cumberland and Westmoreland Scientific Association.'

May 20th.—Eight were seen to alight on the moss about a mile north of St. Michael's-on-Wyre. On the following morning Cuthbert Baines, a farm-labourer, shot four of them (two males and two females); the rest flew N.W. These are the birds referred to by Mr. Hugh P. Hornby ('Field,' June 2nd), who writes me that he was misinformed as to the number of birds in the flock, and the date when his were shot, and that his notes are consequently incorrect on these points.

May 25th.—One seen flying across Tarleton Moss, against a strong east wind, by Henry Cookson.

June 1st.—Two males and one female shot out of a flock of seven on St. Michael's Moss, by C. Baines. One male and one female in Mr. Francis Nicholson's collection; one male in Mr. W. B. Wardle's collection.

June 2nd.—A flock of about twenty seen, by a party of pigeon-shooters on the Manchester Racecourse, flying from the direction of Trafford Park; the birds, after passing over the course, wheeled and returned to the park.

June 3rd.—Three males shot out of a flock of twenty on Rawliff Moss, by John Taylor; the remainder of the birds flew N.W., and were probably the seventeen which the Rev. H. A. Macpherson says were seen on June 11th on the north end of Walney. One in Mr. F. Nicholson's collection; one in the Blackburn Museum: one in my own collection.

June 7th.—A solitary female shot on St. Michael's Moss, by C. Baines. In my own collection.

June 30th.—One seen near Blackstone Edge Reservoir, by James Stancliffe, gamekeeper.

September 3rd.—One seen on Tarleton Moss, by Henry Cookson. This bird was flying west along the same line as the one which he saw on May 25th; but it was travelling in the opposite direction.

From the above list it appears that in Lancashire fifty-nine Sand Grouse have been seen and eleven (seven males and four females) killed. It is quite possible, however, that the flock of twenty seen near Manchester on June 2nd was the same as that observed on Rawliffe Moss, forty miles N.W., on the following day, for most of the birds which escaped the gun flew off in a

north-westerly direction. All those birds referred to, with the exception of that seen on Blackstone Edge, were met with in the low-lying district of West Lancashire, chiefly on the moss-land. Those seen near St. Michael's were partial to oat-fields, and were seldom, if ever, observed on the old grass-land. Cuthbert Baines told me that the birds were wild, and would not allow him to approach within 150 yards in the open; he had to creep down the moss-ditches to get within shot. The birds rose quickly the instant his head appeared above the edge of the ditch, and would not permit him to take the "pot" shot invariably adopted with Dotterel. After being flushed, whether shot at or not, they usually flew a few hundred yards and returned in a short time to the same field; in this respect, as well as in their partiality for oat-fields, resembling Dotterel. They do not carry away much shot; all were killed with No. 10 at about thirty yards distance. On September 6th I examined five birds in the Western Aviary at the Zoological Society's Gardens. The gait is such as one would expect from the shape of the feet, and reminded me of that of a rat.

These Sand Grouse would, I think, have little difficulty in finding an abundant supply of suitable food on our moss-land. In addition to grain (any kind of which it appears the Sand Grouse will eat), most of the moss-land is full of the seeds of goose-foot and various species of knot-grass (*Polygonum*); seeds of the latter, with germinating power unimpaired, are found buried several feet in the peat, and are constantly being brought to the surface as the land is worked. Seeds of the goose-foot (*Chenopodium album*), a very common weed, were found in the crops of the Lancashire-killed specimens, and it appears that the seeds of a nearly-allied plant, *Agriophyllum gobicum*, formed the bulk of the food of the Sand Grouse in Central Asia. Six of the birds killed at St. Michael's have passed, in the flesh, through my hands; and the contents of the crop of the other were sent to me by Mr. Nicholson. I forwarded the crops and gizzards to Mr. Robert Holland, Frodsham, who very kindly furnished me with the following particulars:—

1. Crop: red clover, a few seeds of Italian rye-grass, and knotgrass (*Polygonum persicaria* or *lapathifolium*). Gizzard: half the bulk, small fragments of white quartz; seeds, knotgrass, red clover, and alsyke.

2. Crop: red clover, a few seeds of Italian rye-grass and knotgrass.
3. Crop: same as No. 2, with a few seeds of mouse-eared chickweed.
4. Crop: knotgrass and red clover, a few seeds of trefoil, Italian rye-grass, perennial rye-grass and meadow-fescue. Gizzard: five-sixths of bulk, small fragments of white quartz; seeds, knotgrass, goose-foot, alsyke, and Italian rye-grass.
5. Crop: red clover, Italian rye-grass, knotgrass, and goose-foot.
6. Crop: same as No. 5.
7. Crop: knotgrass, goose-foot, mouse-eared chickweed, Italian rye-grass. Gizzard: one-third of bulk, white quartz; seeds same as crop.

Plumage, dimensions, weight, &c.:—

1. Male;	length, 16·9;	wing, 9·4;	central tail-feathers, 7·6;	weight, 9½ oz.
2. Female;	„ 15·1;	„ 8·2;	„ 5·2;	„ 10½ „
3. Male.				
4. „	„ 15·2;	„ 8·7;	„ 6·2;	„ 9¾ „
5. „	„ 16·1;	„ 9·1;	„ 7·5;	„ 9¾ „
6. „	„ 16·3;	„ 8·55;	„ 6·3;	„ 9 „
7. Female;	„ 13·0;	„ 8·3;	„ 4·0;	„ 9 „

The birds were in fair condition; the female, No. 2, was very fat—hence her weight, for she had little in her crop. The eggs in this bird and No. 7 were about the size of No. 4 shot. The testes in the male were well developed; in No. 1 the left testicle was $\cdot48 \times \cdot22$, right $\cdot42 \times \cdot3$; in No. 5 the left was $\cdot42 \times \cdot32$, right $\cdot26 \times \cdot26$. The plumage was clean, though bleached and worn. The birds which passed through my hands had cast a few of the inner primaries and the secondaries, giving the wing a very peculiar indentation. In No. 1, the new primaries (the ninth and tenth) project about one inch beyond the coverts, are lavender along each side of the shaft, gradually shading to black towards the edges and tips, the edges rich buff $\cdot2$ wide; the new secondaries rich buff, with black stripe $\cdot3$ in width, along outer web, leaving a narrow border of buff; one of the central rectrices, new, 4 in. long. No. 4 has the colours the brightest of any I have seen. Abdominal band rich velvety black; pencillings of chest-band very clear; three inner primaries moulted. No. 7, female, is the most forward in moult. A few scapulars, one of the elongated tail-feathers, 3·8 in. in length; the secondaries, and the three inner primaries with their coverts, new; the eighth and ninth primaries almost full-grown; the

tenth is hidden by the coverts. The black on the new primaries, not so well defined in outline as in those of the males, giving the centre of these feathers a mottled appearance. Abdominal band dark umber; gular band distinct; no trace of chest-band. This is the only bird which shows any new contour feathers.

I have not met with a live Sand Grouse in Lancashire; but on the 12th September I had the pleasure of seeing the flock of seventy-three at Morston, Norfolk, referred to by Mr. Southwell (Zool. 1888, p. 446). The birds were put up at least 600 yards from the place where we stood, and passed within 300 or 400 yards of us. We could hear the call-notes soon after the birds rose, but it was a difficult matter to distinguish the note on account of the number of birds calling at the same time. Shortly afterwards, however, two birds passed us within 150 yards; we then put up three, one, and thirteen,—portions of the large flock which had broken up,—each bird calling as it flew. We all thought the note was very like the “chuck” of the breeding Snipe, with a slight whistling intonation, as described by Mr. Southwell (Zool. 1888, p. 453), uttered at intervals of about a second. The note has a more decided short “chuck,” and less of the whistle than has *Tringa canutus*.

I have not heard that these birds have made any attempts to nest in the county. A thin-shelled, abnormally-shaped egg, found in a field on St. Michael's Moss, which the Sand Grouse had frequented, is pronounced by Mr. Edward Bidwill, to whom I forwarded it, to be that of a Lapwing.

My best thanks are due to Mr. Hugh P. Hornby, Mr. Francis Nicholson, Mr. Harry Hoyle, and Mr. J. Moorcroft for information kindly supplied, and also to Mr. J. H. Gurney, jun., and Mr. T. Southwell for the kindness shown me during my visit to Norfolk, when I had an opportunity of seeing something of the Sand Grouse in a state of nature.

PALLAS'S SAND GROUSE.

REPORTS FROM THE CONTINENT.

HELIGOLAND.—Herr P. C. Reisners, the proprietor of the restaurants on the Dune, says the first pair were shot on the 15th of May, the last two on the 13th of June, 1888; altogether he shot about fifty specimens. The birds came in large flocks which were estimated at forty, sixty, and once at eighty head. The first arrivals were seen in April, and the last four specimens on the 17th of July. Most flocks flew to the west, and only one to the south. ('Der Zoologische Garten,' August, 1888 p. 233).

HOLLAND.—According to Dr. A. C. Oudemans, the first was seen in Holland on the 18th of May. It had flown against a telegraph wire at Loosduinen, near the Hague, and was killed on the spot. It was a fine male, but the front of the neck was almost denuded of feathers by the concussion. Afterwards these grouse were met with in various places, both in the provinces and on the islands of Texel, Vlieland, Terschelling, Ameland, &c. It is curious how many were killed by flying against telegraph wires, which may be due to the fact that the birds generally fly at a height of from five to eight metres from the ground. Hitherto eggs have not been met with out of doors, but it is said that a hen laid three eggs in captivity at Amsterdam. The number of birds observed varied from two to four, and from twenty to thirty, to hundreds, on the islands of the North Sea. Eight were brought to the Zoological Gardens at Amsterdam, five of which soon died. Dr. Oudemans bought a male from Texel for the gardens at the Hague, which also died after six days. This bird moped from the first, although it fed ravenously on seeds, green food, and ants' eggs. ('Der Zoologische Garten,' August, 1888, p. 234).

ITALY.—The first were shot on the coast at Fano, on the 1st of May. About the middle of May a male bird, dead and decomposed, was found in the province of Mantua. About the same time one was caught by hand near Trieste, and was kept alive at the Natural History Museum there. Two specimens were caught at Montagnana, in the province of Padua, one of which was slightly injured, and was kept alive in a large cage

in the house of Signore Dal Fiume, being fed on millet and other seeds. The second specimen was eaten. A pair was shot at Santareangelo; the stomach of the male contained seeds and grains of sand, but that of the female was empty. The flesh was well-flavoured, but tough. (*Tom. cit.* p. 235).

FRANCE.—A great number of Sand Grouse were seen west of Dunkerque, in the direction of Mardyck. Those which were killed were sold to different museums, and others were kept alive in cages. There are two stuffed specimens at Carpentier's, the gunmaker, at Dunkerque. Sand Grouse were also seen on the 28th of May, on the Dunes of Noirmontier, Dieu, and Olonne, in La Vendée (several hundreds, of which three were killed); on the 31st of May, near Calais, ten specimens, one killed; at the beginning of June, near Nantes in Brittany, and in the middle of June, in the north of the Landes. (*Tom. cit.* p. 236.)

SCHLESWIG.—First observed in Schleswig, on the "Schubyer Fields," between the middle and end of April. At this time they did not remain permanently, but seemed as if making reconnaissances in flocks of from twenty to thirty birds, and were only occasionally to be met with. After the birds were protected by the Government, the large estate owners, sportsmen, and others who were interested in birds took the newcomers under their special protection, hoping that they might obtain a new game-bird, should it become acclimatized. They were left unmolested, and all shooting and unnecessary disturbance was avoided in their neighbourhood. These birds do not appear to be so shy in their nature as Partridges, and they soon gained confidence, and took possession of a tract of meadows, pastures and heaths which, perhaps, were not very unlike the steppes. Flocks of the size mentioned, were noticed until the month of May was far advanced. The birds were so tame that they allowed themselves to be approached within a few paces; they sat quite still, and could be readily observed. Several instances of their breeding were noticed in May and June. Nests were found in grassy places (mostly in meadow land) containing one, four, five, seven, and nine eggs. [May not these have been nests of the Landrail?—ED.] The meadows lie high, and are dry, rather than damp; they are not marshy meadows on low-lying rivers. Nests of eggs were also found in grassy places

on the heaths. The nests are like those of the Lapwing, being merely a thin layer of grass stems, on which the eggs are laid. These are blotched with brown, and resemble the eggs of the Woodcock. The nests are arranged in groups, so that we may regard the birds as gregarious during the breeding season, which is rarely the case with other birds, and they were often seen sitting in pairs on the eggs, when they were quiet, and easily observed. During the hay harvest, from the end of June to the middle of July and later, young Sand Grouse were often seen while mowing was going on. Incubated eggs and deserted nests were also found, but were not further observed. The wet and cold summer must have been very unfavourable to the breeding of the Sand Grouse; for abandoned Partridges' nests, containing from fifteen to twenty eggs, were frequently observed. The Raven was found to be an enemy to the Grouse, as well as to the eggs and young. Owing to the presence of carnivorous vermin, no weak or sickly specimens were found, as was the case in other places. The Sand Grouse were seldom seen in the corn-fields, which leads to the inference that they generally feed upon grass-seeds. It was difficult to continue to observe them, owing to the size and extent of the plains, and also on account of the rainy summer which prevented many observations on these birds which might have been of importance. They finally congregated in large flocks about the middle of September, when two flocks of forty and sixty birds were seen several times. The larger size of the flocks in autumn, is probably due to the young birds having joined them. The young and old birds may be distinguished from each other in the flocks, as the former are not full-grown. Although the flocks have assembled a long time, as if they were on the point of migrating, the birds are still here (Nov. 26). They would probably survive a mild winter; but it is doubtful whether they would live through so severe a winter as the last. The note of the bird is not unlike the hoarse cry of the Sea Gull, but not so piercing.* They constantly utter it when on the wing. (Copied from the

* "Die Stimme der Vögel ist dem heiseren Schrei der Möven nicht unähnlich aber nicht so durch dringend." This is a remarkable statement, and conflicts entirely with what has been written of the note of this Sand Grouse by English ornithologists.—ED.

'Schleswigschen Nachrichten,' in the 'Bremer Nachrichten,' No. 329, for 27th November, 1888).

LIVONIA.—I beg to inform you that a Sand Grouse was shot on the 30th October, 1888, in the district of Zarnau, in the province of Wolmar, in Livonia, and was brought to me. At the time the ground was covered with some inches of snow, and was already a little frozen; and the bird had probably been driven by hunger to a farm-yard where a farmer shot it, thinking because it flew very swiftly that it was a small Hawk, of which the people are very much afraid. The crop contained a large quantity of grains of barley and rye, and the bird was not particularly lean. No other Sand Grouse have been seen here this autumn so far as I know.—HARRY VON BLANKENHAGEN (Oberforster, Zarnau, in Livonia. ('Beilage zur Illustrierten Jagdzeitung,' Leipzig, 21st December, 1888, p. 144).

SILESIA.—Sand Grouse have again been seen in the neighbourhood of Leobschutz. While the workmen of Amtsvorsteher Heidrich-Zauchwitz were spreading [manure, they found three dead birds behind a manure heap. At first they thought they were Partridges, but when they examined them more closely they perceived that the birds were quite unknown to them, and brought them to their master as something strange. They proved to be Sand Grouse. The cause of death could not be exactly ascertained. Anyhow, the birds were not starved, for they were in pretty good condition. No signs of external injuries were visible. ('Beilage zur Illustrierten Jagdzeitung,' Leipzig, 21st December, 1888, p. 144).

THURINGIA.—The Sand Grouse appear to have now (December 21st) entirely disappeared from Thuringia, for all the local papers concur in saying that no more have been seen anywhere. (*Loc. cit.*)

BERLIN.—Two pairs of Sand Grouse in one of the aviaries at the Berlin Aquarium are well and lively, and very fat. They have been accustomed to captivity since July last, when Herr Schultze, architect, of Hanover, obtained them on his estate in the Island of Amrum, in the North Sea, feeding them on hemp seed and buck-wheat. They were sent to Berlin carefully packed, and have since lost much of their original shyness. Our Partridge is considerably handsomer both in form and colour. These are, perhaps, the only Sand Grouse in Germany at present (December 28th). The others have already gone back to Tar-

tary. [This is extremely doubtful. ED.] They did not breed here, which proves that they are only visitors. ('Beilage zur Illustrierten Jagdzeitung,' December 28th, 1888, p. 157).

WESTPHALIA. On the 30th November, 1888, a covey of fifteen birds were seen on the preserves of the estate of Niesen.—
C. BRITFISCH (Warburg, Westphalia).

SAXONY.—During two battues on the Alschlebener and Kliëtzer estates, in the province of Saxony, during last December, a single Sand Grouse was shot in each. ('Der Weidmann, Blätter für Jäger und Jagd freunde,' 2nd January, 1889, p. 121.)

SWEDEN AND NORWAY.—Various accounts have been received from Sweden and Norway about the Sand Grouse. It is said that these visitors have been seen in several places in the province of Halland. Since the harvest was gathered, large flocks have remained in the neighbourhood of Warbeg. In Norway, specimens have been shot on the eastern side of the Glommen-Berg in Hedemarken. It has also been stated that a flock of from ten to twenty individuals was observed at a great height in the mountains at Taundalen (1150 feet above the sea).—
B. DAHSE (Ystad, 16th December, 1888).

THE SAND GROUSE PROTECTION ACT, 1888.

THE following is the text of the Sand-Grouse Protection Act, which received the Royal assent on the 25th December last:—

“ An Act for the better Protection of the Sand Grouse in the United Kingdom. 51 & 52 Vict. ch. 55.

“ Whereas it is expedient to provide for the protection of the Sand Grouse, in order that it may, if possible, become acclimatised in the United Kingdom :

“ Be it therefore enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :

“ 1. Any person who shall, after the first day of February one thousand eight hundred and eighty-nine, and before the

first day of January one thousand eight hundred and ninety-two, knowingly or with intent kill, wound, or take any Sand Grouse, or shall expose or offer for sale any Sand Grouse killed or taken in the United Kingdom, shall, on conviction of any such offence before any justice or justices of the peace in England and Ireland, or before the sheriff or any justice or justices of the peace in Scotland, forfeit and pay for every such bird so killed, wounded, or taken, or exposed or offered for sale, such sum of money not exceeding one pound as to the said justice or justices shall seem meet, together with the costs of conviction.

“2. This Act may be cited as the Sand-Grouse Protection Act, 1888.”

On comparing the text of this Act with that of the Bill as originally introduced,* it appears that the intention of its promoters was, very properly, to give effect to the Act the moment it was passed, and the close time originally proposed was “between the time of the passing of this Act and the first day of January, 1892.” This was altered (as we think, very unwisely) to the wording above given, the result being, as might have been expected, that many Sand Grouse have been killed since the Act was passed, apparently because unscrupulous persons have been anxious to procure specimens before it should become illegal to do so. If there was to be any legislation at all on the subject, the pity is it did not come sooner. It is hardly to be expected that any good will now result from it.

THE ELECTRIC ORGANS OF FISHES.

UNDER the auspices of the “Glasgow Natural History Society,” at the Inaugural Meeting of the present session, Professor Cossar Ewart gave an interesting lecture on this subject. He said there were few, if any structures in the whole, realm of nature which, in addition to perplexing and puzzling the naturalist, had attracted more general attention than the

* The Bill was prepared and brought in by Mr. Sydney Buxton, Sir George Trevelyan, Lord Charles Beresford, Sir John Lubbock, Mr. G. Osborne Morgan, Sir Henry James, Mr. Richard Power, Sir Edward Birkbeck, and Mr. Broadhurst.

electric organs of fishes. Aristotle seemed to have pondered long the peculiar force by which the electric ray numbed the fishes that came within its reach, and Darwin after long and careful consideration, came to the conclusion, that the electric organs offered a special difficulty to his theory of natural selection. And although, as the result of numerous investigations, a considerable increase had recently been made to our knowledge of these organs, it was still impossible to account for their origin, in some cases to offer an opinion as to their function, or even to say whether they were progressive structures, or mere useless vestiges. The Torpedo and other electric fishes fascinated the Greeks, and to a less extent the Romans, and held their ground during the dark ages. One of the most noteworthy facts about electric organs was that they were only found among fishes, and that although there were hundreds of different kinds of fishes, there were practically only three kinds that were known to have electric batteries sufficiently powerful to be of any evident use. These were *Malapterurus* of the Nile and other African rivers, the *Gymnotus* of South America, and the Torpedo found at times in our own waters, and in considerable numbers in the Mediterranean and the Atlantic. Others, in which electric organs were known to exist, were the once sacred *Oxyrhynchus* of the Nile, and the Skates and Rays which abound round the coast of Scotland. The *Malapterurus* was a quaint-looking fish, with a fatty dorsal fin like the Salmon, and six long barbules around the snout. It was said sometimes to reach a length of four feet. In this fish the electric battery was in the form of a continuous subcutaneous jacket or tunic, which invested the whole body, with the exception of the head and fins. It consisted of a countless number of minute cells, from which electricity was thrown off at will. The *Gymnotus* was a soft-skinned, sluggish creature, with small stupid-looking eyes, flattened back, and long ventral fin. It sometimes reached a length of six feet, and as the electric batteries occupied nearly two-thirds of the entire fish, one could easily understand how much it was dreaded by the natives of the Orinico region, and how ordinary fishes gave the Electric Eel a wide berth.

The *Gymnotus* had four batteries—two large and two small—on each side of the body, supplied by about 200 pairs of

nerves. The batteries were so powerful, that a shock from a large active fish was strong enough to strike down a man, and numb away his consciousness for several hours. The Torpedo was of special interest, because we were beginning to understand all the steps through which its organ had passed during its long and gradual evolution. Some of the species attained a great size. There was one, the Giant Torpedo, over four feet in length, which, when cast ashore at Cape Cod, was said often by its unexpected shocks to strike down the unwary fishermen when they attacked it with their harpoons and boathooks. The shock of the common British Torpedo was sufficiently strong to kill a duck, and when the organ was connected with a telephone the discharges first produced a croaking sound, but as the fish got excited each discharge was accompanied by a pronounced groan. The electricity discharged from the Torpedo's batteries behaved like ordinary electricity, rendering the needle magnetic and emitting sparks, and it might even be used in charging a Leyden jar. But it should be specially noted that the living battery of fishes differed from the ordinary batteries. A Leyden jar or a voltaic pile had no influence on the electricity it contained, while the electricity of the Torpedo was entirely under the control of its will, the Torpedo refusing to give a shock at one time, but readily discharging its batteries at another. What was perhaps still more remarkable, there were two large lobes in the brain of the Torpedo which regulated the production, storage, and discharge of the electricity. These electric lobes were composed of numerous giant nerve cells, from which numerous nerve fibres extended to pass direct to the batteries. When the electric lobes were destroyed, or the nerves passing from them were divided, the Torpedo was rendered as helpless as an engine without steam.

Prof. Ewart then proceeded to describe the structure of the electric organ of the Torpedo. He stated that the battery consisted of an enormous number of columns or prisms—in the ordinary Torpedo from 400 to 500, in the American about 1000, making in the two batteries 2000 columns for storing electricity. In each of the 500 columns there were about 600 electric plates, so that in the ordinary Torpedo there might be about 300,000 electric plates altogether, and in the Giant Torpedo, some 500,000. These plates were supplied with an enormous

number of nerve fibres, so fine, and dividing more and more, that with the highest power of the microscope it was impossible to trace them. Each of these tissues was connected with the electric lobes in the brain, and when cut across, were seen to be made up of a large number of nerve cells.

The lecturer described in detail the structure of the electric plate, and went on to say that the electric organs claimed special attention, not only because of their remarkable structure and still more remarkable properties, but because their very existence was a mystery. Darwin found the electric organs a special difficulty to his theory of natural selections, for two reasons—he was able neither to understand their individual nor their ancestral history. That the electric organs had been gradually built up as the Torpedo and Electric Eel became more and more specialised, Darwin had no doubt; but he was unable to account for their origin by his law of natural selection. And before proceeding he emphasised the difference between evolution and natural selection. We spoke of the fact of evolution, but the *theory* of natural selection; for while all naturalists now agreed that animals and plants had been evolved, there was still some diversity of opinion as to the method by which the evolution had been effected. In reference to any plant or animal, it would be said by most naturalists that it was slowly evolved out of a mass, originally shapeless, of growing protoplasm, by means of natural selection operating on fortuitous variations. As to the guiding hand, science must be absolutely speechless. In asking science to tell us what was the cause of causation, we were asking her to cross an impassable channel,—to pass from the domain of fact to that of belief,—a feat, which if essayed, must inevitably end in failure.

When, thirty years ago, the ‘Origin of Species’ was launched on its wonder-working career, nothing was known of the ancestral history of the Torpedo. Now the position was altered, and he was able to tell them not only what the Torpedo’s organs had been derived from, but also to trace every step in their life-history. To redeem his pledge, he went on to direct attention to the so-called “pseudo electric” organs of Skate. He pointed out that fifty years ago no one ever suspected that the Skate was possessed of electric batteries, and that until a few months ago naturalists would probably have

expressed surprise had it been suggested that there was considerable diversity in the form and structure of the electrical apparatus of the various members of the Skate family. The discovery of the existence of the electric organ of the Skate was due to Dr. Stark, of Edinburgh, who read a paper on the subject before the Royal Society of Edinburgh in 1844, but having been labelled by naturalists "pseudo electric," it had been until quite recently neglected alike by physiologists and naturalists. But the Skate's organ was coming to the front again on account of the light it threw on the development of the powerful battery of the Torpedo. The discharges from the Skate's batteries, though weak, and, as far as had been ascertained, useless, behaved exactly like the discharges from the Torpedo. The Skate did not keep its electric battery at each side of the gill like the Torpedo, but carefully tucked away in the tail.

He described at length the structure of the electric organ of the Skate. Instead of consisting of a series of plates, it consisted of a series of discs, or cones, fitted into each other like thimbles, and forming a long electric spindle. Each disc consisted of several distinct layers. The first layer, into which all the nerve fibres pass, was not unlike the electric plate of the Torpedo. Altogether in the electric organ of the Skate there might be 25,000 discs, or 50,000 in the two electric spindles. In other Skates, instead of the discs, there were numberless cups, each cup having led into it numerous nerve fibres. He further showed that in other instances the electric organ was composed of muscular cups; and in the young of the Skate the process of development of the muscular tissue into the electrical organ was traced.

In the same way, he said, the electric organ of the Torpedo, notwithstanding its extreme complexity and remarkable powers, had been formed out of ordinary muscular fibres. For some inscrutable reason, the fibres of certain muscles concerned in moving the jaws of the ancestral Torpedoes became more and more modified, generation after generation, until they entirely lost their original function, and were so profoundly altered in structure that it was no longer possible to recognise in them the remotest resemblance to muscular tissues. But though he had been able to show that the Torpedo's electric organs had

been thus evolved, he had to admit that he had only dealt with one of the difficulties—he had said nothing of the manner in which the transformation had been effected.

NOTES AND QUERIES.

The late Churchill Babington, D.D., F.L.S.—A distinguished scholar and an excellent naturalist has just passed away, at the age of 67, in the person of Dr. Churchill Babington, Rector of Cockfield, Suffolk. Although best known for his classical and archæological attainments, and his skill as a palæographer, his labours in the fields of Zoology and Botany were by no means unimportant. So long ago as 1842 he contributed to Potter's 'History of Charnwood Forest,' an Appendix on the Botany and Ornithology of that district, and many years were subsequently occupied in the preparation of a volume on the Birds of Suffolk, which appeared in 1886, and was reviewed in 'The Zoologist' for January, 1887. It is to be regretted that he has not lived to see the publication of his projected 'Flora of Suffolk,' the prospectus of which has for some time been issued. He was perhaps more of a botanist than a zoologist, his name being familiar to readers of the 'Journal of Botany,' and was an authority on Lichens, being a contributor on that subject to Hooker's 'Flora of New Zealand.' Yet his love of animals, and especially of birds, was amply apparent in the large and interesting collections which almost filled his charming country rectory. Those who have visited him there will not easily forget the kindly hospitality with which he welcomed his guests, and the readiness with which he exhibited his treasures, regardless of the trouble involved by searching for specimens and looking up references which he thought likely to be of interest. To very many the news of his death, which occurred on Jan. 13th, will bring "the quiet sense of something lost." *Requiescat in pace.*

Game and Wildfowl in the Paris Markets.—In the Annual Report of the Municipality of Paris upon the consumption of food in the capital during the past twelvemonth, the particulars as to the sale of game and poultry are somewhat striking, notably the appended table, which shows how many head of game were sold in the markets, and what proportion were French, and what foreign. With the exception of Hares from Germany, the figures show an increase for the present year, and the report states that the reason why there were fewer Hares from Germany was, that it was found more profitable to send them to England. But there was a marked increase in the number of Pheasants and Partridges from Germany,

and the prices fell to about three shillings and two shillings each, which is cheap for France. Most of the Deer and Wild Boar came from Germany, and averaged tenpence a-pound. The Wild Duck, Woodcock, and Snipe came chiefly from Holland and England by parcel-post, and sold well, while the Red-legged Partridges were mostly sent from Spain, the Quails and Guinea-fowls from Italy, and the Pigeons, which are also classed as "game" from Italy likewise.

Species.	French.	Foreign.	Total.
Partridges	160,000	421,499	581,499
Hares	18,585	274,941	293,526
Fieldfares and Blackbirds	153,275	110,000	263,275
Quails	14,772	160,000	174,772
Pheasants	8,251	85,000	93,251
Guinea-fowls	1,577	55,000	56,577
Wild Ducks	10,000	40,000	50,000
Plover	619	46,000	46,619
Snipe	7,031	28,110	35,131
Woodcock	11,352	17,115	28,467
Teal	3,934	10,000	13,934
Deer	2,785	10,500	13,285
Wild Boar	299	1,400	1,699
Miscellaneous	316,746	35,000	351,746
	709,226	1,294,555	2,003,781

MAMMALIA.

The Acclimatisation of Red Deer in New Zealand.—A communication under this heading appeared in our last number (p. 24). We have since received the Fourth Annual Report for the year ending 31st August, 1888, of the Wellington (N. Z.) Acclimatisation Society. In this we find it stated that Red Deer are increasing fast on the east coast of South Wairarapa County, and have shown a tendency to spread over new country, namely, the high hills which lie between the Maungaraki Range and the coast; also in the Lower Wairarapa on the ranges lying to the east of the Lake. During the year (1887-88) two hinds and a stag, captured by Mr. Harvey, were purchased at a cost of £20, and liberated on Mr. Holmes's property at the foot of Tararua Range. Unfortunately the stag subsequently died, and another was, with some difficulty, secured at a cost of £6, and left with the hinds. It is hoped that they will prove the nucleus from which the National Deer Park, the backbone range of the island, may be stocked. Few people apparently are aware of the extent of splendid country for Deer that lies above the forest on these ranges. Upwards of 35,000 acres of clear rocky country, covered with grass, form part of a large permanent

reserve of more than 300,000 acres, which it is proposed by the Government to set aside "for climatic purposes." These clear tops are fringed by a belt of thick, almost impenetrable, scrub, from half a mile to a mile broad. Below this line lies birch, gradually changing to mixed forest on the lower levels, full of excellent food for Deer, the home of numerous wild cattle; and in the neighbourhood of Mount Holdsworth and Mitre Peak several tracks cut on to the clear mountain-tops, afford ready access to the Deer.

Wild Dogs in New Zealand.—From the Report above quoted we learn that towards the northern end of the ranges mentioned, Wild Dogs (that is, dogs which have run wild) are very numerous, hunting in packs, on the lower levels, where they find plenty of food in the shape of pigs, Weka-rails, and occasionally even young cattle. It is chiefly from this end of the range that they make raids on the stations on the outskirts of the bush, doing considerable damage by killing sheep. In the interests of stock-owners it is proposed to have poison laid for them on the northern end of the Tararua Range, and on the Ruahine and Pukatoi Ranges, especially in the river-beds near the head waters of the Ruamahunga, Mangahuo, Maungatainoko, and Makakahi, where these animals are said to abound.

Fur-bearing Animals of Siberia.—The Russian Government is, it is stated, about to take steps to preserve the fur-bearing animals of Siberia, which, with the present demand for furs, stand in much danger of extermination. At the great fur fair of Irbit last summer no fewer than 3,180,000 Squirrel-skins were sold; but there were only half-a-million Black Squirrel-pelts offered, against 1,200,000 of the previous year. The other skins sold numbered 1,300,000 Hares, 140,000 Marmots, 30,000 Polecats, 11,000 Blue Fox, 10,000 Badgers, and a smaller quantity of Bear and Wolf.

Pied Squirrel in Norfolk.—Three years ago I reported, in the Naturalist columns of 'The Field,' the occurrence of a pure white Squirrel with pink eyes and claws, the editor, in a footnote, remarking that such a variety was very uncommon. On the 24th October last I received a pied variety of this little animal, procured near Holt. It had a white saddle across its back, all four legs and about half the tail white, also a white tip to the nose.—C. B. DACK (Holt, Norfolk).

Whiskered Bat in Derbyshire.—On New Year's Day I took a male Whiskered Bat, *Vespertilio mystacinus*, in Lathkill Dale, near Bakewell. It was hanging asleep in a damp place, its fur being quite wet, in a tunnel connected with some disused lead-mines. The Bats of this species which I have taken in the copper-workings at Alderley Edge, Cheshire, have frequently been a hundred yards or more from the mouth of the tunnel, but the Lathkill example was within a few feet of the entrance, sleeping

in broad daylight—in fact, I found it before I had lighted my candle.—
CHARLES OLDHAM (Ashton-on-Mersey).

BIRDS.

Notes on London Birds.—The interesting notes on London birds which have lately appeared in 'The Zoologist' have prompted me to offer the following observations on birds which I have met with, chiefly in Kensington Gardens and Hyde Park, during the last few years. As to the Spotted Flycatcher, *Muscicapa grisola*, in Kensington Gardens, which Mr. J. Young says (p. 23) he did not observe last summer, I do not think it was as numerous as in previous summers, but there were certainly some there. I was not in town at the time of their arrival, but my sisters first observed them on May 22nd—very late. In previous years, according to our note-book, they were first observed as follows:—1887, May 4th; 1886, May 15th; 1885, May 9th; and 1884, May 11th. A pair usually build their nest on a ledge of the middle arch of the bridge over the Serpentine; last summer, however, they were not there. The decrease of the London rookeries is much to be regretted, but a good many Rooks may be still seen about the parks. I frequently see a party of about forty feeding on the open ground in Hyde Park near the Marble Arch. It was here, one rather foggy morning in the winter of 1885, that a Sparrowhawk flew close by me; and here, every April, migratory Wheatears may be observed for a day or two. Our smaller migrants, with the exception of the Spotted Flycatcher and Redstart, rarely stay in London during the summer; but the Whitethroat and Blackcap do so occasionally, and I have reason to believe that the Willow Warbler breeds in the Botanical Gardens, Regent's Park. The Garden Warbler may be seen in spring for a short time while passing through town, and sometimes we have short visits from the Chiffchaff and the Lesser Whitethroat—a bird which is very common in the immediate neighbourhood of the Metropolis. On April 19th, 1885, there was quite a large party of Tree Pipits in Kensington Gardens, on the Hyde Park side of the Serpentine, but I have never seen them since. The Meadow Pipit, too, is rarely seen, except in very cold weather, when a few come into London for shelter. Other cold-weather visitors which I have noted are the Sky Lark, the Redwing, Fieldfare, Grey Wagtail, and Missel Thrush. Of these the Lark may be seen occasionally at all seasons, and a few pairs of Missel Thrushes nest in Kensington Gardens. I have seen the Redwing as late as April, but never earlier than December. The Sparrow, Starling, Wood Pigeon, Jackdaw, Blackbird, Thrush, Crow, Hedgesparrow, Robin, and Wren are all residents in greater or less numbers; and the Great Tit, the Coal Tit and the Blue Tit have been noted at almost every season of the year. A Sparrow which my sisters found some years ago in Kensington Gardens, with a broken wing, was

rescued from its inevitable fate, and now lives happily in a cage; its wing has never properly mended, and the bird is consequently unable to fly. After the autumnal moult last year a white tail-feather appeared, and there is one white feather in the head. Varieties of the Sparrow may be seen almost daily. On April 14th, 1886, a sooty black one was observed; on April 16th, 1887, there was a Sparrow in the Zoological Gardens with nearly all the feathers on its back edged with white, giving it a curious streaked appearance. Chaffinches are fairly common in summer, but in winter are much scarcer; I remember one Christmas seeing from my dining-room window a hen Chaffinch searching for food on the deep snow lying in the street. A Bullfinch was seen on May 15th, 1884, near the Serpentine, and a Linnet close to the Bayswater Road, but it is possible that these may have been escaped birds. Greenfinches are scarce in London, but are occasionally observed in the Botanical Gardens, and on Jan. 4th, 1887, I noticed one on a small tree in Oxford Terrace. I have only once or twice come across the Pied Wagtail, and the same remark applies to the Goldcrest, Kingfisher, and Tree Creeper. I nearly caught a Tree Creeper about a year ago in Kensington Gardens by stalking it from the opposite side of a trunk, on which it was busily engaged searching for insects. The Swallow, Martin, Sand Martin, and Swift are all to be seen at times in our parks; but it is a matter of regret that the Martins which we used to watch building their nests every summer under the eaves of a house near the Bayswater Road, have recently deserted the spot. The only other species which have come under my notice in London are the Stonechat, the Cuckoo, the Heron, and the Kittiwake, all of which pay occasional visits to the Metropolis. Curiously enough, I have never had the fortune to see any of the Woodcock or Snipe which have often been reported to have been seen near Hyde Park Corner; but if these are added to this list, which numbers forty-four (exclusive of the doubtful Bullfinch and Linnet), and if we add the other species which are known to have occurred within the last few years (*e. g.*, Whinchat, Black Redstart, Green Woodpecker, Greater and Lesser Spotted Woodpeckers, Nuthatch, Partridge, and Storm Petrel), the result is a really long and interesting list of London birds.—A. H. MACPHERSON (51, Gloucester Place, Hyde Park, W.).

The Invasion of Crossbills in the East of France.—The following is an extract from an article that has appeared in the 'Journal d'Acclimatation' (August, 1888), by M. Brocard, of Besançon, President of the Society of Ornithologists of Franche-Comté:—"Our Society had barely been formed a few months when we had the good fortune to be able to announce one of the most singular facts in Ornithology—an invasion of Crossbills the 'Gipsies of the winged race.' For my own part, though occupied with Ornithology for forty years, I have seen each year in the neighbourhood of Besançon some isolated specimens (of the Crossbill), but never such

numbers as in the present instance. M. Lacordaire, who has amassed a very fine collection of birds (now at Dijon), and was our best naturalist in Franche-Comté, has only recorded the occurrence of this bird as occasional in the lower part of the Department. We know, however, of a young sportsman who at Maiziers, Canton d'Ornans (Doubs), has just killed more than a hundred. Another, at Rougemont, has killed or caught more than forty of them in his garden, and this locality is at the opposite side of the Department. In short, people send them to us from all directions. In less than a week forty-two have passed through our hands. Nothing is easier than to tell the presence of this bird, which is a little smaller than the Hawfinch, and utters a similar cry. It is quite enough to look under the fir-trees, where a quantity of cones may be seen thrown on the ground and torn to pieces, the food of this bird consisting principally of the seeds of the fir. If it only stopped there, it would have done but half its mischief, for it is remarked also to attack the young fir-shoots, and often pulls them off when growing—a decided injury to the tree. This bird, we are told by authorities, comes to us from the North, the region of Conifers. It suddenly makes its appearance in the lower part of the Department,—one cannot tell why,—remains there a longer or shorter time, sometimes breeds there, and, strange to say, it is in January that it constructs its nest at the insertion of a fir-branch, anointing it with the resin of the tree to preserve it from wet. [This we should doubt.—ED.] M. Ricond, of Chaux-de-Fonds, a collector of eggs, says that he has often seen the female Crossbill raise herself from the nest to shake off the snow. . . . It would be important to be able to ascertain the limits of the invasion of these wandering hosts, and we shall therefore be much obliged to those who will be kind enough to communicate their observations to us by post-card, stating the presence of Crossbills in any locality, and later on if they remain there, and, above all, if they breed." In reply to this request for information, M. Brocard adds, "I have received a number of letters telling me of the presence of Crossbills, principally in the East of France. One young sportsman has killed many at St. Etienne (Loire). By the end of August they had almost disappeared. Since then a few have been killed casually, as in every year, but the bulk of the army has departed." May not the late occurrence of Crossbills in Skye be connected with the above, as well as the following;—In December, 1887, five were seen here at Cappagh. In January and February I heard of five separate occurrences in Co. Cork, chiefly near Mallow and Doneraile, and on April 6th I received, in the flesh, one of two Crossbills met with near Cappoquin, Co. Waterford. On November 13th ult., I saw four Crossbills feeding on the cones of larch here.—R. J. USSHER (Cappagh, Co. Waterford).

[Flocks of Crossbills were noticed at Keston, Kent, in October, and a young one having been picked up dead, it was inferred that a pair had

nested in the neighbourhood. See 'The Field,' Nov. 24th, p. 759. On the 18th October a large flock appeared at Edenhall, and some were shot. In Ireland a good many have been lately reported.—ED.]

Sand Grouse in the North-West of England.—I write to ask that if any readers of 'The Zoologist' should happen to hear of any Sand Grouse killed either in Westmoreland or in the heart of the Lake District, they will kindly send me word, or record the bird, or birds. I may say that Mr. C. J. Holdsworth has kindly made enquiries in South Westmoreland, as also has Mr. Duckworth. I have made many local enquiries, but could neither hear of nor see any Sand Grouse either in Westmoreland or among the mountains of Cumberland. Reports from Ullswater, Keswick, Cockermouth, Kendal, Appleby, &c., all negative the idea that any Sand Grouse entered the centre of the Lake District; but I am anxious to thoroughly sift the matter. I may add that, in November last, I visited Walney with Mr. Duckworth, who in May and June had obligingly undertaken repeated visits to Walney at my suggestion. The Sand Grouse all left Walney in July, and only a single bird reappeared in the island early in November. It was on the island at the time of our last visit, but at the south end of it. I may add that the Walney Sand Grouse went on to Bootle and Ravenglass in July, and remained there until they left voluntarily in October, about forty being seen to depart unscathed. I believe that food was then scarce there. In November a small flock reappeared on the Cumbrian Solway, where, but for persecution, one or two hen birds would probably have nested in spring. I regret to say that in November they were ruthlessly shot down, as a matter of sport to lads on the farms. It is possible, however, that one or two pairs may survive, to take advantage of the new Act, but this is uncertain. Since the foregoing lines were written, I regret to say that I have heard that two Sand Grouse were shot on Walney during the present winter. One of these was killed in November, the other on December 20th.—H. A. MACPHERSON.

Sand Grouse in North Yorkshire.—Two Sand Grouse, male and female, were shot on the Kirkleatham estate, near Redcar, on or about the 13th of November last. Both birds were in very good condition as regards plumage, and weighed a little over ten ounces each. The crops contained wheat and buckwheat.—T. H. NELSON (Redcar).

Pallas's Sand Grouse in Hampshire.—A specimen of Pallas's Sand Grouse was sent to me, for preservation, on the 15th December last, from Stubbington, near Fareham, apparently killed the day previous. It was a male bird, in good condition, weighing $8\frac{3}{4}$ oz., in very good plumage, though the wings and tail were rather worn.—W. JEFFERY (Stoke Road, Gosport).

Sand Grouse in Northamptonshire.—On Jan. 15th a male Sand Grouse was shot in the parish of Weedon, as it flew out of some turnips

close to a rick of barley, where it had evidently been feeding, as its crop proved to be full of grain.—W. BAZELEY (Taxidermist, Sheep Street, Northampton).

Weight of the Pectoral Sandpiper.—In 'The Zoologist' for January (p. 33), Mr. Williams, of Dublin, writing on an example of this species obtained during the past autumn in Ireland, says "it almost turned the scale at 8 oz." Surely, for a bird slightly over the dimensions of the Purple Sandpiper, there must be some error in the weight recorded, or perhaps 8 was a misprint for 3. I have never weighed a Pectoral Sandpiper, but, to judge from the size of the bird, and comparing it with the known weight of other waders, I should have thought that $2\frac{1}{2}$ to 3 oz. would have been much nearer the mark. In the last edition of Yarrell's 'British Birds,' the weight of the Don specimen is given at $2\frac{1}{4}$ oz. It is not a bad Snipe which weighs $4\frac{1}{2}$ oz., and a Knot will weigh the same; a fat Dunlin 2 oz. The Great Snipe, in good condition, is twice the weight of a Common Snipe, or 8 to 9 oz. The Golden Plover weighs 8 oz., and I once weighed eight, killed at the same time, which averaged 9 oz., but these were very fine birds and excessively fat. An example of Bartram's Sandpiper (a bird rather larger than a Reeve), loaded with fat, is recorded in Yarrell's 'British Birds' (4th ed. vol. iii. p. 444) as weighing 6 oz. 2 dr.—JOHN CORDEAUX (Great Cotes, Ulceby).

[Considering the weight given by Mr. Williams (*l. c.*) to be very heavy for the size of the bird, and much in excess of that given by R. Gray, 'Birds of West of Scotland,' as quoted in the fourth edition of "Yarrell" (iii. p. 372), we wrote to Mr. Williams to enquire whether any mistake had been made, and he has replied as follows:—"In answer to your enquiries about the weight of the Pectoral Sandpiper, I weighed the bird with a parcel-post balance, and as the indicator just touched the $\frac{1}{2}$ -lb. mark, I concluded that that was the correct weight. I have since tested the balance carefully, and find it is just 1 oz. out, which would make the bird exactly 7 oz.; but from the quantity of fat, which quite soaked the plumage through, I should say it was, at the very least, 2 oz. over the weight of an ordinary individual of the same species. There can be very little doubt the weight given in 'Yarrell' is too little. I showed the bird to Mr. A. G. More, so there can be no doubt of its being a Pectoral Sandpiper. It has since been purchased for the collection in the Science and Art Museum, Dublin."—ED.]

Green Sandpiper in Glamorganshire.—On January 4th, whilst out Snipe-shooting near here, I shot a Green Sandpiper, *Totanus ochropus*. I have been told that this species has been known to frequent the lakes at Penllergare, near Swansea; and I have also known of one that was obtained at Sant-y-nill Pond, St. Fagans, and another on Ely River, shot by the gamekeeper at St. Fagans, in 1885. Strictly speaking, however, the

species must be considered a scarce one in this county.—DIGBY S. W. NICHOLL (Cowbridge, Glamorganshire).

Food of the Manx Shearwater.—In reply to Mr. C. R. Gawen's enquiry (p. 24), whether the sprats disgorged by the Manx Shearwater might have been thrown overboard by some of the fishermen, as well as the entrails (also disgorged), I do not think so, for the sprats looked perfectly fresh and silvery, as if only swallowed a few minutes before the bird was shot: another reason against the supposition is, that fishermen are too economical of their bait to throw any of it overboard while fresh; and the third reason is, that during that week's fishing, and on that day, we used herrings for bait, there being no sprats for sale in the bait market at Queenstown. But why there should be any doubt as to the Shearwater catching fish for food, because it has not been recorded that any person has actually seen them catch and swallow fish, I cannot understand. [Capt. S. G. Reid has so observed them. See 'The Ibis,' 1888, p. 80.—ED.] Their gliding flight, and skimming the surface of the water, would give very little opportunity to the observer to obtain even a passing glance at the sort of food they pick up: even the very shape of the Shearwater's bill, with its sharp sides and hooked point, shows that it must be a very efficient weapon for both catching and holding such slippery prey. On referring to my note-book I find that we were out on the "Maide," a fishing-ground about three miles outside Cork Harbour, fishing for Hake, and while at anchor—as early as 12 o'clock in the day—we observed several flocks of Shearwaters flying about, and as one flock passed close by I knocked down two birds, and, as we got into the small boat to pick them up, one of them—very badly hit, almost dying—threw up some solid matter when caught; the second, being only winged, swam off, diving several times, but only for a short distance, under water, and, when overtaken and about to be caught, disgorged the sprats and fish entrails, as I have already stated. On the same occasion I remarked a pair of dark-coloured Shearwaters, much larger than the others, amongst a flock of the common ones; these I took to be the Great Shearwater, *Puffinus major*; but a short time ago having been shown a specimen of the Sooty Shearwater, *P. griseus*, taken off the Kerry coast, I am now of the opinion they were the last-named species, from the under parts being so much darker than those of the Great Shearwater. The occurrences of that day were deeply impressed on my memory, for it was the last day's Hake-fishing I ever enjoyed. We took our eighty-five Hake; and my brother—quite a small boy—caught sixteen fine fish, and a Turbot of six pounds weight, on his own line.—ROBERT WARREN (Moyview, Ballina).

Habits of the Manx Shearwater.—Mr. Gawen and myself have arrived at such a pleasant termination to our discussion on the Shearwater,

that for the present I intend to say nothing more on that score. But I should like to allude to another point. Probably most of your readers are accustomed to find the Shearwater nesting at a very moderate height above sea-level; I thought myself that the colony which nests on Eigg, at a height of nearly 1000 feet, was unusually ambitious. Mr. M. Byles, however, who has tenanted the island of Rum as a deer forest for several seasons, informs me that Shearwaters breed on that island at a height of more than 2000 feet above the sea—a pretty contrast to their quarters at Annet.—H. A. MACPHERSON.

Bittern in Lancashire.—A fine male Bittern was shot on Dec. 26th, 1888, on Bryn Moss, about three miles from Wigan, and was sent for preservation to a taxidermist in the town, at whose place I had an opportunity of seeing it. It had been killed by a single pellet, which had passed through the neck near the base of the skull and severed some of the principal blood-vessels, death ensuing from hæmorrhage into the throat. It was able to run vigorously a short distance after it was shot, and being pursued by a dog the bird stood at bay, and, erecting its crest, assumed such a threatening and terrifying aspect that the dog turned tail and refused to face it. The body was loaded with fat; the stomach was quite empty, its last meal having been thoroughly digested and disposed of. The last occurrence of the Bittern in this district, as far as I know, was about twenty-eight years ago, when two were shot at the same time on a small mill-pond at Roby Mill, Upholland, about five miles from here.—W. WORTHINGTON (Wigan).

Rooks in the Isle of Wight: Correction of Error.—I find a mistake has been made in the note I sent you (p. 28). It was a "brown" Rook that was thought strange, though white varieties are not uncommon here, as elsewhere. The Rook is as numerous a species in the Isle of Wight as in most parts of England. The error occurred in the copying, which I regret.—HENRY HADFIELD (High Cliff, Ventnor).

Nutcracker, Crossbill, and Sand Grouse in Norfolk.—On Nov. 9th I received for preservation a female specimen of the Nutcracker, *Nucifraga caryocatactes*. It flew out of an old chalk-pit, and was shot by a game-keeper in mistake for a young Blackbird. On Nov. 24th, when out for a walk, I saw five Crossbills feeding on fir-cones, the first I have seen in this district for twenty years. I think they are rather rare as a Norfolk bird. I had a right and left shot at a male and female, but unfortunately lost the female; the male I obtained was a fine red bird. On Nov. 30th I bought an old male Sand Grouse with a very long tail and fine orange head. I record this as we had plenty in the summer, but they all disappeared about September. The crop contained a good number of wheat-grains, mixed with the customary seeds that were found in all the earlier.

killed birds. I think the visitation is about over, as I hear now of only here and there a straggler or two left behind, and it may be many a long year before they pay us another visit.—C. B. DACK (Holt, Norfolk).

Scarcity of the Carrion Crow in Norfolk.—Referring to the Editor's suggestion in the footnote (p. 10), it is possible that some of the Black Crows seen by me in the marsh were young Rooks, but some were certainly Carrion Crows. I am quite aware of the scarcity—even rarity—of the latter bird in the northern portion of Norfolk, and these were the first I had met with in that district, although I saw some flying low over Hickling Broad in December, 1886.—OLIVER V. APLIN.

Lapland Bunting in Ireland.—In the migration schedule of Mr. George Dunleavy, Principal Lightkeeper on the Fastnet Rock, Co. Cork, seven miles from shore, the following entry occurs under date Oct. 16th, 1887:—"One Skylark and one Twite (supposed) dead on rock, at 9 a.m.—believed to be killed striking; wind light, east, clear." On the night of 15th several Skylarks and Starlings are entered as striking, 8 to 11 p.m.; wind E.N.E., hazy. The "Twite (supposed)" was forwarded to me in the flesh, and it proved to be a female Lapland Bunting, *Plectrophanes lapponicus*. This is the first instance of the occurrence of this species in Ireland. Prof. Newton writes that the Greenland examples of *P. lapponicus* are generally larger than those from Europe, and he thinks my specimen is of European origin, but does not speak positively. Dr. Gadow is inclined to hold the opposite opinion, but he also expresses himself cautiously. The above occurrence is mentioned briefly in Saunders's 'Illustrated Manual of British Birds,' but none of the above details have yet been published.—R. M. BARRINGTON (Fassaroe, Bray, Co. Wicklow).

Crossbills in Ireland.—I have received several Crossbills lately from Letterkenny (Co. Donegal), Doneraile (Co. Cork), Parsonstown, King's County, Basonbay (Co. Cavan), Tipperary, and Edenderry, which shows they are very common in Ireland this winter. They belong, without exception, to the common species.—E. WILLIAMS (2, Dame Street, Dublin).

Swallows in December.—On the morning of December 17th, six Martins, *Hirundo urbica*, were observed feeding about the cliffs near Marazion, Cornwall, and I enclose a specimen which was shot for identification. On the previous evening I watched for some time three of them, apparently male birds in full plumage, which appeared quite as strong and active as they are in the summer time. Since September last this species has appeared at uncertain intervals, from one to three weeks apart, and in sunshine just as frequently as in dull and cold weather. For some weeks past, on bright and mild days, the Starlings have been flying about picking up insects in the air, very much after the fashion of Swallows.—F. W. MILLETT (Marazion, Cornwall).

Rough-legged Buzzard in Lancashire.—The local papers of Nov. 18th having reported the capture of an Eagle in the neighbourhood of Bolton, and having reason to doubt the statement, my brother and I arranged to go over and see it. Instead of a Golden Eagle we found that the bird was *Buteo lagopus*, with the plumage rather soiled and one leg nearly off, but in other respects in good condition. 'The Field' for Nov. 10th reported the occurrence of two more near Leeds.—C. E. STOTT (Lostock, Bolton).

Little Gull in Glamorganshire.—Since forwarding my account of the Little Gull in Glamorganshire (p. 25) I have been informed by Mr. Cording, taxidermist, of Cardiff, that a male specimen of this species was shot, at the mouth of the Taff, in March, 1885.—DIGBY S. W. NICHOLL (Cowbridge, Glamorganshire).

Wood Warbler at Cley.—Perhaps the large Warbler met with in the scrub at Cley, by Mr. Aplin (p. 10) was a Wood Warbler, *Phylloscopus sibilatrix*, which is a species I have shot there in the young plumage in autumn.—J. H. GURNEY, jun. (Keswick Hall, Norwich).

FISHES.

Burbot off the Yorkshire Coast.—On December 26th, 1888, Mr. T. H. Nelson sent me a fish which he stated to be very rare at Redcar, and not known to the fishermen. I saw at once it was a Burbot, *Lota vulgaris*, and in this determination I was confirmed by Mr. Edward E. Prince, B.A., who has paid much attention to the British food-fishes, and to whom I showed it the same day. Mr. Nelson has since informed me that it was caught on the day he sent it off, at sea, about a mile off the Point of Huntcliffe. The fishermen at Redcar told him they had never seen a fish like it before. It was caught on a mussel-bait. Being the first time I have heard of this—a river-fish—being caught at sea, I should be glad to learn if similar instances are known.—W. DENISON-ROEBUCK (Sunny Bank, Leeds).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

January 17, 1889.—Mr. W. CARRUTHERS, F.R.S., President, in the chair.

The following were elected Fellows:—J. R. Green, M.A., Prof. Botany Pharmaceutical Society; R. J. Harvey Gibson, M.A., Lecturer Botany Univ. Coll. Liverpool; James W. White, of Clifton, Bristol; and Herbert Stone, of Handsworth, Birmingham. The following recently elected

Fellows were formally admitted:—Alfred B. Rendle and Henry Powys Greenwood.

On behalf of M. Buysman, of Middleburg, Mr. B. D. Jackson exhibited a series of careful dissections of *Nymphæa carulea*, collected by Dr. Schweinfurth in Egypt.

Mr. D. Morris exhibited specimens of drift-fruit from Jamaica, where he had collected no fewer than thirty-five different kinds brought by the gulf-stream from the mouths of the Orinoco and Amazon. Although the species exhibited had not been determined with certainty, it was believed to be probably *Humiria balsamifera*, Aud. (the flower of which is figured by Eichler, 'Flora Brasiliensis,' vol. xii. pt. 2, p. 420, pl. xcii.), but the fruit undescribed. It was commonly known in French Guiana as *Bois rouge*, and from it was obtained a gum used medicinally and burnt as incense. An interesting discussion followed, in which Mr. J. G. Baker, Mr. Rolfe, and Mr. Breese took part.

Mr. T. Christy exhibited a material felted from Manilla hemp, and waterproofed, very strong and light, and particularly useful for surgical bandages, for which purpose it was highly recommended by army surgeons.

Mr. F. Crisp exhibited some specimens of agate, so curiously marked as to lead to the erroneous supposition that they enclosed fossil insects and crustacea.

A paper was then read by Mr. J. G. Tepper, on the natural history of the Kangaroo Island Grass Tree, *Xanthorrhæa Tateana*. This tree grows abundantly in Kangaroo Island, South Australia, in poor gravelly and sandy soil, intermixed with ferruginous concretions, and attains a height of from 6 to 14 feet, with a diameter of 6 to 18 inches, and a floral spike of from 10 to 19 feet. It is thus a most conspicuous plant, and lends a peculiarly weird aspect to the country it occupies. Its rate of growth is described as very slow, old settlers having remarked but little change in individual trees after thirty years' observation. The most remarkable feature in the structure of the stem is the formation of a dense ligueous central core immediately above and connected with the roots, exhibiting numerous annular zones traversed by transverse (medullary) fibres. The flowers are borne in a dense spike upon a smooth peduncle. Individually they are inconspicuous, of a whitish colour, and develop a strong odour and abundant nectar during the warmer part of the day, when they are visited and fertilized by hymenopterous insects, the most remarkable being a large metallic-green Carpenter Bee (*Xylocopa*), which tunnels out cells in the dead flower-stalks. An interesting discussion followed upon the botanical position of the Grass-trees, and the antiquity of the type, in which the President, Mr. A. W. Bennett, Mr. J. G. Baker, Mr. Morris, and Mr. Rolfe took part.

The meeting adjourned to February 7th.

ZOOLOGICAL SOCIETY OF LONDON.

December 18, 1888.—HOWARD SAUNDERS, F.Z.S., in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of November, and called attention to a specimen of the Small-clawed Otter, *Lutra leptonyx*, presented by Mr. W. L. Sclater, Deputy Superintendent, Indian Museum, Calcutta, new to the Society's Collection; and to a Monkey of the genus *Cercopithecus*, from South Africa, apparently referable to the Samango Monkey, *C. samango*, also new to the Society's Collection.

Mr. G. B. Sowerby read descriptions of fourteen new species of Shells from China, Japan, and the Andaman Islands, chiefly collected by Deputy Surgeon-General R. Hungerford.

A communication was read from Mr. Herbert Druce, in which he gave an account of the Lepidoptera-Heterocera collected by Mr. C. M. Woodford in Guadalcanar Island, Solomon Islands. The collection was stated to contain examples of fifty-three species, eighteen of which were described as new to science.

Mr. J. H. Leech read the second portion of a paper on the Lepidoptera of Japan and Corea, comprising an account of the *Sphingidæ*, *Bombycidæ*, *Notodontidæ*, and *Cymatophoridæ*, in all 352 species. Of these thirty-eight species were now described as new to science.

Dr. Hans Gadow read a paper on the numbers and on the phylogenetic development of the remiges of Birds. The author showed that the number of primaries is of very limited taxonomic value, as was proved by the numerous exceptions mentioned in the lists contained in the paper. A comparison of the remiges of the Penguins with those of other *Carinata* seemed to indicate an extremely low stage in the Penguins, which, however, was not borne out by other anatomical features. The *Ratitæ* were most probably descendants of birds which formerly possessed the power of flight and had lost it. This view was strengthened by an examination of the structure of their wings and of the feathers of their nestlings. The paper concluded with general remarks upon the probable gradual development of the organism of flight in birds.

January 15, 1889.—Prof. FLOWER, 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 December, 1888, and called attention to a young Chimpanzee purchased of Mr. Cross, of Liverpool, December 6th, which was undoubtedly of the same species as the specimen purchased October 24th, 1883, still living in the Society's Gardens, and was, so far as could be at present ascertained, referable to the Bald-headed Chimpanzee, *Anthropopithecus calvus*.

A letter was read from Heer F. E. Blaauw, of Amsterdam, containing an account of the development of the horns of the White-tailed Gnu, as observed in specimens bred in his Menagerie.

Prof. Newton exhibited a specimen of *Pennula millsii*, Dole, brought from the Sandwich Islands by Mr. S. B. Wilson, remarking that it seemed to be specifically identical with *Rallus obscurus*, Gmelin, a species which has not been lately recognised.

Prof. Bell made some remarks on the question of the food of *Bipalium*.

Canon Tristram made some remarks on a specimen of *Emberiza cioides*, a Bunting of Siberia, of which a specimen was believed to have been obtained in this country at Flamborough in October, 1887.

Prof. F. Jeffrey Bell read a note on the Echiuoderm fauna of the Bay of Bengal.

Mr. F. E. Beddard and Mr. Frederick Treves gave an account of the anatomy of the Sumatran Rhinoceros, as observed in two specimens of this animal that had lately died in the Society's Gardens. The muscular anatomy of the limbs of this Rhinoceros was especially treated of.

Prof. Newton read a paper on the breeding of the Seriema, *Cariama cristata*, in the Society's Gardens.—P. L. SCLATER, *Secretary*.

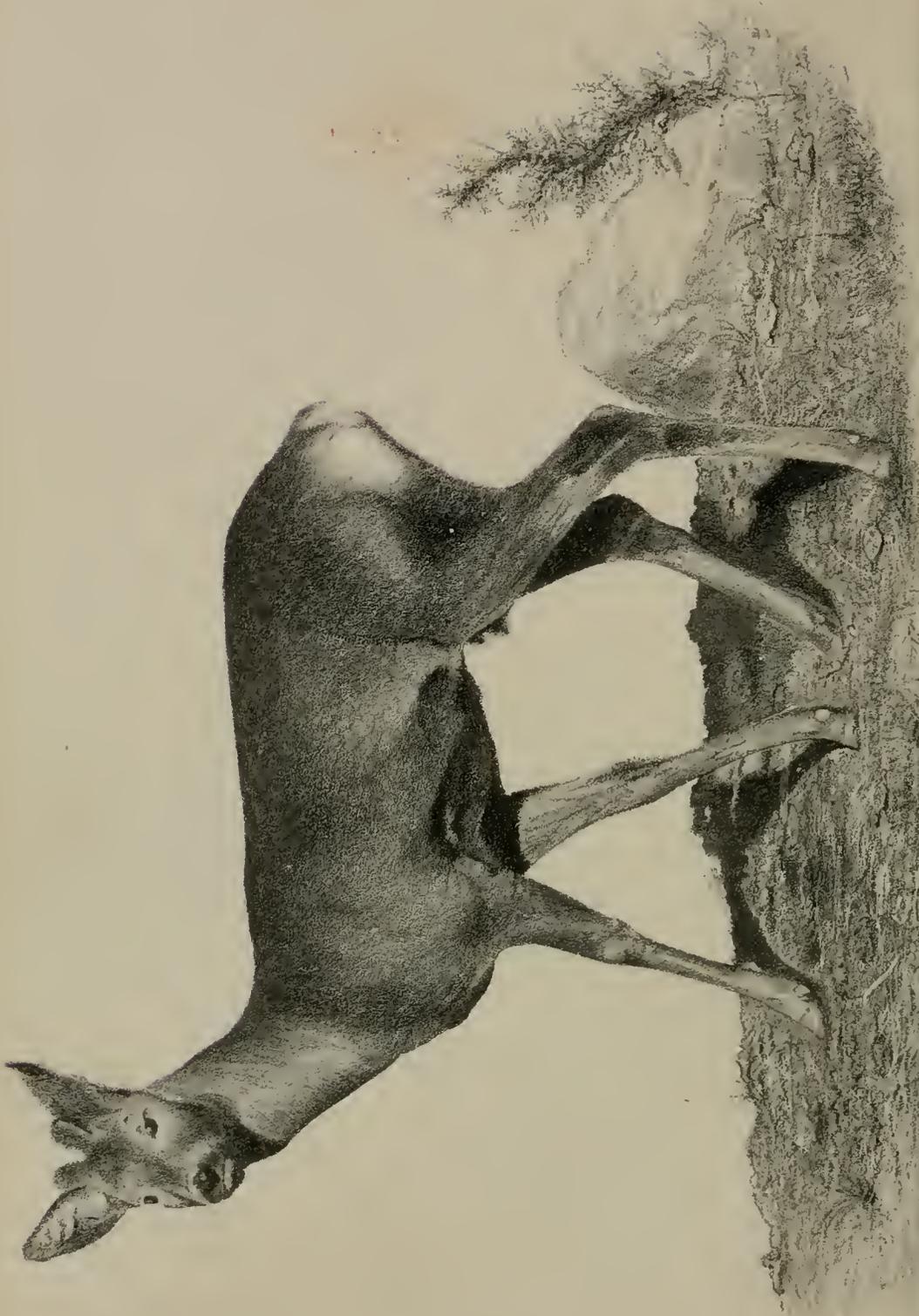
ENTOMOLOGICAL SOCIETY OF LONDON.

The Fifty-sixth Anniversary Meeting, Jan. 16, 1889.—Dr. D. SHARP, F.L.S., President, in the chair.

An Abstract of the Treasurer's Accounts, showing a balance in the Society's favour, was read by Mr. Osbert Salvin, F.R.S., one of the Auditors; and Mr. H. Goss read the Report of the Council. It was announced that the following gentlemen had been elected as Officers and Council for 1889:—*President*, the Right Hon. Lord Walsingham, M.A., F.R.S.; *Treasurer*, Mr. Edward Saunders, F.L.S.; *Secretaries*, Mr. Herbert Goss, F.L.S., and the Rev. Canon Fowler, M.A., F.L.S.; *Librarian*, Mr. Ferdinand Grut, F.L.S.; and as other Members of Council, Mr. Henry W. Bates, F.R.S.; Mr. H. J. Elwes, F.L.S.; Mr. William H. B. Fletcher, M.A.; Mr. F. DuCane Godman, M.A., F.R.S.; Prof. Raphael Meldola, F.R.S.; Dr. Philip Brooke Mason, F.L.S.; Mr. Osbert Salvin, M.A., F.R.S.; and Dr. David Sharp, F.L.S.

Dr. Sharp, the outgoing President, then delivered an Address, for which a vote of thanks to him was moved by Mr. Elwes, seconded by Mr. Osbert Salvin, and carried. A vote of thanks to the Treasurer, Secretaries, and Librarian was moved by Mr. J. W. Dunning, seconded by Lord Walsingham, and carried. Mr. Saunders, Mr. Goss, and Mr. Grut severally replied.—H. Goss, *Hon. Secretary*.





Young Roebuck (*Capreolus caprea*). From a photograph.



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THE ROE-DEER, *CAPREOLUS CAPREA*.

BY THE EDITOR.

(PLATE I.)

THE presence in so many English Parks of herds of Fallow-deer, and in smaller numbers of Red-deer, has rendered the appearance of these two species tolerably familiar to most people, while the Red-deer, still a "beast of chase," is hunted with stag-hounds in England and Ireland, or falls to the rifle of the deer-stalker in Scotland. It is otherwise with the Roe-deer, whose appearance is less familiar, because the animal—in England, at all events—is much less common, while in Ireland it is quite unknown. It is curious that it should be so, for the Roe, like the Red-deer, is an indigenous British animal, while the Fallow has been introduced. The explanation, however, is to be found in the fact that while the Fallow-deer has been protected in parks, where it is fed during the winter, and prevented by fences from straying away, the Roe has been suffered to take its chance, and has met with the fate which would naturally overtake any game animal of its conspicuous size and wandering disposition.

There was a time when it must have been common in all our English wood-lands, for there is abundant evidence, both geological and historical, to show that it existed in widely separated localities in many different counties. Amongst these may be mentioned Northumberland, Cumberland (whence Charles I. stocked

the royal park at Wimbledon*), Durham, Yorkshire, Lancashire, Leicestershire, Norfolk, Suffolk, Cambridgeshire, Hants, Dorset, and Devon, not omitting Wales, where it was to be found in the time of Queen Elizabeth. The evidence of its former existence in these places has been so fully detailed elsewhere,† that it is unnecessary here to repeat it. Suffice it to say that, with the exception of Cumberland, where a limited number are established near Wigton (Zool. 1887, pp. 382, 383), Dorsetshire (Zool. 1879, pp. 120, 170, 209, 262, 301), and Essex (where it was re-introduced in 1884, after having been extinct for many years), and certain parks, such as Windsor and Petworth, where a few have been turned down, the Roe can now only be looked for in any numbers beyond the Scottish borders. There it still roams in many a covert sufficiently remote from human habitation, and there we have had the pleasure of observing it in all its pride of unrestrained freedom; now jumping up suddenly from some bed of fern in which it had been lying concealed; now stealing away, like a shadow before the shooters, or when driven by advancing "beaters," coming with a rush to its doom through some accustomed pass. In Dorsetshire, too, when pheasant-shooting, it has been our good fortune to see sometimes as many as twenty or more in a day, of which three or four, perhaps, at intervals, would fall to a charge of No. 5 shot at close quarters, making a pleasing variety and weighty addition to the game-bag. On such occasions it was astonishing to see the almost impenetrable covert through which a Roe would dash at full speed without any apparent harm, although one would suppose that its large and prominent eyes could scarcely escape serious injury from the opposing twigs and thorns which barred its way.

"It is a rare thing," says Colquhoun, in 'The Moor and the Loch,' "to take a right and left at Roe; they slip past so quickly, and generally in small numbers. I have known many old sportsmen who have shot them all their lives, and yet never killed a couple right and left. During my whole shooting life I have only

* Cf. Harting, 'Essays on Sport and Natural History,' pp. 47, 48.

† "On the former Existence of the Roe-deer in England," Harting, 'Essays on Sport and Natural History,' pp. 38—55. The Roe was at one time (1716) to be found in the Channel Islands on the island of Herm (Zool. 1880, p. 399), but probably only as an introduced species.

done so five times, and yet few men have slain more Roes." Charles St. John has truly said ('Sport in Moray,' p. 34) that no man with any feeling can kill a Roe without a pang of regret; and yet his natural instinct as an animal of prey will lead him on to hunt and kill another Roe an hour afterwards!

The Roe was introduced into Dorsetshire at the beginning of the present century by the then owner of Milton Abbey, who kept some in a large walled-in park which he made there. After they had increased rapidly, his neighbour Mr. Drax begged some, and turned them out in Vere Wood, which was then fenced in by a park-paling. Here they also went on increasing; the paling fell out of repair, and the deer wandered and spread over the country. In 1879 Mr. Mansel-Pleydell estimated that there were about 120 head, and in 1884 about 150 head, in the Milton, Whatcombe, and Houghton Woods, which fringe the southern side of the Vale of Blackmoor, from Stoke Wake to Melcombe Park, and the Grange Wood westward, the number being merely a question of preservation or non-preservation by adjoining land-owners. It is said that Lord Portman, in the interest of fox-hunters, gives a reward for every Roe killed in his coverts, to prevent his hounds from following their scent, as they will do, in preference to that of fox.

From the centre of distribution above mentioned the Roe-deer sometimes wander to a considerable distance, but generally get killed before they succeed in establishing themselves in a new locality. In 1883 a buck was found in Somersetshire, and hunted by the Seavington Hounds, who came upon him in the chain of large coverts lying to the south of the Vale of Taunton. They ran him eight miles with a burning scent, and killed him near Otterford. No doubt he had strayed from South Dorsetshire, perhaps from the Hook Park coverts on Lord Sandwich's property, which would be about twenty miles from the place where he was found.

It was in Dorsetshire, in the spring of 1884 that some Roe-deer were captured in the coverts of Mr. Mansel-Pleydell at Whatcombe and Houghton, and of Col. Hamboro at Milton, and transported by cart and rail into Essex, where they were liberated the next day in Epping Forest to re-stock the glades in which their species had formerly roamed, but where they had long been extinct. It was our privilege to take part in the capture, the

feasibility of which was doubted by many, and after travelling all night with them to save time, we had the pleasure of seeing them restored to liberty in a new country within twenty-four hours of securing the first one. As the *modus operandi* has been fully detailed elsewhere,* it is unnecessary to repeat a description of the hunt. Suffice it to say that in the following spring, through the exertions of Mr. E. N. Buxton, one of the Verderers of Epping Forest, a few more were obtained from Dorsetshire and turned out in the forest, where, being well looked after by the keepers, they have since roamed undisturbed, and have increased in number every year.

The keepers in Dorsetshire do not concur in the generally accepted belief that the Roe is monogamous, asserting that in the breeding season they have often seen a buck consorting with two and sometimes three does. This does not tally with the statements of foresters in Scotland and Germany, where the habits of the Roe-deer have been attentively studied, and may be an error of observation, the animals seen with the buck in the rutting-season being possibly a doe with a fawn, or fawns, which would not breed. The buck remains the winter through with the doe and fawns until he begins to change his grey winter coat, when he leaves her, and roams alone.

The does bring forth their young in April and May, generally two, male and female, very rarely three,† and these, like the young of other species of deer, are at first speckled with white. The white spots disappear in a few weeks, and the colour then resembles that of the parent. In the "bedding season," as it is termed, the doe retires to some quiet and secluded spot, and on the birth of the kids covers them over so carefully that they are very rarely found.

One of the brothers Stuart, who enjoyed such unrivalled opportunities for observing the habits of the wild animals of Scotland, thus graphically describes the bed of a Roe:—

"In the middle of the thicket there was a group of young trees growing out of a carpet of deep moss, which yielded like a down pillow.

* 'The Field,' 5th April, 1884. See also 'Transactions of the Essex Field Club,' 1887, pp. 46—62.

† See 'The Field,' 2nd Sept. 1871.

The prints of the doe's slender forked feet were thickly tracked about the hollow, and in the centre there was a bed of the velvet 'fog,' which seemed a little higher than the rest, but so natural that it would not have been noticed by any unaccustomed eye. I carefully lifted the green cushion, and under its veil, rolled close together, the head of each resting on the flank of the other, nestled two beautiful little kids, their large velvet ears laid smooth on their dappled necks, their spotted sides sleek, and shining as satin, and their little delicate legs as slender as hazel-wands, shod with tiny glossy shoes, as smooth and black as ebony, while their large dark eyes looked at me out of the corners with a full, mild, quiet gaze which had not yet learned to fear the hand of man."

The affection of the doe for its young is very strong, and, timid and feeble as it is by nature, inspired by danger threatening its offspring it becomes brave and daring, and in their defence will attack not only animals but men. When quite young the kid, if alarmed, will crouch like a hare on the ground, laying down its ears on its spotted back.

One of the most singular points in the history of the Roe-deer is the abnormal gestation of the doe. It was well known to German foresters, to whom this animal is of course much more familiar than to keepers in this country, that the Roe-deer produced its fawns at the end of April or beginning of May, somewhat earlier than the fawns of the Red-deer and Fallow Deer are found,* and, although most people assumed that the rutting season was at the same time of year as with the larger *Cervidæ* (the Brothers Stuart, for example, were of this opinion, and even that great authority on woodcraft, Dietrich aus dem Winkell), German foresters asserted from observation that it was two months earlier, namely, in the month of August. If this were true, as it was proved to be by the late Dr. Ziegler, it seemed strange that the period of gestation should be two months longer than in the case of its larger relatives, and it was some time before the matter was explained. At length the researches of a well-known embryologist, Dr. Bischoff, Professor at the University of Munich, put the matter in a true light, and revealed a very curious and unexpected fact. From an examination of a considerable number of does shot at various intervals between the months of August and May, he discovered that although the pairing

* Cf. Harting, Proc. Zool. Soc. 1884, p. 152.

season, as already stated, is in August (sometimes at the end of July), the germ, or *ovum*, remains dormant, and of minute size, for about four months and a half, until December, when it suddenly begins to develop at the normal rate, the whole period of gestation being forty weeks.* Commenting upon this singular fact, Bell, in his 'History of British Quadrupeds' (2nd ed. p. 365), observes, "As far as we are aware no similar phenomena have been observed in any other quadruped, and it is difficult to conceive why this species should differ so markedly from others which are nearly allied to it both in organization and habits." Upon this we would remark that, having under consideration a great number of instances in which female Badgers, after having been kept in solitary confinement for periods as long as ten, eleven, twelve, and even thirteen months, have suddenly produced young, there is some reason to suspect that with this animal also there may be a period of "suspended gestation," and it would be well if some competent embryologist would institute as careful an enquiry in the case of the Badger as has been made by Prof. Bischoff in the case of the Roe.

The fawns follow their parents for about six months, and it is not until the following spring that the young bucks begin to get their horns. In their first year these are single straight tines; in the second year there are two tines, and in the third year three, after which no other tines are added, the horns merely increasing in size according to circumstances, the growth of the antlers depending in a great measure on the abundance or scarcity of good and nutritious food.

In no other Deer with which we are acquainted are the horns so liable to variation as in the Roe. A very large collection might be made in which no two heads would be found alike. Our readers may recollect that in 'The Zoologist' for 1884 (pp. 353, &c.) we described and figured some very remarkable Roe horns from a collection made in Germany, some of these being noticeable for their unusual length, or fantastic growth, and two in particular were figured as being probably unique of their kind. In one of these (Fig. 10) there are two pairs of horns growing on the same skull, as in the case of the Indian Four-horned Antelope (*Tetraceros*); and in another (Fig. 11) is seen a coalescence of

* Bischoff, 'Entwicklungsgeschichte des Rehcs,' Giessen, 1854.

the burrs of what should have been two independent horns, and a union of the two beams in the centre of the forehead with a subsequent bifurcation and development of a single tine on each prong of the fork. By many sportsmen these abnormal horns are much valued and eagerly collected. The pages of the German sporting papers—such as the ‘*Illustrierte Zeitung*’ and ‘*Der Weidmann*’—contain, in almost every issue during the shooting season, engravings from photographs of remarkable Roe heads.

Roes shed their horns from the beginning of December until January, and are then at their best. In February they begin to fall off in condition, and by the beginning of March they are useless as food until the following November. Bucks shot during the first week of December have had their horns so loose that they have fallen off on the way home. The time at which they lose the velvet from the new horns in the spring depends on the mildness or otherwise of the season, the bucks during a backward spring retaining it sometimes until the middle of April, while in early seasons the horns are quite clean by the beginning of that month.

Occasionally a female Roe with horns has been met with, but such instances are undoubtedly rare. One with budding horns was shot on October 26th, 1875, by Mr. Duncan Davidson, of Inchmarlo, Banchory, Aberdeenshire. The skull of another, procured from Petworth Park, Sussex, is figured in the ‘*Proceedings of the Zoological Society*’ (1879, p. 297), in illustration of some remarks on the subject by the late Edward Alston; and on January 5th, in that year, a third “in the velvet” was killed on the estate of Sir James Fergusson, Bart., of Kilkerran, Ayrshire, as reported in ‘*The Field*’ of the 18th of January, 1879. Two other instances noted in the Black Forest, at Kippenheim, are mentioned in ‘*The Zoologist*’ for 1886, p. 435.

The colour of the Roe varies with the season, being reddish brown in summer and grey in winter.* Until they exchange the red hair for the mouse-coloured, says Colquhoun (*op. cit.*), they

* It is noteworthy that all three species of British Deer are distinguished by names indicative of their colour, namely, Red, Fallow (cognate with the German, *falb*, yellow), and Roan.

are only bags of bones covered with dark dry flesh, without a particle of fat.

The summer coat begins to change for the winter one in September, being complete in November, before which time no Roes should be shot. Red-deer stags, on the contrary, never come into prime order until they are divested of the winter grey and have assumed the rich red of the sporting season.

When the woods are thick with leaves, it is very difficult to force a Roe into open ground at all; but instinct also warns it not to come into view when at its weakest state. Thus, whether for sport or food, the Roe should never be hunted except for the short time they are, or ought to be, in their prime; and if this rule be broken they will equally disappoint the shooter and the gourmand. An adult Roebuck will measure from twenty-five to thirty inches at the shoulder, and weigh from forty to fifty pounds. In Dorsetshire bucks killed in February, when in good condition, have been found to weigh as much as seventy pounds.

Occasionally a white Roe has been met with, but so seldom as to cause considerable comment amongst sportsmen, and particular notice in the journals devoted to sport and natural history. One shot near Luss, on Loch Lomond side, is preserved in the collection of Sir James Colquhoun, and another may be seen amongst the sporting trophies of the Margrave of Baden, at Zwingenberg Castle, on the Neckar.

The habits of the Roe-deer, as observed in Scotland, have been well described by the brothers Stuart.*

“ Like the Red-deer, Roe seek a change of places at various seasons, and it is essential to their condition. In the mountain forests, however, they do not ascend like Red-deer to the heights, but frequent more generally the braes, the woods, and lower pastures. In fine dry weather they lie out in the heather like hares, and nearly as closely. Like all wild herbivorous animals, their feeding-time is from a little before dawn until the sun grows hot, and from sunset until night. During the day they ruminate, or sleep in the deep brackens, heather, blaeberreries, or other small coverts, or stand, like horses, in open woods and thickets. In winter they draw in from the hills and moors to the woods and coppices, and as the severity of the season increases, pass down the country from the higher to the lower shelters, to which, if a large and tranquil forest, they will resort for twenty

* ‘Lays of the Deer Forest,’ vol. ii. p. 149, &c.

miles. In the summer those which remain, and which are generally the natives, keep the close coverts, and are very fond of high ferns, junipers, and thorn jungles, or deep "pots," *i.e.*, small abrupt dells, where the heath or blaeberrys grow as high as their crouching bodies; but in wet and snowy weather they go to the tall open woods where the herbage is short, and they are free from the drenching storm and rain which loads the bushes and low branches. On naked or short-clothed ground they always scrape for their bed, laying it bare to the fresh mould. This they will do several times during the night, so that the numbers of a family cannot be judged by their beds, for each will often make three or four in a night. Roe-deer do not wallow in pools like Red-deer, but in hot weather when fretted by flies, to brush them from their heads and flanks they stand by a bush and run round it so continually, that they soon beat a circle like the lunging ring of a horse. In July and August these circuits are often found in bushy woods, and as they occur in the weaning season when the kids are seen pursuing their dams for milk, by those ignorant of their habits, their circuitous runs have been thought an exercise to wean the young.*

Roe-deer are extremely cautious and delicate in their tread, always, except by accident, stepping over fallen sticks, or any object which might make a sound among the dry leaves; and when anxious or watchful, they move with extraordinary silence and caution, planting their feet directly and gently, without any tripping or trailing, and sometimes suspending an extended hind leg while listening, lest in setting it down they should rustle the leaves or otherwise attract notice.

They will take the water readily and are good swimmers. The breadth of a good-sized lake will not deter them from passing to the opposite shore; and Boner states that he has known them cross the rapid Danube even where the current was strongest.

* On this point Charles St. John writes:—"The Roe have a singular habit of chasing each other in regular circles round particular trees in the wood, cutting a deep circular path in the ground. I never could make out the object of this manœuvre, but the state of the ground proves that the animals must have run round and round the tree for hours together" ('Sport in Moray,' p. 192). Boner explains it thus:—"The mother will play with her kid, bounding now towards and now away from it; and a favourite pastime seems to be to pursue her little one, or be pursued by it, round the stem of a tree. They thus will play at "Bopeep" together, and you may find trees in the forest, round the stems of which a circle is trodden in the ground, from the merry racings of the happy play-fellows" ('Forest Creatures,' p. 31).

This will happen not only when the animal is pursued by the hunter, but when it has discovered beyond its accustomed haunts some unusually good feeding ground, or hears the call of a doe in the breeding season.

The cry of the Roe is a horse bleat, resembling the word *boeuf*, without the final *f*. In Germany the foresters imitate it very cleverly with a piece of coarse grass, or a bit of the inner bark of the birch tree, placed between the lips.

The food of the Roe is of a varied nature; grass, leaves, heather, and the young shoots of spruce and oak forming its chief sustenance. Amongst other plants, the *Rubus saxatilis* is said to be such a favourite as to have earned for it in the Highlands the name of Roebuck-berry. The late Edward Alston once examined the contents of the stomachs of two Roe-deer, buck and doe, shot in the month of October, and found remains of grass, moss, blaeberry leaves, young heather, spruce shoots, a little corn, and numerous fragments of various species of fungi which abounded in the woods where the deer were shot.* This observation has since been confirmed.†

“Nothing can be more graceful,” says Charles St. John,‡ “than the light and agile movements of this animal while nibbling the tender shoots of the bushes and trees on which it feeds. The wild rose and the bramble are amongst its favourite morsels; from the long twigs of these plants it nibbles off leaf by leaf in the most graceful manner imaginable. The foresters accuse these animals of being very destructive to the young oak trees, and fond as I am of them, I am afraid I must admit the accusation is just, as they undoubtedly prefer the topmost shoot of a young oak tree to almost any other food. Nevertheless the mischief done to the woods by Roe is trifling when compared to that of Rabbits.” St. John might have added that the practice of rubbing their new horns against the branches and stems of trees causes much injury to the young plantations. Where Roe-deer are plentiful you may see in all directions the stems stripped of their bark which hangs down in ribbons.

In severe winters the Roe suffers greatly; it sinks into the deep snow, and may sometimes be found embedded to the flanks,

* Alston, ‘Zoologist,’ 1864, p. 9359.

† ‘The Field,’ Aug. 12th, 1871.

‡ ‘Natural History and Sport in Moray,’ p. 250.

either dead from exhaustion, or so incapacitated as to fall an easy prey to Wolves and Foxes. Nor are these the only enemies it has to contend with. We well remember stumbling one day upon a dead Roe which lay strangled in a snare that had been set in the woods by some wily poacher, who did not, however, reap the reward of his ingenuity. In parts of Germany and Austria, where Roe-deer are more numerous than in this country, they offer a great temptation to poachers, since their comparatively small size renders it much easier to carry them away without the aid of a pony, which could not be dispensed with in the case of the larger Red-deer, unless, of course, the animal were cut up and transported piecemeal.

The general appearance of the Roe must be sufficiently familiar to most people, even to those who have never seen the animal alive, through pictorial illustration. But as artists almost invariably depict the full-grown buck and doe, we have thought it of interest to give in the accompanying plate (Plate I.) a portrait of a young buck with horns "in the velvet," reproduced from an instantaneous photograph.

ON THE SYSTEMATIC POSITION OF THE SWIFTS (*CYPSELIDÆ*).

BY W. K. PARKER, F.R.S.

My friend the Editor has recently put into my hands a paper on this subject by the late Professor Garrod ('Zoologist,' 1877, pp. 217—220), and invited my criticism thereon. No one valued the work done by that talented young anatomist—so early lost to us—more than I did, notwithstanding that his charity did not abound towards me. The fact of the case was this,—he was always looking at the newest specializations of this or that type, in the modification of the vocal organs, and the circulatory and muscular systems; whilst I was always in search of *old things*, any "unconsidered trifle" that might help me to imagine what sort of parents the first birds had. It seems to me, in endeavouring to form a true estimate of the qualities of Garrod's mind, that he was eminently fitted for *action*, but was too restless and impatient for *contemplation*. Many things in the paper just

referred to are true and well said, but the last words on the relationship of the Swifts to the Swallows on one hand, and to the Humming-birds and Goatsuckers on the other, have not been said yet.

I have just received a short, but valuable paper on the Swifts, by my friend Mr. Frederic A. Lucas, of Washington,* and I am, almost impatiently, waiting for Dr. R. W. Shufeldt's paper on these birds and their relations, which I understand is to appear in the 'Journal of the Linnean Society.'†

For my part, I am always more inclined to observe and study facts, than to make inductions from those facts. In the present short communication I will try and do both.

The Swifts lie between two groups of birds that differ in the most marvellous manner—the *Passeres* and the *Picariæ*, or *Coccygomorphæ*; the former are *five times* as numerous, as the latter are *ten times* more polymorphic, than the former. Moreover, the *Passeres*, with the Raven as their type, are the highest creatures that have arisen from the general mass of the *Saurop-sida*; the *Coccygomorphæ* only take a second place; and notwithstanding all their plasticity, their marvellous suppleness, taking on as they have done any size and any shape that might help them in their struggle for existence, they nevertheless form but a small kingdom as compared with the thousands of neat and uniform *Passeres*, birds in which the elements are kindly mixed, and in which the large brain makes possible the highest ornithic intelligence.

Why the Swallows should have come to the top, to be members of this most highly accomplished, most wonderfully endowed order of birds, and why the Swifts should have come short—have missed their mark as to avian nobility—no one can say.

In one respect the Swifts certainly are at the head of the whole class, and that in the most distinguishing attribute of the class; they are the highest of all flying creatures; not only Insects, Pterodactyles, and Bats, but all other "birds of wing" are inferior to them in their distinguishing faculty; they seem to me to have been ready to part with everything that they might

* 'The Auk,' vol. vi. pp. 8—13, figs. 1—3.

† The paper referred to is entitled "Studies of the *Macrochires*, morphological and otherwise with the view of pointing out their relationships, and defining their several positions in the system."—ED.

obtain this coveted power, and to forego development in their hind limbs, that their fore limbs might carry them more swiftly by far than any of their relatives, "through the great deserts of the air," as Calderon expresses it. I do verily believe that this is the key to the secret—that their large wings have materially detracted from their puny legs.

In matters of this sort I never differ from my friend Dr. Sclater without a strong feeling of misgiving; and yet his expression, that "the Swifts have no relationship whatever with the Swallows, *Hirundinidæ*" (Proc. Zool. Soc., 1865, p. 593), is, I consider, too emphatic to be true.

It would not be true of the relationship of the Swifts to any Passerine bird; for they certainly lie on the Passerine border of the *Picariæ*, if they cannot be put even as abnormal *Coracomorphæ*.

I agree with my friend Dr. Shufeldt that the "Swallow and the Swift are near akin." My own opinion is not the simple judgment it was forty years ago. I have observed a good many things since then in the structure of birds of all sorts.

To take one fact,—all the Passerine birds are "Finch-jawed" (*Ægithognathous*); no other birds but the Swifts are so, except in an imperfect degree. This peculiar structure, which is isomorphic with what is found among the Mammalia, very commonly, and which arises from a fusion of the vomer (or vomers) with the floor of the nasal labyrinth (base of "middle turbinal" of man), is not the only thing in which the Swifts agree with the Passerines, and disagree with all other birds. Correlated with the *Ægithognathous* palate I have always found a peculiar structure of the palatine bones. As a rule, in all the Sauropsida and Mammalia the old Ichthyopsidan cartilaginous palatine bar is aborted, and the palatine bone is formed directly from mere membrane. In Ganoids, Osseous fishes and Amphibia, the primary rod of cartilage becomes ossified during growth. In Passerine birds and in Swifts, and in no other kinds, a large "remnant" of the old Ichthyopsidan cartilaginous palatine is developed postero-laterally to the main bony bar, becomes ossified independently, and then becomes fused with that bar, and forms its projecting part, or apophysis.

A second point is that the *Cypselidæ* are very variable. Amongst a few dozen specimens, there is far more variation

in the legs than is seen in the 6000 specimens of true *Passeres*.

Moreover, as Mr. Lucas in the paper above referred to has shown, the wing is extremely variable; in some it is as marvellously modified as in the Humming-bird, in others it comes much nearer to that of the true Swallows, *Hirundinidæ*.

I had just noticed this in fact the day before I received Mr. Lucas's welcome paper in the 'Auk.'

I will now give the measurements of the three main regions of the wing in two of the largest of the *Cypselidæ* :—

	Humerus.	Ulna.	Manus.
<i>Macropteryx mystacea</i> .	24 mm.	29 mm.	47 mm.
<i>Chætura caudacuta</i> .	17 mm.	24 mm.	57 mm.

I leave these facts to tell their own tale, and proceed to one or two more statements. As in all the Passerines, the Swifts and Humming-birds have no second phalanx on the "pollex," nor a third on the "index;" notwithstanding that these are present in the Goatsucker (*Caprimulgus europæus*), the type, certainly, which has the greatest right, next to the Swallow, to be accounted a relative of the Swift.

I have noticed with interest a remark by Prof. Newton, in his valuable article "Ornithology" in the ninth edition of the 'Encyclopædia Britannica.' Speaking of the "Oscines" (p. 47), he says, "This last and highest group of birds is one which, as before hinted, it is very hard to sub-divide. Some two or three natural, because well-differentiated, families are to be found in it; such, for instance, as the *Hirundinidæ*, or Swallows, which have no near relations."

That passage pleases me so much, that for the sake of it I forgive my friend the author for his downright heresy, expressed in the same paper, as to the *non-raptorial* nature of the Owls. I hope as to this that he will be spared to recant.

Bearing on the lonely position of the Swallows in their own proper Order, I have just discovered a most remarkable fact, albeit "an unconsidered trifle." Amongst all *Passeres* and related types, a Swallow is the only bird in which I have found a second or unguis phalanx to the *pollex*; and only one of the many of the *Hirundinidæ* examined by me, with reference to this point, shows it; this is the Sand Martin or Bank Swallow (*Cotyle riparia*);

it is well seen in the embryo, and is not quite obscured in the adult; in the embryo it is relatively as long as in any bird among the *Carinatae*.

One "last word;" all the *Coracomorphæ* have a peculiar bony bridge over the top of the interosseous space between the second and third metacarpals; it is fused with both those bones. So it is in the *Picidæ*, *Ramphastidæ* and most of the *Alcedinidæ*, in which it is unusually large; in the *Gallinacæ* generally it is almost as large, but does not unite with the third metacarpal. The rudiment of this part is much larger in Humming-birds than in Swifts, which agree with the Goatsuckers in having this intercalary element aborted.

I have put these facts down on paper; if any one can explain them it were act of charity to us all to show their meaning. Prof. Garrod did not say the last word either about Swifts and Swallows, or about any member of this bewildering class of vertebrates.

NOTES ON A VOYAGE TO THE GREENLAND SEA IN 1888.*

BY ROBERT GRAY.

(Concluded from p. 51.)

JULY 5.—Lat. 74° 40', long. 12° W. Water clear and blue; temperature, 32°. From a Narwhal shot to-day I removed a fœtus measuring five feet in length. In the stomach of the mother a few worm-like Entozoa were present (*Ascaris simplex*, Rudolphi), while the pharyngeal openings of the Eustachian tubes formed the habitat of another parasitic form, much smaller in

* In the clause relating to the presence of valves in the throat and vagina of *Mysticetus* the sentence "A somewhat similar but larger structure . . ." (page 43, line 29) has undergone derangement, and instead of reading as in the text should be read as follows:—"A somewhat similar but larger structure attached to the opening of the vagina, evidently acted in the same way; as also did another with regard to the opening of the throat, which on a previous occasion I examined attached to the base of the tongue, but which probably represents the epiglottis." Again, in the footnote, page 48, for "Scotch writers" read "Scotch whalers."

size (*Pseudalius alatus*, Leuchart), for the names of both of which I am indebted to Dr. von Linstow of Göttingen, through the kindness of Mr. John Murray, of the 'Challenger' Commission.

July 9.—Lat. $74^{\circ} 49'$, long. $11^{\circ} 40' W$. Colour of the water slightly grey; temperature, 35° . In the evening we fell in with a number of Hooded Seals *Cystophora cristata*, lying on the loose ice at the pack-edge. I examined the stomachs of several which were shot. While most were empty, one was packed full with a bluish mud or ooze, in which were embedded the crystalline lenses of two eyes belonging probably to some small species of fish, and the remains of one crustacean common at the surface (*Themisto*). The stomachs of three other Seals contained mud alone. With regard to the presence of mud in these animals' stomachs, while considering the depth of the water too great (in this instance 200 fathoms,—in another, to be afterwards recorded, 1100) to permit the bottom being reached, the only explanation I am able to offer is that the substance must be swallowed in small quantities by the Seals along with their ordinary food (crustaceans living at the surface), and that, owing to its indigestible nature, accumulates in course of time in the stomach. These Seals are occasionally observed disappearing under the ice, for the purpose, I believe, of feeding on the immense number of crustaceans which are known to accumulate there. Many of the ice-fields bear on their surface, immediately under a superficial coating of snow, cargoes of mud (apparently of an alluvial origin). During the process of melting, the mud may accumulate on submerged tongues or ledges of the ice, and thus become the retreat of numbers of crustaceans, which, as they are devoured by the Seals, are swallowed along with a small quantity of the mud.* Some such explanation must, I think, be conceived.

July 16.—Lat. $75^{\circ} 10'$, long. $8^{\circ} 4' W$. Colour of the water, slightly green; temperature, 34° . Saddle Seals very numerous, some lying on the ice, others sporting about in the water. There was a fair proportion of this year's Seals present, the average length of some which I measured being 3 ft. 2 in. from the tip of the nose to the tip of the tail. Unfortunately I did not

* This conclusion is supported by a comparison of the report on the mud from the Seals' stomachs with that of a sample of mud of the ice.

succeed in examining any of their stomachs, but numerous fragments of red crustaceans floating at the surface may have been passed in their fœces. The young Saddle Seals at this season, with their silvery grey coats, marked here and there with an irregular black spot, with their large round black eyes and long delicate whiskers, are perhaps the most beautiful of all the Seals of the Greenland Sea. Their movements, too, have a peculiar grace and elegance, darting about with rapidity under water, performing various movements at the surface, and now and again with remarkable agility leaping clean out of the water—enlivening the solitary regions of the ice.

July 17.—Lat. 74° 37', long. 9° 30' W. Colour of the water, greenish but clear; temperature, 39°. The evening being remarkably quiet and fine, I amused myself in the capture of surface invertebrate forms, some species of which were very abundant. The Crustacea were represented by *Gammarus locusta*, an amphipod occurring in great abundance throughout the Arctic Sea and frequently found congregating under the ice; of these many bore eggs. *Euthemisto libellula* (Mandt), so often found in the stomach of the Floe Seal,—a more elegant form than *G. locusta*, and very difficult to capture on account of its agility,—was darting about in considerable numbers; while the copepod *Calanus finmarckicus*, on account of its abundance, the crustacean *par excellence* of the Greenland Sea, and undoubtedly contributing very largely to the support of *Balæna mysticetus* and *Balænoptera Sibbaldi*, existed in great numbers at the depth of a few fathoms. Besides crustaceans, there was an abundance of the quaint-looking shell-less pteropod *Clio borealis*, their wing-like appendages continually moving and meeting one another, both dorsally and ventrally. Some of these *Cliones* were very large, measuring 2½ inches in length. The surface of the water had a very oily appearance, which perhaps was due to the oil-globules which now and again might be noticed floating up to the surface, spreading out and displaying iridescent colours.

July 19.—Lat. 74° 53', long. 10° 30' W. The water had a dull lead-coloured appearance, with much oil at the surface lying in streaks, running parallel with the direction of the wind. In one of these oily streaks I noticed a number of Mallemites busily engaged in eating something present at the surface. On

further examination I found an immense number of *Calani* present where the water was oily, and these crustaceans the Mallemokes were eating. The streaked arrangement of the oil must, I think, be due to the wind blowing it away from more or less stationary areas, where in this case *Calani* were present in abundance, either in the surface or sub-surface waters.

July 24.—Lat. $74^{\circ} 43'$, long. $11^{\circ} 30' W$. During the last few days we have seen many schools of Narwhals, all of which invariably consisted of full-grown females accompanied by calves. The calves were all about the same size, very small, and evidently only recently born. This observation, together with the finding of the mature fœtuses already mentioned, renders it probable that the Narwhal usually brings forth its young at this season,—an *à priori* conclusion agreeing with previous observations. To-day a female was killed, from which I obtained a fœtus $7\frac{1}{2}$ inches in length,—an illustration of the fact that fœtuses of a similar size are not unfrequently procured during the months of June and July. If there is a regular season for bringing forth the young, the period of gestation would appear to be about twelve months. This agrees with the fact that copulation occurs during May and June. The fœtuses of small size—*e. g.* $7\frac{1}{2}$ in. in length—must, then, be regarded as about two months old. This may appear a somewhat rapid rate of growth, but it is well to bear in mind, as Owen pointed out, that the cetacean fœtus bears, when mature, a greater proportion to the mother as regards size than that of any other animal. In the case of the Narwhal I have measured several fœtuses exceeding 5 feet in length, the average length of the mother being 14 feet; while in *Hyperoodon* I have seen two, both over 10 feet in length, the mother in each case being about 26 feet long. Therefore, both in the case of the Narwhal and in the case of *Hyperoodon*, the fœtus may reach while *in utero* fully one-third the length of the mother.

The colour of the water, which, as I have already mentioned, was everywhere blue and clear when we first visited this locality, has now assumed in many places a dark green colour. The change was gradual, and occurred probably through the development of diatom spores. During the interval the ice had cleared away, exposing the surface waters to the light, evidently the only favourable condition wanting to the presence of vegetable life.

Easterly winds prevailing during the latter part of July, and the ice as a necessary consequence remaining close, we visited the northern grounds, hopeful of obtaining more favourable conditions for the prosecution of the fishing. During our absence several remarkable changes had occurred. The whole of the "S.E. pack" had disappeared, open water extending northward as far as lat. 80° . The surface waters, formerly so extensively turbid and discoloured with Diatomaceæ, were now everywhere clear and blue.

During our progress northward we saw now and again a solitary "Blue-fin Whale" sending its "blast" high and pillar-like into the air, feeding perhaps on *Limacina arctica*, of which there was a considerable abundance in the surface waters. Some of these pteropods, which by the way are not so very common throughout the Greenland Sea as is generally supposed, were of somewhat unusual size, measuring fully 8 mm. in diameter. With regard to *B. Sibbaldi*, a number of observations which I made from the Crow's Nest concerning its breathing gave the following results, viz.:—Period under water, maximum 10 min., mean 8 m. 20 s., minimum 7 m.; period at surface, maximum 4 m., mean 3 m. 15 s., minimum 2 m. 40 s.: number of expirations, maximum 15, mean 12·5, minimum 11; period between expirations while at the surface, maximum 20 sec., mean 15·5 s., minimum 13 s.

Besides these Whales there were a considerable number of birds about, — Looms and Rotches, mostly the former with their young, which, although quite unable to fly, had already ventured fully 100 miles away from land. The number of feathers of these birds, floating about on the surface, showed that their moulting season had already commenced.

On reaching lat. 80° we wrought south-westwards along the ice-edge, in search of Whales. Owing to easterly winds, however, the ice had altered greatly for the worse, and with the exception of great numbers of Narwhals hurrying to the N.W., which we saw on the 6th, in lat. $78^{\circ} 39'$, long. $0^{\circ} 10' W.$, there was very little life.

Having overhauled the northern grounds without success, we continued working south-westwards along the ice. The following extracts from my Log will indicate our progress during the rest of the voyage:—

August 12.—Lat. $73^{\circ} 41'$, long. $15^{\circ} 00'$. Colour of the water, dark green; temperature at the surface, 36° . Lay becalmed in a "bight" formed by the ice all day; many Narwhals about, most of which were males with "horns." Early in the morning I discovered several of these animals lying motionless at the surface, evidently asleep. Manning a boat we pulled quietly towards one in this position. As we slowly approached I enjoyed an excellent opportunity of noting its position and movements. After we left the ship, the animal raised its head above water and breathed for a brief interval, relapsing immediately afterwards into its former position. At the distance of a few feet before harpooning it we could easily see that the animal was in a slightly bent position, its tail being immediately under the surface, the pectoral fins outstretched with their surfaces horizontal, the head weighted with a long protruding tusk pointing downwards, and only a small part of the back above the surface. The animal was absolutely motionless, not the slightest trace of any movement being visible,—the spiracle, or "blow-hole," being immersed, respiration could not possibly have been going on. From these facts, and a number of somewhat similar observations which I have previously made, I conclude that during sleep, animation being partially suspended, the period during which these animals are able to remain under water, with the respiratory organs excluded from the atmosphere, becomes extended. Let the Narwhal, after having completed the process of respiration and having all its plexuses stored with oxygenated blood, relapse into sleep. During this condition the animal remains motionless, and the position which the body assumes is involuntary and becomes regulated by hydrostatic laws. If the individual in question be provided with a "horn," as the protruding tusk is called, the whole of the head will probably be immersed; if without, as in the case of the female, the opening of the "blowhole" may appear at the surface; but in no case, as far as I have been able to observe, does respiration go on until a protracted period having elapsed, when the animal either awakes or by a reflex movement raises its head, if need be to the surface, and unconsciously respire. Remarkable as these facts may appear, the matter does not rest here; many intelligent whalers have long held that the cetaceans possess the power of remaining asleep, for a considerable period, under

water entirely removed from the surface. This belief seems to have been suggested by the following facts:—(1.) When a Bottle-nose Whale, *Hyperoodon rostratus*, the only one visible at the time, has been harpooned, has dived, and has again appeared at the surface, it is occasionally accompanied by a number of other Whales not previously in sight. I have made this observation myself on several occasions. May not the harpooned Whale in its distress have sought the assistance of its slumbering friends, with whose position under water it was acquainted? (2.) The appearance, after an absence of a number of hours, of *Balæna mysticetus*, from under a field of ice of such a nature that air-holes could not have existed. (3.) The daily appearance and disappearance, with some regularity, of Whales at the surface. I have noticed this concerning all the cetaceans of the Greenland Sea. (4.) The fewness of Whales seen asleep at the surface, the fact that they are only seen during calm weather when the water is smooth, and never when the sea is stormy,—all of which I am able to corroborate. Keeping these statements in view, and having seen that the Narwhal may be found motionless at the surface with the “blowhole” under water, a position practically equivalent to complete submersion,—and remembering (a) that the state of the sea is seldom so quiet as to permit an animal resting with comfort at the surface; (b) that, the animal remaining motionless and the position assumed being necessarily involuntary, it is doubtful whether the spiracle would in all cases appear above water; (c) the position assumed being such that the spiracle would appear above water,—it is questionable, owing to the low power of flotation, whether inspiration would be safe without voluntary or highly complex reflex action on the part of the animal. I venture to arrive at the following conclusions, *viz.*, that in the Cetacea, during the condition known as sleep, the animal remains absolutely motionless and passive, respiration occurring at prolonged intervals, when the animal either awakes and performs the function consciously, or, its sleep remaining unbroken, the necessary movements are brought about by a series of reflex and involuntary actions acquired by habit. The depth at which the function is performed seems to be determined by depth to which the wave-motion may extend, immunity from disturbance in all cases being secured; the animals appearing at the surface only when

the sea is smooth, the spiracles not necessarily being above water.

August 17.—Lat. $73^{\circ} 1'$, long. $14^{\circ} 46'$ W. The water a beautiful olive-green colour; temperature at the surface, 39° . *Calanus finmarchicus* abundant, with their alimentary canals filled with Diatomaceæ. While we were lying near the ice a strange Whale appeared near the ship; it was swimming backwards and forwards in a somewhat erratic matter; its dorsal fin, which was prominent and situated well forward on the animal, frequently appeared above water. On approaching with a boat I found the water alive with *Calani* where the Whale (probably a Hunchback, *Megaptera longimana*) was swimming, and on which it was probably feeding, although a small fish with silvery scales, dangling from the beak of one of a number of Arctic Tern which were flying overhead, shook somewhat my faith in this belief.

August 20.—Lat. $71^{\circ} 39'$, long. $14^{\circ} 15'$ W. Water olive-green; temperature, 34.5° . Many Blue-fin Whales in sight all day: for some time in the morning, while lying becalmed, we were quite surrounded by these huge cetaceans, the noise of their blasts being almost incessant. I noticed one young animal about twenty feet in length.

August 22.—Lat. $71^{\circ} 10'$, long. $15^{\circ} 48'$ W. A few Bladder-nose Seals lying on the ice, two of which were shot. The stomach of one was empty, while the second was packed full of fine bluish mud, similar in appearance to that obtained on July 9th from the stomachs of Seals of the same species. At night we made our way towards the sea, and next day bore up, arriving at Peterhead on September 3rd.

I conclude these notes by appending a list of the contents of stomachs of Whales, Seals, and Birds examined during the voyage of the 'Eclipse.' The species determined through the kindness of Dr. John Murray, of the 'Challenger' Commission:—

Bottle-nose Whale, *Hyperoodon rostratus*.—April 25th: $68^{\circ} 28'$, 5° W.; contained abundant remains of the cephalopod, *Gonatus fabricii* (determined by Mr. W. E. Hoyle).

Narwhal, *Monodon monoceros*.—1. July 1st: $74^{\circ} 37'$, 11° W.; contained remains of Cuttlefish and fragments of *Pasiphaë tarda*, Kroyer (determined by Prof. Sars). 2. July 5th: $74^{\circ} 40'$, 12° W.;

contained Cuttlefish remains. 3. July 22nd : 74° 49', 10° 30' W.; contained Cuttlefish remains, hundreds of mandibles and crystalline lenses, and the fleshy portions, in a more or less digested condition, of at least eleven specimens of *Gonatus fabricii* (determined by Mr. W. E. Hoyle); also crustacean remains belonging to two different species, both large and bright red in colour,—the largest *Pasiphaë tarda*, which was also present in greatest quantity, measuring six inches in length, the other *Hymnourdora glacialis*, Buchholz, 2½ inches (the latter also determined by Prof. Sars). 4. August 12th : 73° 41', 15° W.; contained Cuttlefish remains (specimens recognised as belonging to *Gonatus fabricii* by Mr. Hoyle).

Saddle Seal, *Pagophilus grœnlandicus*.—1. June 16th : 75° 50', 6° 9' W.; contained *Euthemisto libellula*, Mandt and Lichtenstein, and *Nyctiphanes norvegica* (the former determined by the Rev. T. R. R. Stebbing, M.A., of Tunbridge Wells, the latter by Dr. Murray). 2. July 9th : 74° 49', 11° 40' W.; contained *E. libellula* alone.

Hooded or Bladder-nose Seal, *Cystophora cristata*.—July 9th : 74° 49', 11° 40' W. 1. Bluish mud or ooze, with a few fishes' eyes and crustacean remains, *Euthemisto libellula*. With regard to the mud Mr. F. G. Pearcey, of the 'Challenger' Commission, reports as follows:—A blue mud, coherent, homogeneous, gritty; shows no perceptible effervescence when treated with dilute HCl. A few fragments of sponge spicules and one or two diatoms were all the organisms observed: the mineral particles make up probably 50 per cent. of the whole, having a mean diameter of 0·2 mm., angular and rounded, consisting of quartz, zircon, feldspar, hornblende, oliöine?, mica, magnetite, and some red-brown coloured particles like glauconite; *silicious organisms* 2 per cent., sponge, spores, and diatoms; *fine washings* 28 per cent., consisting of argillaceous matter and many fine mineral particles. 2. Mud alone present: according to Mr. Pearcey the mud present in this stomach is similar to the last, but the mineral particles are somewhat larger, the mean diameter being 0·3 mm.: the same organisms are present. 3. Mud alone present, similar to the above, according to Mr. Pearcey, but contains in addition a few small otoliths of fish and beaks of cephalopods. 4. Aug. 22nd : 71° 10', 15° 41' W. Mud alone present, similar to above. To permit comparison, a report by Mr. Pearcey on a sample of mud

off the surface of the drift ice, obtained in this latitude last season, is here inserted:—"Yellow-brown clay, very coherent, homogeneous?, dries into hard lumps, showing lustrous streak dark brown when wet, unctuous, shows no traces of carbonate of lime when treated with an acid. A few diatoms and sponge spicules were all the organisms observed. Deposit made up of 50 per cent. of minerals, having a mean diameter of 0·06 mm., rounded and angular, consisting of quartz, mica, feldspar, hornblende, zircon, and magnetite, with a few coloured altered particles. *Silicious organisms* 2 per cent., consisting of diatoms and one or two fragments of sponge spicules. *Fine washings* 48 per cent. Amorphous clayey matter with many mineral particles and a few diatoms."

Floe Seal, *Pagomys fœtidus*.—1. May 12th : 71° 18', 6° 37' E. *Euthemisto libellula*, *Nyctiphanes norvegica*, and a few Cuttlefish remains. 2. June 2nd : 78° 47', 3° 6' E. *E. libellula* and *Gammarus locusta*. 3. June 7th : 78° 00', 2° 30' W. Entirely filled with *E. libellula*, mostly of large size, some measuring 40 mm. in length. 4. *E. themesto*, and a few immature examples of *N. norvegica*. 5. June 26th : 73° 1', 13° 31' W. Full of *N. norvegica*. half grown.

Brunnich's Guillemot, or Loom, *Alca arra*.—May 12th : 78° 18', 6° 37' E. One stomach examined; contained a small pebble and the otolith of a fish. May 19th : 79° 40', 4° 6' E. Seventeen stomachs examined; one contained mostly young *E. libellula*, but also a few some 30 mm. in length; the others either empty or contained only a few pebbles of sandstone or other rock.

Little Auk, or Rotch, *Mergulus alle*.—May 12th : 78° 18', 6° 37' E. A number of stomachs examined were found to contain *Calanus finmarckicus* in greatest quantity, but also *E. libellula* and a few young of *N. norvegica*.

Black Guillemot, or Dovekie, *Uria grylle*.—A few stomachs examined contained in most cases crustacean remains, probably *E. libellula*, in others only a few pebbles.

NOTES AND QUERIES.

MAMMALIA.

A New Australian Mammal.—In 'The Zoologist' for November, 1888, under this heading (p. 424) we referred to the then recent discovery near Adelaide of a small burrowing animal, externally resembling the Cape Mole (*Chrysochloris*), but differing from it as we pointed out in several important respects. Another new mammal from Australia has since been described by Prof. Milne-Edwards, in a memoir lately published by the Société Philomathique de Paris. He refers it to the genus *Dactylopsila* from New Guinea, and has named it *Dactylopsila palpator*. It is said to be remarkable for the extraordinary length of the fourth digit of the forelimb, which is more than an inch longer than the adjoining digits, exceeding even in its proportions the curious third finger of the Madagascar Aye-Aye (*Chiromys madagascariensis*).

BIRDS.

Note on Willow Wrens.—In reply to Mr. Gurney's suggestion (p. 77), that the large, light-coloured, yellowish warbler shot by me at Cley was a Wood Warbler, I wish to say that the wing-formulæ, and especially the comparatively long first primary, proved that it was an undoubted Willow Wren. It was apparently an example of the large and (so-called) dark-legged race, of which Lord Clifton wrote in 'The Field' for August 16th, 1884. Lord Clifton described a male of this race, received from Mr. Swaysland, of Brighton, in spring, as considerably larger than the Wood Wren, of a deep brownish olive above,—something like the Garden Warbler,—with a band of deep buff, inclining to yellow, across the breast; and a female, received with the eggs, as having the same distribution of buff, but much paler, and the upper parts greyish olive without any brown tint; legs in both, neutral coffee-brown, but not so dark as in the Chiff-chaff; feet as dark as, if not darker than, the legs. It is upon this last point that Lord Clifton lays great stress, stating that in the typical Willow Wren the feet are yellowish, and at all ages paler than the legs; soles of the feet bright yellow. I have a skin of the large Willow Wren, shot at Spurn Point, Yorkshire, in August, 1885 (apparently a bird of the year), and given to me by Mr. J. H. Gurney, jun., which agrees very well with my note of the Cley bird (which was not preserved), and also (making allowance for the difference in the time of the year at which the specimens were procured, and the different ages of the birds, Lord Clifton's being presumably adult) agrees in some points with the description in 'The Field' above quoted. My specimen is quite as large as, if not larger than,

the Wood Wren; it possesses the deep breast-band, has dark legs, and feet as dark as the legs. I do not think, however, that much importance can be attached to the colour of the Willow Wren's legs and feet, as this seems a rather inconstant and uncertain character. For instance, in three specimens procured on the same day in May, these parts were coloured as under:—*a* and *b*, legs light brown, feet and claws paler; *c*, legs and feet medium brown, claws darker. The soles of the feet in all three were clay-coloured, and in my experience it is only in birds of the year that they are bright yellow; a bird of the year procured in the following September had them so coloured. In a male and female procured in April, both with pale legs, the feet (in the dried skins) are no paler, but in a young bird procured in August they are decidedly so. On the other hand, in a male sent to me from Rainworth, Nottinghamshire, by Mr. Whitaker, early in May, 1887, the legs are dark brown, darker than those of the Spurn bird, and nearly as dark as those of the Chiffchaff; feet decidedly darker, and as dark as in the latter bird. Yet this example is no larger than typical Willow Wrens. It is a very grey bird, and bears some resemblance to those described by Mr. H. Seebohm (Brit. Birds, vol. i.) from high latitudes, with "all the yellow and green abraded, leaving the general colour earthy brown, the eye-stripe having faded to a greyish white." My grey bird, however, still exhibits a little dull greenish yellow on the upper parts, and the eye-stripe is slightly tinged with the same, but there is very little sign of the usual yellow and buff on the under parts. Laid side by side with an ordinary Willow Wren, also procured in spring (four days only earlier in the year), the difference in the appearance of the two birds is very striking. Dark legs then cannot be said to characterise the larger race of Willow Wren.—
OLIVER V. APLIN (Bloxham, Banbury).

Thick-knee in Essex in January.—A specimen of the Norfolk Plover, or Thick-knee, *Edicnemus crepitans*, was shot on the marshes near here last month. This is perhaps worth recording, as the bird, being of migratory habits, usually leaves us about September. Just previously a fine Peregrine Falcon was picked up on the same marshes. It had been shot at and wounded, but was alive when found.—A. F. GATES (Marsh Gate Laue, Stratford).

Reported Nesting of the Redstart in December.—There appeared in the local papers at Scarborough an account of a Redstart's nest and eggs being discovered on Christmas Day. Knowing that the Redstart is a summer visitor only, I went to the place where the nest had been found (Hackness, a small village some six miles from Scarborough), and made inquiries. I was fortunate enough to find the individual who discovered the nest, and I obtained the following information:—The nest, which was placed in a hole in an oak tree, was built of "wicks" moss and grass, and

lined with hair and feathers. The bird, which was seen to leave the place was described as "a small brown bird with a red tail." The egg, which is unfortunately broken, is undoubtedly that of the Common Redstart. Is not this a most uncommon occurrence? The Redstart has hitherto been looked upon as a summer visitor only, coming in April and leaving about September. Yet here are two birds, which have apparently passed the winter with us, and actually have a nest and two eggs on the 25th of December. Has any similar case been known? I cannot hear of one in this district.—W. J. CLARKE (35, Londesborough Road, Scarborough).

[Were it not for the assertion that the egg examined was undoubtedly that of the Common Redstart, we should have been inclined to suspect that it was that of the Wren, this bird, like the Robin, occasionally nesting during the winter months when the season is a mild one.—ED.]

Little Gull, near Penzance.—I have lately (Feb. 15th) received from St. Just, to the west of Penzance, an adult specimen of the Little Gull, *Larus minutus*. It weighed a little under 7 oz., and measured 13 in. from tip of bill to end of tail feathers, the expanse of wing being 2 ft. 9 in., or more than double the length of the bird. It is now being "set up," and will soon be on view should any one like to call on me and see it.—THOMAS CORNISH (Penzance).

Recollections of the Bustard in Suffolk.—I had lately the pleasure of a conversation with perhaps the only person who can claim to have seen the indigenous race of Suffolk Bustards, both alive and dead, as well as their nests and eggs. Mr. W. Bilson, formerly a bird-stuffer in Bury, who was born in 1808, happened to call on me, and while looking over my birds the Great Bustard was mentioned. Mr. Bilson well remembers as a lad seeing the eggs in a Bustard's nest at Icklingham, and as the then owner of the Icklingham estate was very careful to preserve the few remaining Bustards, the eggs in question were, to the best of my informant's knowledge, left undisturbed. This would probably be between 1818 and 1825. He also told me that a man once sold his father a hen Bustard freshly killed for £3, and subsequently offered him a fine cock bird for £10, but the two could not come to terms, Mr. Bilson, sen. declining to go beyond £7; however, the owner of the Bustard obtained his price from another customer. He can also recollect once seeing near Thetford a cock Bustard, flying with (as he expressed it) "the pouch hanging down." Whether or not the pouch is perceptible during flight, or whether the long neck-feathers were mistaken for the pouch, I must leave for those to decide who have seen the Great Bustard on the wing.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

[The hen Bustard bought by the father of Mr. Tuck's informant was doubtless that trapped at Eriswell, as mentioned by the late Mr. Stevenson

(Birds Norf. ii. pp. 35, 36); but the cock bird was (we understand from Prof. Newton, who had the story from Mr. W. Bilson in 1855) offered to his father by the notorious otidicide George Turner.—ED.]

Sand Grouse in Yorkshire.—I have to report the occurrence of three Sand Grouse, one male and two females, which have come into my possession. One of the females was found dead in a fallow field near York, and the other two were shot near Beverley in June last. The male bird was a particularly fine one, by far the best I have seen out of some sixty specimens which I have examined; the bright orange feathers at each side of the head being unusually fine, and the length of the two central tail feathers, and the first primary of each wing, being especially noticeable. The majority of the birds I have seen were in poor plumage (some well advanced in moult), and chiefly females. The sixty specimens examined by me were all shot in Yorkshire.—WILLIAM HEWETT (3, Wilton Terrace, Fulford Road, York).

Pallas's Sand Grouse in Cornwall.—I was much interested in Mr. Southwell's article on 'Pallas's Sand Grouse,' which appeared in the 'Zoologist' for December last; for during the previous months of August, September, and October, I was the fortunate possessor of a live male of this species. It was fairly tame when I received it, having then been in captivity about two months, and consequently I could observe its actions to advantage. Mr. Southwell mentions, from information he was able to gather, that when in captivity the Sand Grouse show a great indifference to water. I kept my bird in a cage made out of an old wine-case padded at the top to prevent injury to the bird when flying up suddenly. The bottom of the cage I covered with fine sea-sand about an inch in depth, but I soon had to substitute straw, as I found the bird's legs and belly were always in a mess from its persistently getting into the water-trough. I at first thought it had fallen in by accident when flying to the top of the cage, but having watched it for some time, I saw it on several occasions deliberately get into the water and remain there for some minutes at a time. On different occasions I have seen it drink, which it did after the manner of a Pigeon, filling the throat well before lifting its beak out of the water. Unfortunately it never got through the moult, and died in the month of October. On January 3rd, I had brought to me in the flesh another male Sand Grouse. It had been shot at Kelynaek, in St. Just-in-Penwith, the same place from whence I obtained my live specimen.—THOMAS CORNISH (Penzance).

Sand Grouse in Kent.—It may interest you to hear that a specimen of Pallas's Sand Grouse was picked up in the fog on the 14th December last with its head cut clean off, lying underneath the telegraph wires on the Isle of Grain railway. Three weeks previously four Sand Grouse had been

seen on a ploughed field five miles distant, which when disturbed, about ten yards off dropped again in the same field.—W. PRENTIS (Rainham).

Weight of the Pectoral Sandpiper.—Referring to the question which has arisen (p. 73) as to the weight of the Pectoral Sandpiper, I may remark that one which was shot in Norfolk, in September, 1887, weighed $2\frac{1}{2}$ oz., as reported by Mr. R. W. Chase (Zool. 1887, p. 433), in whose collection that specimen is preserved.—J. H. GURNEY, jun. (Keswick Hall, Norwich).

Dusky Redshank in Summer Plumage in Lancashire.—I don't know whether the occurrence of a Dusky Redshank (*Totanus fuscus*) on the coast of Lancashire is sufficiently unusual to merit a notice in the 'Zoologist,' but I may report that one was shot by a keeper in the month of April, four or five years ago, and he still has it stuffed. I had a good look at it, and found that it agreed exactly with the description in Yarrell's 'British Birds,' except that the legs and the dark red base of the lower mandible have lost their colour. The back also was whiter than I expected, but he explained that he had made the white show as much as possible for effect. When first observed the bird was standing by a pool on the "marsh" land near the mouth of the Ribble, and was quite tame, and he shot it on the ground. It is in the sooty black summer plumage as I suppose all these birds are in April.—CHARLES F. ARCHIBALD (Rusland Hall, Ulverston).

[Although *Totanus fuscus* is an annual migrant to the British Islands, passing through the country twice a year in spring and autumn, it is much less common during the former than the latter season. We have often seen it in September and October, but on two occasions only have we met with it in the breeding plumage, once in Breydon Harbour, Norfolk, and once in Pagham Harbour, Sussex, and have seen but few specimens in the black plumage procured in England. We remember once when staying at Abbeville in the autumn, and shooting on a marsh near St. Valery, on the south bank of the Somme, we fell in with a small flock of these birds, which were still in the black plumage peculiar to the breeding season. They were too wild however to suffer a sufficiently near approach to shoot one.—ED.]

Destruction of Eagles.—I observe with much pleasure the editorial protest against the destruction of Golden Eagles (p. 31), and, as I feel rather strongly on the subject, perhaps I may be allowed to emphasise, from personal observation, what has been said. In 1886 I was in North Uist, and enquired after a pair of Golden Eagles that had an eyrie on the island. They were protected by the proprietor. Were they thriving, then? No; they had nested duly, but the male bird had been trapped or shot, and the survivor was left a widow. In 1887 a pair of Golden Eagles occupied an eyrie in Skye. Of course, they bred? No; a keeper succeeded in

destroying one of them while the nestlings were still young. In 1888 another pair of Golden Eagles nested on the Skye coast: they had bred for several years just on the march between two properties, and, though our shepherds complained of losing lambs, we had been delighted to encourage them. In May, 1888, a keeper laid out some poisoned rats for Hooded Crows: one of the breeding Eagles took the poison, and its carcase was found on the hill-side some weeks later. I have its skeleton. These are instances of the destruction that goes on in spite of the efforts of proprietors to protect their Golden Eagles. The White-tailed Eagle has been similarly persecuted, and is all but extinct in Skye. Only a few years ago one miscreant shot an old bird of this species on her eggs, and sent bird and eggs to a collector in the South. On another occasion a shooting tenant shot the feathered young in the nest, as he could not get them alive. But I believe that most mischief is done by egg-collectors, who corrupt the morals of keepers and shepherds. One Edinburgh tradesman is reputed to have obtained a hundred Eagles' eggs from the Scottish Highlands; and if I was at liberty to reveal confidences, I could show that the instigators of egg-stealing are not all dealers by profession, as one would have supposed, but often men who well know what harm they are doing.—H. A. MACPHERSON.

Night Heron in Ireland.—A specimen of the Night Heron, *Nycticorax griseus*, was shot on December 31st, in an old quarry on the south side of Dublin. The bird is in the immature spotted plumage, was in very good condition, and measured 3 ft. 5 in. from tip to tip of wings, 1 ft. 11 $\frac{3}{4}$ in. from point of bill to end of tail. The stomach contained the remains of frogs.—EDWARD WILLIAMS (2, Dame Street, Dublin).

FISHES.

Clupea Finta, Cuv., at Killarney.—The occurrence of a Shad, *Clupea finta*, Cuv., in Killarney Lake, was first made known by the late William Andrews, who was informed that "Herrings" were occasionally captured by the fishermen. Charr are also often called "Herrings" in many of the Irish lakes, and I have obtained specimens of both Shad and Charr from the Lower Lake of Killarney. These Shad are taken by the "trawlers" when drawing their nets for Salmon, and especially when using a smaller mesh for Trout. I never saw any specimens at all equal in size to the Shads, also *A. finta*, which are taken in the river Moy, of which I have now before me a specimen measuring nearly 24 inches in length; or the so-called "Bony Horsemen," (*A. finta*), which in May frequent the mouth of the Blackwater in Waterford to the length of 20 inches. When visiting Kerry I often tried to ascertain whether anything was known of the breeding habits of the Killarney Shad, and whether it is ever found

ascending from the sea. But the result of my enquiries was that I could never hear of any being taken, either in the river Laune, or in the salt water. They are captured in numbers, and of various sizes according to the season of the year, always small, up to about Herring size; and I am now inclined to believe that these small Shads are resident in the Lake of Killarney, as in some of the Italian lakes. If this surmise is correct, we have here an instance of a land-locked Shad, resident and breeding in fresh water, perhaps an incipient species.—A. G. MORE (92, Leinster Road, Dublin).

New British Fishes.—At a recent meeting of the Zoological Society, Dr. Günther exhibited and made remarks on some fishes which had been taken on the west coast of Scotland by Mr. John Murray, and which were not previously known to occur in British waters. They were *Cottus Lilljeborgii* (Colett), *Triglops Murrayi* (sp. n.), *Gadus Esmarckii* (Nilsson), *Onus Reinhardti* (Colett), *Fierasper acus* (Brünnich), *Stomias ferox* (Reinhardt), and *Scopelus scoticus* (sp. n.). He also exhibited a specimen of *Lichia vadigo* (Risso), known previously only from the Mediterranean and Madeira, and which was taken in September last by Capt. MacDonald, off Waternish Point, Isle of Skye.

Hybrid between Roach and Bleak.—At the same meeting of the Zoological Society, Dr. Günther exhibited a hybrid between the Roach, *Luciscus rutilus*, and the Bleak, *Alburnus alburnus*, which had been taken in the river Nene, Northamptonshire, and forwarded by Lord Lilford.

PROTRACHEATA.

Peripatus in Victoria.—In 'The Zoologist' for February, 1888 (p. 69) we published a letter from Mr. A. Sidney Olliff, of the Australian Museum, Sydney, announcing his discovery of *Peripatus* (presumably *P. Leuckhartii*) in New South Wales, on a tributary of the Hunter River, about 120 miles from the coast. Mr. Arthur Dendy, formerly of the British Museum (Nat. Hist.), but now of the University of Melbourne, writes to say that in December last, while exploring a fern-tree gully at Warburton, on the Upper Yarra, Victoria, he found two specimens of *Peripatus*, believed to belong to a new and very beautiful species. He is not yet certain whether it is identical with the *Peripatus* recorded by Mr. Fletcher, from Victoria (Proc. Linn. Soc. N. S. Wales, vol. ii. part i. (1887), see 'Zoologist,' 1888, p. 69), but can only state at present, that if Mr. Fletcher's species be *P. Leuckhartii*, the newly acquired specimens do not agree with the description of that species published by Prof. Sedgwick, in his Monograph of *Peripatus*, printed in the 'Quarterly Journal of Microscopical Science.'

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

February 5, 1889.—Mr. C. B. CLARKE, M.A., F.R.S., Vice-President, in the chair.

Messrs. J. R. Green and J. W. White were admitted Fellows of the Society; and, on a ballot taking place, the following were elected:—The Earl of Ducie, Messrs. Henry Hutton and Malcolm Lawrie.

The Rev. E. S. Marshall exhibited several interesting varieties of British plants collected by him in Scotland, and made remarks thereon.

Mr. E. M. Holmes exhibited a specimen of a new British Marine Alga, *Rhododermis elegans*, Cr., var. *polystromatica*. Previously this Alga was only known to occur at Brest. The discovery of it at Berwick-on-Tweed by Mr. E. L. Batters, and at Bognor by Mr. Holmes, therefore extended its geographical distribution. The variety found in Britain was new to science, since the typical plant was found by Crouan to have only two layers of cells, whilst the British plant had several, although it did not otherwise differ from the type.

A paper was then read by Mr. A. D. Michael on three new species of parasitic *Acari* discovered by him in Derbyshire during the autumn of 1888. These were a *Myocoptes*, proposed to be called *M. tenax*, parasitic on the Field Vole, *Arvicola agrestis*; a *Symbiotes*, proposed to be called *S. tripilis*, parasitic upon the Hedgehog; and *Goniomerus musculus* (gen. et sp. nov.), a minute parasite found on the ear of the Field Vole. Specimens of all three were exhibited under the microscope, and a discussion followed in which Professors Mivart, Stewart, and Howes took part.

Prof. Martin Duncan then gave the substance of an important paper which he had prepared, entitled "A Revision of the Families and Genera of the *Echinoidea*, recent and fossil." Reviewing the labours of his predecessors, Prof. Duncan traced the growth of the literature of his subject, and showed that although many lists and papers had been published from time to time, no general review of the class *Echinoidea* had been attempted since 1846. Dealing with all the material at his command, he found it necessary to propose certain alterations in the classification, and to dispense with a good many genera and subgenera, which he considered had been needlessly founded. Above all, he had set himself the task of revising the descriptions of the genera, giving positive instead of comparative characters, a course which he believed would prove of great utility to students. The paper was criticised by Mr. Sladen, Prof. Stewart, and Mr. Breeze, all of whom testified to the necessity which had arisen for some authoritative revision of the subject such as had been undertaken by Prof. Duncan, and

which undoubtedly would lighten very considerably the labours of future enquirers.

The meeting adjourned to February 21st.

ZOOLOGICAL SOCIETY OF LONDON.

February 5, 1889.—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 during the month of January, 1889.

Mr. Sclater exhibited a living specimen of the Thick-billed Lark, *Rhamphocoris clotbeyi*, lately received by the Society from Southern Algeria, and called attention to its structural peculiarities.

Mr. G. A. Boulenger read a paper on the species of Batrachians of the genus *Rhacophorus*, hitherto confounded under the name of *R. maculatus*, and pointed out their distinctions.

Mr. Sclater pointed out the characters of some new species of birds of the family *Dendrocolaptidæ*, which were proposed to be called *Upucerthia bridgesi*, *Phacellodomus rufipennis*, *Thripophaga fusciceps*, *Philidor cervicalis*, and *Picolaptes parvirostris*.

A communication was read from the Rev. O. P. Cambridge on some new species and a new genus of Araneidea. Two of these species (*Pachylomenus natalensis* and *Stegodyphus gregarius*) were based on specimens living in the Insect House in the Society's Gardens.

A communication was read from Prof. F. Jeffrey Bell, containing descriptions of new or rare Holothurians of the genera *Plexaura* and *Plexaurella*.

Dr. Günther exhibited and made remarks on some fishes which had been dredged up by Mr. John Murray off the west coast of Scotland, and were not previously known to occur in British waters, viz. *Cottus lilljeborgii* (Collett), *Triglops murrayi*, sp. n., *Gadus esmarkii* (Nills.), *Onus reinhardti* (Collett), *Fierasper acus* (Brünn.), *Scopelus scoticus*, sp. n., *Stomias ferox* (Reinhardt).

Dr. Günther also exhibited and described a specimen of *Lichia vadigo* (Risso), a species of which only a few specimens were previously known from the Mediterranean and Madeira: this specimen was obtained by Capt. MacDonald on Sept. 17th, 1888, off Waternish Point, Isle of Skye. He also exhibited a hybrid between the Roach (*Leuciscus rutilus*) and the Bleak (*Alburnus alburnus*), sent to him by Lord Lilford from the river Nen, Northamptonshire.

Mr. Beddard read a paper descriptive of the coloured epidermic cells of *Æolosoma tenebrarum*.

Mr. Boulenger exhibited and made remarks on a series of living

specimens of Tortoises of the genus *Homopus* from the Cape Colony, lately received by the Society from the Rev. G. H. R. Fisk.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

February 6, 1889.—The Rt. Hon. Lord WALSHINGHAM, M.A., F.R.S., President, in the chair.

The President announced that he had nominated Capt. H. J. Elwes, Mr. F. Du Cane Godman, F.R.S., and Dr. Sharp, Vice-Presidents for the session 1889-90.

The Rev. F. D. Morrice, M.A., of Rugby; Mr. A. Robinson, B.A., of Brettanby Manor, near Darlington; and Mr. H. Burns, of Fulham, S.W., were elected Fellows.

Lord Walsingham exhibited a larva of *Lophostethus dumolini*, Guer., sent to him by Mr. Gilbert Carter, from Bathurst, West Coast of Africa.

Mr. G. T. Porritt exhibited several melanic specimens of *Boarmia repandata* from Huddersfield, and, for comparison, two specimens from the Hebrides. Mr. M'Lachlan remarked that melanism appeared to be more prevalent in Yorkshire and the north midlands than in the more northern latitudes of the United Kingdom.

Capt. Elwes read a paper "On the genus *Erebia*, and its geographical distribution." The author, after referring to the number of species and named varieties, many of which appeared to be inconstant as local forms, made some remarks on the nomenclature of the genus, and suggested that a better system of classification might be arrived at by anatomical investigation. It was stated that little was known of the early stages and life-history of species of this genus, the geographical distribution of which was Alpine rather than Arctic. The author remarked that it was curious that there was no species peculiar to the Caucasus, and that no species occurred in the Himalayas, where the genus is replaced by *Callerebia*; that none were found in the Himalo-Chinese Subregion, and none in the Eastern United States of America. He also called attention to the similarity of the species in Colorado and North-West America to the European species. Lord Walsingham, Mr. Waterhouse, Mr. O. Janson, Mr. M'Lachlan, Dr. Sharp, and Mr. Jenner Weir took part in the discussion which ensued.

Mr. W. Warren read a paper "On the *Pyralidina* collected in 1874 and 1875 by Mr. J. W. H. Traill in the Basin of the Amazons."

Mr. C. J. Gahan read a paper entitled "Descriptions of new or little-known species of *Glenea* in the Collection of the British Museum."

Dr. J. S. Baly communicated a paper entitled "Notes on *Aulocophora* and allied genera."—H. Goss, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

Our Rarer Birds : being Studies in Ornithology and Oology.
 By CHARLES DIXON. With Twenty Illustrations by CHARLES
 WHYMPER, and a Frontispiece by J. G. KEULEMANS.
 8vo. pp. 373. London : Richard Bentley & Son. 1888.

THE title of Mr. Dixon's book is not well chosen, for to those who are tolerably familiar with British birds it does not convey an accurate indication of the contents. We will not do Mr. Dixon the injustice to suppose that he really regards as rarities a number of Birds which most naturalists agree in considering very common (that is, common in their natural haunts and at their proper seasons); but when we find classed as rarities such familiar species as the Brown Owl, the Butcher-bird, Nightingale, Reed Warbler, Green Woodpecker, Nightjar, Stock Dove, Turtle Dove, three or four kinds of game, and such well-known shore-birds and sea-birds as any one may meet with in the course of an ordinary walk along the coast, we fail entirely to appreciate the author's idea of rarity. That he has enjoyed good opportunities however for studying a variety of birds in their natural haunts is evident from his descriptions, many of which are well written, and accurate so far as they go, though they do not contain much that is new. The freshest paragraphs, perhaps, are those which relate to the habits of some of our British birds as observed abroad, and these are interesting enough. Take, for example, the case of our well-known Hawfinch, concerning which Mr. Dixon writes :—

“ I had many opportunities of studying the habits of the Hawfinch in the evergreen-oak forests of northern Africa. One would almost be led to think that the cause of the bird's shyness in England was owing to the manner in which it is persecuted by gardeners and collectors, if we did not find it just as wild and wary in these forest solitudes where it is never molested by man. I first met with the Hawfinches in a clearing of the forest, where the trees were scattered up and down in little clusters, and, as a rule, it was only when they flew from tree to tree that I could get a view of them. Sometimes I observed them sitting quietly among the branches, turning their large heads from side to side in evident alarm, and peering about in all directions as if in search of the danger. The flight of the Hawfinch is undulating, but sometimes straightforward, and is then

very rapid. As the birds flew from tree to tree, I noticed that they usually dropped down into the branches in preference to flying up into them from below. When sitting in the trees the males occasionally uttered a twittering note, which put me in mind of the Greenfinch. In fact, the Hawfinch possesses slight claim to rank as a songster; in the vernal year it utters a few loud notes, which might almost be called monotonous, if several birds did not join in the chorus, when the general effect is far from unpleasing. Many birds love to perch in conspicuous positions when engaged in song, but the Hawfinch twitters from the dense recesses of the foliage, and keeps well out of sight amongst the trees.

Writing of the Pied Flycatcher (p. 51) he says:—

“I have had many opportunities of studying the habits of this interesting bird, both in North Africa, where it is specially common, and in the wooded hill districts of Yorkshire. In the former country I met with it both in the oasis of the Sahara, as well as in the Arab gardens high up the solitudes of the Aures Mountains. In England it loves the birch coppices near the mountain streams, especially where old decaying timber is abundant; and in all situations its conspicuous dress of black and white makes its identification easy. . . . In Africa this species is constantly to be seen in company with the Spotted Flycatcher, but in Great Britain the haunts of the two species are considerably different,—one bird loving the wilderness, and the other cultivated localities and the habitation of man.”

It would have been well, perhaps, if Mr. Dixon had told us a little more about the St. Kilda Wren, which from his remarks might be supposed to have been unknown until, as he says, he was fortunate enough to discover it some four years ago. All that Mr. Dixon really did was to remind ornithologists that a Wren existed on St. Kilda, which was little known for the reason that few naturalists visit that remote isle. But it was no new discovery, for the bird in question may be found mentioned in Macaulay's 'History of St. Kilda,' 1764; and even longer ago than that, in Martin's 'Voyage to St. Kilda,' 1698. Mr. Seebohm, in 1884, conceiving from its isolated haunt that it might present some peculiarity as insular forms often do, and believing from examination of a specimen brought from St. Kilda by Mr. Dixon, that it might be specifically distinguished from the common Wren of this country, described it in 'The Zoologist' for 1884 (pp. 333—335) under the name *Troglodytes hirtensis*, giving at the same time a nicely engraved figure of it. The following year in 'The Ibis' (1885, pp. 69—97), Mr. Dixon referred to it in an

account which he gave of the Ornithology of St. Kilda, accompanied by a coloured plate of the supposed new Wren, and it is an uncoloured copy of that plate (although the author has omitted to say so), which forms the frontispiece to the present volume. Since then other specimens of the bird have been received from St. Kilda, and from an examination of these it is now generally admitted by ornithologists that Mr. Dresser is probably right in his opinion ('The Ibis,' 1886, p. 43), that after all *Troglodytes hirtensis* is not specifically distinct; an opinion lately echoed by Mr. Saunders in his 'Illustrated Manual of British Birds.' As none of these facts have been alluded to by Mr. Dixon in the volume now under review, it can hardly be said that his chapter on this bird places its history in a true light.

It is curious what misconception exists in the minds of most modern writers on birds whenever they take occasion to refer to Falconry. They almost invariably allude to it as a thing of the past, and (notwithstanding the information afforded by the "Falconry" columns of 'The Field'), are apparently quite unaware of the fact that hundreds of Partridges and Grouse are killed in this country every game season with trained Peregrines; that numbers of Larks are taken with Merlins; and Blackbirds and Thrushes with Sparrowhawks; and that a dozen owners of Goshawks might be named, who annually take scores of rabbits and fewer hares with their trained birds.

Mr. Dixon apparently is one of those who imagine that the art of Falconry is no longer practised in this country, judging by his remarks (p. 26), and he is equally in error when asserting (p. 28), that "Peregrines prey upon the weakly, the weary, and the unwary." Had he seen as many Grouse and Partridges killed by Peregrines as the writer of this notice, he would never have penned the lines above quoted. We are well aware that much has been written in an attempt to prove that Falcons and Hawks are "nature's police," that by killing the weakly game birds (because they are presumably the easiest to catch) they render infinite service to man by leaving only the healthiest and strongest birds to breed. This is a very pretty theory, but unfortunately for its supporters it is not true. It is undoubtedly the fact, that certain birds of prey, like the Harriers and Owls which fly low, and quarter their ground closely, carry off numbers of defenceless young birds, and old ones too occasionally, when

they find them at a disadvantage, a method not unpractised by the Sparrowhawk; but they have to take their chance of securing healthy or sickly birds as the case may be. The Peregrine, so far from selecting the youngest or weakest bird in a covey (apparently the easiest to catch), will often knock down the leader at a distance, perhaps a fine old cock bird. We have repeatedly seen a Falcon ignore a young Grouse directly under her, and stoop with success at a fast-flying bird much further away from her; the inevitable conclusion being that there is no need for such an hypothesis as that of taking the weakest, for the power of wing in a Falcon is such as to place any quarry that may be selected at a disadvantage, unless by throwing itself headlong into the heather, bracken, or other cover, as a Grouse often does, it contrives to avoid the fatal stoop.

While on the subject of Hawks, we may remark that the description given of the plumage of the Merlin (p. 32) is insufficient "to enable the young naturalist to identify" this bird, since it applies only to the adult male; and the majority of Merlins procured in this country are in the very different plumage of immaturity.

Glancing at the chapters on Game-birds, the account given of the Capercaillie (pp. 151-154) strikes us as being quite inadequate after the exhaustive treatise on this bird published by Mr. Harvie Brown,* which was reviewed in this journal in 1879 (p. 468), and of which no mention is made by Mr. Dixon. Had he referred to this source of information he would have discovered that so far from having to go back 400 years to find the Capercaillie common in the pine forests of Scotland, the date of its extinction may be fixed no longer ago than 1760, and that of its re-introduction, 1836.

In the chapter on the Red-legged Partridge (pp. 165-169) there are several statements open to criticism. "This bird," says Mr. Dixon, "is not indigenous to this country, but was introduced here like the Pheasant, so long ago that we have quite got to look upon it as a bird of the southern fields." But the two birds are not to be placed upon the same footing, for the Pheasant was introduced by the Romans, while the Red-legged Partridge was not acclimatized here until the latter half of the last century.

* 'The Capercaillie in Scotland.' By J. A. Harvie Brown. 8vo, pp. 155. Edinburgh: Douglas. 1879.

Again, we are unable to accept the statement, that "unlike the Pheasant, its immigration [a term wholly inapplicable] has not been attended with very great success." So far from this being the case, there is abundant evidence to show that from all its centres of introduction it has spread in every direction, and is now to be found in many counties to which it must have found its way unaided by man's intervention.* "It is, perhaps, fortunate," says Mr. Dixon, "that the Red-legged Partridge does not thrive very well in this country, because in all the localities in which it has established itself, the Common Partridge has sensibly decreased in numbers, and in some places has been completely exterminated by the larger and much more pugnacious species."

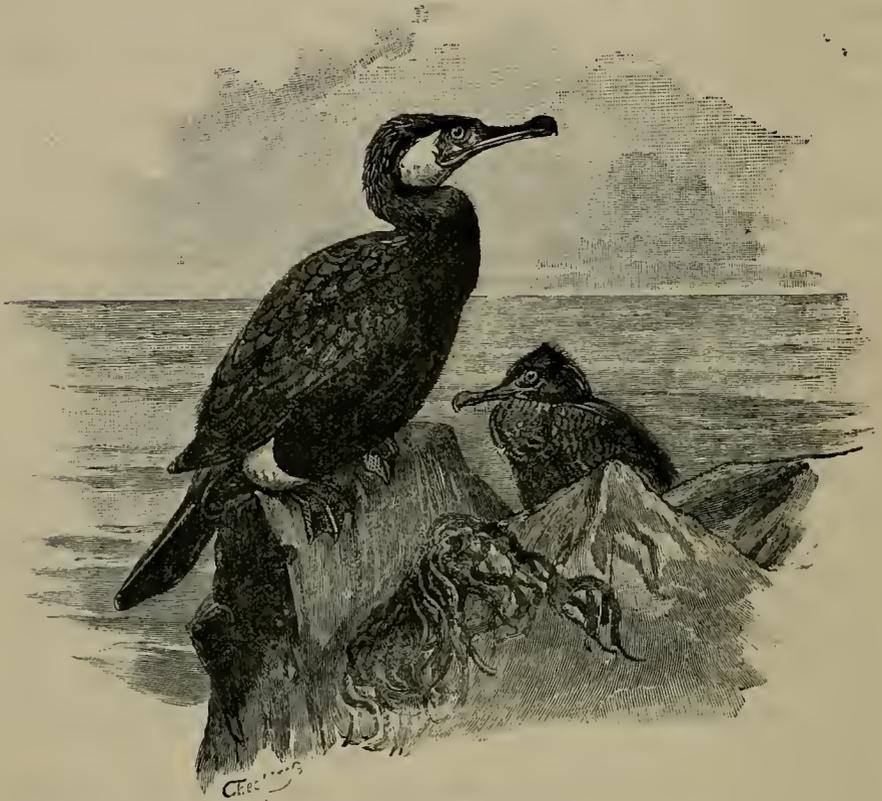
We do not know to what "places" Mr. Dixon refers, but having shot for many years in Norfolk, Suffolk, Essex, and Sussex, in all of which counties the Red-legged Partridge is well established, we can assure him that the view above expressed is quite contrary to our experience. We have not only found a good stock of both species occupying the same farms, but have flushed covies of both in the same field, and have known many instances of their laying in each other's nests. That there is no danger of the Grey Partridge being "completely exterminated" by the Red-legged species, may be inferred from the statistics furnished by Prof. Newton, in an article in 'The Ibis,' for 1861, p. 194.

The statement (p. 167) that "the nesting season of the Red-legged Partridge is much earlier than that of the common species, the eggs being laid by the end of April or beginning of May," is negatived by the fact that we have repeatedly seen eggs of the Grey Partridge during the first week of April, and eggs of both species, as above stated, in the same nest.

But enough of adverse criticism. Mr. Dixon's book has much in it to recommend it to the notice of all lovers of bird life; and if, here and there, there are passages which stand in need of correction, or amplification, there are many pages detailing the result of much patient observation, which will be acceptable to those who, with the same tastes as Mr. Dixon, have had fewer opportunities of indulging them.

* See an article "On the Local Distribution of the Red-legged Partridge," in 'The Field,' 27th Jan. 1883.

A word of praise must be bestowed also upon the capital illustrations by Charles Whymper. Some of them, to a critical eye, may be thought a little faulty in outline, but there is no mistaking the species for which they are intended; and in most of them the drawing as well as the engraving is excellent. Amongst those which strike us as being particularly true to nature are the Oystercatcher (p. 185), and the Cormorant (p. 342), the latter of which through the courtesy of the publishers we have been permitted to reproduce.



CORMORANT AND SHAG.



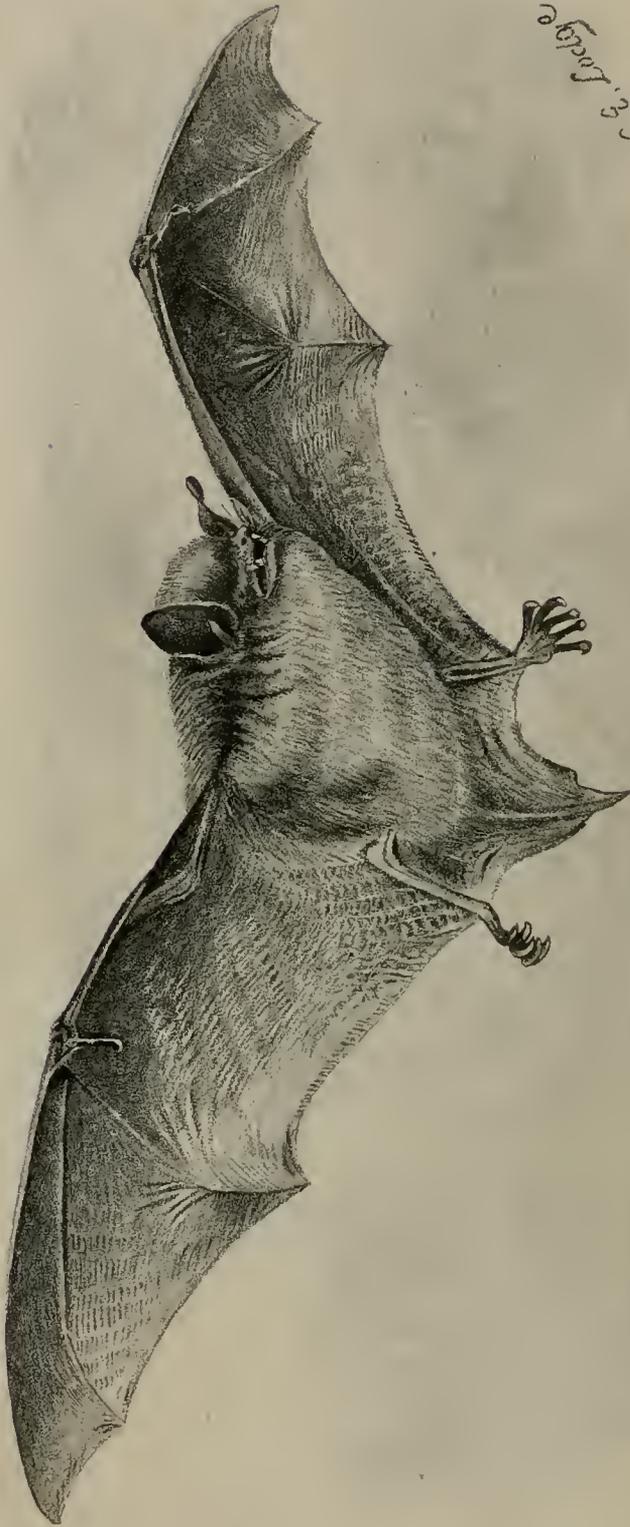


Fig. 25
Folige

Daubenton's Bat.
Vespertilio daubentonii.

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[No. 148.

NOTES ON THE SEAL AND WHALE FISHERY OF 1888.

BY T. SOUTHWELL, F.Z.S.

IF perseverance could command success surely the Greenland and Davis Straits whalers would be richly rewarded, yet year after year they renew their costly outfit, and venture amongst the thick-ribbed ice, braving the fogs, storms, and countless discomforts of the Arctic Seas only to return disappointed men! Surely there must be some peculiar fascination which attracts them year after year to the inclement north to so little profit; for eight seasons I have chronicled the declining results of their efforts, and am at a loss which most to admire, their indomitable perseverance, and the tenacity with which they cling to their vanishing industry, or the manly courage with which they bear their reverses. Whaling, like mining, is a "venture" which may prove a great success or the reverse, and there is all that element of uncertainty attending such a voyage which to adventurous men possesses so great a charm. Who can tell but to-morrow their toil may be sweetened by success, and the vessel bear up for home a "full ship," or any season the state of the ice may be found to have changed, and the long series of bad years give place to a series as remarkable for their successes?

The report from the Newfoundland Sealing for 1888 shows an improvement upon that of the previous season, the total number captured by the British vessels being 210,810 against 177,733, and no casualties have occurred. The fleet consisted of the same vessels as took part in the season of 1887, with the exception

of the 'Arctic,' which was lost at the Whale fishery in Davis Straits, and has not been replaced. Nineteen vessels were present, three of which are reported "clean," and the average of the remaining sixteen was 13,176 per vessel; but as usual the take was very unequally distributed, although not so much so as in 1887, for seven vessels made cargoes of over 15,000 (against four only in the previous year), *viz.* the 'Neptune,' 42,242; the 'Eagle,' 26,000; the 'Aurora,' 25,000; the 'Ranger,' 24,151; the 'Esquimaux,' 22,824; the 'Iceland,' 16,000; and the 'Falcon,' 15,811; an average of 24,575, whilst the remaining nine vessels averaged only 4309. No second trip was made this season. The value of the Newfoundland oil was about £19 15s. per ton, and the skins produced from 10s. to 18s. each. Four Dundee vessels were at the Newfoundland sealing, *viz.* the 'Aurora,' which took about 25,000; the 'Esquimaux,' 22,824; the 'Terra Nova,' 11,895; and the 'Polynia,' 7135; all of which are included in the above total.

The young Greenland sealing was much more successful than in 1887; there were some twenty-three Norwegian and three Scotch vessels present; the former took 38,200, and the latter 1700, or a total of about 39,900 young Saddle Seals. In addition to the 1700 young seals it appears that the Scotch vessels subsequently shot some 9388 others, almost all Bladder-nose; and the 'Alert' returned from Cumberland Gulf with 3300, which brought the Greenland total up to 14,388.

At the Newfoundland and Greenland old and young sealing together, eleven Scotch vessels captured 82,235 seals (against 57,240 in the previous season), showing a considerable increase in both fisheries, but a total vastly smaller than was annually secured in days gone by. These at an average of, say, 10s. per skin, would produce £41,117, to which must be added 997 tons of oil at £20 per ton, £19,940, or a total of £61,057, against a similar estimate of £30,852 for 1887—a much more satisfactory return, so far as this branch of the industry is concerned, the result being helped as well by the increased capture of seals as by the slightly better prices of produce. Included in the seal-oil is the yield of 311 Walrus brought home by the Davis Straits vessels.

The total number of vessels which left Dundee last season for the Seal and Whale fishery was ten, the same as in 1887, the

'Earl of Mar and Kellie,' which was not out last year, taking the place of the 'Arctic,' which, as already stated, was lost in Davis Straits. The list of Peterhead vessels is increased to six, against four the previous season, for although the 'Erick' has entered the Hudson's Bay service, the 'Windward,' which had not been out since 1884, was put in her place for the sealing, and the return of the 'Alert' from Cumberland Gulf, where she had wintered, as also an irregular voyage, apparently undertaken for sporting purposes by the 'Traveller,' gave an apparent increase of numbers, which, however, was not real.

Any slight advantage which was gained in the sealing was more than lost in the Whale Fishery; this was particularly the case at Davis Straits, the eight whales taken there being very small, and yielding only 43 cwt. of bone; the Right-Whale oil is not given separately, the returns under that head including the White-Whale oil also; but at the usual average of one ton of oil to every cwt. of bone, it will be seen that this branch of the fishery was far from remunerative. As in the past two seasons the ice has never cleared out of the Straits, its position remaining practically unaltered; and until this clearance takes place, I am informed, it is the opinion of practical men that there will be no fishing in Davis Straits, the whales having sufficient shelter to prevent the vessels getting within reach of them. I am told the spring fishing for this reason, although many whales were reported by the natives, was a complete failure, and that in the fall no whales were seen, that the eight whales secured were all caught in Lancaster Sound in July, and that even from this once-favoured locality the fish have either been killed off or have gone elsewhere, thirteen being the total number seen there during the past season. The 'Active' returned clean.

The reports from Greenland are not less unfavourable, not so much owing to the scarcity of whales as from continued bad weather, and the extremely unfavourable condition of the ice; only four whales were brought home from Greenland, which although very small, yielding only 44 cwt. of bone and 52 tons of oil, must have been greatly superior to those from Davis Straits; two of these fell to Capt. D. Gray of the 'Eclipse,' and two to his brother, Capt. J. Gray of the 'Hope.' The 'Perseverance' from Cumberland Gulf came back clean. I shall refer to the voyage of this vessel farther on.

The total quantity of whaling produce brought home by the Dundee and Peterhead vessels was 286 tons of whale-oil, the bulk of which would be the produce of 902 White Whales, 28 tons of Bottle-nose oil, and 4 tons 7 cwt. of bone. The oil, at £20 per ton for Whale-oil and £26 for Bottle-nose, represents £6448, and the bone, at £1600 per ton (allowing for under-size), about £6360 more; together, £12,808, against a like estimate for 1887 of £17,060, notwithstanding the increased price of bone. This is by far the smallest amount I have yet had to record. To show the serious falling off in this branch of the industry, I may mention that the estimates made on the same basis in my last five years' Notes have been as follows:—£88,570 in 1884; £31,800 in 1885; £29,890 in 1886; £17,060 in 1887; and in the past season £12,880 only.

In addition to the Whales and Seals above recorded, 311 Walruses and many Bears were obtained.

Of the incidents of Capt. Gray's voyage in the 'Eclipse' there is no need to speak, as Mr. Robert Gray, his son (and chief officer), has already communicated extracts from his "Log" to 'The Zoologist' (pp. 1, 41, 81 *ante*).

I have mentioned the 'Perseverance,' which returned clean to Peterhead after a fourteen-months' voyage to Cumberland Gulf. I have been favoured with some particulars of her voyage, which I will briefly condense, as they will indicate the character of the autumn and spring fishery, to engage in which the vessels winter in Cumberland Gulf. The 'Perseverance,' a barque of 163 tons, left Peterhead on July 20th, 1887, and after a very stormy passage arrived at Cumberland Gulf on Sept. 14th, where she discharged stores at Blacklead Island, the American station. Thence she was towed by the 'Active' s.s. (of Dundee) to Kickerton, to discharge more stores for Mr. Noble's station, returning to Blacklead Island, and proceeding to Niantilick (Winter Harbour), to take up position for the fall fishing. After about four weeks the ice began to make, and she attempted to get down to Harrison's Point; but a southerly gale broke up the ice, and drove her and the 'Germania,' another sailing vessel belonging to Peterhead, outside the islands altogether, and they wintered off Bouilli Island in company. In the spring the Gulf was so filled with ice that they could not get their boats into the water, and the fishing was a failure; an attempt for White Whales was equally

unsuccessful, the fish breaking back and all escaping. Finally the 'Perseverance' left for home on August 28th, 1888, the 'Germania' staying for the fall fishing. Only one Right Whale is said to have been seen, and the other vessels and stations in the Gulf are reported to have had no better fortune than the 'Perseverance.'

One of the most successful whalers is Capt. Adams, formerly of the 'Arctic,' but now commanding the 'Maud,' and in the past season his good fortune (skill?) has not failed him. Capt. Adams arrived from Davis Straits with a full ship, his cargo consisting of three small Right Whales, 300 White Whales, 1000 Seals, and 175 Walrus, yielding 115 tons of whale and seal oil and 13 cwt. of bone; he also obtained several Bears, one of which he brought home alive. The following is a brief account of Capt. Adams's voyage to Davis Straits, extracted from one of the Dundee papers, which I hope you will allow me to quote, as it not only shows the state of the ice in Davis Straits, but also gives a fair idea of the course followed by the Straits fishers.

Capt. Adams states that the S.W. fishery proved barren on account of the stormy weather. Three times the vessel was driven down near to the Labrador coast, 180 miles distant, and each time three days were occupied in regaining the fishing-ground. A number of Seals were secured, but only one Whale was seen, and the crew failed to capture it. As there were no prospects of success at the S.W., the whale-fishing on the E. side of Davis Straits was attempted, but the impenetrable fields of ice barred the way, and nothing could be done. The voyage northward was therefore continued to Disco, where a number of Walrus, Seals, and Bears were shot. In communication with the natives, Capt. Adams learned that many large Whales had been seen off Disco early in the year, but that the natives had been unable to capture any of them. Melville Bay was comparatively clear of ice, so that no difficulty was experienced in crossing it. Continuing northward, Cary Islands were passed, and Capt. Adams made an attempt to reach what is known as the Middle Ice fishing-ground. But here no open water was to be seen, the whole of Baffin's Bay being completely blocked with ice. The only course was to get up Lancaster Sound, and this was effected after great difficulty, a way having to be cut for a considerable distance through the ice-barrier at the entrance to the Sound. Lancaster Sound was

exceptionally full of ice, but a passage was made to Prince Regent Inlet, a favourite resort of the Black and also of the White Whale. Here the crew succeeded in capturing three Black Whales, one of medium size, with 9 ft. 3 in. in bone, one small fish, the third being a sucker. After the disappearance of the Black Whales the 'Maud' proceeded down the Inlet to Elwin Bay, where a shoal of White Whales was surrounded by the boats and the fish driven into a sheltered creek. Here on the tide receding the men entered the water and speared the fish, 300 of which were captured. The scene at the capture was most exciting, the men being waist-deep in the water, while the fish were raising the mud by the violent lashing of their tails in their struggles to escape. After these Whales—all large males—had been got on board it was found that the 'Maud's' tanks were full, and she returned through Lancaster Sound and down the W. side of Davis Straits, along which so much ice was packed that there was no chance of prosecuting the fishing, even although Whales had been seen. The 'Maud' accordingly bore up for home.

I have again to thank Messrs. W. Grieve & Co., of Greenock, for the statistics of the Newfoundland Sealing; Mr. David Bruce and Mr. Kinnes, of Dundee, and Capt. David Gray and his son Mr. Robert Gray, of Peterhead, have also, as usual, very kindly rendered me great assistance.

FIELD NOTES IN WESTERN SWEDEN.

BY F. P. JOHNSON.

THE following notes were made in the summer of 1888, when I paid a short visit to a relative who happened to be renting the fishing and shooting of Lake Änn, in Western Sweden. This lake is fed by three tributaries, all of which rise upon the watershed dividing Norway from Sweden. Their united waters pass through a chain of lakes, of varying extent, and flowing eastward as the River Ljungan, enter the Gulf of Bothnia near Sundsvall. Lake Änn extends about ten miles in length, and probably measures seven miles in span, including several large islands within its area. Its depth is for the most part insignificant, but the southern extremity is very deep. The finest of its tributaries

is the Handel, which rises on Sylfjellen (6552 ft.), and a short distance above the lake falls over a fine fosse, thence forcing its way through numerous small channels, intersected by islets overgrown with mountain-ash and willow.

When I arrived, on June 11th, the deeper end of the lake was thickly coated with ice, and snow lay in drifts down to the water's edge. The season was unusually late, and a rapid thaw caused the lake to rise considerably above its usual level. Lake Änn is situated in the heart of a forest region. Upon its eastern border the forest is continuous, only broken by the occasional presence of small clearings; on the western side it extends from the margin of the lake (2000 ft.), until the tall spruce-firs give place to a broad belt of dwarf willows. Across the lake, from our quarters, snow-capped ridges of hills extend in one unbroken line along the horizon.

That birds were extremely scarce was my first impression of this wild region, and although, as spring advanced, fresh species appeared, we never found many birds except in the neighbourhood of the lake.

The Fieldfare was first noticed on June 12th; on the 24th I took a clutch of fresh eggs, between which date and July 5th we examined many nests of this Thrush, some incomplete and empty, others containing incubated eggs. A few Ring Ouzels nested on the nearest fells. Redstarts found attractive stumps of old timber near the water, and I lifted a hen Redstart off her incubated eggs on June 28th. I was anxious to find the Dipper, *Cinclus melanogaster*; but our boatman, who knew it well, said that the resident birds had been killed, he thought, by the severity of the preceding winter.

Numerous Willow Warblers haunted the forest as well as bushes near the water, while an occasional Marsh Tit flitted through the woods. Every farmstead was frequented by a pair of White Wagtails, but the Grey-headed Wagtail, *Motacilla cinereocapilla*, was seen only on the islands of the lake. The Tree Pipit was the only species of *Anthus* observed; one obtained at Lake Änn proved to be smaller than an average English specimen. House Martins built their mud-nests under the eaves of our farmhouse, but we only observed the Swallow coursing over the country.

The weather during my stay was brilliantly fine, and the

Bramblings, *Fringilla montifringilla*, sang out jubilantly from their favourite fir-tops. A nest of this finch, taken on June 28th from a spruce-fir, contained seven eggs. The materials included fresh moss and fine stems of grass, trimmed with grey lichens, and quilted inside with feathers (among which we recognised with pleasure some feathers of the Nutcracker, the only intimation we had of its presence in the neighbourhood). Another common bird was the Reed Bunting. Magpies nested near our quarters, and visited us daily for scraps, an office in which the Hooded Crows, being early abroad, frequently forestalled them. The Cuckoo and Swift were likewise present. Once I picked up some feathers of a Snowy Owl, but we never saw or heard any Owls, nor did the Kite or Rough-legged Buzzard ever cross our path. The Merlin was fairly common, and I was interested to find one sitting on her eggs in a spruce-fir, about thirty feet from the ground. I shot her off the nest for identification. Her eggs were fresh, and the nest appeared to be that of a Hooded Crow.

Desiring to obtain eggs of the Osprey, I visited two eyries that were tenanted and several old ones; but no eggs were to be had, though I gave up much time and trouble in an attempt to secure them. One of the nests I photographed. In both of those in repair the old Ospreys had chosen to build on spruce-firs, the tops of which had been broken off previously, thus forming a natural platform for the compact pile of strong and interlaced sticks of which the nest was composed. In this part of the country, fish being difficult to obtain in abundance until the end of July, the Ospreys breed late, in order to cater the better for their young; our boatman had once taken young Ospreys out of an eyrie in August.

The *Tetraonidæ* of the district are Hazel Grouse, Capercaillie, Black-game, and Willow Grouse, regarding the first of which we learnt nothing new. Capercaillie nested freely in the district, and I often saw their droppings. Black-game preferred the islands, on one of which I disturbed a grey hen sitting on six eggs. For Willow Grouse the likeliest ground was upon the verge of the forest. The only eggs of the Willow Grouse that I obtained agree pretty closely in colour with a common reddish variety of *Lagopus scoticus*, but are decidedly smaller and in shape less spherical.

Fishing occupied so much of our time, as to afford considerable facility for observations on such wildfowl as tenanted

the lake. I never identified the Mallard, Teal, or Pintail; nor did I find a Wigeon's nest, though a hen Wigeon, when shot, showed by her bared breast, that she had already commenced the duties of incubation. A pair of Scaups, *Fuligula marila*, might be seen daily feeding at the mouth of the Handel, but when shot, on July 2nd, their plumage showed no signs of breeding. The drake wore the usual nuptial dress; his mate was an interesting bird, exhibiting very little freckling on the back, and having the white under parts closely mottled with brown feathers, producing a marbled appearance.

Goldeneyes came flying up the river to fish every evening, and I often saw them at other times, but never came across a nest. When I first arrived, Common Scoters, *Ædemia nigra*, were numerous on the lake, swimming in flocks of from fifteen to twenty birds. I found a full nest of the Common Scoter within a few feet of the water; it was placed under cover of a drooping fir-branch, and resembled that of the Mallard. I also found some sucked eggs of this species. The Velvet Scoters, *Æ. fusca*, had already paired when I first saw them on June 11th, but it was not until the 18th that I found a nest of this duck on a small island overgrown with bilberry. The nest, composed of down and dry leaves, was placed at the foot of a stump of mountain-ash—rather an exposed situation, but the eggs were slightly covered up. I shot a female Velvet Scoter off another nest a few days later; this was placed under a low branch of birch, and contained eight eggs. Two drakes which I shot on the lake at the same time were in full nuptial dress, and showed no signs of eclipse. They are strong birds, very tenacious of life, and hard to kill. Red-breasted Mergansers, *Mergus serrator*, were common, and nested freely on the islands, concealing their nests beneath long, trailing branches of firs close to the water. I shot a couple of drakes in full eclipse in the middle of June.

The prevalence of marshes near Lake Änn raised premature hopes that we should meet with some of the rarer waders, and had time enabled us to explore the morasses carefully we should no doubt have been rewarded. Cranes were observed, but only as passing over us, nor did the Red-necked Phalaropes, *Phalaropus hyperboreus*, prolong their visit to the lake beyond a day or two, when we watched them floating quietly on the water.

Golden Plovers, of course, nested on the fells, and Woodcocks

“flighted” through the forest-glades of their summer home, but I never identified the Jack Snipe, and indeed only once fell in with the Common Snipe. The abundance of the Common Sandpiper, *Totanus hypoleucus*, fully justified its trivial appellation, and I was entertained by a smart chase between one of these little waders and a Merlin, when the Sandpiper adroitly *dived* away from his pursuer. I was much interested in the Green-shank, *T. glottis*. Nearly every extensive bit of bog contained a pair of these birds, which on our approach raised their vehement protests, perching on hayracks, stumps of trees, and other prominent points; one anxious pair perched on the top of a tall spruce-fir. Whether they had begun to lay I do not know, though I searched long and fruitlessly for their nests. The Whimbrel, *Numenius phaeopus*, preferred drier ground, and a clutch of fresh eggs of this bird was brought to me one morning from a neighbouring moss.

The great lake was singularly destitute of sea-fowl (*Laridæ*). I never observed a Gull of any kind, though once a party of Arctic Terns paid us a short visit. Nor did I see the Red-throated Diver, *Colymbus septentrionalis*, but upwards of twenty pairs of the Black-throated Diver, *C. arcticus*, frequented this extensive lake. Linnæus has recorded that the skin of this Diver was valued for its toughness, and used in the manufacture of caps ('Lachesis Lapponica,' ii. p. 98). The Swedish proprietors of the shooting we rented, including the lake, told us that they sometimes shot one for this very purpose, but added that, generally speaking, they were protected by their extreme wariness. I secured two clutches of eggs, both deposited on small islands.

In concluding these jottings, it is fair to say that they were made in the intervals of fishing only, and do not represent such results as might have been expected had our chief object been ornithology and the collection of specimens. At the same time, of course, the forest being preserved for us, we possessed advantages in freedom of action which would not fall to the lot of casual travellers.

A NESTING PLACE OF *LARUS FUSCUS*.

BY J. W. WILLIS BUND, M.A., F.L.S.

It is usually stated that the Lesser Black-backed Gull, *Larus fuscus*, builds on rocks and cliffs near the coast. This, however, is not always the case, for it sometimes nests inland.

I was travelling third class in a train on a Welsh railway one very wet day in the autumn of 1887, when a man who was in the carriage called my attention to the flooded state of a large marsh which was skirted by the railway. He said "I am glad I am not there now, gathering Gulls' eggs." On my asking for an explanation, he told me that he went there every year to get Gull's eggs, and that they were very good to eat. He could not, however, name the particular species of Gull. The place was a large peat-moss through which a river flowed, and although, here and there, there were large channels and backwaters connected with the river, on the whole the place was dry, and by no means the sort of locality for *Larus ridibundus*, the Gull one would expect to find breeding in colonies inland.

The following May I was again in this part of Wales, and I then determined to find out something about this "Gullery." On making enquiries I received very contradictory information, several people denying that there were any Gulls there at all, and asserting that the only birds that built in the marsh were Peewits and Curlews. Part of this marsh belongs to a nobleman who preserves his game strictly, and I enquired from one of his keepers. "Yes, there were Gulls there, a large number of them; the people came to gather the eggs and eat them. I was welcome to go and see." He could not say what species of Gull built there, but he thought it was the Common Gull. So I started one day with a guide to see and judge for myself.

The marsh is the remains of what must have been at some geologically recent period a large lake, probably about six miles long by about two across; a river flowing through the long way divides it into two unequal portions, and there are various brooks flowing across it into the river. It is one huge mass of peat, of which at different spots large quantities are dug for fuel. In places the surface is fairly smooth, in others it is covered with

luxuriant heath; and at one spot there are numerous hillocks, like gigantic mole-hills.

We saw numbers of Peewits and Curlews, but looked in vain for their nests, although I am sure we were close to both. We crossed a small brook, the marsh became higher and drier, and as the result saw nor heard any more of Peewit and Curlew. So far we had not seen any sign of a Gull, and I began to doubt their existence here. Going on a little further I heard a croak, and looking up saw a Gull I could not quite make out, though I was sure it was not a Black-headed Gull. About a quarter of a mile off some twenty or thirty Gulls were standing on the hillocks, and on nearing them we began to look about for nests. We soon found traces of these either on or near the hillocks, round depressions which the birds had worked out with their bodies, exactly like the nests of tame ducks. Some of these were lined with dry grass, others had nothing in them but a stray feather or two. At last I almost walked into one, in which there was a large brown egg spotted with black, about the size of a duck's egg. Proceeding a little further, I found a nest containing two eggs, one grey with black spots, the other brown; and then, in a radius of say 100 yards, I found half-a-dozen more nests, containing from one to four eggs. The Gulls were now flying all round us, and so far as I could see they were the Lesser Black-backed Gull; but to make the matter quite certain, I found a dead bird on one nest that had the distinctive characteristic of yellow legs. There was no doubt, therefore, that this was a colony of *Larus fuscus*. We soon got through the breeding place, and seeing no more nests, I went back to try and ascertain the area over which the nests were distributed. Speaking roughly, I should say that it was a space of about a quarter of a mile one way, and half a mile the other. In this area the Gulls are very numerous. I imagine there were at least 100 pairs, but the nests were far more numerous. I counted about fifty nests, of which some twenty contained eggs. On none of these were the birds sitting.

They rose, and after circling round us, settled about 200 yards off, one or two flying round croaking as long we remained. The ground was quite dry, the spot selected being the highest point of the marsh. I took one or two eggs, and found in the same nest one newly laid and one partly incubated. Clearly the birds lay in each other's nests. The eggs are of the most varied

colour, from chocolate-brown with black spots, to light grey with black spots. Even in the same nest the colour of the eggs often varies greatly. The shape also differs a good deal, some of the eggs being quite elliptical, others very pointed at one end. We did not stay long at the place, as I did not want to disturb the birds more than was necessary, having seen all that was to be seen. In the middle of the Gull colony I found a nest and eggs of the Meadow Pipit, *Anthus pratensis*, and a very short distance beyond a nest and eggs of the Red Grouse, *Tetrao scoticus*.

About a quarter of a mile away I lay down to watch the Gulls return. It was some time before they did so, and they came one by one, flew all round, and alighted near the nest. I did not see any go on to the nest, but they walked about and then stood usually on a hillock close by the nest. In about an hour it was all quiet, a casual Gull flew overhead; but except that, the place was still. The white breasts of the birds standing about could be seen, but to no very great extent, and it was hard to believe that within a few hundred yards there was a large and thriving colony of Lesser Black-backed Gulls. As far as I can make out, all the year round chance Gulls may be seen about the place, but except at the breeding-time no very great number. I asked the keeper if they did any harm to game or fish. He said, "No; it is those big ones (meaning the Great Black-backed Gulls) that do the mischief; they will kill young birds, young rabbits, and even young lambs."

I have purposely abstained from mentioning the locality of this gullery, for I should greatly regret that the birds should be disturbed. The place lies in the regular tourist track, and the birds would soon be exterminated if the professional egg-hunter or collector was informed of the place. It is not so very far from an inland breeding-place of the Cormorant. It would be a pity to disturb the colony. I know of no other in a similar place.

ORNITHOLOGICAL NOTES FROM NORFOLK.

By J. H. GURNEY, JUN., F.Z.S.,
President of the Norwich Naturalists' Society.

IN continuation of my Notes for 1888, which have been communicated to the end of May (p. 18), I now forward those for the remainder of the year, premising that in the month of June no observation was made of sufficient interest to be reported. I purposely refrain from any remarks on the visitation of Sand Grouse, which last summer attracted so much attention, because it seems to me that, so far as Norfolk is concerned, Mr. Southwell's excellent article (Zool. 1888, pp. 442—456) leaves nothing to be desired.

I may correct, *en passant*, a slight error in my last contribution which escaped me when revising the proof, namely, the Cirl Buntings referred to on page 14 were obtained in January, not February.

In July the prevailing direction of the wind was S.W. On the 4th of that month the members of the Norwich Naturalists' Society made one of their summer excursions to the seat of Sir Reginald Beauchamp, at Langley, and in the course of their ramble were shown a Wild Duck which had selected the top of a thatched shed for the place of her nest, the colour of her plumage so closely resembling the old shed that it was difficult to distinguish her. On the 11th two full-grown young Kestrels, able to fly, taken at Stokesby, had the tails blue washed with rufous and faintly barred with black, which is singular at such an early age. Several of the changes of plumage which the Kestrel undergoes are described by Mr. Cecil Smith (Zool. 1886, p. 110) and Mr. F. C. Aplin (Zool. 1887, p. 112), but the blue tail is usually regarded as characteristic of the adult male. The sex of the two birds above referred to was not ascertained by dissection, but it is assumed that they were both males.

In August the prevailing wind continued S.W. On the 2nd a Montagu's Harrier rose out of the sedge at Ranworth. I did not fire at it, but two others afterwards rose from the same place, and, a shot being fired, one was brought down: they were young birds, the one procured not being full grown. The flight of Montagu's Harrier is very deliberate, and more or less a

circular flight (with deviations), but every few seconds there is a stop, and the wings hang motionless in the air with their points above the plane of the back. On the 21st an Eared Grebe, still in summer plumage, was shot at Salthouse.

In September the prevailing wind was E. On the 10th Mr. George Power, who was so fortunate as to obtain a Barred Warbler, *Sylvia nisoria*, on September 4th, 1886 (*cf.* Norwich Nat. Tr., iv. 37), shot another within half a mile of the same spot. Both of them were resting in thick bushes of the shrubby saltwort (*Chenopodium fruticosum*), which is such a characteristic plant at Cley and Blakeney, and in each case the bird when shot clung parrot-like to the branches; indeed for a Warbler its feet are thick and powerful. This second example proved to be a male by dissection, and apparently a young bird; its dimensions were—length, 7·2 in.; expanse of wing, 10·3 in.; wing from carpus, 3·4 in. The colour of the beak was brown; base of the lower mandible and mouth flesh-colour; legs light blue. The contents of the stomach, microscopically examined by Mr. T. Southwell and Mr. J. Edwards, were considered to consist almost entirely of the remains of earwigs; also a small carabideous beetle, *Acocephalus nervosus*, and the limbs of a minute crab. A Blue-throated Warbler, shot the same day, was found by Messrs. Southwell and Edwards to contain a preponderance of the remains of *Acocephalus nervosus*, one *Philænus spumarius*, and one small shell of *Littorina rudis*. A Whidah bird (*Vidua principalis*, Linn.) was shot at Trimmingham, supposed to have escaped from a vessel some time this month.

In October the prevailing wind was S.W. A Stone Curlew, to all appearance of a pure white, took up its abode during the summer not far from Brandon, and was many times observed. As autumn drew on it joined the flock of birds of its species which annually assembles in that neighbourhood. There it was shown, on October 8th, by Messrs. F. and E. Newcome, to Prof. Newton, who informs me that he had a good view of it both on the wing and on the ground, where, naturally enough, it was very conspicuous. Before the close of the month, as I learnt from Mr. Upcher, it had disappeared.

In November the prevailing winds were E. and S.W. About the 8th a Nutcracker, *Nucifraga caryocatactes*, was shot at Haunworth: it was a female, with rather a thin beak measuring along

the ridge $1\frac{3}{4}$ inch, and the upper mandible projected $\frac{1}{8}$ th inch. The depth of the beak at its base is almost $\frac{3}{4}$ inch.

At the beginning of November a Sea Eagle took up its quarters at Postwick and Plumstead, and, Mr. Buxton and Mr. Birkbeck having given their keepers orders to protect it, remained there a long time, but on December 23rd it was found dead. Mr. Southwell and I went several times to look for it, but could not obtain a view of it until at length we saw it in the hands of Mr. Gunn, of Norwich, for preservation. The prevailing direction of the wind this month was S. and S.W.

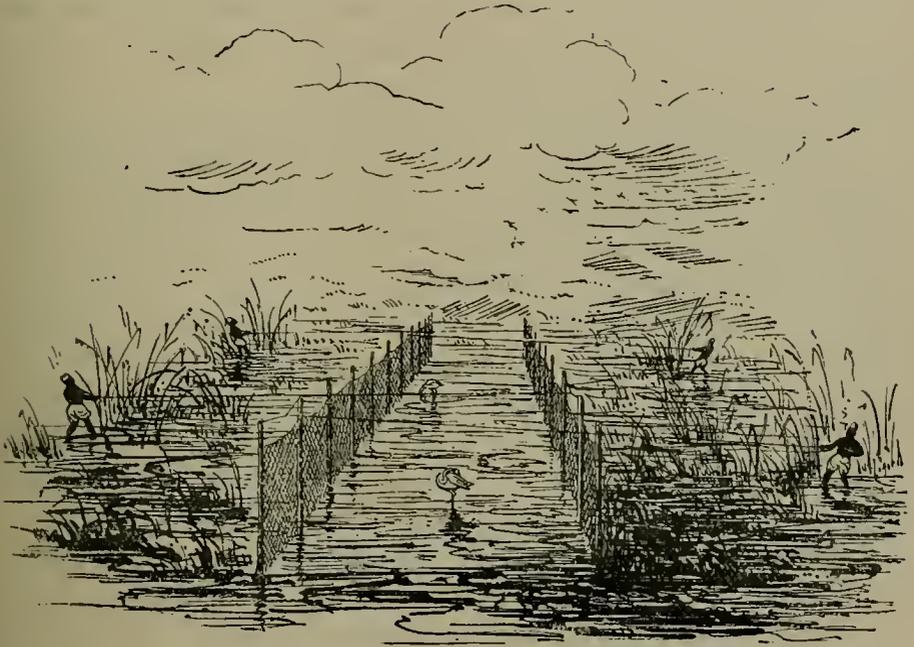
FLAMINGO CATCHING IN LOWER EGYPT.

It has long been known that large numbers of Flamingoes are annually taken alive by Arabs, at the mouths of the Nile, for export to Europe, but the precise mode of capture has until lately been unexplained.

We are indebted to Lord Lilford for having placed in our hands an interesting correspondence which has resulted from his enquiries, and those of Dr. G. H. Kingsley, who has recently returned from Egypt, and which embodies information obtained on the spot, with the assistance of Mr. W. P. Burrell, H.B.M. Consul at Port Said.

From the letters forwarded it appears that the capture of live Flamingoes is made chiefly at Lake Menzaleh, between November and the end of the winter. It is effected by means of two nets from 20 to 25 yards long, and from 3 to $3\frac{1}{2}$ yards wide, connected at the two ends of one side by a stout cord. To these nets are attached at intervals upright poles, from 3 to $3\frac{1}{2}$ yards high, at the foot of which are fastened small wooden stakes, each about 18 or 20 inches in length, one-half of which is driven into the ground below the water, the other half remaining above. To the top of each pole is fixed a strong line, about 50 or 60 yards in length, to be held and pulled by a man at the proper time, the cords of the *right hand* net being pulled from the *left*, and *vice versa*, so as to cause the two sides to fall towards the centre, and meet each other like the ordinary "clap-net" employed by English bird-catchers.

When the proper time arrives, the men employed at this work, to the number of five or six in each boat, go in search of the Flamingoes at night, and as soon as they can make them out, standing where the water is from 18 inches to 3 feet deep, they stop the boat about a hundred yards off and, commence to lay down their nets and apparatus under water, driving into the ground for half their length the little stakes to which they are attached. They then stick into the ground under water a lot of slender reeds about a yard high, and at a little distance apart, so as to form a sort of lane about 10 or 12 yards wide, leading up to, and passing on either side of, the nets. All being in readiness,



FLAMINGO NETS IN LOWER EGYPT.

the men row round and put up the Flamingoes, driving them towards the lane of reeds, where, the water being comparatively shallow, they are almost sure to alight. At a given signal the men who are holding the cords pull over the nets and a number of birds are caught, when the men hurry up to get hold of them. Crossing their wings over their backs (like our English decoymen do when they want to keep alive the ducks captured by them), they put them into the boats and take them away for sale to Damietta, Matarieh, and Port Said, where they are disposed of at a price varying from 6 to 7 and 8 Egyptian piastres apiece.

The Egyptian piastre, which is of silver and the exact size of our threepenny piece, is of no greater value, so that the cost of a live Flamingo first-hand at the port of delivery may be said to be from eighteenpence to a couple of shillings.

This information is derived from a letter in French addressed by a resident at Damietta, Mons. A. Anhoury, to Mr. Burrell, H.B.M. Consul at Port Said, and kindly forwarded by him.

Another account, by Dr. Couvidon, forwarded by Dr. G. H. Kingsley, while confirmatory of the mode of capture above described, adds some further details of interest which are worth quoting.

It appears that the poorer Arabs who do not own boats are obliged in this pursuit to rely on their own individual exertions, and have to resort to a different stratagem.

The Flamingoes never swim in deep water, and are generally to be seen in the proximity of small islands without going at any time out of their depth, but standing on their long legs, hardly ever wetting their breast-feathers. They put their heads, however, under water in search of food, and can remain in that position a long time without detriment. They are very watchful, and place sentinels (as Wild Geese do) to give notice of the approach of an enemy. These sentinels watch while the rest of the flock sleep, standing on one leg, the long neck folded backwards in graceful curves, the head reposing on the back, half buried in the scapular feathers. At the first cry of alarm they are all off.

These habits being known to the natives, says Dr. Couvidon, "the Arab who is poor and without capital goes at night, sinking himself in the water up to his mouth, his head covered with grass from the lake, crawls noiselessly near the sentinel, which he seizes by the legs and draws swiftly under water, before it can cry out or give an alarm; and by keeping the beaks of his victims closed he can secure a certain number before the flock has awakened and departed."

There is yet another plan when the fowler is single-handed. He crawls sufficiently near to the birds to throw a net over them, and in this way catches sometimes as many as six or eight, and even more, at a time.

Referring to the method first above-mentioned, Dr. Couvidon states that a few stuffed Flamingoes are used as decoys, and are stuck up in the centre of the net, watch being kept by the fowler

until a flock arrives, which they generally do late, between 11 and 12 o'clock. Seeing the stuffed ones apparently asleep, with their heads under their wings, they gradually alight, and as soon as they have settled down for the night, the Arabs at a given signal pull all at once on the ropes, the two sides of the net fall towards the middle, and perhaps the whole flock, or the greater part of it, is secured.

Dr. Couvidon adds that he has seen Wild Ducks captured on Lake Menzaleh in a similar manner.

THE LATE WILLIAM BRODRICK.

To "give honour where honour is due" has always been our aim, and, when death has robbed us of a master of his craft, to testify with gratitude to the worth of his example. A succession of keen votaries of the kindred sports of hunting, fishing, and shooting has at all times precluded the risk of their extinction; but it has been otherwise with the equally ancient though less practised sport of hawking, which, but for the efforts of a few, in the face of many obstacles, has often stood in danger of being abandoned. As one who by his published works and private enterprise has done perhaps more than any of his generation to popularise and encourage the art of falconry in England, the name of William Brodrick deserves to be remembered, and his recent death, at the ripe age of seventy-four, will be regretted almost as much by those who knew him only by reputation as by the many personal friends whom he has left behind him.

Mr. Brodrick died on December 21st last, at Littlehill, Chudleigh, North Devon, where he had lived for more than twenty years, esteemed by all who knew him. Having formerly held the command of the Chudleigh Volunteers, a number of his old corps, commanded by Colonel Lord Clifford, attended his funeral, eight of the non-commissioned officers officiating as bearers. Born in London, where his father was a barrister of some eminence, William Brodrick was educated at Harrow and University College, Oxford; and, although he was wont to say *à propos* of his lifelong love for natural history, that "all he learned at Harrow was how to catch birds," yet, as he took his

degree at Oxford, it is clear that he must have learned something more. He studied medicine at Edinburgh, but never chose to practise, and, after his marriage, he settled at Belford, in Northumberland, where he enjoyed the great advantage, to a young and enthusiastic beginner in falconry, of hawking over the moor of his uncle, Mr. Selby, of Twizel, whose name with ornithologists is "a household word." In those early days he procured, trained, and used very successfully many fine eyess Falcons and Tiercels; Peregrines from the northern coasts, notably one from St. Abb's Head, Berwickshire; and when, later on, he moved to the South of England, and resided at Bath and Ilfracombe, he for several years procured young Peregrines from Lundy Island, discovering, like every other falconer who has been lucky enough to obtain birds from this well-known eyrie, that in a Lundy Hawk he had a falconer's treasure. Falcons from Lundy were much valued in the Middle Ages, and their praises have been echoed by Charles Kingsley, in his 'Westward Ho.' Well do they deserve it, although of late years the persistent robbery of two eyries, occupied for ages on the island, has resulted, it is feared, in the desertion of both. Indeed, hardly a nest of this noble Falcon on any part of our coast, save in a few inaccessible spots, escapes the greed of so-called collectors, much to the regret of naturalists and falconers. After leaving Ilfracombe Mr. Brodrick settled at Chudleigh, but, the neighbourhood there being quite unsuited to the practice of his favourite sport, he had reluctantly to give it up, and solaced himself by keeping, as pets, most, if not all, of the Hawks and Falcons usually employed in modern falconry, except the Indian Luggers and Shaheens. Under his care examples of the Greenland, Iceland, and Norwegian Jerfalcons, Sakers and Lanners lived for years, a source of admiration to all who saw them.

But it is as a writer on falconry, and an admirable draughtsman and painter of birds of prey, that Mr. Brodrick was and will be widely known. In 1855, in conjunction with his old friend Capt. F. H. Salvin (who from his lifelong devotion to falconry may well be called the father of the craft in England), he brought out the first edition of that much-admired work 'Falconry in the British Isles,' the capital illustrations to which were all drawn by him from the life, the letterpress being the joint production of Capt. Salvin and himself, and, like the plates, a labour of love.

The figures of Hawks are in their way inimitable, and bear comparison with the best work of his friend and only rival in the same line, the accomplished animal painter Joseph Wolf. The letterpress has only one fault, that of being too short. It contains, however, almost all that modern falconers deem essential to be told, the works of the old masters—even the best of them—being overladen with errors, notably in the many fanciful and absurd recipes for the cure of real or imaginary diseases in Hawks. In this direction it must be confessed the work above mentioned does not err, though we opine that modern falconers would yet be grateful for a somewhat longer pharmacopœia than is therein contained. In 1873 a second edition of this work appeared through the same publisher (Mr. Van Voorst), when, the original lithographic stones having been destroyed, the plates were re-drawn by Mr. Brodrick, with some additions. Previously to this, however, namely, in 1865, the same hand had produced a charming series of folio plates of Hawks, entitled ‘Falconers’ Favourites,’ in which he gave life-sized coloured figures of a famous Tiercel “Comet,” from Lundy, and “Hurricane,” the best Dutch passage Falcon he ever possessed, with other portraits of a Goshawk and Sparrowhawk, Hobby, and Merlin. Nor did Mr. Brodrick’s talent end here. A lifelong study of the habits and attitudes of birds of prey, in motion and at rest, coupled with unusual skill as a taxidermist, resulted in the production of some of the most remarkable groups of stuffed birds with which we are acquainted. With the exception of his friend Mr. John Hancock, of Newcastle, no amateur in this line has ever rivalled him in his best efforts. His house was full of stuffed birds, and some of his finest cases, having to be moved for want of room, were lent for exhibition to the museums of Bath and Exeter, where we have often admired them, and where, it is to be hoped, they will be allowed to remain. Nor were the smaller kind of birds neglected. Of Canaries especially Mr. Brodrick was an excellent judge and successful exhibitor, possessing the purest, and latterly almost the only, representatives of that singular variety known as the “London Fancy.” Like all admirers of this particular strain of late years, he found them sterile and troublesome to breed and rear, and towards the end they dwindled down to one or two, and finally became extinct, for it is believed that there are not now to be found any good representatives of this once much-prized breed.

It is curious that all young "London Fancies," until their first moult, externally resemble young "Lizards;" but, while the "Lizard" undergoes no material change of colour or markings, the London Canary changes from the sober hue of a brown-spangled bird (like a Linnet) to a splendid deep uniform yellow, or equally fine buff or pale yellow colour, with black wings and tail, and ever after so remains.

It is to be regretted that Mr. Brodrick's shy and retiring disposition prevented his talents from being more widely recognised and appreciated, and it will probably surprise some of our readers to learn that he has left behind him some of the most remarkable drawings (many of them coloured) of the external form and internal structure of British Mollusca and Sea Anemones* which have perhaps been ever prepared under high microscopic power—a feat the difficulty of which is well known to all who have attempted a similar task.

Here we lay down the pen, certain that the memory of William Brodrick will long be held dear by all who had the advantage of knowing him, and that nothing would have pleased him better than to have known (as it is feared he did not know) how very highly his 'Falconry in the British Isles' was esteemed by the many falconers and naturalists who may happen to peruse these lines.

NOTES AND QUERIES.

Cambridge Entomological Society and Field Naturalists' Club.—At the Annual Meeting of this Society, held on February 15th, it was decided to collect information for the publication of a Fauna of Cambridge-shire and Huntingdonshire. It is hoped that all those who can furnish lists of species found in the two counties, or give any other information, will communicate with the Secretary, F. V. THEOBALD, F.E.S., St. John's College, Cambridge.

* A new British Sea Anemone, *Phellia Brodrickii*, which he discovered in August, 1857, on the rocks at low water on Lundy Island, was named after him by the late Mr. P. H. Gosse, who described it in the 'Annals and Magazine of Natural History' (ser. 3, vol. iii. p. 46), and subsequently figured it in his 'History of British Sea Anemones and Corals' (pl. viii., fig. 2).

MAMMALIA.

White Hares in Nottinghamshire.—In October last the Earl of Burford shot at Bestwood Park, near here, a full-grown white Hare with eyes of a pale blue, so often seen in white varieties. A white Leveret also was caught, soon after it had left the nest, in the previous April. Possibly they were both of the same litter. The Duke of St. Albans has kindly presented them to me for the variety collection here. In December last a white Hare was shot at Rufford, and it is very curious that these should have occurred in one year, especially as there are now so few Hares left—not one to twenty of former days. No white Hare has occurred about here for forty years to my knowledge, though Hares used to swarm all over these parts.—J. WHITAKER (Rainworth, near Mansfield, Notts).

The Rabbit Pest.—Mr. W. Rodier, of Tambua, Cobar, New South Wales, has forwarded to this Society a printed sheet, containing, as it appears to me, by far the best suggestion yet made for the extermination of Rabbits—a subject to which my attention has been repeatedly called by various correspondents in the Australian colonies, where, as is well known, the damage done by these animals is enormous. Mr. Rodier states that his plan has been in operation at his station in New South Wales for about eight months, “with the utmost possible success,” and has cleared the country of Rabbits. It is a very simple plan. Ferrets and nets are used in the usual way to capture the Rabbits, but while all the females taken are destroyed, the males are turned out again uninjured. The results of this mode of operation are that the male Rabbits, as soon as they begin to predominate in numbers, persecute the females with their attentions, and prevent them from breeding. They also kill the young Rabbits that happen to be born; and even, as Mr. Rodier asserts, when they largely predominate in numbers, “worry the remaining does to death.” This is all strictly in accordance with what we know takes place under similar circumstances in the case of other animals, so that we can readily believe it to be likely to happen. The ordinary mode of trapping, as Mr. Rodier points out, is more likely to increase the number of Rabbits than to diminish them. For reasons which he clearly explains, more buck Rabbits are always killed by the trappers than does. Thus the does predominate in numbers, and, a few bucks being sufficient for a large number of does, are perpetually breeding and increasing the stock. The plan advocated by Mr. Rodier is so simple and easy that I cannot doubt it will be widely followed when known. No disease that might otherwise cause injury is introduced, no other noxious animal is proposed to be imported, but advantage is taken of the well-known natural laws which regulate the increase of life to effect in this instance a salutary decrease.—P. L. SCLATER (Zoological Society of London, 3, Hanover Square, W.).

A new Australian Mammal.—Allow me to offer a brief remark. I see in 'The Zoologist' for March (p. 105) that you suppose *Dactylopsila palpator* (Milne-Edw.) to be from *Australia*, but on p. 176* 'Mémoires publiés par la Soc. Phil. Paris, 1888,' I read,—“Le Muséum ne possède qu'un seul exemplaire de cette espèce: c'est un mâle très adulte, venant de la côte sud de la Nouvelle-Guinée.—F. A. JENTINK (Leiden).

Fawn-coloured Variety of *Mus decumanus*.—On January 14th a curious variety of the Brown Rat was trapped at Holbrook, near Ipswich. It was fawn-coloured above, white beneath, and had pink eyes.—E. W. GUNN (89, Princes Street, Ipswich).

BIRDS.

Lapland Bunting near Brighton.—On February 24th I received a male Lapland Bunting, *Calcarius Lapponicus*, which was caught by a birdcatcher about a mile from this town. It is of rare occurrence here.—C. BRAZENOR (Brighton).

Hen Harrier in Essex.—An adult female of this species was shot on December 20th, 1888, at Walton-on-the-Naze, Essex. The ovaries were very small, and in its crop I found a portion of a Thrush in a semi-digested condition.—E. W. GUNN (Ipswich).

Red-breasted Merganser in Essex.—An adult male of this species was shot on the beach at Walton-on-the-Naze on January 16th last, and was sent to me for preservation. It was in good condition, and had recently fallen in with a shoal of Sprats, for its gullet contained no fewer than twenty-three (some half-digested), all averaging about three inches in length, and amongst them I found one small Whiting. They were all packed in close, like Sardines. The gizzard and intestines were full of the remains of fish.—E. W. GUNN (89, Princes Street, Ipswich).

Great Grey Shrike near Ipswich.—A female specimen of this bird was brought to me on the evening of January 28th, having been caught by a birdcatcher earlier in the day at Whitton, near Ipswich. It had struck and instantly killed his call-bird, a Goldfinch. Upon dissecting it I found the gizzard quite empty and the bird in poor condition, evidently half-starved.—E. W. GUNN (89, Princes Street, Ipswich).

Ornithological Notes from Wexford.—In view of the preparation of a new edition of Thompson's 'Birds of Ireland' the following notes may be useful to the Editors:—In the autumn of 1885 an Osprey was shot at Courtown, and sent to Mr. Williams, of 2, Dame Street, Dublin, for preservation. On March 1st, 1886, a Brambling was shot near Adamstown, by the Rev. T. Manning, after a fall of snow: the bird is a rare winter visitor to Co. Wexford. August 28th, 1886: Dr. Gibbons, of Rosslare, tells me that three Hoopoes were shot in his part of the county about this

date. No. 1 was shot in his garden at Rosslare by his man, during his absence in Dublin. No. 2 was shot at Bargy Castle (which is about five miles south of Rosslare) about the same time. No. 3 was received by Mr. J. Wheelock, bird-stuffer, Wexford, to be stuffed for some man living in the Faythe, Wexford: it was shot somewhere not far from Wexford. Mr. Wheelock told Dr. Gibbons that four or five Hoopoes had been brought into his shop during the four or five years preceding 1886. On October 29th, 1886, a female Buzzard was caught, in an exhausted condition, at Stokestown: some men were cutting reeds, out of which it rose when disturbed, but flew quite weakly and was easily caught. There is at Stokestown a male Hen Harrier, shot in the Co. Tipperary. On August 7th 1887, I found a Wren's nest at Kilmanock, containing two eggs; it is such an unusually late date that I think it worth recording: the nest was forsaken, owing, I think to my finding the bird on the nest and disturbing her. On September 11th, 1887, another late nest was found at Kilmanock,—a Wood Pigeon's—containing two eggs: the nest was lined with dry grass and a few feathers. On October 2nd, 1887, a Little Bittern was shot at Drinagh, about two miles south of Wexford, as I learn from my friend Mr. R. J. Ussher: it was sold by Mr. Wheelock, of Wexford, to the Dublin Museum. In June, 1888, Mr. R. J. Ussher received a Sand Grouse from Mr. J. Bent, of Rosslare. I have received the following further particulars about it from Mr. Bent; it was shot by his brother, in his own land, near the sea-shore. . . . "I have been told," he says, "of a flight of them a week after that was seen in Mr. Meldon's virgin soil land." During this month a strange bird was reported to me by a coastguard at Fethard; it frequented the gardens there for about a week, and evaded all attempts to shoot it: this bird was described to me as being in size between a Thrush and a Jackdaw, its colours being green and red; it was said to be like a Parrot, but not one. This description, if it can be relied on, comes nearer to the Green Woodpecker than any other bird I know,—a bird which has, I believe, only twice occurred in Ireland. On October 24th, 1888, a Water Rail was shot near Adamstown, and sent to me: the bird is probably not rare in suitable localities throughout the county. On December 20th, 1888, or about this date, a nearly pure white Thrush was shot at Canagren Hill, Ferns: it has since come into my possession, and the only sign of dark colour in its plumage is a very slight tinge on the back. I heard of a "white Blackbird" (male), said to have been caught near Arthurstown this winter, which had "a few black feathers in his tail." There is also a Blackbird at Arthurstown, shot in 1886, with more white in his plumage than black; while I have seen them with large white spots on the back—so that partially white Blackbirds would seem to be not at all rare in this district. A white Magpie was shot at Stokestown a few years ago.—
G. E. BARRETT-HAMILTON (Kilmanock, Co. Wexford).

Sand Grouse near Redcar.—I regret to state that three more Sand Grouse, *Syrrhaptus paradoxus*, have been killed near Redcar. One, a female, was shot from a flock of seven on the South Gare Breakwater, at the Tees Mouth, on February 14th. Another (also a female) was killed at the same place on the following day; and a third, a male, was picked up on the sands on the 16th. It had an old wound in the side,—the cause of death,—was very poor in body, and the flesh was quite putrid. Both the others were in good condition.—T. H. NELSON (Redcar).

[How about the Sand Grouse Protection Act, which has been in force since the first of February?—ED.]

Notes on Birds observed at Sea.—Every fact connected with the migration of birds is I think worth recording, and on this principle I send you some extracts from letters received from my son, whose duties as a sailor on the 'Sobraon' have caused him for some years to pass between England and Australia, leaving home generally about September 20th. He writes me that this year from some cause land birds have been in greater abundance than he has ever seen them. From lat. 15° N. to 5° N. and long. 20° to 23° W. birds were very frequent, especially Swallows, and in company with these Swallows were three Kestrels, all of which came on board and were caught (one had white claws) and carried alive to Melbourne. The one he caught he saw chase and capture a Swallow, and, what was a new fact to him, it plucked and ate the Swallow while on the wing. He gave this bird to the Melbourne Zoological Gardens. Two small Owls, the smallest he ever saw, were also caught, but he could not recognize them; they only lived for a few days. Some Quails came aboard, but they were treated in a most inhospitable manner, being utilised as food for the previously captured Hawks,—a fate he much regretted, as he thinks he might have been able to preserve them for the Melbourne Zoo also. Several flocks, containing a dozen or so of individuals of some species of birds quite strange to him, passed the ship. On October 1st, lat. 49° 15' N., long. 5° 56' W., in fine calm weather, they passed a dead Whale; a boat was lowered to examine it, and it was found to be floating belly uppermost with the head a long way under water; the skin of the belly was of a whitish colour, with deep longitudinal cuts or folds in it; the length was estimated at about seventy feet. He considered it, from all he could gather, to be a specimen of *Balaenoptera musculus*, and in this he was probably correct. It was accompanied by a few Sharks, but he did not think it was far enough gone to attract the birds. In running their Easting down they saw the usual birds,—Petrels, Albatrosses, and so on. One Albatross dived under the water for something sinking. This, he says, he never saw the large Albatross do before, although he has seen all the smaller ones diving frequently. In this note of my son's, who is a capital observer, there is one fact stated quite new to me,—that is, the possibility of a Hawk

plucking and devouring its prey on the wing : certainly there was nowhere it could rest for the purpose, but I should have thought the difficulties of the operation would have quite rendered it impossible. Have any of the readers of 'The Zoologist' seen a similar case? — HENRY LAVER (Colchester).

Method of Fishing adopted by Diving Birds.—As I have ascertained that the following fact is not well known, I send you this account in the hope that it may be of interest to naturalists and to the general public. Anyone who lives in the Western Hebrides will have often watched on a calm day the sea-birds feeding with noisy clamour in the sea-lochs and about the numerous islands. This is especially the case in August, when the shoals of small herring are very plentiful. Some years ago, when in a sailing-boat off the west coast of Mull, I caught with a hand-net a dishful of these small fry as they swam along the surface of the water. Last year, noticing from a steam-launch the birds congregated in great numbers at one spot, the idea struck me to steam to the place and try to get a share of the birds' repast. The idea was at once carried out. I stood on the prow with landing-net in hand, and the launch was steered towards the birds. As we drew near, the banqueters flew away with evident dissatisfaction at the interruption, a few of the more greedy making their last hasty dives. In another moment we were at the spot, and I saw, to my intense surprise, about two feet under the surface, a large reddish brown ball, two to three feet in length and two feet in depth. I made a frantic swoop with the net into the ball, and brought on deck half a pailful of the sea-birds' dinner. Even as we passed we could see the great living ball sinking and breaking into pieces. This year I and others have tried the same spot with great success. Sometimes the ball has sunk too deep to be reached ; sometimes there was no ball to be seen ; but on the most successful day I filled a pailful in three hauls. In September we saw no ball, because, perhaps, the fish had grown too large for the birds to manage. As far as I can judge, the *modus operandi* is carried out by the divers, who surround a shoal and hem them in on all sides, so that the terrified fish huddle together in a vain effort to escape inevitable destruction. The divers work from below and other sea-birds feed from above : and, as in some cases after the birds had been at work for some time I saw no ball, I suppose not one fish is left to tell the tale. I must leave to naturalists the real explanation of the matter ; but I may mention that, when disturbed by the boat, the divers seem to come to the surface in a great ring round the scene of their feast. I may also mention that once, when the boat was still 300 or 400 yards away, the birds suddenly rose and whirled about with frightened screams. I wondered what could be the cause, until I saw the round back of a porpoise rolling lazily round at the exact spot, and then rolling back again. When we steamed past there was no sign of a ball. What two

delicious mouthfuls for the porpoise!—COMPTON (Loch Luichart, Ross-shire, N.B. [From 'Nature.'])

Notes from Breconshire.—The past season has been a fairly good one for Woodcocks, but I have observed hardly any Fieldfares or Redwings. Some rare visitors in the shape of White-fronted Geese have been killed at Llangorse Lake, near here, out of a flock of seven: they were exceedingly tame, and looked as if they had come a long way, as they seemed tired; three were killed, and if large shot had been used probably nearly all would have shared the same fate; but on the following day they had recovered themselves, as it was found impossible to get within shot of them. A white, or nearly white, Woodcock, was lately killed by a gentleman in this county, and I am sorry to say was eaten! Mr. Crawshay killed a fine Bittern on the course of the old river near Talybont, which I shall have the pleasure of inspecting when he gets it from the birdstuffer's. A curious light brown coloured Jackdaw has also been killed by Mr. Butler, at Llangoed Castle, in this county. I fear the White or Barn Owl is nearly extinct about Brecon, as I never see one now by any chance. Can it be that the Brown Owl drives it away? The Kite does not increase much, although I can hear of none being shot or trapped, and, though several pairs still breed in the country, I fancy the young ones desert us. I constantly hear of one or two of these birds being seen near here, but I think were the same pair, or possibly two pairs, as Kites cover such a quantity of ground in the course of a day. The same remarks apply to the Buzzard, but this bird is much more plentiful with us than the Kite. In very old Ravens do the breast-feathers get like the hackles of a cock? I saw a bird that was killed near here; it had the appearance of great age and was in splendid plumage, but the breast-feathers resembled the neck hackle of a black game cock, and were glossy in the extreme. A curious circumstance has been commented on by others besides myself, during the past season only, in several parts of the county, and that is the great preponderance of hen Pheasants over cocks in wild bred birds. During Christmas week I killed what at first sight appeared to be a good specimen of the old English Pheasant, *Phasianus colchicus*: it was a fine wild-bred bird, very red on the breast and very dark on the under parts: on carefully examining it, however, I found just the suspicion of white on the extreme edge of a very few neck-feathers, showing the faintest cross of *torquatus*. The difference was distinctly apparent when compared with a Chinese bird; the English bird very much bigger, much redder on the breast, and much darker beneath whilst the rich red colour made the golden colour of the Chinese bird look quite a sickly yellow in comparison. I begin to despair of ever killing a true old English Pheasant in this county.—E. CAMBRIDGE PHILLIPS (Brecon).

Woodcocks.—It might be interesting to ascertain the experience of your readers in the matter of Woodcocks during the past season. Here in Oxfordshire both the numbers and weights of the birds have been abnormal. This would seem to point, so far as numbers are concerned, to the mildness of the weather, which may have arrested them on their westward passage, and, so far as weight is concerned, to the sufficiency of food they have found,—due also, perhaps, to the softness of the ground. During the third week in January one of my keepers shot two Woodcocks, right and left, each of which weighed over a pound, thus beating Sir F. Chantrey's record so far as weight was concerned. Woodcocks are said to have been shot weighing nine or ten ounces more, but I doubt if any living person has seen them. If it should prove that Woodcocks have been more scarce than usual in Devonshire last season, I think my theory may be assumed to be correct. I am given to understand that these birds have been more abundant than usual this winter in the east of Ireland.—E. W. HARCOURT (Nuneham Park, Abingdon).

[We do not know how our correspondent ascertained the weight of Chantrey's Woodcocks. It is not mentioned in the extracts from the Holkham Game Book, nor in Mr. Stanhope's account of the well-known feat printed in Muirhead's 'Winged Words on Chantrey's Woodcocks,' published in 1857.—ED.]

Gadwall in Somerset.—The Gadwall seems to me of sufficiently rare occurrence in this county to make the capture of one worth recording. I saw a female of this species at Mrs. Petherick's, the birdstuffer at Taunton, early in February. and wrote to the owner—Mr. Hill, of Langport—for some information as to its capture, and in due course received the following account:—"The Gadwall duck was shot on January 10th, 1889, in Sedgemoor, about three miles from Langport: there were a duck and drake together, but the latter managed to get away. A drake was shot in the same district about three years ago."—CECIL SMITH (Bishop's Lydeard,

Ornithological Notes from Yorkshire.—The past autumn in this part of Yorkshire was marked by the occurrence of several of the more uncommon species of predatory birds. During the month of October and early part of November I heard of the capture of two Peregrines, two Rough-legged Buzzards, and a Hen Harrier. A Hobby also was reported, but on inspection proved to be a Merlin. One of the Peregrines was shot under the Castle Cliff about the end of the first week in October, and was an adult and rather large bird, probably a female. The second specimen was shot on the coast between Scarborough and Filey, in a little bay known to our fishermen as Pudding Hole. It is a falcon of the year, and measured $19\frac{1}{2}$ inches from beak to the extremity of the tail, and

44 inches from tip to tip of the expanded wings—a fine bird in good plumage. The Peregrine has from time to time been known to breed in the vicinity, and doubtless would do so again annually were it allowed to remain unmolested; but when one by chance makes its appearance on the coast, it is generally shot by someone lying in wait near the haunts of the Rock Doves. The first Rough-legged Buzzard was also procured a short distance from here. It is in good plumage, but as this species varies so much in the markings I cannot speak as to the age or sex. The other example was recorded in 'The Yorkshire Post' of November 7th, as having been shot near Meanwood (a few miles from Leeds), and described as in excellent plumage: it measured 56 inches from tip to tip of expanded wings. The Hen Harrier above referred to was killed a little way inland, at the beginning of October, in a state of moult. A young Red-backed Shrike was obtained, about the same date, near Hackness. On Nov. 1st a great passage of Gulls took place, when, I am informed, thousands—said to be Kittiwakes—crossed Filey Brigg on their way south, and some hundreds were shot to send to London, where the gunners can sell unlimited numbers at sixpence each. All light-coloured small Gulls are "Kittiwakes." A few days later I visited the Brigg, and saw many Great Black-backed Gulls, some fine old birds and some immature ones; also some large flocks of Ducks,—Common Wild Ducks, some Wigeon, a large flock of Common Scoters, a Common Sheldrake, and three Purple Sandpipers. I heard no report of any Glaucous Gulls being seen. Mr. Fountain, of the 'Ship Inn,' showed me a Common Guillemot, of immaculate whiteness, that was shot on December 2nd, 1887, by William Jenkinson, of that place. The beak, irides and legs are described as being of a lemon-colour when in a fresh state. Woodcocks arrived on Nov. 3rd, in larger numbers than I ever remember near Scarborough, it being estimated that about forty were shot on Oliver's Mount alone, and one in the grounds of the Cliff-Bridge Company, about a hundred yards from where I write. I may add to the birds above mentioned two examples of the Sooty Shearwater, *Puffinus griseus*, shot near here,—one, if not both, on October 25th; also a female Eider, at Filey, on November 12th. In conclusion, I take this opportunity to draw attention to a notice of the Little Egret, *Ardea garzetta*, given by me in 'The Zoologist' (1881, p. 213); I have since had reasons to believe that it was not a British-killed specimen, and I was misled, though at the time confidently assured it was authentic, and I now very much regret such notice should have been sent for publication.—

ROBT. P. HARPER (38, Esplanade, Scarborough).

Wilson's Petrel in the Isle of Wight.—I learn that the supposed Bulwer's Petrel alluded to by Mr. Rogers (p. 28) has the lower part of the back white, and pale yellow oval patches on the webs of the feet. Hence it

is to be inferred that it is not Bulwer's, but Wilson's Petrel, *Oceanites oceanica*. It was found dead on the shore of Freshwater Bay, Isle of Wight, last autumn, after a severe storm, and is now in the collection of Dr. Hollis, of Freshwater. This is the second Wilson's Petrel which has been picked up at or near Freshwater (*cf.* Yarrell, 'British Birds,' iv. p. 50), or at any rate, which is said to have been found there.—J. H. GURNEY, JUN. (Keswick Hall, Norwich).

Reported Nesting of the Black Redstart in Essex.—With reference to the record by Mr. W. R. Ogilvie Grant (Zool. 1888, p. 390) of this species having bred, early in May last, "in a hole in an ivy-covered oak tree" growing in Danbury Park, having, through the kindness of Mr. Grant himself, had an opportunity of inspecting the nest and eggs at the Natural History Museum, I should like to say that, in my opinion, the eggs and nest are undoubtedly those of a Robin. The white variety of the eggs of this bird may almost be called common, and I have repeatedly either taken or heard of such in this district. The nest is composed externally of dead hazel- or oak-leaves, the interior being constructed of bents, fine roots, and skeletonized leaves, lined with fine grass and a very little hair. I consider it a typical Robin's nest in all respects, except that it contains no moss. The two eggs which have been preserved differ much in size. The larger and normal one measures $\cdot 8$ by $\cdot 6$ of an inch, almost exactly, these being the average dimensions of Robins' eggs. The other egg is very much smaller, and is evidently an abnormal egg, such as might be expected from a weak or injured Robin laying colourless unspotted eggs. I have not yet seen the site of the nest, but I feel confident the nest is that of a Robin, and that the "dark-coloured bird with a red tail," which Mr. Grant's informant thought she saw leave the nest was a Redstart with a nest somewhere in the immediate vicinity. The breeding of the Black Redstart in England has been several times recorded on very doubtful grounds, but never yet satisfactorily established.—MILLER CHRISTY (Chignal St. James, Chelmsford).

Diving Powers of Gannets.—Having read Mr. Collison-Morley's enquiry about the diving powers of Gannets (p. 25), I am induced to forward the following notes on the subject. I have at different times had the pleasure of watching great numbers of Gannets feeding, both when immature and adult, and I can assure those who have never seen it that it is a treat that will repay a walk of miles. Their mode of feeding is quite different to that of any other large sea-birds. The nearest approach to it is seen in the larger Terns, but the latter seize their prey either on or near the surface, and seldom go out of sight; whereas Gannets will remain immersed for some seconds, the time, of course, varying with the depth at which the fish are swimming. As to the depth they may be able to dive,

I am unable to form an idea, nor have I ever read or heard of anyone attempting to fix a maximum depth. Where I mostly saw the birds in numbers was in that picturesque bay inside the Farnes group of islands, and stretching north and south from Holy Island to North Sunderland. There I have often witnessed the alternate falling and rising, or rather the plunging and ascending, of what we may liken to enormous snow-flakes, with an occasional dark-coloured immature bird amongst them. The flight of the Gannet is exceedingly light and graceful, yet powerful, and in or on the water its buoyancy is remarkable. On detecting a fish, it quickly wheels round, ascends a few feet, then drops perpendicularly with a velocity that is startling to witness, so suggestive of the bird's destruction. In a few seconds it re-appears on the surface as sudden and buoyant as a liberated bladder. I believe only one fish is secured at each plunge. On coming to the surface they turn head to wind, which no doubt enables them to take wing more easily. I should not consider the Gannet a "diving-bird," in the strict sense of the word, for I have never seen it attempt to go under except by plunging from the air. It may be able to dive perhaps if wounded and pursued, as many sea and shore-birds will do. I have seen the Oystercatcher, for instance, and other shore-birds swim and dive when wounded so as to make it very difficult to secure them. There is one peculiarity about the Gannet that I have never seen noticed in any work on Natural History: the bird seems susceptible either to a sort of stupor or fear, paralysing its power of flight, of which only one other instance has come under my notice, in the case of Richardson's Skua. Out of five specimens of the Gannet in my collection, three were taken alive either from the water or beach, and to all visible appearance were unhurt. Two are fine adult birds, the other immature, in the pied plumage.—JAMES SUTTON (Durham).

Scarcity of the House Martin in Hampshire.—For some years past I have noticed that Martins have gradually diminished in numbers in this immediate neighbourhood. As a boy I well recollect the rows of nests which were formerly built underneath the overhanging eaves of many houses in the street, and the not over-clean appearance of many of the houses in consequence, especially after the young were hatched. The nesting-places still remain, but the birds have almost disappeared: during the past summer I have seen but one solitary nest, and in that I believe no young were brought out. Perhaps uncongenial weather might account for such a state of affairs; but even people who take no particular interest in birds have, from time to time, called my attention to the fact of the former abundance, but present scarcity, of the nesting community. It would be interesting to know if the species has decreased in numbers in other localities [Capt. Hadfield says they have decreased in the Isle of Wight.—ED.], and if so, what is the probable cause. I am well aware the common House Sparrow has often been blamed for expelling the Martins,

and not without reason. I cannot think, however, that the Sparrows are wholly to blame, but that some more subtle influence has been at work. None of the Swallow tribe are particularly robust in constitution, and, judging from the comparatively later arrival amongst us of the House Martin, it is somewhat more delicate than kindred species. Is it possible that our cold and often retarded springs, of late years, have killed the old birds, and that the early frosts of autumn have caused the destruction of the late broods? for it must have been noticed how soon the fledglings succumb to the cold, and that late broods of House Martins are more frequently found than other allied species. It is a generally received opinion, if not an ascertained fact, that "our summer migrants" do not breed in their winter retreats. If such is the case, and our changeable climate is a fair representation of the reception met with in their breeding quarters, it is scarcely to be wondered at that the more delicate birds decrease in numbers, or that the migration is more circumscribed in its northern limits. I may mention that during last summer there appeared to be no particular scarcity of Swallows or Swifts, and that Sand Martins were by far the commonest of the class, which is usually the case with us; but I noticed how unusually early in the year the species congregated in the early mornings preparatory to their journey southwards. — G. B. CORBIN (Ringwood, Hants).

Pied Variety of the Coot.—In March, 1888, Mr. Johnson shot on his mill-dam, near Southwell, Nottinghamshire, a variety of the Coot, about a year old, which was splashed all over with white, and looked as if it had been in a snow-storm, the markings being larger and more numerous on the back and tail-coverts. Varieties of this species are so very rare, that I was much interested with the bird. I only know of two others, one mentioned by Morris, and one in the Packington Collection, both of which are white. — J. WHITAKER (Rainworth, Notts).

Curious Variety of the Woodcock.—A very striking variety of the Woodcock has been forwarded from Carrick-on-Shannon, having the primaries pure white, a white collar round the throat, and white feathers dappled over the rest of the plumage, which is rather of a richer colour than the ordinary Woodcock. I may also mention having received a second bird marked somewhat similar, which was shot close to the city, and which the owner believes to have been the same bird he had fired at unsuccessfully in the same place the previous season. — EDWARD WILLIAMS (2, Dame Street, Dublin).

The Nutcracker in Lincolnshire.—A specimen of the Nutcracker, *Nucifraga caryocatactes*, was shot by Mr. Thomas Sargent, at Marsh Chapel, a parish on the Lincolnshire coast, on November 6th, 1888. This is, I believe, the first example of this bird known to have been found in Lincolnshire. — G. H. CATON HAIGH (Grainsby Hall, Great Grimsby).

FISHES.

Motella maculata as an Irish Fish.—A few years ago (about 1874) I obtained from a Dublin fishmonger a fine large specimen of the Three-bearded Rockling. This I presented to the Natural History Museum, and placed it there under the name of *Motella maculata* (Günther), as identified from Dr. Günther's excellent 'Catalogue of Fishes' (vol. iv. p. 366). My specimen was of a reddish salmon colour, or rich pinkish yellow, when fresh, with a number of black spots, and the fishmonger reported it as taken on the coast near Dublin. So difficult is it to ascertain the exact locality of any non-marketable, or small, insignificant fishes, when sold in the wholesale Dublin Fish-market, that I should like to draw attention to the Spotted Rockling, with a view of ascertaining whether it exists all round the Irish coast, or whether it be not rather a western and southern form, as seems likely.—A. G. MORE (74, Leinster Road, Dublin).

MOLLUSCA.

Limnæa involuta probably a Variety of *L. peregra*.—For many years in succession I collected specimens of *Limnæa involuta* (Harvey) in the little lake, called Lough Crincaum, above the Town Lodge, on Cromaglaun Mountain, near Killarney. The shells were always scarce; I never obtained more than from twelve to twenty specimens, which used to be found creeping along the tops of submerged stones, as if they were feeding upon the scanty Algæ which grew upon the surface of the stones. They were very fragile, and I used to turn them carefully into a soda-water bottle, full of water, into which I had put a good many bits of *Sphagnum* moss. In this way they travelled safely to Dublin, and I kept them, several times, alive for many months, once for two years,—they subsisting, as it seemed, on the minute organisms contained in pure water from the Vartry Reservoir, in Wicklow, and they required no other food. More than once eggs were laid on the side of the small glass vase in which I kept them, but I do not think that any young were hatched in my room in the Natural History Museum. I gave some to my friend the late Mr. E. Waller, of Aughnacloy, the well-known conchologist, and he told me that after two or three years, and when he had reared several generations in captivity, he found the involute spire disappearing in the younger progeny, and that he was satisfied that *Limnæa involuta* had thus become converted into *L. peregra* (Müller). The examples which Mr. Waller brought, and showed to me, fully bore out this view. Some had still the involute spire; others were simply thin and slight examples of *L. peregra*, in shape much like the shell figured by Forbes and Hanley (Plate cxxii., fig. 5). With so careful an observer and so skilled a conchologist as Mr. Waller, the only risk seemed to be that, in feeding his Killarney mollusks as he did on water-

cross, the *ova* of *L. peregra* might have been accidentally introduced. Still his shells of the successive broods were all of similar small size and of the same remarkable thinness, which are characteristic of *L. involuta* quite as much as the inserted spire. Some were provided with a very short spire; others like Forbes and Hanley's fig. 5, as above mentioned. I have before now recorded, in the 'Annals and Magazine of Natural History' (ser. 4, vol. iv., 1869, p. 46), with a figure (Pl. iii., fig. 3), that the animal of *L. involuta* does not differ from that of *L. peregra*, and that the former is not an *Amphipeplea* at all. Still I was desirous to carry out, or see carried out, a second series of experiments; but since the death of Mr. Waller I have not had any opportunity. I am myself inclined to believe that Mr. Waller's observations and his results were quite reliable, and I should agree with him that they do prove *L. involuta* to be only a variety or form of *L. peregra* (Müller), which we know is one of the most variable of our water shells. Isolated for a long period in a small mountain tarn, nearly a thousand feet above the lower Lake of Killarney, and finding only a scanty supply of lime and less food than in the lowland waters, *L. involuta* has probably altered its appearance, and has shrunk, as it were, into smaller dimensions, drawing in its spire at the same time, while its shell became thinner and thinner, till when first found it was held to present sufficiently distinct characters to be described as a new species.—A. G. MORE (74, Leinster Road, Dublin).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

February 21, 1889.—Mr. CARRUTHERS, F.R.S., President, in the chair.

Mr. G. A. Grierson was admitted a Fellow of the Society; and, on a ballot being taken, Messrs. Hindmarsh, Kirkby, Lowe, and Morton were elected Fellows.

Mr. George Murray exhibited a fossil Alga, *Nematophycus Logani*, Carr.

Mr. G. C. Druce exhibited some rare British plants from Scotland, amongst which were *Calamagrostis borealis*, *Ranunculus acris* var. *pumilus*, and *Bromus mollis* var. *decipiens*.

Prof. Marshall Ward exhibited a sclerotium of a Fungus produced from a *Botrytis* spore, and explained the method by which it had been obtained.

A paper was then read by Mr. F. Townsend, M.P., on *Euphrasia officinalis*, with a description of a new subspecies, and a discussion followed in which the President, Mr. J. G. Baker, and others took part.

In the absence of the author, a paper by Mr. C. T. Drury on sexual apospory in *Polystichum angulare* was read by the botanical Secretary, Mr. B. D. Jackson, upon which remarks were made by Mr. Murray and Dr. D. H. Scott.

Mr. Murray then gave the substance of a paper on a new genus of Green Algæ, proposed to be named *Boodlea*, and in so doing made some instructive observations on the affinities and distinguishing characters of allied genera. The paper was criticised by Messrs. A. W. Bennett, Reay Greene, and Dr. D. H. Scott.

In continuation of his researches upon the eyes of insects, Mr. B. T. Lowne gave an admirable exposition of the structure of the retina in the Blowfly, illustrated by preparations under the microscope, and some excellent photographs.

March 7, 1889.—Mr. CARRUTHERS, F.R.S., President, in the chair.

Messrs. Herbert Stone and Malcolm Laurie were admitted Fellows of the Society; and Messrs. John Bidgood and Christopher Mudd were elected.

Mr. J. E. Harting exhibited specimens of a South American Bat (*Noctilio leporinus*), alleged to be of piscivorous habits, and which, through the kindness of Sir William Robinson, K.C.M.G., the Governor of Trinidad, had been forwarded from that island by Prof. M'Carthy, together with a report on the subject. From this report it appeared that the stomach of one specimen, opened within half-an-hour after it had been shot, on the evening of Dec. 29th, "contained much fish in a finely divided and partially digested state." In three others procured at 6 a.m. the following morning, the stomachs were empty. On the morning of Dec. 31st, at 3 a.m., numbers of these Bats were observed returning to their caves; two were shot, and "both contained considerable quantities of fish." Prof. M'Carthy added that in the stomachs of other specimens examined by him fish-scales were undoubtedly present. Of the specimens forwarded in spirits to this country two had been skinned and the stomachs and intestines examined by Mr. Harting. The sac-like stomach was much less muscular than might be expected in a fish-eating mammal; but in one of them (the other being empty) fragments of a finely striated and iridescent substance resembling fish-scales were found. A discussion followed, in which Prof. Howes and Mr. W. P. Sladen took part, the conclusion being that, although there was no *à priori* improbability in the alleged piscivorous habits of this Bat, it could hardly be accepted as a fact until the fragments supposed to be of fish were really proved to be so by careful microscopical and chemical examination. [See report of next meeting, March 21st.]

A paper was then read by the Rev. Prof. Henslow, M.A., "On the Vascular Systems of Floral Organs, and their importance in the interpretation of the Morphology of Flowers." The author drew attention to the importance of this class of observations, as supplementing development and teratology; for by referring all organs back to their "axial traces," their real origins could generally be discovered. Taking the cords meta-

phorically as "floral units," he explained how they can, as it were, give rise to axes as well as to all kinds of floral appendages. Quoting Van Tieghem's definitions of axial and foliar characters, the former was shown to be subject to exceptions. After describing the arrangements of the cords in peduncles and pedicels, in which endogens often have the cords as regularly placed as in exogens, the author explained the different ways by which pedicels of umbels are found in each class respectively. The "chorism" and union of cords were illustrated and the effects produced. Considerable light was thrown upon the cohesion and adhesion of organs, and the interpretation of the "receptacular tube" and "inferior ovary" was shown to depend upon the undifferentiated state of the organs when in congenital union. The true nature of axile and free central placentas was revealed, so that in the case of the former, with scarcely any exception, the axis takes no part in the structure, all "carpophores," "stylopods," &c., being simply the coherent and hypertrophied margins of carpels. Similarly the free central placenta of *Primula* received its interpretation as consisting of the coherent and ovuliferous bases of fine carpels, which have the upper parts of their margins coherent in a parietal manner. Illustrative diagrams were exhibited of nearly seventy genera typical of about thirty orders. The paper was favourably criticised by Dr. D. H. Scott, Mr. A. W. Bennett, and Prof. Marshall Ward.

The meeting then adjourned to March 21st.

ZOOLOGICAL SOCIETY OF LONDON.

February 19, 1889.—Dr. ST. GEORGE MIVART, F.R.S., Vice-President, in the chair.

Mr. Sclater exhibited specimens of the eggs and chicks of the Hoatzin, *Opisthocomus cristatus*, from a series collected by Mr. R. Quelch in British Guiana, and called attention to the extraordinary development of the wings in the chick, in reference to the statement that these organs are used like hands for climbing purposes.

Mr. Sclater exhibited heads and skins of a new Antelope obtained by Mr. H. C. V. Hunter in Eastern Africa, which he proposed to call *Damalis hunteri*, after its discoverer.

Sir E. G. Loder, Bart., exhibited and made some remarks on a skeleton of the Rocky Mountain Goat, *Haplocerus montanus*.

Dr. Günther exhibited a mounted specimen of Thomson's Gazelle, *Gazella thomsoni*, and pointed out its complete distinctness from Grant's Gazelle, *G. granti*. The specimen in question had been obtained in Masailand by Mr. H. C. V. Hunter.

Mr. R. Lydekker read a paper on the skull of *Lytoloma*, an extinct genus of Chelonians allied to *Chelone*.

Mr. R. Lydekker pointed out the characters of an apparently new species of *Hyracodontotherium*, based on specimens from the phosphorites of Bach, near Lalbengue, in France.

Dr. A. Günther described some new fishes from the Kilima-njaro district in Eastern Africa, based on specimens obtained by Mr. F. J. Jackson during his recent expedition into that country. He also exhibited a dried specimen of a fish obtained by Mr. H. C. V. Hunter from one of the crater-lakes in the same district, which he referred to a new genus and species of *Chromidæ*, proposed to be called *Oreochromis hunteri*.

Dr. Günther also exhibited a pair of horns of an Antelope obtained many years ago in the interior of Southern Central Africa, which were remarkable for their length and gentle backward curvature, with only a very slight twist near the tips. He referred these horns to a new species proposed to be called *Antilope triangularis*.

Dr. Günther read some notes on a Bornean Porcupine, which he had formerly described as being without a tail, and named *Trichys lipura*. It now appeared that some specimens of this animal possessed a long and slender tail, but that other characters would necessitate the retention of the genus as distinct from *Atherura*.

Mr. F. E. Beddard read a paper directing attention to certain points in the anatomy of the Accipitres with reference to the affinities of *Polyboroides*. This form was shown to belong to the *Falconidæ*, and to have no real affinities with *Serpentarius*.

Sir Walter Buller read a paper on a species of Crested Penguin from the Auckland Islands, based on a specimen lately living in the Society's Gardens, which he proposed to call *Eudyptes sclateri*.

March 5, 1889.—Prof. FLOWER, 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 February, and called attention to four Marbled Polecats, *Putorius sarmaticus*, presented by Col. Sir Oliver St. John, K.C.S.I., new to the collection; and to a fine specimen of Owen's Apteryx, *Apteryx oweni*, from the South Island of New Zealand, presented by Prof. T. Jeffrey Parker.

Mr. A. Thomson exhibited a series of insects reared in the Insect-house in the Society's Gardens during the past year, and read a report on the subject.

Prof. G. B. Howes exhibited and made remarks on some specimens of the embryo of *Myrmecobius fasciatus*.

Mr. O. Thomas exhibited a specimen of a new Muntjac from Tennasserim, lately discovered by M. Fea, and proposed to be called *Cervulus fea*.

A communication was read from Mr. J. S. Baly, containing descriptions of some new South-American Coleoptera of the genus *Diabrotica*.

A communication was read from the Rev. H. S. Gorham, containing descriptions of some new species and a new genus of the coleopterous family *Telephoridae* from Eastern Asia. Thirty-nine new species and one new genus (for which the name *Lycocerus* was proposed) were described. Of these new forms the greater part were from India and China.

Col. R. H. Beddome read a paper on new land-shells from the island of Koror (Pelew group), based on specimens collected for Dr. Hungerford by a resident in that island. The series comprised examples of eight new species of the genus *Diplommatina*, of two new and very curious species of *Endodonta* (a section of *Helix*), and of a remarkable new genus, allied to *Diplommatina*, proposed to be called *Hungerfordia*.

Mr. W. E. Hoyle read a paper on the anatomy of a rare cephalopod, *Gonatus fabricii*, originally discovered by Fabricius in the last century, but little known in recent times. The author gave a general description of the anatomy of the species, and recorded the existence of several tracts of cartilage hitherto unobserved in the Cephalopoda. Some details were given regarding the structure of the pen-sac and the development of the pen, as well as some new facts regarding the structure of the funnel-organ, and a suggestion regarding its function. The genus was regarded as being somewhat more nearly related to *Onychoteuthis* than to *Enoploteuthis*, but much further removed from them both than they are from each other. The creation of the subfamily *Gonatidae* was then held to be justified.—
P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

March 6, 1889.—The Rt. Hon. Lord WALSINGHAM, M.A., F.R.S., President, in the chair.

The Rev. W. F. Johnson, M.A., of Armagh; the Rev. C. F. Thornehill, M.A., of Burton-on-Trent; and Mr. C. R. Straton, F.R.C.S., of Wilton, were elected Fellows.

Mr. F. P. Pascoe exhibited several specimens of the Saüba Ant (*Ecodoma cephalotes*), from Parà, carrying portions of dried leaves. It seemed questionable whether the leaves were collected by the Ants for the purpose of making their nests or for the sake of some fungus which might be growing on them.

Mr. Jenner-Weir exhibited, and read notes on, specimens of a Butterfly (*Tirumala petiverana*), from Mombaza, Eastern Africa.

Mr. J. H. Durrant exhibited a living larva of *Cossus ligniperda*, which had entirely lost its ordinary colour and had become first pink and then white. He attributed the change, and subsequent loss of colour, to the fact

that it had been deprived of its natural food and fed for eighteen months on pink paper, with which the box in which it was kept was lined, and subsequently on white cardboard. Mr. M'Lachlan remarked that the most extraordinary peculiarity about this larva, in addition to the colour, was the absence of the usual odour of *Cossus*. Lord Walsingham observed that it was questionable whether the colours of larvæ were dependent on the colours of their surroundings, or whether they were affected by the contents of the intestinal canal. Prof. Meldola said that the caterpillar exhibited having eaten the pink paper had most probably become dyed by the colouring matter, and he did not think the observation had much bearing on the question of the protective colouring of caterpillars. It was well known to physiologists that certain dye-stuffs could be introduced into the tissues of animals by mixing the colouring matters with the food, and paper was frequently stained with coal-tar dyes such as eosin, magenta, &c., so that it was simply a case of direct dyeing of the larva. Mr. W. White observed that two extreme forms of a larva might often be found feeding side by side on the same tree or shrub, so that the colour of a larva could not be altogether governed by the colour of its food.

Mr. B. A. Bower exhibited a specimen of *Parasia neuropterella*, bred from heads of *Centaurea scabiosa*, and said he believed the species had not been previously bred. He also exhibited series of *Coleophora olivaceella*, *C. solitariella*, and *Laverna subbistrigella*. The President remarked on the beautiful condition and setting of the specimens.

Mr. White exhibited a series of male and female specimens of *Orgyia thyalina*, belonging to Mr. Leech, and obtained by the late Mr. H. J. Pryer in Japan. Some of the females had their wings fully developed, and some of them were semi-apterous, as is usual with the females of this genus. Mr. White remarked that he knew of no other species of the genus in which the females had fully-developed wings. Lord Walsingham, Prof. Meldola, and Mr. R. South took part in the discussion which ensued.

Lord Walsingham exhibited specimens of preserved larvæ of *Eupithecia extensaria*, from King's Lynn, Norfolk; also a preserved larva of *Smerinthus ocellatus* and one of *Sphinx ligustri*. The larva of the last-named species was a variety, and the President remarked that it was the only one of this species he had ever seen.

The Secretary read a communication from the Rev. Dr. Walker, announcing his intention of making an expedition to Iceland this year, from the 23rd June to the 29th July, and asking that any entomologists who might wish to accompany him would send him their names.

Mr. Gervase F. Mathew communicated a paper entitled "Descriptions and Life-Histories of new species of Rhopalocera from the Western Pacific."—H. Goss, *Hon. Secretary*.



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DAUBENTON'S BAT, *VESPERTILIO DAUBENTONII*, LEISLER.

BY THE EDITOR.

PLATE II.

WE are indebted to Mr. Edward Hart, of Christchurch, for a specimen of this Bat, in the flesh, captured in his neighbourhood, and from this the illustration, issued inadvertently with our last number, was drawn by Mr. Lodge.

Although usually regarded as one of the rarer British Bats, it has probably either escaped particular observation or has been perhaps mistaken for some other species. Indeed the various captures of specimens referred to in the second edition of Bell's 'British Quadrupeds' (1874), and the many additional notes of its occurrence which we have collected, lead to the conclusion that it is entitled to be considered locally common; for where it does occur it is by no means solitary, but is found in some numbers. This was observed by Mr. Tomes to be particularly the case in Warwickshire, where he has seen hundreds flying over the Avon at Stratford, and has taken more than twenty at a time from the belfry of Stratford Church. Mr. Borrer also found great numbers of this Bat in the church at Christchurch, Hants, where in one chamber communicating with an aperture in the north wall, through which they passed to and from the river, their accumulated excrement was "knee-deep." He had no difficulty in procuring as many specimens as he wanted. On several evenings afterwards he saw numbers fitting, much in the manner

of Sand Martins, over the surface of the river near the bridge in the town, never appearing to rise very high in the air, and seldom flying much beyond the river-banks. He adds (Zool. 1874, pp. 4127, 4128) that in April, 1856, he obtained this species from the Isle of Purbeck, and in July, 1863, from Ulleswater, where (as well as at Grasmere) they do not fly till late at night over the lakes, but in the boat-houses they fly by day. He has also seen specimens taken at Preston, near Brighton, a locality in which he would not have expected them, as they appear to be especially addicted to water, and there is none there. Before quitting the Isle of Purbeck, it may be well to note another locality for this Bat in the same county of Dorset, namely, Glauville's Wootton, where Mr. J. C. Dale, in his account of the local fauna, states that it is abundant. From the Isle of Wight it has been reported by the Rev. C. A. Bury, and it is probably the species referred to by Mr. W. P. Cocks, under the name *Vespertilio emarginatus*, as not uncommon in the neighbourhood of Falmouth, *V. emarginatus* of Jenyns being identical with *V. daubentonii* of Leisler and Kuhl, but not with *V. emarginatus* of Geoffroy, a continental species (with a longer, more pointed, and more deeply emarginate ear) which has not yet been found here. Amongst other localities for *V. daubentonii* Bell gives Milton Park, near Peterborough, and even mentions its occurrence in London, at Islington, whence three examples were procured by Yarrell. To these may be added another locality near London, namely, Kingsbury Reservoir, where we have seen it flying over the water near the Hyde bridge, and where, to identify the species, we shot one about seven o'clock one evening in August, 1867. Another, in the collection of Mr. Bond, was found clinging to the wall at the head of this same reservoir one cold wet day in summer. On turning to an old note-book of that date we find the following entry:—“Daubenton's Bat seen at the Hyde bridge on the Brent several times. Frequents stagnant water. Flies very late; is slower on the wing than most of the other Bats. Wings more pointed, and does not turn and twist like many, but skims like a Sand Martin over the water.” This peculiarity seems to have struck most people who have had an opportunity of obtaining it alive. Mr. Tomes, writing in 1874 of its habits, as observed by him in Warwickshire, says:—“So peculiar are the vespertinal habits of this species that, while very abundant, an ordinary observer might

be quite unconscious of its existence. It is essentially an aquatic species, if such an expression be admissible applied to an animal which never enters the water. It haunts that element continually, flying so near its surface as to render it difficult to distinguish between the creature itself and its reflection. The flight, quivering and slow, is performed by very slight but rapid strokes of the wings; it may, indeed, be said to vibrate rather than fly over the surface of the water. It could not well fly in any other manner so near the surface of the water without striking it, and this it seldom or perhaps never does, although it often pauses to dip its nose into the water, whether to drink or pick up some floating food we have been unable to ascertain."

According to the observations of Dr. Laver, of Colchester, this Bat is not rare in his neighbourhood. Doubleday procured it at Epping, and observed it flying over the river at Sudbury.

At Easton, in Norfolk, it has been noted by Mr. Gurney, and we have the authority of Mr. F. Bond for stating that specimens have been taken at Carlisle. Bell states that the most northern locality for this species in England known to him is Durham, where the specimens of *Vespertilio ædilis*, Jenyns, subsequently identified with *V. daubentonii*, were obtained. But not only is Carlisle somewhat further north, but we find this Bat included in Messrs. Meynell and Perkins' 'Catalogue of the Mammalia of Northumberland and Durham,' where it is stated to have been met with at Darlington, Shotley Bridge, Auckland St. Andrew, and Long Benton.

As regards Northumberland, also, the late Mr. Selby, in one edition of his 'Fauna of Twizel,' doubtfully included *V. emarginatus*, by which name the present species was probably intended.

In Scotland Daubenton's Bat appears to be pretty widely distributed on the mainland, but to be local. It was first correctly identified as a Scottish species by William Macgillivray, who, in 1840, captured a specimen in Aberdeen Cathedral (Edinb. New Phil. Journ. xxxi. p. 205), where subsequently John Macgillivray found eighty in two large clusters (Ann. Mag. Nat. Hist. viii. p. 230), and in the same county a specimen was taken by the Rev. G. Gordon in the church of Peterculter. It was probably this species which Fleming got in Fifeshire (Hist. Brit. An. p. 6), and referred to as having been taken near Dover by M. Brogniart,

although he named it *Vespertilio emarginatus*, Geoffroy. Subsequently Macgillivray met with it in Dumfriesshire (Nat. Libr. xxii. p. 95), and Robert Gray noted it in Kirkcudbright. One in the Glasgow University Museum was captured on Glasgow Green, as recorded by the late Edward Alston (Proc. Nat. Hist. Soc. Glasgow, i. p. 203), who subsequently examined another, which had been taken in the West End Park, Glasgow.

Thomas Edward, in his list of the Mammals of Banffshire, appended to Smiles' 'Life of a Scotch Naturalist' (p. 392), includes Daubenton's Bat as one of the two species recognized by him in Banffshire, the other being the Pipistrelle. A third species, "larger than either of the other two," is mentioned as having been "met with in woods," but not identified. It was most probably *Plecotus auritus*.

Fleming, in his 'History of British Animals' (p. 6), identified the *Vespertilio auriculatus* of Walker's 'Fauna Scotica'* with the Noctule; but, as pointed out by Alston, the description agrees much better with *V. daubentonii*.

As regards Ireland, Bell states that the occurrence of Daubenton's Bat in *two* localities has been established, namely, in Donegal and Kildare (Proc. Nat. Hist. Soc. Dublin, ii. p. 154), but he has omitted to notice the specimen mentioned by Thompson (Nat. Hist. Ireland, iv. p. 2) as having been obtained by the Ordnance collectors in the Co. Londonderry, and determined by Mr. Jenyns (now Blomefield). Since that date, probably, it may have been recognized in other parts of Ireland, and it would be satisfactory to receive information on this point.

The difficulty of identifying any uncommon species of Bat was at one time considerable, owing to the want of properly authenticated specimens for comparison, and the absence of published descriptions which indicated distinctive characters with sufficient clearness. Now things are different. Specimens properly named may be found in most museums; and the publication of Mr. Dobson's excellent 'Catalogue of the Chiroptera in the Collection of the British Museum' has furnished students of Zoology with a reliable guide for the determination of any species they are likely to meet with.

Turning to the Analytical Table, or Synopsis, of the species

* Published in his 'Essays on Natural History,' p. 472.

belonging to the genus *Vespertilio*, given at pp. 285—289 of this work, we find the genus divided into two sections, or subgenera, which are thus characterised:—

I. Subgen. LEUCONOE.

Feet very large; wing-membrane from the tibia or ankle, rarely from the side of the foot; interfemoral membrane forming a very acute angle in the centre of its free margin behind; tail projecting by the last vertebra, or by the last two vertebræ, from the membrane; calcaneum very long, extending at least three-fourths the distance between the ankle and the tail.

To this subgenus belongs *V. daubentonii*.

II. Subgen. VESPERTILIO.

Feet moderate; wing-membrane from the base of the toes, rarely from the metatarsus; interfemoral membrane forming an obtuse angle in the centre of its free margin behind; tail wholly contained in the membrane, or projecting by its extreme tip only; calcaneum extending about half-way between the ankle and the tail.

To this subgenus belong *V. emarginatus*, Geoffroy (not *emarginatus*, Jenyns, which is *daubentonii*, Leisler and Kuhl), *V. nattereri*, *V. bechsteinii*, *V. murinus*, and *V. mystacinus*.

In the Synopsis above referred to, *V. daubentonii* is thus specially characterised (p. 286):—

“Wings from the metatarsi. The second lower premolar stands in the tooth-row, or is partially drawn inwards. The second upper premolar stands in the tooth-row, or with the first is partially drawn inwards. The ear laid forward does not extend beyond the end of the muzzle; fore-arm, 1.45 in.”

The more detailed description given by Mr. Dobson (p. 297) is as follows:—

“Head very slightly raised above the face-line; ears moderately long, laid forwards the tips extend quite to the extremity of the muzzle; the inner margin forms a regular arc of a circle from the base to the tip, which is shortly rounded off; and the upper third of the outer margin is flat or concave, owing to the abrupt convexity of the succeeding middle third; tragus about half the length of the ear, the extremity straight, not curved outwards; the inner margin is straight, the outer has a very

distinct triangular rounded lobe at the base, then becomes regularly slightly convex upwards, reaching its greatest width about the middle, and terminating in an acute point.

“Wings from the metatarsi; calcaneum extending more than three-fourths the distance between the ankle and the tail.

“The face is sparingly covered with hair in front of the ears. The small labial glands are thinly clothed by some long straight hairs.

“On the dorsal surface the base of the interfemoral membrane, as far as a line drawn between the centres of the tibia, is covered; the tibiæ and the remaining part of the interfemoral naked.

“Above, the hairs are dark at the base, with reddish brown extremities; beneath, similar at the base, but with white extremities.

“The upper incisors are equal in size, and have strongly diverging cusps; the second upper premolar stands in the tooth-row, is very small, not one-third the size of the first premolar, and its summit very slightly exceeds the cingulum of the first molar.

“Length (of an adult male preserved in alcohol):—Head and body, 1·9 in.; tail, 1·7 in.; head, 0·65 in.; ear, 0·55 in.; tragus, 0·28 in.; fore-arm, 1·45 in.; thumb, 0·35 in.; third finger, 2·4 in.; fifth finger, 1·9 in.; tibia, 0·6 in.; foot, 0·4 in.”

Generally speaking, the characters most likely to strike a beholder upon a superficial examination are the large feet, moderate-sized rounded ears, pointed wings, and elongated caudal vertebræ. Its peculiar mode of flight and partiality for water, already referred to, may serve as a hint to collectors in search of specimens.

NOTES ON THE RARER BIRDS OF GLAMORGANSHIRE.

BY DIGBY S. W. NICHOLL, F.L.S.

IN his ‘Birds of Somersetshire’ Mr. Cecil Smith has enumerated no less than 217 species, whilst several additional species, which have occurred since his book was published in 1869, will be found mentioned in ‘The Zoologist’ for 1888 (p. 174).

Somerset, as well as Glamorgan, is washed by the waters of the Bristol Channel, and consequently both counties offer

exceptional chances for the occurrence of some of our rarer marine birds. On the other hand Somerset possesses, in the Mendips and the Quantock range of hills, suitable places for such species, as, for instance the Golden Plover, to breed, and Mr. Smith mentions the fact that a few are said to do so in the wild country near Dunkery Beacon and Exmoor.

In Glamorgan I have not been able to ascertain that the Golden Plover is more than a winter visitor, making its appearance in numbers varying with the severity of the weather. The Grey Plover is occasionally shot or seen on the coast in winter.

After a great deal of correspondence with competent authorities on the subject, together with my own observations, I am able to claim for Glamorganshire no less than 218 species, being one more than the number given for Somersetshire by Mr. Smith when he published his book on the birds of that county.

As an accidental visitor the White-tailed Eagle has occurred several times. I have records of nine such occurrences, only four of which, however, are in my opinion reliable.

Two examples of the Goshawk, and three of that rapidly-decreasing bird the Kite have been obtained. In 'The Zoologist' (1888, p. 188) will be found an interesting letter on the "Kite in Glamorganshire," received by me from Lord Aberdare.

On the authority of the Rev. H. Morgan-Stratford, Rector of St. Athan, near Cowbridge (than whom no one is better acquainted with the avifauna of the county), I am able to include the Little Owl, a specimen of which was shot by him some few years ago, but unfortunately he has forgotten the date.

The Eagle Owl is recorded as having occurred near Swansea, by Mr. Dillwyn, in his 'Fauna and Flora of Swansea,' and by Mr. Harting, in his 'Handbook of British Birds' (1872, p. 95).

Passing on from the Owls to the Shrikes, we have Pallas's Shrike, *Lanius major*, a specimen of which (now in the Cardiff Museum) was obtained at Bridgend in April, 1881.

There is next to be noticed the Great Grey Shrike, *Lanius excubitor*, which is only an irregular winter visitant; and then two of our summer visitors, namely, the Pied Flycatcher and the Golden Oriole.

I have recorded in 'The Zoologist' (1888, p. 229) that on the 8th of May I obtained a male specimen of the Pied Flycatcher, and I believe it is the only authentic occurrence of the species in

this county, for on reference to the 'Fauna and Flora of Swansea' it will be seen that the author was not at all satisfied with the evidence submitted to him with respect to its occurrence in Glamorganshire.

That beautiful bird the Golden Oriole frequented Hendrefoilan, near Swansea, the seat of Mr. L. L. Dillwyn, M.P., throughout the summer of 1885, and I am glad to say was left unmolested. Mr. R. Drane, of Queen Street, Cardiff, tells me that this species nested at Penarth in 1863. An egg in his possession was seen by him on a string, with those of the Thrush and Blackbird, in possession of a boy, who described the nest accurately, and said that he and two others took it, and divided the five eggs it contained amongst themselves.

Another summer visitor, but with no claim to rarity, is the Ring Ouzel. It breeds annually in the hilly part of the county (where it goes by the name of the Mountain Blackbird), and specimens are taken not unfrequently in the "Vale of Glamorgan," usually young birds.

The Redstart, which is common in the adjoining county of Monmouth, is decidedly uncommon in Glamorgan, and the examples seen are few and far between.

The Black Redstart has been obtained three times, all three examples having been well authenticated.

In the article on the Nightingale in the fourth edition of Yarrell (vol. i., p. 316) there are two misprints. In the eleventh line from the top of the page "Perthkerry" should read "Porthkerry," and in the twelfth line "Boreter" should read "Boteler." The Nightingale, though local, may be heard most years in May, in the Llancadle and Castleton coverts.

On April 4th I obtained a male Cirl Bunting, *Emberiza cirrus*, at this place (the Ham, near Cowbridge). Mr. Howard Saunders, in his 'Illustrated Manual of British Birds' (p. 203), states that this species, he believes, was "unknown in Wales until Mr. E. C. Phillips obtained a male on 15th March, 1888, near Brecon." But I can record two previous occurrences of this species in Glamorganshire, one so far back as 1876. It is apparently seldom seen in these parts, being but locally distributed.

I can record one undoubted occurrence of the Tree Sparrow, *Passer montanus*, for a male was obtained by Mr. Cording, taxidermist, of Cardiff, at Waterstone, in 1882.

It is not often that Glamorganshire is favoured with a visit from that curious bird the Waxwing. Mr. R. Drane saw a flock of six or seven near Cardiff, in the winter of 1859, and has known of a single instance of its occurrence since. The Crossbill has occurred oftener.

Most winters bring a few specimens of the Snow Bunting, but rarely in full adult plumage.

Amongst other winter visitors may be mentioned the Brambling, Siskin, and Twite, and occasionally the Hawfinch.

Two specimens of the Rose-coloured Pastor are noticed in the 'Fauna and Flora of Swansea,' as having occurred near there in 1836 and 1837.

The Rusty Grackle, *Scolecophagus ferrugineus*, a North American species, was shot on the East Moors, near Cardiff, on October 4th, 1881. My informant, Mr. R. Drane, of Cardiff, tells me that its plumage was in a perfect state, showing, in his opinion, that it was not an escaped cage-bird: this, however, is by no means conclusive.

Mr. Howard Saunders, writing to me about a specimen of the Red-winged Starling which was killed by flying against the Nash Light, says, "No doubt it was an escaped bird from some Bristol-bound vessel," and this may have been the case with the last-named.

The Chough is still to be found in moderate numbers upon the Gower coast, but I have never heard of its having been seen further eastward.

The Raven breeds annually in the cliffs between Aberthaw and Dunraven, and the Hooded Crow has been obtained on several occasions.

Mr. E. C. Phillips, in his 'Birds of Breconshire,' says he has seen but one stuffed specimen of the Nutcracker, *Nucifraga caryocatactes*, in Wales, and that was a bird in perfect plumage killed in Glamorganshire many years ago, so I am able to include it.

Seven well-authenticated specimens of the Hoopoe can be claimed for the county, two of which are recorded by Mr. Dillwyn in his 'Fauna and Flora of Swansea.'

On November 19th, 1885, a female example of the Little Bustard was obtained near Gileston, and is now in the collection of the Rev. H. Morgan-Stratford, Rector of St. Athan. This is the only example that I have known to occur in Glamorganshire.

The Great Plover, or Thick-knee, is also rare in the county, only one occurrence—near Swansea in 1885—having come to my knowledge.

The Greenshank and Spotted Redshank occur but rarely; the Common Redshank is very numerous along the coast, during the winter months especially.

The Green Sandpiper occurs occasionally, the last occurrence that I know of being one shot by myself on the 4th January last, and recorded by me in 'The Zoologist' (1889, p. 73).

Amongst other occasional visitors may be mentioned the Curlew and Purple Sandpipers, the Little Stint, Grey Phalarope, and Great Snipe.

An example of the Red-breasted Snipe was shot by Mr. Llewelyn on Penllergare Common. Whilst it was at Leadbeater's, the late Mr. Gould saw it (in the flesh), and identified the species.

There are three Heronries in the county, namely, at Hensol, Margam, and Penrice.

Mr. Cording, taxidermist, of Cardiff, tells me that a female example of the Night Heron was shot at Peterstone, near Cardiff, in 1880. Mr. R. Drane notes the occurrence of the Common Bittern six or seven times during the last twenty-five years, and I am able to record five examples of the Little Bittern, one being quite a young bird, found dead under the telegraph-wires, by flying against which it had probably been killed: from this it would appear that its parents had bred in the neighbourhood.

I now come to the Little Crake: Mr. Dillwyn has recorded one, taken by hand on the Afon River in 1839, which is (or was) preserved at Margam.

Of the *Anatidæ* the Geese and Ducks form a good portion on the Glamorganshire list. The species of Geese (all, with the exception of the Egyptian Goose, of which six well-authenticated specimens have occurred) being more or less frequent winter visitants, they include the Grey Lag, White-fronted, Bernicle, Brent, and Bean Geese; also the Canada Goose, which is kept in a state of domestication on the lakes at Penllergare.

The Ducks consist of the Wild Duck or Mallard, the Gadwall, Shoveller, Pintail, Wigeon, Teal, and Garganey; also the Pochard, Ferruginous Duck, Scaup, Tufted Duck, and Goldeneye, and the Smew, Common and Velvet Scoters.

The Ferruginous Duck is recorded by Mr. Dillwyn in his

'Fauna and Flora of Swansea,' and Mr. L. L. Dillwyn, M.P., tells me that he has seen examples of the Surf Scoter more than once in game-shops at Swansea, in hard winters.* He also saw one swimming in the surf off the rocks beyond Caswell Bay, in Gower, and he observed it carefully with the aid of a glass.

Sir R. Payne-Gallwey, in his 'Book of Duck Decoys' (p. 93), has given a description of the only decoy in Glamorgan, namely, the one at Park Wern, the property of Sir H. Hussey Vivian, Bart., M.P. From this decoy Sir H. Vivian has received specimens of the Gadwall.

The Garganey is of rare occurrence. I possess two specimens, obtained near here in 1886, and have records of seven others.

The Shoveller also, though met with far more frequently than the Garganey, must still be called rare.

Mr. L. L. Dillwyn, M.P., informs me that a Hooded Merganser was killed during the hard winter of 1838, but he omitted to state where.

The Whooper or Wild Swan occurs in severe winters, but not in any great numbers.

The Red-throated Diver is recorded by Mr. Dillwyn in his 'Fauna and Flora of Swansea,' while the Red-breasted Merganser, Goosander, Great Northern Diver, and the Great-crested, Red-necked and Slavonian Grebes are also of occasional occurrence.

Among the *Alcidæ* is the Little Auk. Two are mentioned by Mr. Dillwyn in his previously-mentioned work; and one was shot by the Rev. H. Morgan-Stratford, at the mouth of the Thaw, in January, 1856.

The *Laridæ* are the last to be dealt with: they include the Arctic and Common Terns, the Lesser and Black Terns (both of which I give on Mr. Drane's authority), the Greater and Lesser Black-backed Gulls, and the Ivory Gull, one of which was seen by Sir H. H. Vivian, flying about over a piece of water which he has near Fairwood Moor, in Gower: he tried to secure it, but failed. There is also a record of one seen by Mr. H. Dillwyn (son of Mr. L. L. Dillwyn, M.P.), in Swansea Harbour, about the year 1883.

The occurrence of the Little Gull in March, 1885, and again in November, 1888, has been noted by me in 'The Zoologist' (1889, pp. 25 and 77).

* Most likely the Velvet Scoter is intended.—Ed.

Occasionally the Common Skua may be seen off the Worm's Head, on the coast of Gower. Three examples of Richardson's Skua have been obtained.

The Manx Shearwater occurs occasionally.

One specimen of Leach's Petrel was picked up some years ago on the beach at Gileston, and is now in the collection of the Rev. H. Morgan-Stratford.

With that tiny mite of a web-footed bird, the Storm Petrel, this list of the rarer Glamorganshire birds closes. Examples of the Storm Petrel are not unfrequently driven inland during boisterous weather, and a gale in October, 1881, drove many of these birds inland, and one was picked up in an exhausted state at Llantrissant.

If any reader of these Notes can add to, or in any way help in rendering the avifauna of this county more complete, I should indeed be glad, for as yet there is no book published on the Birds of Glamorganshire.

THE STATUS OF THE FIRECREST AS A BRITISH BIRD.

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

THE Firecrest was introduced into the list of British Birds fifty-seven years ago, by the Rev. Leonard Blomefield (then Jenyns), on the strength of an example caught by a cat near Cambridge. The bird was a young one, killed in August, and is doubtless that described in the following terms on p. 114 of that author's 'Manual of British Vertebrate Animals':—

“The young of the year before the first moult is only to be distinguished from those of the last species [Goldcrest] by the longer and broader bill; cheeks cinereous, without any appearance of the longitudinal streaks.”

It is scarcely possible that this description can be correct as applying to a Firecrest, for Mr. Dresser in the 'Birds of Europe' (ii. p. 460), quoting from Naumann, states that the young bird just fledged has, on the sides of the head, the black and white stripes so characteristic of the Firecrest, like the adult bird, but duller; and in a nestling from Sardinia which I examined, at least one stripe was apparent. The inference is that Mr. Blomefield's bird was really a young Goldcrest, and this is strengthened

by the circumstance that August is a very unlikely month in which to find the Firecrest here.

If this be so, the example obtained in Cornwall in March, 1845, must be regarded as the first recorded British specimen, while the Cambridge bird, which has been referred to as a Firecrest by every writer on British Ornithology, should be expunged altogether from the list.

The Firecrest is a winter visitant, regularly to Cornwall, and occasionally to the rest of England, but the number of authentic records north of the Thames is small. It is strictly a winter visitant, and not one of the reported occurrences in summer can be considered as proved.

One was killed at St. Leonard's on the 9th of April, 1868, and I had it in the flesh, but this was clearly a late migrant. Another was taken in the autumn on the rigging of a ship off the coast of Norfolk, in the early part of October (Mag. of Zool. and Bot., p. 491), and some have been obtained in Sussex in that month, but these were doubtless migrants from Central Germany, whence after the breeding season a few find their way to Belgium and Heligoland, and fewer still to our own shores.

It is remarkable that it should be a winter visitant, inasmuch as it does not breed—unlike other visitors at that season—anywhere in Europe in any latitude north of England. The Firecrests which visit the British Islands probably come by a lateral migration from Germany, and this is confirmed by no less than seven having been taken in the North Sea, close to our eastern coast, *viz.*, the one already alluded to, five on another occasion ('Zoologist,' 1888, p. 225), and one brought into Yarmouth and certified by Mr. Gunn, of Norwich.

The Firecrest has been taken oftener in Cornwall than any other county; Rodd, Bullmore, and others testify to the numerous examples which have from time to time been met with. Indeed the late Mr. Vingoe, of Penzance, is the only naturalist who has described its habits in this country (Rodd, 'Birds of Cornwall,' ed. Harting, p. 43). He mentions its great shyness and tendency to concealment, and its preference for the higher branches of trees. These traits are not noticed either by Mr. Dresser or Mr. Seeböhm, who have described the habits of this bird as observed in Germany and France; but something may be due to difference of locality.

Mr. Monk, of Lewes, has a case of Firecrests procured in Sussex, and very naturally mounted on a larch bough by the late Mr. Swaysland, and I have had two or three from Worthing and St. Leonard's. I do not think Mr. Saunders is over the mark in stating ('Manual,' p. 57) that it has occurred twenty times in Sussex, although there is a story of a bird-stuffer, now deceased, who sold one and the same Sussex Firecrest to ten customers! But apart from this there is no doubt that it has occurred very often in Sussex.

Other counties in which the Firecrest has been taken are Oxfordshire, Yorkshire, Kent, Shropshire (four), Suffolk, Dorsetshire (six), Berkshire, Hampshire, and Devonshire,—in fact in all the Southern and in some of the Midland counties.

The Scottish records, as Mr. Saunders justly remarks, stand greatly in need of confirmation. There is one record for Cumberland ('Birds of Cumberland,' p. 8), a bird killed with a stone and identified by the cut in 'Yarrell,' but the cut does not show the distinguishing features well, and Mr. Macpherson is not able to trace the bird, on which accordingly no absolute reliance can be placed.

Mr. Hancock states ('Cat. Birds Northumb. and Durham,' p. 75) that the only recorded occurrence in Northumberland and Durham is an erroneous one; and with regard to three shot *on one occasion* out of a flock of Goldcrests in Lancashire, by the late Mr. J. Hardy (Mitchell, 'Birds of Lancashire,' p. 19), I have a strong suspicion that these also may have been Goldcrests, knowing the way in which again and again the two species have been confounded, and the fact that the Firecrest is a visitor chiefly to the south of England.

In 'The Zoologist' for 1882 (p. 49) Mr. Phillips states that he has killed several in Breconshire; but this I imagine is a mistake, for the only authenticated Welsh specimen, available at least for examination, is in the possession of Mr. E. Bidwell, and it is therefore not unlikely that some fine male Goldcrests may in this instance have been mistaken for Firecrests. Mr. Phillips, with whom I communicated by letter, is of opinion that they were Firecrests, but it is remarkable what misapprehension still exists about the distinctive characters of these two closely allied species, though Mr. Harting has pointed out in the clearest manner ('Birds of Middlesex,' p. 56) what these characteristics are.

ORNITHOLOGICAL NOTES FROM CUMBERLAND.

BY THE REV. H. A. MACPHERSON, M.A.

SINCE August, 1888, I have spent more time than ever in working at all parts of our faunal area, but notwithstanding almost daily railway journeys to the coast, and an active correspondence, the results are not commensurate with the labour bestowed.

As regards Westmoreland, indeed, the least common birds that have come under my notice are the Bittern, Red-throated and Great Northern Divers, all killed in that county; a specimen of the second species named having been killed by telegraph-wires near Kendal, and others obtained on the coast.

With regard to Cumberland the case is brighter. The Shoveller nested with us as in previous years, and several young birds were killed by flight-shooters in August. A tolerable number of Waders visited our estuaries during that and the following month. It was numerically a poor autumn for the *Limicolæ*, Grey Plover and Bar-tailed Godwits being far less plentiful than in 1887, though I saw a very large flock of the latter species on Christmas-eve, when usually only small parties are to be seen. A few Greenshanks, Ruffs, Curlew Sandpipers and Little Stints accompanied the commoner birds. The Ruffs* I generally found associating with Peewits, and the Little Stints with Dunlins.

August 20th was a red-letter day for us, for one of our local gunners, whom I had long encouraged to search for *Totanus fuscus*, succeeded in shooting an immature specimen of that wary wader. No occurrence of this species had been authenticated in Cumberland for more than fifty years, though I know of a more recent example killed in the adjoining county, and shown to one of my friends as a "dusky retainer" (?). The late James Cooper informed Mr. Adamson that Mr. Heysham obtained one in 1829 and saw another in 1833 ('Birds of Cumberland,' p. 159); but my examination of the Heysham MSS. showed that the first bird was shot on October 13th, 1830, and that it was in 1834 that Cooper saw another.

* The occurrence of the Ruff in England in mid-winter is noteworthy as being unusual. See 'The Naturalist,' 1889, pp. 78, 79.—ED.

Goldeneyes arrived (and were shot) on October 10th, and were as usual plentiful this winter, occurring on Derwentwater and other lakes and rivers, from Furness to the Solway, inland especially.

Pochards and Tufted Ducks, Scaups, and all the usual fowl visited us this month, a couple of Wigeon having been shot as early as August 30th.

We searched in vain for any remarkable small birds, a pretty cinnamon variety of the Common Whitethroat being the only Warbler worthy of notice. As if to compensate for disappointment, we were cheered by the detection of the Pectoral Sandpiper, *Tringa maculata* (Vieillot), three specimens of which were found near Penrith, and two were shot ('Ibis,' Jan. 1889, p. 136). We searched the rushy spot where they were found without obtaining any glimpse of the survivor.

A young Glaucous Gull and an old Velvet Scoter were seen in November, but I am glad to say escaped destruction.

Few winters or springs pass without my hearing of Wild Swans, but they are rarely shot, and when killed are generally eaten. Last December five Bewick's Swans visited a quiet sheet of water, and there two of them remained until March, when they flew northward. The other three unfortunately strayed to the coast, and were shot by a punt-gunner on Christmas-day. Two of these were cygnets, and they were subsequently staked at cards and lost! I traced the gamesters in time to find one bird plucked and headless; the other I secured, with the old one, for our local Museum. As we hung up these fine birds side by side to photograph them, the words rose to my lips—"Beautiful in their lives, in death they were not divided," the trio having been shot at one discharge as the young birds swam up to the old male for protection from a Greater Black-backed Gull that hovered menacingly overhead. The other two Swans were adults, and I showed them to several of my friends, the farmers in the district supplementing my endeavour to secure the sanctity of their asylum, while we studied their movements on every available opportunity.

A Grey Shrike, *Lanius excubitor*, was captured by a bird-catcher early in December, while striking at a call-bird, but was unfortunately killed for stuffing before I heard of it. I saw a second, and heard of one or two others. This reminds me,

en passant, that my friend Dr. Parker, of Gosforth, reported that he had seen a single Grey Shrike on a property of his, at the beginning of June.

On New Year's day was shot a Black-tailed Godwit, *Limosa melanura*, which I selected out of some Bar-tailed Godwits, all shot together with one of the numerous punt-guns that render Wild-fowl unapproachable by owners of shoulder-guns on the Solway. In January also I saw, but could not approach within gun-shot, a bird closely resembling *Larus melanocephalus*. I wrote to my friends the Manns of Aiglegill, and asked them to look out for a strange Gull. They did not turn up the doubtful bird, but a close investigation added a nice specimen of *Larus minutus* to their collection.

Other scarce birds have since occurred here,—the White-fronted Goose, Black-throated Diver and Slavonian Grebe,—and when the number of trained observers is increased we shall hope for better things. Mr. Saunders' 'Manual' is a monthly source of pleasure to the four working men whom I supply with copies; I wish that 'The Zoologist' could circulate amongst them, to encourage their taste for Natural History.

THE SUBORBITAL PITS OF THE INDIAN ANTELOPE.

BY PROCTER S. HUTCHINSON, M.R.C.S.

It may be of interest to those who have not already noticed them to draw attention to the well-marked suborbital pits on the face of the Indian Antelope, *Antilope cervicapra*, now in the Zoological Gardens.

These pits, or glands, are found on various parts of the body in several species of Antelopes, Deer, and most Sheep and Goats, though small in the latter. They occur chiefly on the face, but are found behind the ear in the Chamois, and near the tail in the Musk-deer. They bear some relation to the reproductive functions, and are larger in the male than the female, being entirely absent in the latter in some species. Prof. Owen, in his 'Anatomy of the Vertebrates,' associates them with the various scent-glands found in the Beaver, Peccary, certain tropical Bats, the Shrew-mice, Civet-cats, Skunk, and many other animals.

The scent from these glands serves the purpose of enabling an animal to join the others of its own species, but also enables enemies to follow them; in the Skunk the awful smell given off serving as a defence from the latter when attacked. The staining of the face in deer, from the secretion of these glands, gives the appearance of weeping to the animal, and has been suggested as the origin of Shakespeare's lines on deer weeping, occurring in 'As You Like It':—

“The big round tears
Cours'd one another down his innocent nose
In piteous chase.”

And again, in 'Hamlet':—

“Why, let the stricken deer go weep.”

The accompanying sketch, taken from an Antelope now in the Zoological Gardens, shows the situation of the gland at a short distance below the eye, and sufficiently near for the tears to run



over into it. It will be noticed that the animal has the power of closing and opening the orifice of the gland by means of muscles. The pit is about an inch long and not very deep. It is formed by a folding in of the skin, and the secretion from the little glands opening into it is tenacious, and has a somewhat musky odour. The keeper at the Gardens told me that he had not noticed that the secretion was more copious or more odorous at one time than another, though Darwin mentions that in some deer it smells more during the rutting season.

In the female of the Indian Antelope the gland is much smaller, appearing simply as a black marking, and the animal does not appear to have the power of opening it. I have not had the opportunity of examining it very closely, but have not seen any secretion from it. These animals have not bred; the keeper tells me that the male and female fight if put in the same pen.

It was an old idea, noticed in White's 'Selborne,' that the sub-orbital pits communicated with the nose, and allowed the animal to breathe while drinking with the nose under water; but of course, as pointed out by Mr. Harting, in his edition of that book, the gland is only in the skin, and does not communicate with the nostril. The same author suggests that the fallacy of Alcmaeon, that goats breathe through their ears, may have been due to his having seen the openings of the pits behind the ears in the Chamois. In Caton's 'Deer of America,' the glands found on the legs of Reindeer, Mule-deer, Wapiti, and other deer will be found described at length. These glands are found in the male and female, and at all ages. The only advantage to the animal suggested is in enabling it to find its companions by the scent. In the Wapiti, as may be seen by inspection of those now in the Zoological Gardens, the glands are placed in a tuft of hair on the hind legs, below the hock.

NOTES AND QUERIES.

MAMMALIA.

Distribution of Plants by Frugivorous Bats.—Recently when walking in the Royal Botanic Gardens of Port-of-Spain, in company with the Superintendent, Mr. J. H. Hart, I noticed under a tree numbers of a large brown nut, about six or seven inches in circumference; these nuts evidently did not belong to the tree overhead, which bore a totally different fruit. Referring to Mr. Hart for an explanation, he informed me that it was due to the fruit-eating Bats, who resorted to favourite trees at night, bringing their food with them, and that suspended from a branch by their hind feet they fed at leisure. He further informed me that the nut I had noticed did not belong to any tree growing in the Botanic Gardens, nor to a tree that, so far as he was aware, grew in any close proximity to Port-of-Spain, and that the fruit must have been transported from some con-

siderable distance by the Bats, notwithstanding the large size and weight of the nut. Mr. Hart then drew my attention to other trees in the gardens, and on the ground beneath them were accumulations of seeds of various kinds of fruit-bearing trees, brought thither by the same agency. Years ago, when passing through the Straits of Malacca, I observed at evening-time hundreds of great fruit-eating Bats passing overhead at a high altitude, like a flight of migratory birds, from the Malayan to the Sumatran shores, and returning in the early dawn. If these animals have the same habit of carrying part of their food with them, what a wide-spread means of distributing fruit-bearing plants and trees must exist in those regions! In Trinidad these fruit-carrying Bats might easily extend their nocturnal flights to the mainland, and possibly do so. It is quite within the bounds of probability that fruit-carrying Bats have been caught up in gales of wind, and have been borne along, still clinging to their food, until by some fortuitous circumstance they reached an island at some distance from the point of departure. This may be one of the means by which seeds that will not bear long immersion in salt water have been transported to islands.—H. W. FEILDEN (Trinidad, March 16, 1889).

BIRDS.

Crossbill breeding in Co. Waterford.—The Crossbills, four of which I first noticed here on November 13th last, have continued to frequent this place throughout the winter, so that the loud rattling call-note, which they always utter on the wing, has become familiar to me and to others here. Their haunts have accordingly been watched, and the discovery was made in March of a nest, placed 37 feet from the ground, near the extremity of a lateral branch of a Scotch fir, the terminal tree of a group on the hill-slope, many other masses of old Scotch firs, with silver and larch, being in the vicinity. On the 21st March I watched with a telescope, from the high ground above the nest, the female Crossbill which was hatching. She frequently changed her position, preened her feathers, and would sometimes rise from her crouching attitude, wriggle, and turn in the nest. While watching her I heard the rattling cry, more subdued than usual, of the male, which perched on the nesting-tree. The female immediately, leaving the nest, joined him, and they flew away together for a short time, when I discovered them perched on a neighbouring tree. The female, which had evidently received some food there from her mate, then returned to the nest. On the 22nd, having learned that these birds and their nest were wanted for the British Museum, I ascended the tree to inspect the contents of the nest. To my surprise the female, which was hatching, did not move when I reached the base of the branch she was in, but sat staring at me. I then took a stick and pushed her. She resisted the pressure and tried to bite the stick. I then pushed her out of the nest, but she kept a

grip of it with her claws, and as soon as the stick slipped off her, she sank again into the nest. I then called to my servant to get above me in the tree, and look into the nest while I pushed the bird off. I renewed my efforts to dislodge the bird, which this time consented to creep to the end of the branch, but not to leave it. My man reported four eggs in the nest. Next morning, March 23rd, my servant watched near the nest for the male since before 6 o'clock. He was not long there when the call-note of the male was heard, and the female flew away with him to some distant trees and was fed. After 7 o'clock the male perched on a neighbouring tree and was shot. I then, with my servant's assistance, took the female, which sat on the nest until—after many ineffectual efforts—we got a wire noose tightened on her neck. She was in greenish yellow plumage, while the male was golden yellow, slightly inclining in some places to red, in others to green. The four eggs which the nest contained have a few bold, rounded spots and streaks of dark red-brown, with lighter reddish brown markings, chiefly towards the larger end: they contained embryos whose eyes were about the size of No. 4 shot, but I have been able to clean them out, and they, as well as the birds and nest, have been forwarded to the British Museum. The nest, which was placed between two or more minor stems in an intricate part of the branch, was well overshadowed by luxuriant tufts of the fir-needles. It was very loosely constructed, the materials forming beneath a sort of tuft hanging down between the stems that supported the sides of the nest. It was composed externally of the smaller dead twigs of Scotch and spruce fir, intermixed with dried grass and other stems, and lined with softer dried grasses. In general appearance it might remind one most of a Greenfinch's nest. On February 11th I had heard the male Crossbill singing on the top of an elm not far from where the nest was found: this song, which was subdued, had a mixed resemblance to that of some Goldfinches which were answering from a neighbouring tree, and to the notes of a Greenfinch. The female Crossbill, which alighted beside him, used her beak in climbing like a Parrot. From accounts that I have heard of Crossbills occasionally continuing to frequent places in the central counties of Iceland, as well as from their breeding having been recorded before in a few instances, it seems probable that when these strange wanderers light upon a place that suits them, as in the present instance, they stay and breed more frequently than is imagined, though they cannot be considered residents in Ireland, and are often absent for years.—R. J. USSHER (Cappagh, Co. Waterford).

The Parrot Crossbill in Ireland.—We have long been looking for the Parrot Crossbill, *Loxia pityopsittacus*, in Ireland, but it is only within the last few weeks that its occurrence here has been fully established. From the demesne of Lord Rosse, at Parsonstown, Mr. Edward Williams, of Dublin, received for preservation, in January last, a bird which seemed to

him heavier and stronger in the bill than usual; and I am glad to say that his suspicion has proved correct. Prof. Newton confirms our determination of the *sub-species*; and Mr. J. G. Millais, of the Seaforth Highlanders, now quartered in Dublin, most kindly took the trouble to have sent from London a series of Crossbills obtained by himself in Scotland, which enabled me, by comparison, to make quite sure of the name, though of course the opinion of Prof. Newton would of itself have been quite sufficient. This, the first authenticated Irish specimen of the Parrot Crossbill, was shot, as I am informed, in Parsonstown demesne, on January 12th last. The past winter has been remarkable for the number of Crossbills which have been observed in various parts of Ireland.—A. G. MORE (74, Leinster Road, Dublin).

Assumption of Male Plumage by the Female Crossbill.—On the 18th October last I received from Edenhall two Crossbills, *Loxia curvirostra*, shot out of a large flock by the son of the head keeper. They were both in the dull crimson plumage of the male; but, on careful dissection, one proved to be a female bird, the ovary being slightly enlarged. To this I may add that Crossbills were extremely numerous in this district all last summer. In November their numbers were largely increased by migratory flocks.—E. TANDY (Penrith).

Crossbills in Suffolk.—A good many Crossbills have appeared this winter in West Suffolk, more than in any season since 1867, when I can remember having seen the table of a birdstuffer's shop in Bury almost covered with recently-killed examples in various plumages. In one box of seven, sent to me from near Retford, were male birds in four quite different plumages, one being in the bright yellow-brown dress, which seems the most uncommon of all. Another male, in the red plumage, measured in the flesh $7\frac{3}{8}$ inches, and has a very powerful bill: this has been pronounced to be intermediate between the Common and Parrot Crossbill—JULIAN TUCK (Tostock Rectory, Suffolk).

Nesting of the Black Redstart in Essex.—Writing on this subject (p. 151), Mr. Miller Christy says:—"The breeding of the Black Redstart in England has been several times recorded on very doubtful grounds, but never yet satisfactorily established." As I happen to know of one authenticated case in which the eggs have been preserved, it may be worth notice. The nest I refer to was found by my father, William Jesse, whose name will be familiar to your readers as that of the naturalist who accompanied the Abyssinian Expedition under Lord Napier, and his account of the discovery, which was inserted in his collection-book at the time, is as follows:—"These specimens [*i. e.* four] were taken by myself in the garden-wall of Mr. James Parder, Braddon House. I saw both birds myself, the hen on the nest. I once saw a Black Redstart (male) killed at the Hyde

[Ingatestone, Essex] by my grandfather's gardener. My grandfather had it stuffed." Of the four eggs two are now in my possession, one was given to Mr. W. Colchester, of Grundisburg Hall, Suffolk, and the other to Mr. Harvie Brown, of Dunipace House, Stirlingshire, Sept. 18th, 1867.—
WILLIAM JESSE, JUN. (Selwyn College, Cambridge).

Nesting of the Black Redstart in Durham.—In Mr. Christy's note (p. 151) on the reported nesting of this bird in Essex, he seems to be under the impression that *Ruticilla tithys* has never been known to breed in this country. Allow me to refer him to Mr. Hancock's 'Catalogue of the Birds of Northumberland and Durham' (p. 68), where it is stated that, in the year 1845, a pair of Blackstarts nested in the garden of the Rev. James Raine Crook Hall, in this city. The nest and some of the eggs were secured by the late Mr. Wm. Proctor, Sub-curator University Museum. I feel quite certain that Mr. Proctor would duly identify the birds before removing the nest and eggs, "as was his usual strict habit." Some time after, the nest and one egg were given to Mr. Hancock by the son of the rev. gentleman in whose garden the nest was found. They are to be seen in the Newcastle-on-Tyne Museum at present.—JAMES SUTTON (33, Western Hill, Durham).

[See also Sterland, 'Birds of Sherwood Forest,' pp. 67, 68.—ED.]

Woodcocks.—You ask how I came to know that Chantrey's Woodcocks did not weigh over 16 oz. apiece, as no mention is made of their weight in the Holkham Game-book. Perhaps you will allow a third party to be judge between us. My friend, whose authority I think no sportsman would be disposed to question, writes thus to me on this subject:—"The day on which Chantrey shot those two Woodcocks was the 20th November, 1829, as recorded in the Holkham Game-book, with this note:—'Amidst the events of this day it is especially worthy of being recorded that Mr. Chantrey killed *at one shot two Woodcocks*'—testified by T. W. Coke, Archdeacon Glover, J. Spencer Stanhope. Not one word is said about the weight of the Woodcocks, which, if they had scaled 1 lb. each, would surely have been mentioned as a most unusual weight. I have killed, in Lower Brittany and Devonshire, a great number of Woodcocks,—my ten or twelve a-day for years, shooting three or four days a-week,—and weighed the big ones, but never, to my recollection, killed one over 14 oz." Bewick says they generally weigh about 12 oz.; Yarrell that they vary from 7 to 14 or 15 oz., but records some heavier exceptions; and in Daniel's 'Rural Sports,' one is recorded as weighing 17 oz. Gould records that the weight of seventy out of eighty birds in fair condition will range between 11 and 14 oz., and that it is a very large cock that weighs 15 oz., and an extraordinary one that turns the scale at 16 oz. "It is my conviction," says my correspondent, "that not one in 500 weighs 1 lb. What proof then can there be," he continues to say, "that Chantrey's Woodcocks weighed 1 lb. each? I think

we may take it that we possess the strongest possible indirect testimony that they did not do so, for such rare birds would certainly have had the pæans of their weight sung in the Holkham Game-book." By way of compromise, I should be quite willing to alter the disputed passage in my letter (p. 149) in this fashion—"thus beating, I may be allowed to assume, Chantrey's feat, so far as weight was concerned."—E. W. HARCOURT (Nuneham Park, Abingdon).

Number of Eggs laid by a Magpie.—When in Cornwall this spring I found a Magpie's nest, with ten eggs in it, in an orchard (April 10th). The nest was in an apple-tree about ten feet from the ground, and not fifty yards from the house: the eggs were much incubated. This nest has been used by the same birds for certainly three, if not four years. Do not Magpies, as a rule, make a new nest every year?—WILLIAM JESSE, JUN. (Selwyn College, Cambridge).

Food of the Common Wren.—On March 28th I saw, at the brink of a nearly dry pond, a little brown Wren busily engaged with some large dark object. Holding this in its beak, it kept dashing it with great vigour against surrounding sticks and bushes, after the manner of a Kingfisher with a fish, varying this treatment with an occasional savage peck. On my approach the Wren dropped, or rather jerked away, its prize, which proved to be the case of a caddis-worm, composed of dark, sodden oak-leaves. The occupant was missing, and was, I fancy (judging by the bird's actions), successfully extracted by means of the last frantic effort.—G. T. ROPE (Blaxhall, Suffolk).

Sand Grouse in Lincolnshire.—I am sorry to say that three Sand Grouse were shot at a marsh village, Saltfleetby, near Louth, during the week ending Feb. 23rd. According to a local paper, they were shot from a flock of about 100 birds. I may add that I wrote a letter to the local paper, giving a copy of the Sand Grouse Protection Act, the existence of which, apparently, is unknown to the general public.—HENRY F. ALLISON (Beckingham, Lincolnshire).

Sand Grouse in Ayrshire.—If not already recorded, it may be of interest to readers of 'The Zoologist' to know that two Sand Grouse were picked up dead in April, 1888, near Dalrymple Station, Ayrshire, apparently killed by telegraph-wires. Another was shot by a gamekeeper at Cloncaird, Maybole, Ayrshire, on Dec. 12th, which has been preserved.—JAMES SARGENT (Nith Lodge, New Cumnock, N. B.).

Rose-coloured Pastor in Kent.—I think I may with certainty record the occurrence of a Rose-coloured Pastor here in January last. It was seen in company with some Fieldfares, and from the description given to me, the observer being very near the bird, I have not a doubt as to its

identity: the rose-colour was conspicuous, but the black on head and wings was less so: the breast was described to me as "a most beautiful rose," and the "head above the eye dark." The bird was also described as smaller than the Fieldfares with which it was feeding. About midsummer, 1888, a young Pastor, with the immature grey-brown plumage of the first year, was killed at Godmersham, some six or seven miles from Canterbury, and was at first taken for a Starling, but subsequently identified by Mr. Gordon, of the Dover Museum, who had it set up. I saw this bird, and it was most certainly a Pastor. The occurrence of these two birds in comparatively the same neighbourhood in the same year, one quite immature, the other having passed the autumn moult, seems to point to their having been bred in the locality; at least this would be a reasonable surmise if the rose feathers appear after the first autumn moult. Some years ago I obtained a fine specimen of the mature Pastor in very nearly the same neighbourhood; it was shot in a garden while eating cherries.—W. OXENDEN HAMMOND (St. Alban's Court, Wingham, Kent).

Hawks devouring their Prey on the Wing.—With regard to Mr. Henry Laver's query (p. 147), I may mention that, although I have never seen any hawk attempt to devour any bird whilst on the wing, it is to my knowledge the common habit of La Marmora's Falcon, *Falco eleanora*, and the Hobby, *F. subbuteo*, to devour their insect prey in this manner; and it is more than probable that one of these falcons taking a Swallow out at sea, with no perching place at hand, except perhaps the yards of a ship in motion, would so devour such like quarry. Mr. Laver mentions that the hawk specially referred to in this connection by his son was a Kestrel, in which case the Swallow must have been very tired, or the Hawk an exceptionally good flyer. I think I may confidently assert that the greater part of the food of both the European species of Kestrel is taken from the ground, whilst that of the two falcons above mentioned, as well as that of the Red-legged Falcon, *Erythropus vespertinus*, is, with few exceptions, caught in the air. If the Hobby was as good a "footer" as he is a flyer, no small bird could escape him in fair flight.—LILFORD (Bournemouth).

The Destruction of Small Birds on the Continent.—It may interest some of your readers to know what becomes of our migratory birds which collect in large flights on the South Coast in September and October. The fields are then covered with Thrushes, Finches, Larks, Linnets and Wagtails, on their way across the Channel to where the "Chasse aux Grives" is eagerly looked forward to by the French sportsman, and where all the small birds find their way to the poulterers. The great majority of our indigenous birds, as also those that come from Norway, as soon as they have crossed the Channel, follow the coast of France to Biarritz, on their way to the warm climates of Spain, Italy, and Africa. I was several winters at Biarritz, and was witness to the great destruction of birds

which takes place on their annual passage. As the result of subdivision of landed property in France, every one or two small fields is held separately by a peasant and his family. These are usually cultivated with Indian corn, haricot beans, and vegetables, and the crops are all off by September. The field is generally a square or a parallelogram, and as soon as it is clear, each man puts up a small hut in one corner, and fixes a long folding clap-net in the middle of his field. Seed is then spread, and tame Finches, Larks or Pigeons, attached by a short string, are placed as decoys. Monsieur le Propriétaire then sits in his hut and waits, keeping a sharp look-out for the flights coming from the north: as soon as he sees them coming he agitates his decoys, and the birds immediately come down to feed and rest, when a pull of the cord encloses ten, twenty, forty, or more at one haul. These are killed and picked clean for the market, and the net re-set. This goes on all day and every day during the period of migration in all the fields in the district, and presumably in most other parts of the country. I used to go round to watch the proceedings, and at every hut I found by the man's side a mound (a foot or more high) of little victims without their feathers. The Finches were the most numerous: Chaffinch, Greenfinch, Hawfinch, Goldfinch, Linnet, and Siskin,—nothing comes amiss to them, and everything finds a ready sale in the market. One man I found picking a Sparrowhawk. I suggested that it was not eatable; but he said, "With the head and feet cut off, no one would know it from a Pigeon"! After all, considering the vast flights that are moving at these seasons of migration, it is a question whether this partial destruction does more than decimate the different species or sensibly diminish their numbers. I have stood at my window at Biarritz, overlooking the sea, and watched flights of thirty or forty Chaffinches every three or four minutes pass incessantly to the south. In addition to the nets, wherever there are fences or hedges I found them covered with limed twigs, which are visited every day for insectivorous birds. These they have a plan of packing by the dozen, by inserting their necks between a split stick tied at both ends. I was once driving at Cambo, and saw a man with some of these sticks of coloured birds, and thinking they might be rare specimens I bought one in a hurry, and on reaching home found they were Robins and Redstarts! They take the Stock Dove and Turtle Dove at Biarritz, but the capture of the Wood Pigeon is a special pursuit. Vast flights of our Common Cuckoo, or Wood Pigeon, migrate south in the autumn through the gorges of the Pyrenees, the inhabitants of the localities having an hereditary vested interest in particular narrow gorges in the mountains through which they pass. These are known as "Palombières." At the proper season nets are spread across these narrow passes from trees on one side to the trees on the other. At the top of a high tree at the side, a boy is stationed provided with a stuffed hawk: he

watches the approach of the Pigeons from the north, and as soon as they are in view throws his hawk in the air, on sight of which they dive down through the gorge, where they are netted. One may judge of the numbers taken by seeing the markets full of them, and these "Palombières" are a valuable possession to their owners. Besides, wherever there are high trees, which the Pigeons frequent for roosting, there are huts built high among the branches, from which they are shot. I will conclude this with a list of birds that I took down from a poulterer and game-dealer's shop in Rome:—Blackbird, Thrush, Linnet, Goldfinch, Robin, Blue Tit, Greenfinch, Hawfinch, Jackdaw, Peewit, Sparrowhawk, Nightjar, Redwing, Blackcap, Red-legged Partridge, Grey Partridge, Jay, Magpie, Siskin, Lark, Wild Goose, Mallard, Teal, Shoveller, Pintail Duck, and Little Bustard. Besides birds, I saw Hare, Roe-deer, Wild Boar, and Porcupine.—E. C. MITFORD.

[*Cf.* Waterton's account of the Bird-market of Rome.—ED.]

Early nesting of the Goldcrest.—On March 24th I had a nest of the Goldcrest brought to me in a dead branch of a furze bush that had grown long and straggling in a wood facing the south: it contained seven eggs, showing no evidence of incubation, but the yolk in each adhering to the side, as if they had been some time laid. The finder informed me that when he discovered the nest, on the 14th, it contained four eggs; that on the 20th there were seven, and that the bird was sitting on this number when he took it on the 24th. As we had frost on the night of the 19th, followed by cold wind from the north, it is probable that the vitality of the eggs was then destroyed. I have never hitherto known Goldcrests to breed before the latter half of April, and May and June are the most usual months.—R. J. USSHER (Cappagh, Co. Waterford).

Shoveller nesting in Cumberland.—In his 'Illustrated Manual of British Birds' Mr. Howard Saunders states, of the Shoveller, that "probably a few pairs inhabit the marshes on the Cumberland side of the Solway, inasmuch as the bird is known to nest in Kirkeudbrightshire." Mr. Saunders has forgotten that in 1886 I recorded a nest of the Shoveller taken on the Cumbrian Solway in 'The Naturalist,' describing also the young in down. In 1887 we again obtained a nest, and, though none was found in 1888, the old birds bred, and young ones were shot on the marshes with the first days of August. The case is really stronger for us than for the Scottish Solway, because the Scottish evidence rests only on young birds shot when feathered, while we have found the nest twice, and obtained feathered young on several occasions. In fact the Shoveller nests with us in two localities, twelve miles at least apart.—H. A. MACPHERSON (Carlisle).

FISHES.

A Rare Fish on the Norfolk Coast.—I am indebted to Mr. Arthur Patterson, of Yarmouth, for a specimen of a beautiful little fish, *Scopelus*

mülleri (*Maurolicus pennantii*), which he obtained under the following circumstances:—On April 1st, seeing some men drawing a seine-net on the Yarmouth side of the entrance to the river Yare, he stopped to examine the refuse from the net, and amongst other small fry found the subject of this notice, which he says he recognised from his remembrance of the figure in Couch's work. Mr. Patterson very kindly sent the fish to me; but having been roughly handled, it reached me in a very dilapidated condition, and, in order to place the occurrence beyond doubt, I sent it on to Mr. Francis Day, who was good enough to confirm our conclusions. In 1886 Mr. Robert Gray sent me one of these little fishes in spirits, and in capital condition, which he had taken on the 1st August of that year, in lat. $73^{\circ} 12'$ North, long. $1^{\circ} 28'$ West, somewhere to the north-west of Jan Mayen (*cf.* Zool. 1886, p. 131). This specimen I also sent to Mr. Day, who described it in 'Nature' of the 14th Oct. 1886. A fish believed to be of the same species has been found as far south as the Mediterranean; it therefore appears to have a very extensive range, if indeed they are identical, which, judging from the diversity in the figures I have seen, may not be the case, or the difference in appearance may arise from the specimens figured being in more or less perfect condition, owing to their extreme delicacy and the ease with which the scales become detached.—T. SOUTHWELL (Norwich).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

March 21, 1889.—Mr. CARRUTHERS, F.R.S., President, in the chair.

Messrs. H. B. Hewetson, W. Narramore, W. J. Rabbits, and M. B. Slater were elected Fellows.

Mr. T. Christy exhibited the pod, thirty-six inches in length, of an Apocynaceous plant received from the Gaboon as *Strophanthus*, but believed to be allied to *Holarrhena*.

Prof. Stewart, referring to the specimens of *Noctilio leporinus* exhibited at the last meeting of the Society, stated that he had examined the contents of the stomachs submitted to him by Mr. Harting, and had found without doubt fragments of fish-scales, and fin-rays, and a portion of the lower jaw of a small fish, proving the correctness of the assertions which had been made regarding the piscivorous habits of this Bat.

Mr. W. B. Hemsley furnished a report on the botanical collections made on Christmas Island during the voyage of the 'Egeria.' This included a complete list of the plants collected, with remarks on their general distribution, the author being of opinion that the flora of this island, which lies about 200 miles south of the western end of Java, was more

nearly related to that of the Malayan Archipelago than to that of Australia. Mr. C. B. Clarke, commenting on the author's observations on the buttresses of trees, described some remarkable instances which he had seen of this singular mode of growth. Mr. J. G. Baker, referring to the Ferns which had been collected, noticed their affinities and distribution. Mr. R. A. Rolfe commented on three species of Orchids which had been brought home by this expedition, all of which were new. Mr. Thiselton Dyer, referring to Mr. Lister's report to the British Association on the zoological collections from this island, in which it was stated that the character of the avifauna was Australian, considered that this was not borne out by an examination of the flora, which was decidedly Malayan.

A paper was then read by Mr. R. A. Rolfe, "On the sexual forms of *Catasetum*, with special reference to the researches of Darwin and others." The purport of Darwin's paper (Journ. Linn. Soc. 1862) was to show that *Catasetum tridentatum* had been seen by Schomburgk to produce three different kinds of flowers belonging to the same number of supposed genera, all on the same plant, and that the three represented respectively the male, female, and hermaphrodite states of the species. Mr. Rolfe showed that Schomburgk's remarks applied to two distinct species, *C. tridentatum* and *C. barbatum*, the females of which resembled each other so closely that they were thought to be one and the same, viz. *Monacanthus viridis*. Neither of these, however, belonged to the true plant of that name, which was really the female of another species, namely, *C. cernuum*—a fact hitherto unsuspected. The key of the situation was that the females of several species resembled each other very closely, and to three of them the name *Monacanthus viridis* had been applied.

After some critical remarks by the President and Mr. Bull, a paper by Mr. MacOwan was read on some new Cape plants.

The meeting adjourned to April 4th.

April 4, 1889.—Mr. CARRUTHERS, F.R.S., President, in the chair.

Mr. A. C. Lowe was admitted a Fellow of the Society, and Messrs. T. W. Cowan and Rupert Vallentin were elected.

Mr. D. Morris exhibited a specimen of the hymenopterous insect, *Eulema cayennensis*, concerned in the fertilization of *Coryanthes macrantha* (see Crüger, Journ. Linn. Soc. viii. 129), and obtained from Mr. Hart, of Trinidad. Referring to the illustrations of the structure of the flower given in the 'Gardeners' Chronicle' (xvii. 1882, 593, and xxiii. 1885, 145), Mr. Morris explained the process carried out by the insects, chiefly bees, in removing the pollinia and subsequently attaching them on the stigma. The observations of Crüger had been verified by Mr. Hart in the Botanic Gardens, Trinidad.

Sir Edward Fry exhibited and made some instructive remarks on a

copy of Grisley's 'Viridarium Lusitanicum,' 1661, presented by Linnæus to his pupil Loeffling, the author of the 'Iter Hispanicum.'

Prof. R. J. Anderson exhibited some photographs of educational museum cases in Queen's College, Galway.

A paper was read by Mr. Lister on the Myxomycetes, or Mycetozoa, a group of organisms on the borderland between the animal and vegetable kingdoms, and formerly classed with Fungi. His remarks were illustrated by numerous coloured drawings of representative species, and the author exhibited under the microscope the swarm-cells from the spores of *Amaurochæte* and the streaming plasmodium of *Badhamia*. Attention was especially directed to the mode of feeding of the swarm-cells, and observations made on those of *Stemonitis*, where large bacilli were seen to be caught by pseudopodia projected from the posterior end of the organism, and drawn into its substance and digested. An interesting discussion followed, in which the President, Prof. Marshall Ward, Prof. Howes, and Mr. Breese took part.

A paper was then read by Mr. E. W. Hoyle on the deep-water fauna of the Firth of Clyde, embodying the result of recent investigations. The explored area, which is shut off from the Irish Sea by a submarine plateau extending from the Mull of Cantyre to the Ayrshire coast, contains seven distinct deep-water basins in which the depth exceeds 20 fathoms, and in some cases reaches 80 or 100 fathoms. An account was given of the dredging which had been carried on, with lists of the species obtained at various depths. A discussion followed, in which Messrs. John Murray, W. P. Sladen, and G. B. Howes took part.

The meeting adjourned to April 18th.

April 18, 1889.—Mr. CARRUTHERS, F.R.S., President in the chair.

The Rev. R. Collie was admitted a Fellow of the Society, and Messrs. P. Goiffon, T. W. Shore, and R. W. Scully were elected.

In view of the approaching Anniversary Meeting, the following Auditors were appointed:—Dr. J. Anderson and Mr. Jenner Weir for the Council; Mr. T. Christy and Mr. D. Morris for the Fellows.

The President called attention to a valuable donation of books on Fishes, including the celebrated work of Bloch, recently presented to the Society's Library by Mr. Francis Day, C.I.E., F.L.S., who, he regretted to say, was lying seriously ill at Cheltenham, upon which a cordial vote of sympathy and thanks for the gift was unanimously accorded.

Mr. J. R. Jackson, Curator of the Museum, Kew Gardens, exhibited specimens illustrating the mode of collecting at Ichang, China, the varnish obtained from *Rhus vermicifera*, so largely used by the Chinese and Japanese for lacquering. He also exhibited some Chinese candles made from varnish seed-oil.

On behalf of Mr. Henry Hutton, of Kimberley, some photographs were

exhibited, showing the singular parasitic growth of *Cuscuta appendiculata* on *Nicotiana glauca*.

Dr. Cogswell exhibited specimens of vegetables belonging to four different families of plants, to illustrate the symmetrical development of the rootlets.

Prof. Martin Duncan exhibited under the microscope, and made some remarks upon, the *Spharidia* of an Echinoderm.

Dr. Masters gave a summary of a paper "On the Comparative Morphology and Life-history of the *Coniferæ*," a review of the general morphology of the order, based upon the comparative examination of living specimens in various stages of development. These observations, made in various public and private "pineta," supplemented by an examination of herbarium specimens, demonstrated the utility of gardens in aid of botanical research. The mode of germination, the polymorphic foliage, its isolation or "concrecence," its internal structure, the arrangement of the buds, the direction and movements of the shoots, were all discussed. In reference to the male and female flowers, the author described their true nature, tracing them from their simplest to their most complex or most highly differentiated condition, and showed that, so far as known, the histological structure and development were essentially the same throughout the order. Various special forms, such as the needles of *Pinus*, the phylloid shoots of *Sciadopitys*, and the seed-scales of *Abietinæ* were described, and their significance pointed out. The phenomenon of Enation, with the correlative inversion of the fibro-vascular bundles in such outgrowths was considered in relation to the light it throws upon certain contested points in the morphology of the order. The chief teratological appearances noted in the order were detailed and their significance discussed. The various modifications were shown to be purely hereditary, or partly adaptive, and dependent on permanent or independent arrest, excess, or perversion of growth and development, and to various co-relative changes. Lastly, the polymorphic forms of the so-called genus *Retinospora* suggested that in studying them we might be watching the development and fixation of new specific types.

The meeting adjourned to May 2nd.

ZOOLOGICAL SOCIETY OF LONDON.

March 19, 1889.—Prof. FLOWER, C.B., LL.D., F.R.S., President, in the chair.

The Secretary read a list of the fishes collected at Constantinople and sent to the Society by Dr. E. D. Dickson. The species were sixty-six in number, and had been determined by Mr. G. A. Boulenger.

Mr. Tegetmeier exhibited a female Gold Pheasant in male plumage, and a curiously distorted pair of horns of the Ibex of Cashmir.

The Rev. A. H. Cooke read a paper on the position of the land-shells of Australia and the adjacent islands, commonly referred to the genus *Physa*, which it was shown (mainly from an examination of the *radula*) were really more nearly allied to the genus *Limnæa*. Mr. Cooke proposed to refer those species to the genus *Bulinus*, established by Adanson in 1757.

Mr. G. A. Boulenger read notes on some specimens of Lizards belonging to the Zoological Museum of Halle, which had been sent to him for examination. To these notes were appended revised descriptions of two Lizards from the Argentine Republic—*Gymnodactylus horridus* and *Urostrophus scapulatus*.

A communication was read from Prof. W. N. Parker, containing an account of the occasional persistence of the left posterior cardinal vein in the Frog. This condition, abnormal in the Frog, was shown to be essentially normal in *Protopterus*.

A communication was read from Mr. J. Douglas Ogilby, containing notes on some fishes new to the Australian fauna.

Mr. Oldfield Thomas read a paper giving the description of a new Bornean Monkey belonging to the genus *Semnopithecus*, obtained by Mr. Charles Hose on the north-west coast of Borneo. The author proposed to name it *Semnopithecus hosei*, after its discoverer.

April 2, 1889.—Prof. FLOWER, 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 attention to a specimen of the Manatee, *Manatus australis*, purchased March 2nd, being the second example of this Sirenian obtained alive by the Society; to an oriental Phalanger, *Phalanger orientalis* var. *breviceps*, presented by Mr. C. M. Woodford, of Sydney; and to a specimen of Owen's Apteryx, *Apteryx oweni*, presented by Capt. C. A. Findlay.

Mr. Smith-Woodward exhibited and made remarks on a maxilla of the early Mesozoic Ganoid *Saurichthys* from the Rhætic formation of Aust Cliff, near Bristol.

A communication was read from Mr. W. K. Parker on the osteology of *Steatornis caripensis*. The conclusion arrived at as regards the affinities of this isolated form of birds was that *Steatornis* is a waif of an ancient avifauna, of which all the near allies are extinct, and the *Podargus* of Australia is its nearest surviving relative.

Mr. Oldfield Thomas read some preliminary notes on the characters and synonymy of the different species of Otter. The author gave a revised synonymy of the four species of *Lutra* recognised as belonging to the Palæarctic and Indian Regions, and of the two found in the Æthiopian

Region. The American Otters, for want of a larger series of specimens, could not at present be satisfactorily worked out.

Mr. E. T. Newton read a paper entitled "A Contribution to the History of Eocene Siluroid Fishes." Mr. Newton observed that spines of Siluroid Fishes from the Bracklesham Beds were described by Dixon, in his 'Fossils of Sussex' (1850), and referred to the genus *Silurus*. Mr. A. Smith-Woodward had recently shown good reason for referring these specimens, and certain cephalic plates from the same horizon, to the tropical genus *Arius*. The greater part of a skull, from the Eocene Beds of Barton, in the Museum of the Geological Survey, confirmed the latter generic reference. Its close resemblance to a skull of *Arius gagorides* in the British Museum left no room for questioning their generic relationship, while at the same time the fossil differed from any known species of *Arius*. The fortunate discovery of one of the otoliths within the fossil skull, and its resemblance in important points to that of *A. gagorides*, still further confirmed this determination. Some other otoliths from Barton, and one from Madagascar were also referred to the genus *Arius*.

Mr. A. Smith-Woodward read a note on *Bucklandium diluvii*, a fossil from the London Clay of Sheppey, noticed by König, and hitherto not satisfactorily determined. It was shown that this fossil was a portion of the skull of a Siluroid Fish allied to the existing genus *Auchenoglanis*.

A communication was read from Mr. H. W. Bates, containing descriptions of new species of the coleopterous family *Carabidæ*, collected by Mr. J. H. Leech in Kashmir and Baltistan. A second communication from Mr. Bates gave descriptions of some new species of the coleopterous families *Cicindelidæ* and *Carabidæ*, taken by Mr. Pratt at Chang Yang, near Ichang, in China.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

April 3, 1889. — Mr. F. DU CANE-GODMAN, M.A., F.R.S., Vice-President, in the chair.

Messrs. A. Cant, C. Cave, N. F. Dobrée, J. Harrison, S. L. Mosley, and B. G. Nevinson, were elected Fellows.

Mr. Osbert Salvin exhibited specimens of *Ornithoptera trojana*, Staud., and *O. plateni*, Staud., received from Dr. Staudinger, and obtained in Palawan, an island between Borneo and the Philippines. He remarked that *Ornithoptera trojana* was allied to *O. brookiana*, Wall.

Mr. R. M'Lachlan exhibited, and made remarks on, seven examples of *Æschna borealis*, Zett., a little-known species of European Dragonfly. He said that some of the specimens were captured by himself at Rannoch, Scotland, in June, 1865, when he was accompanied by Dr. Sharp and the

late Mr. E. C. Rye. The other specimens were taken in Luleå, North Sweden, and the Upper Engadine (5000—6000 ft.), in Switzerland.

Mr. W. H. B. Fletcher exhibited specimens of *Agrotis pyrophila* from various localities, including two from Portland, three from Forres of a smaller and darker form taken by Mr. Salvage last year, and a melanic specimen from Stornoway at first supposed to belong to *A. lucernea*, but which, on closer examination was seen to be referable to this species. He also exhibited series of *Triphana orbona* from Stornoway and Forres, and *T. subsequa* from Forres and the New Forest. The specimens of *T. subsequa* from Forres were more distinctly and richly marked than those from the New Forest, and were also rather more variable in colour.

Dr. Sharp exhibited specimens of *Proculus goryi*, Kaup, found by Mr. Champion in Guatemala, prepared to show the rudimentary wings under the soldered elytra. Dr. Sharp called attention to the existence of a peculiar articulated papilla at the base of one of the mandibles; and he also showed sections of the head of *Neleus interruptus* displaying this *papilla*, as well as the articulated teeth on the mandibles.

The Rev. Canon Fowler exhibited specimens of *Agapanthia lineatocollis*, Don, and remarked that they were able to produce a distinct stridulation by the movement of the head against the prothorax, and of the hinder part of the prothorax against the mesothorax; they were also able to produce an unpleasant scent. He further remarked that Dr. Chapman had lately informed him that *Erirrhinus maculatus*, F., had the power of stridulating strongly developed. He also exhibited a specimen of *Barynotus*, taken in Norfolk, which was apparently an abnormal example of *B. obscurus*.

Mr. Edward Saunders exhibited, on behalf of Mr. G. A. J. Rothney, in illustration of his paper on Indian Ants, specimens of the following:—*Camponotus compressus* and fragments of *Solenopsis geminatus* destroyed by it; *Camponotus* sp.?, with a mimicking spider (*Salticus* sp.); *Pseudomyrma bicolor*, with its mimicking *Salticus*, and a new species of *Rhinopsis*, viz. *ruficornis*, Cameron, also found with it, and closely resembling its host; *Diacamma vagans*; *Holcomyrmex indicus*, with specimens of the grain which it stores and the chaff which it rejects; and *Aphanogaster* sp., with the pieces of *Mimosa*, &c., with which it covers its nest.

Mr. G. A. J. Rothney communicated a paper entitled "Notes on Indian Ants."

Mr. Lionel de Nicéville communicated a paper entitled "Notes regarding *Delias sanaca*, Moore, a Western Himalayan Butterfly."

Capt. H. J. Elwes communicated a note in support of the views expressed by Mr. de Nicéville in his paper.—H. Goss and W. W. FOWLER, *Joint Hon. Secs.*

NOTICES OF NEW BOOKS.

The Naturalist in Siluria. By Captain MAYNE REID, Author of 'The Scalp Hunters,' 'The Death Shot,' &c. Post 8vo, pp. 240. London: Swan Sonnenschein & Co. 1889.

ON glancing at the title of this volume and its contents, two things, in the absence of any explanation from the publishers, strike us as somewhat remarkable: first, that a collection of serious essays on Natural History should emanate from a writer whose name has been known to us since our school-boy days as the author of sensational novels, and, secondly, that he should be writing on Natural History topics in 1889, when we happen to know that he died in October, 1883. Some additional words seem wanting on the title-page, such, for instance, as "Posthumous Essays, by the late" or (if it be the fact) some indication that this is not the first edition which has appeared. The unwary reader is allowed to suppose that this is a new book, or finds himself, as we do, in a dilemma. Not a word of explanation is given in the "Introduction," and "Preface" there is none. And yet, taken seriously, the book is worth notice, not on account of its tasteful "get up," or illustrations, many of which are execrable as engravings, and erroneous in their teaching, but because it bears on many pages the stamp of out-door observation by a resident in an English rural district which is described and named.

"My residence," says the author, "is in *Siluria*, contiguous to that singular and symmetrical 'valley of elevation' known as Woolhope. From the summit of a high wooded hill, Penyard, which rises abruptly in rear of my house, I can look over the whole series of Upper Silurian rocks, from the northern edge of their upcast at Mordiford, near the city of Hereford, to their southern projection by Gorstley, in Gloucestershire. There they dip under the Devonian or Old Red Sandstone, again to show upon the surface a little further south, in the smooth rounded dome of May Hill, standing solitary with its crest of Scotch firs conspicuous from afar. . . . Westward, and in fact all round me, extends the Old Red Sandstone, the characteristic rock of Herefordshire, as also the adjacent county of Monmouth. . . . Near by, on the west,

lies the valley of the Wye, rich in drifts of geological interest, and eastward the wide and more extended valley of the Severn, itself an ancient sea-bed. Turning southward, I have the Forest of Dean before my face, a tract of country as singular as it is celebrated."

So much for the district in which the author's observations have been made; now for the notes themselves. We have read most of the book, and feel bound to say that, setting aside certain inconsistencies (*e. g.*, pp. 195, 198), repetitions (pp. 27—29, 67—70, 77—82, 80—91), the rehabilitation of ancient and marvellous tales (pp. 163, 236), and the occasional misapprehension of real facts for want of reading, there is much that will repay perusal, either because it is confirmatory of the statements of others on points of interest, or because the personal observations of the author are in a sense new.

Referring to the presence of the Rock Dove, *Columba livia*, in Herefordshire, he writes (p. 27—29):—

"Mr. W. Lloyd, a local naturalist [of Kington], reports it as breeding on the Stanmer Rocks, a basaltic upheaval near the border-line between the counties of Hereford and Radnor—altogether away from the sea. It has also a nesting-place in the cliffs overhanging the Wye, by the celebrated Symond's Yat, and all down through Monmouthshire to Caldy Island. There, *à fortiori*, they should be found, since these cliffs are nearer to its known *habitat* on the sea-coast."

(*Cf.* Bull, 'Birds of Herefordshire,' 1888, p. 176).

The Great Black Woodpecker, *Picus martius*, turns up again (p. 46), and is characterised as "so rare that many ornithologists even doubt its existence in any part of England."

"It has been observed, however, and in my own grounds in South Herefordshire, myself the observer. In the summer of 1880 [here we get a date] a pair passed over my head, one flying behind the other at an interval of a hundred yards or so. They lit in a tall linden tree near the house, only to stay in it for a few seconds; then continued their up and down flight towards some hanging woods beyond, where I lost sight of and never saw them again."

He then alludes to Mr. Chapman's observation of this species in the same county, as mentioned in Bull's 'Birds of Herefordshire' (p. 92), and concludes, "There can be no doubt, therefore, of the Great Black Woodpecker occasionally visiting the

Welsh bordering shires, if it be not a permanent resident in them."

Referring to the Chaffinch, and to the alleged separation of the sexes during winter, he says:—

"I have been observing the Chaffinch, one of our most familiar birds, for several years throughout all the winter and summer, and have never known the sexes so to separate. In all cases where there were flocks, the cocks and hens seemed to be in about equal numbers, or at least no difference worth noting; and Mr. Knapp, the author of 'The Journal of a Naturalist,' bears similar testimony of them. He says:—'With us the sexes do not separate at any period of the year, the flocks frequenting our barn-doors and homesteads in winter being composed of both.' Mr. Knapp's observations were made in Gloucestershire, on the left bank of the Severn; mine chiefly in the valley of the Wye. So if those of Linnæus and Gilbert White be correct, then the habits of the birds in these western shires must differ from what they are elsewhere, even in our own islands—a somewhat singular circumstance."

He suggests that the flocks seen by Gilbert White were supposed to be "almost all hens," because the young cock birds of the year had not at that season attained their characteristic plumage.

Referring to the Selborne naturalist's statement that the Carrion Crow goes in pairs the whole year round, he says:—

"This is an error that, with many more in relation to the habits of this bird, has been perpetuated by Yarrell and most other English ornithologists, so as to become the stereotyped phraseology of the encyclopædias. I am able to state for certain that the Crow never goes in pairs, save during the days of nest-building. If seen thus at any other period of the year, it is because the nest has been robbed, or the brood in some way destroyed, leaving the bereaved parent birds alone for the length of another twelvemonth. But when successful in hatching and bringing up of their young, there is no separation nor pairing. Instead, the whole family keeps together—though apart from all others—throughout the summer, autumn, and winter, and till nesting time in spring. To verify this habit, I have been for years observing the behaviour of this bird, and can now vouch for it as a fact. My opportunities are excellent, as the Carrion Crow is common in my neighbourhood, more than one family having their cantonments near."

This may be all very true of the district in which the above observations were made, but it does not follow that it is of universal application. Indeed we feel satisfied—from what has been stated by other good observers—that it is not. Circumstances alter cases.

Turning to the notes on Mammalia which are scattered throughout the book, we observe that the Dormouse occurs in Herefordshire in Penyard Wood (p. 102), where also, as in the Forest of Dean, the Squirrel is common:—

“One of the woodwards of the Forest of Dean informs me that in the larch plantations over which he had wardship for some years past, he had now and then noticed large branches and even tops of the trees themselves broken off by the wind. Some of them were of large size, thick as a man's thigh; and for long he could not tell why Eolus was dealing such wholesale destruction, for there were acres upon acres of the larch woods strewed with the dead and broken branches. He learnt at length, discovering the cause to be Squirrels. Their mode of procedure was by peeling off the bark, not only in isolated patches, but in broad rings all round the branch or bole of the tree,—their object, of course, being to eat it,—and thus naturally killing so much of the branch as was above, which, after a time decaying, gave way before the wind.”

The author states that “it is rare to meet with white Stoats so far south as Gloucestershire, though instances have occurred, some even in Cornwall” (p. 120). He mentions two which were taken in the parish of Flaxley, Gloucester, near the Forest of Dean boundary, one of which was “nearly as white as a true Arctic Ermine.”

Some experiments are detailed (pp. 128, 129) to show that the Mole will not eat “wire-worms” by choice, as has been alleged, but will greedily devour earthworms, which are believed to be its principal food.

A chapter on Wild Cats, in which the author hints at the possibility of one “having found its way into Herefordshire from the Welsh mountains, following the course of the stream downward, perhaps here and there making temporary sojourn,” closes with the remark (p. 146) that, “among the wooded ‘dingles’ where the Wye has some of its sources—very fastnesses—this now rare animal is believed still to have existence.”

Badgers are reported to be occasionally met with, notably in the hanging woods of Penyard Hill and on the slope of Howle Hill, a lofty eminence overlooking the Wye, some four miles below the town of Ross, where one was captured weighing twenty-seven pounds,—“not one of the largest,” says our author, “for in my notes I have record of many weighing at least a third more.” A story is told (p. 190) of a Fox and Badger being found by terriers in the same drain, and beside the Badger lay *a china egg*, one of those in common use as “nest-eggs,” which no doubt had been taken from a farm close by, and which, notwithstanding sharp teeth and powerful jaws, had proved “a nut too hard to crack.”

Writing of the occurrence of the Marten, which is still found occasionally in the district,—Siluria,—the author quotes an interesting letter from “a friend resident in a western shire,” whose uncle, a master of hounds for forty seasons “used to hunt Marten-cats very early in the season with the young hounds and a few old ones to teach them, as he said, to ‘pack’ well.” This correspondent says:—

“The scent of a Marten-cat is so strong that it is hardly possible for hounds to lose it; and my uncle used to say that it drew them together and taught them to pack well, so that when they began fox-hunting later on it almost saved the expense of an extra whip. Foxes were so scarce in those days that we could not afford to go cub-hunting in the early part of the season, or we should have had many ‘blank’ days before the end. Of course, now that foxes are more plentiful, young hounds can be entered to the legitimate scent at the beginning. We used to find the Marten-cats in large coverts, and it was a common occurrence for one to give the hounds a run of three or four hours in a thick cover, the animal every now and then taking to a tree. From this it would be dislodged by some one climbing up to it, when it would run along a bough to the outside end, then drop into the cover, and away again, although perhaps twenty couple of hounds might be baying at it under the tree. I have seen one ‘treed’ at least a dozen times before it was killed.”

“I question the correctness of my friend’s conjecture as to the Marten being extinct in the shire of which he speaks. Indeed, I have evidence of its existence in that county, though not in his neighbourhood. In my own, I am happy to say, it is far from being extinct, many recent cases of its capture having come to my knowledge. Only

six years ago a poacher of my acquaintance killed a beech, or as sometimes called, 'stone,' Marten within less than a mile from my house. He found it while 'rabbiting,' his ferrets having run it out of a hole in a hedge-bank, and far away from woods. No doubt it had made an excursion thither on the same business as the poacher himself.

"But in many of the fastnesses around the Forest of Dean I know that Martens, if not plentiful, are yet in goodly numbers. One of the Forest-keepers tells me that, five or six years ago, he used to see many, and shoot many, too, in the High Meadow Woods—a tract of the Forest which overhangs the River Wye; and there is the skin of one stuffed and mounted in the house of a farmer in that neighbourhood, which very recently fell to a gamekeeper's gun. Again, a gipsy of my cognizance, who tents in all parts of the Forest, tells me that he and his tribe often meet with 'Marten-cats,' which he affirms to be far from uncommon in the woods near Blakeney and Lydney, where there is some rather heavy timber. He says they vary much in colour and markings—a remarkable fact, if fact it be."

In 'The Zoologist' for 1886 (p. 240) Mrs. Attwood Mathews, of Pontrilas Court, Hereford, has noticed the recent occurrence of the Marten in the county in which she resides, and the following year (Zool. 1887, p. 190) Mr. Cambridge Phillips reported the appearance of one near Brecon in September, 1886. He regards it as a rare animal in Wales at the present day.

The illustrations to this volume, as we have said, are for the most part very poor. The best are copied from Bewick, the remainder being from different sources, and several of them wrongly lettered. For example, the bird figured on p. 19 as the Rock Dove, *Columba livia*, is the Stock Dove, *C. anas*; that figured as the Nuthatch, *Sitta caesia* (p. 55), is the Nutcracker, *Nucifraga caryocatactes*. Of the two birds figured as Herons (p. 232) one is a Bittern, and none of the half-dozen warblers figured on p. 177 are named.

The absence of dates, or precise reference to the time of year at which certain observations were made, is a serious drawback in estimating their value. Notwithstanding these defects, the extracts which we have given above sufficiently show that the subject matter of the book is good enough to have deserved better treatment than it has received at the hands of the printer and publisher.



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MUS HIBERNICUS, THOMPSON, RESTORED TO THE
BRITISH FAUNA.*

THE discovery of this almost forgotten and neglected mammal in the Outer Hebrides is not only important, since a significant extension is thereby added to its limited geographical range, but also because it re-opens for consideration the history and status of the creature itself, which it is thought most desirable should be undertaken.

To the fauna of these islands the presence of this peculiar Irish quadruped must be regarded as an important link in the chain of evidence bearing upon the general zoological relationship of the archipelago—a link in strict consonance with the views of the late Mr. E. R. Alston.

The occurrence of a Black Rat in the islands had been known many years to Mr. Alexander Carmichael, but to Dr. John MacRury our thanks are due for reminding us of the fact, and finally enabling us to add a new species to the fauna of Scotland and to Great Britain. This gentleman reported the Black Rat as occurring there in a letter dated the 21st of August last, after

* From Messrs. Harvie Brown and Buckley's recently published 'Fauna of the Outer Hebrides' (8vo, Edinburgh, 1889), of which a review will shortly be given. In a future number, by favour of the authors and publisher, we propose to reproduce the plate given of this animal.

the mammalian portion of our book had been printed. A desire was at once expressed to see specimens, and a reward offered to the inhabitants for their capture. This resulted in our receiving two specimens in spirit, and these proved on inspection to be the species described by Thompson as *Mus hibernicus*, a species which had not hitherto, we believe, been recorded out of Ireland.

It is not deemed advisable to enter into detail on the Hebridean range of this animal, but it is only withheld in the interests of a species limited not only in its distribution, but also in its numbers. Regarding its habits, &c., we give the following extracts from notes, kindly communicated to us by Dr. MacRury. This gentleman says: there seems to be little difference between their habits and those of the Brown Rat; the latter predominates, but it is thought the black species is holding its own; although they are not very numerous they seem to be more so than they were within the recollection of the inhabitants. They appear to be most numerous on the sandy portions of the island, though found elsewhere upon it; and they affect barns and outhouses, but Dr. MacRury never heard of their being seen in dwelling-houses.

As to the claims of this mammal to specific rank, and as regards its characters, general description, and history, we quote the words of our friend Mr. W. Eagle Clarke, of the Natural History Department of the Edinburgh Museum of Science and Art, who has most kindly undertaken a thorough examination of *M. hibernicus* and its relationship to the larger species of the British *Muridæ*—a service which it affords us much pleasure to acknowledge. Mr. Eagle Clarke reports as follows:—

On the 13th of June, 1837, Mr. William Thompson, the well-known author of the 'Natural History of Ireland,' in a communication* to the Zoological Society of London, described and exhibited a new species of rat under the name of *Mus hibernicus* = Irish Rat. In this Mr. Thompson tells us that although he had heard of the animal before, yet it was not, he says, "Until April last, when a specimen was sent from Rathfriland, county of Down, to the Belfast Museum, I had not an

* For full account see 'Proceedings of the Zoological Society,' 1837, pp. 52, 53.

opportunity of either seeing or examining the animal. This individual differs from the *M. rattus* . . . in the relative proportion of the tail to that of the head and body; in having shorter ears, and in their being better clothed with hair, as is the tail likewise; and in the fur of the body being of a softer texture. The difference in colour between the *M. rattus* and the present specimen is, that the latter exhibits a somewhat triangular spot of pure white extending about nine lines below the breast, and the fore feet being of the same colour. . . . These differences incline me to consider this animal distinct from *M. rattus*, and being unable to find any species described with which it accords, I propose to name it provisionally *Mus hibernicus*."

It is not a little remarkable that after the careful examination made by Thompson, as is evidenced by his published detailed account, that this excellent naturalist should have associated this animal with *M. rattus*, an error of judgment which is repeated in his 'Natural History of Ireland' (vol. iv. p. 16), published in 1856, where it is obviously considered to be a mere variety of the Black Rat—an error perpetuated up to the date of issue of the second edition of Bell's 'British Quadrupeds,' where the animal is merely alluded to as a variety of *M. rattus*; and down to the present time, the primary fact of its colour being black seems to have exercised not only a misleading but a lasting influence on our naturalists.

Since Thompson's investigations *M. hibernicus* appears to have received practically no attention at the hands of zoologists; at least, endeavours to procure further published observations on it have failed. Its discovery, however, in the Outer Hebrides has re-opened the question, and the writer has to express his obligations to the authors of this work for the opportunity afforded him of examining and reporting upon their specimens received in the flesh, as well as a series of skins furnished by their obliging correspondents.

Before proceeding to the consideration of the true status of *Mus hibernicus*, it is desirable to institute a comparative examination of the British species of rats. This is conveniently and sufficiently afforded by the following tabulated information:—

	<i>Mus rattus</i> (from Bell).		<i>Mus alex-</i> <i>andrinus</i> .*		<i>Mus</i> <i>decumanus</i> .		<i>Mus</i> <i>hibernicus</i> .	
	in.	lin.	in.	lin.	in.	lin.	in.	lin.
Length of head and body . . .	7	0	7	4½	9	1	8	6
„ of head	1	9	2	0	2	0½	2	4
„ of ears	0	10	1	1½	0	9	0	8½
Width of ears . . . . .	...		0	9	0	7	0	7
Length of tail	7	6	8	11	7	1	7	6
„ of fore feet and claws .	0	8¼	0	9	0	10	0	8
„ of hind feet and claws .	1	4¼	...		1	8	1	7¼

The four species readily fall into two groups:—

1. The *Long-tailed* and *Large-eared species*, in which the tail is longer than the head and body, and the ears comparatively large. *M. rattus* and *M. alexandrinus* belong to this section.

2. The *Short-tailed* and *Small-eared species*, in which the tail is shorter than the head and body, and the ears comparatively small. *M. decumanus* and *M. hibernicus* belong to this section.

This results in *M. hibernicus* being more nearly allied to *M. decumanus* than to *M. rattus*, with which it has hitherto been associated. This is most undoubtedly the case, and is borne out by a careful examination of the other characters of the two animals. Indeed, if specific rank be not conceded to *M. hibernicus*, then it must be regarded as a variety of *M. decumanus*.

It is now necessary to state the differences which lead to the belief that *M. hibernicus* may be something more than a variety. Briefly stated, they are:—

1st. It is a smaller and more elegant animal than *M. decumanus*, which is a much coarser creature in build and other characters.†

* From H.M.S. 'Devastation.' Forwarded in the flesh by Capt. J. R. N. Macfarlane, R.N.

† Since the above was written I have been much indebted to Mr. G. Barrett Hamilton, of Kilmanock, Co. Wexford, for many valuable notes. Mr. Hamilton informs me that he has had specimens of *M. hibernicus* equal in length to ordinary specimens of *M. decumanus*, but that the former were always lighter in weight; he also tells me that the head and tail are proportionately longer in *M. hibernicus* than in *M. decumanus*. I think it is possible, however, that melanic varieties of *M. decumanus* may sometimes be confounded with *M. hibernicus*.

2nd. The fur is finer in texture, and silky to the touch. In this respect it is even finer than *M. rattus*, and affords marked contrast to the rough and somewhat harsh coat of *M. decumanus*.

3rd. In the general colour of the fur, and its constancy in shade.

4th. In its peculiar and circumscribed distribution. This singularly limited and isolated western range, in which it has been so long known to exist in some numbers, is most remarkable and important, and, taken together with the fact that it does not appear to have been recorded for the mainland of Great Britain, nor from Europe, affords weighty evidence against *M. hibernicus* being regarded as of varietal value only.

The following table shows the comparative measurements of *M. hibernicus* and *M. decumanus*, and are taken from specimens while in the flesh :—

	<i>Mus hibernicus.</i>				<i>Mus decumanus.</i>			
	Male.		Female.		Male.		Female.	
	in.	lin.	in.	lin.	in.	lin.	in.	lin.
Length of head and body	8	5	8	3	9	7½	9	1
„ of head	2	4	2	0	2	0½	2	0½
„ of ears	0	8½	0	9	0	10½	0	9
„ of tail	7	5	7	8	7	3	7	1
„ of fore feet and claws	0	8	0	9	0	10	0	10
„ of hind feet and claws	1	7	1	8	1	7	1	8

DESCRIPTION.—The fur is glossy. The hairs on the back are of two kinds—a longer, which is white at the roots and darkens gradually to the tips, which are black; and under this a shorter fur, of an ashy grey colour. The general colour of the upper surface is dark silvery grey, almost black. This shades into a paler tint on the sides. The under surface and limbs silvery mouse-grey. The head is slightly browner than the back, with the muzzle mouse-grey. The digits silvery white. The white stripe, regarded as *the* important diagnostic character by Thompson, does not possess that value. In both Hebridean and Irish examples examined by me, the specimens wanting the stripe have been as numerous as those possessing it, so that it may be commoner to this than to *M. rattus* and *M. decumanus*, in both of which it is said occasionally to occur. When present in *Mus*

hibernicus it forms a patch or stripe extending from between the fore limbs backwards, sometimes for a length of one inch and a half.

I regret that, owing to the scarcity of material, it has not yet been possible to make a complete examination of the osteological characters, if any, of *M. hibernicus*. The results of this and of further general research and comparisons are deferred for a future occasion.

A male having the white stripe, and a female, are figured, both Hebridean specimens, and have been kindly presented to the Museum of Science and Art, Edinburgh.

ON THE PRODUCTION OF COLOUR IN BIRDS' EGGS.

By A. H. S. LUCAS, M.A., Oxon., B.Sc. Lond.*

THE question of the cause of the coloration of birds' eggs has often been referred to, but has not, to my knowledge, been adequately treated of in any work on Oology. Perhaps we may consider the latest views on the subject to be those enunciated by Mr. H. Seebohm in his lecture at the London Institution, December 20, 1886.† I had published in the Melbourne 'Leader' of December 26, 1885, a popular account of the colours of Australian birds' eggs, in which I advanced suggestions which seemed to me to throw light on the subject. After reading the abstract in 'Nature' of the interesting lecture by this high authority, I have thought it worth while to make a more formal scientific record of the ideas broached in the 'Leader.'

My hypotheses may well be encountered with criticism, but they do serve at least very conveniently to connect a multitude of facts together. The antiquity of the Australian Avi-Fauna, and the preservation of ancient types, render a comprehensive consideration of Australian eggs of the greater value. My suggestions have been founded on studies of large collections, and after a certain amount of experience in the field. Australian eggs yield a rich abundance of facts which are of scientific

* From the Trans. and Proc. Roy. Soc. Victoria, vol. xxiv, pp. 52—60.

† Printed in 'The Zoologist,' 1887, pp. 137—139.

interest *per se*, and which will be of still higher value if we can discern their bearing on biological problems.

We take it that the natural or original colour of birds' eggs is the pure white of the mineral substance (carbonate of lime) of which they are composed, just as the natural colour of bone is white, and that, too, of the shells of mollusca, &c. All shells are secreted by animal membranes. In the mollusca, an external layer of membrane usually remains free from admixture of mineral matter, as an animal epidermis, which can be peeled off. But this is not the case with birds' eggs; they possess a membranous lining, generally white, occasionally brownish or bluish, but outside this the animal substance and mineral matter are intimately commingled to the very surface. Colour, if produced, is then, in almost all eggs, ingrained. Often it can be detected incorporated in the inner layers of the shell, as blotches beneath the surface.

Birds' eggs have many foes. Even where man has not appeared upon the scene, a number of systematic nest-robbers exist. Snakes, the great Lace-Lizard (*Hydrosaurus* or *Varanus varius*), which takes such liberties with the settlers' hen roosts, the "native cats" (*Dasyurus viverrinus* and *D. maculatus*), perhaps the Bush Rats, and last, but by no means least, other birds, and especially the crows, are very destructive of our native birds' eggs, and of the young birds in the nest. To such intruders pure white eggs would be a conspicuous and gratuitous advertisement, and the birds would be exposed to undue danger while in the egg. As has been remarked hundreds of times before, we accordingly find that white eggs, and especially eggs of shining or pearly whiteness, are almost always found in nests which either conceal the eggs completely, or which are themselves completely concealed. Thus the cockatoos, parrots, parrakeets, and other members of the family, in almost all cases, build in holes of trees, usually high up and quite out of reach. Owls build in holes of large gum trees; Kingfishers, including the Laughing Jackass (*Dacelo gigas*) in holes of trees or banks; the Diamond Birds, the Roller, and Bee-eater, in holes in trees or in burrows. The Penguins and many of the Petrels lay their eggs at the extremities of long burrows in the ground, facing the sea. The eggs of all of these birds are white.

The eggs of the doves, pigeons, and podarguses, are

beautifully white, often shining as if enamelled. The birds construct slight nests of twigs, placed crosswise on horizontal branches of trees. Much light can pass through the interstices between the twigs, and it is a difficult matter, even for the trained human eye, to detect from below whether there are eggs in the nest or not. Here the white, light-reflecting eggs are at a positive advantage.

The Australian finches conceal their eggs in the depths of relatively huge covered baggy nests, provided with side spout-like entrances. The eggs are in no way visible from without, are securely stowed away, and are pure white. All of the English finches, on the contrary, lay in open nests, and the eggs are spotted, usually, too, on a neutral-tinted ground. In this case we may presume that we have preserved the ancestral type in Australia.

Since a glaring uniform white must be a dangerous colour for exposed eggs, we are not surprised to find that variations, favourable to preservation, have been originated and preserved, and that colour is now a protection to the great majority of eggs. In all cases we have to consider two questions:—(1) How could the colour have been acquired? and (2) How is the colour now protective or otherwise beneficial? That natural selection would be called into play to preserve favourable markings or tints we may allow, but we believe, with Mr. Seebohm, that “natural selection is not the cause of evolution” in this case, “but only its guide.”

The first question then is, How could the colour have been acquired? and I do not know that anyone has attempted hitherto to give any answer to it. The following has occurred to me as a probable explanation of the process; at least the phenomena are referred back to principles already recognised:—

In the first place, it is important to note that the shell of the ovum is formed in the third portion of the oviduct (“the uterus”), and entirely during the 12—18 hours which immediately precede the expulsion or laying of the egg. This is the length of the period in the case of the common fowl; we may assume, generally, a similar number of hours, probably shorter, in the case of the smaller species. That the formation of the shell is a process distinct from the formation of the yolk, is further brought before us strikingly, by an experiment of

M. Tarkhanoff. He introduced a small ball of amber into the upper part of the ovarium, and obtained later on a quite normal egg, with chalazæ, albumen, and shell, but with the ball of amber in place of a yolk.

At the breeding season, the females of certain animals are well known to be especially impressionable, and we think that the effect of the surroundings during the time of the formation of the shell, upon the mental or nervous constitution of the bird, is a main factor in the production of colour in the eggs. Any variations of value are seized on by natural selection, and transmitted by the principle of heredity. Individuals at the present day are influenced in part by the surroundings, but mainly restricted by the tribal habits of generations. We have, in fact, sufficient adherence to type for an experienced collector to be tolerably sure of the species of bird to which a particular egg belongs, but sufficient variation to make him wonder at the differences which often exist between eggs of the same clutch. As we find in all groups, that some species are more stable and less variable than others, so the eggs of some birds are apparently fixed in colour and pattern, while those of others vary within wide limits.

We will now consider in detail the influence of surroundings, and the utility of the effects produced.

The general tint of the egg is often protective. The colour of the ground prominently before the vision of the laying bird, is reproduced in various shades in the eggs of the Pheasants and Partridges, and in our Mallee hen (*Leipoa ocellata*) and Megapode. In the rich brown variety of the egg of the domestic fowl, we probably see the colour developed in the feral state, now usually lost by reversion to the original white, as there is no longer advantage to be gained by its retention.

In addition to the protective ground tint, darker spots and markings lend further security. The eggs of the Sandpipers and Dotterels cannot be distinguished, even when seen from the sands on which they lie, without close concentration of the attention. Grouse and Quail, Rails and Night-jars, Plovers and Terns, Oyster-catchers and Gulls, all lay on the ground, with or without nests, and the eggs exhibit different shades of the soil or of the rocks, with an appropriate ornamentation of spots, blotches, and smears.

White eggs become similarly less conspicuous if the white be broken up by the introduction of spots or blotches of shading. This is a very simple, but by no means ineffective, means of avoiding detection. The eggs of the Australian Shrike-thrushes, White-winged Corcorax, and Frontal Shrike-tits, are good instances of exposed white eggs so protected. In many families it is noteworthy that those kinds of eggs which are quite concealed are white, while those which are exposed are speckled or freckled. In the Tree Swallows and Martins, we find a graduated series. The eggs of the English Sand Martin, laid at the ends of tunnels in soft sandstone, are quite white. Those of the Australian Tree Martin which lays in spouts of trees, are very slightly spotted. Those of the Fairy Martin, laying in social colonies, under the eaves of houses, &c., are more freely flecked. Lastly, the English swallow, and the Australian Welcome Swallow, which builds under bridges, or in shallow spouts of trees, in more exposed situations, are plentifully covered with spots. So amongst English Titmice (a family wanting in Australia), the only purely white eggs are those of the long-tailed Titmouse, whose long and roomy mossy nest, with side entrance, often contains a clutch of a dozen or fourteen eggs. The warblers, the larks, and the honey-eaters, are other families of birds with spotted eggs.

The experiments of Jacob (Genesis xxx. 37—43) are recorded as having been successful in producing mottled colours in the animals under his charge. By the simple device of placing green rods before them at the time of conception, in which he “pilled white strakes, and made the white appear which was in the rods.” “And the flocks conceived before the rods, and brought forth cattle ring-straked, *speckled* and *spotted*.” It is then not difficult to understand that surrounding objects of very different appearance, but of unequally coloured surface, might as readily produce spots and speckles on bird’s eggs, as on the skins of mammals.

In the case of the Honey-eaters, we may venture a surmise as to what the parti-coloured objects are which produce the spotted eggs. The eggs of these birds are of various shades of ground colour, white, buff, salmon, flesh-coloured, with small dots or flecks of purple, chestnut, reddish-brown, or even black. The birds, as their name denotes, may be seen busily extracting the honey from the flowers by means of their long tongues.

Familiarity with pale and warm-tinted flowers, and with the dotted orange, red, purple, or black anthers, may possibly account for the coloration of this type of egg.

Many birds which nest in trees or bushes have eggs which are of a pale or darker green ground hue, speckled or splashed over with olive or brown, reminding one of the different shades of the surrounding foliage, and, moreover, difficult to see from a distance through a bower of leaves. Such are the eggs of the Crows, Magpies, and Crow-shrikes, the species of *Grauculus*, the English Blackbirds, and the Australian Mountain Thrush and Robins [*Petroica*, *Drymodes*, &c.]. In this case both origin and use of the colour are apparent.

Eggs with irregular streaky lines of bizarre appearance are found in a few families. In England, the Yellowhammers and Buntings are good examples. In Australia, we have the *Pomatostomi*. The eggs of the latter are about an inch long, and three quarters of an inch at the widest, olive-brown, with all kinds of hieroglyphic pencillings in black. Both families line their nests with hair, and the eggs are protected by their resemblance to the lining of the nest. Gould similarly remarks, in speaking of the Victorian Lyre-bird, "the colour resembles, in fact so closely that of the feathers with which the nest is lined, that it is not easy to detect the egg."

Eggs of a pale bluish or greenish uniform tint are common. Such neutral tints are found in the Grebes, Cormorants, Swans, Ducks, and Geese, the Mangrove Bitterns, the Glossy Ibis; and attaining to the deepest and loveliest shade in the Herons. Just as the hue of the eggs of the Pheasants, &c., may have been suggested by that of mother earth ever before their eyes, so these tints of the water-birds' eggs may have arisen from the contemplation of vast sheets of water, and the consequent impression upon the mental organisation of the parents. This peculiarity of colour, too, has been of service in rendering the eggs less easy of detection, as being of neutral hues, or as resembling, more or less, the water around or near the nest.

But the brightest blues of all occur, very exceptionally, in groups of birds of totally different habits, in no way adapted to an aquatic life. Such are, for instance, amongst English birds, the Thrush and the Starling, the Hedge Sparrow and Lesser Redpoll, the Wheatear, and to a less extent, the Stonechat and

Whinchat. Amongst Australian birds, are those of the naturalised Indian or Ceylon Mynah, the Coach-whip bird, and the Wedge-bill, and the species of *Zosterops*, a small family allied to the Honey-eaters. Such examples, it is to be noted, are extremely scarce. It is difficult to surmise the causes which can have combined to produce this unique coloration. If the "motive" be protection, it must fall under the general principle that intruders are shy of the brightly coloured objects. Some support for this view may be derived from Mr. Bates' well-known observations on deterrent colours amongst insects. It is difficult, moreover, to discover a blue in the surroundings of the birds, which could produce so pronounced a mental conception of this colour. It may be the blue of the butterflies on which they feed. It may be the blue of the aërial vault above. It would seem, if this second suggestion be the right one, that very few indeed of the birds have their attention attracted strongly by the azure of the skies, while they occupy their aërial homes.

The eggs of the Ostrich vie in colour with the pale yellow sand of the African desert, in which they are buried for the sake of incubation by the sun's heat*; but those of the Emu, laid in the Australian bush, are, as every one knows, dark green. Here we have an indication that the Australian bush is not made up of yellow sandy deserts. The Emu, in fact, scoops out a hole in the ground amongst low scrub, and contemplates eucalypts and salt-bush, and other dull vegetation. Its eggs are exposed, and protected by their colour. The Cassowary, laying and living amongst the bright green of the tropical grasses and the vivid green of a more diversified tropical foliage, produces lighter and brighter green eggs.

With the birds of prey the mental perception of habitual surroundings seems to have been intense (as might have been expected from their known keenness of vision), and the influence upon the colouring of the eggs remarkable. The nests of the Eagles, Falcons, and Hawks are large, and exposed on the tops of trees or on the ledges of lofty cliffs. The eggs are generally more or less blotched with rusty red, presenting a marked resemblance to old blood spots, such as the family are so well acquainted with. The Nankeen Kestrel breeds in spouts of

* This is a misapprehension. The process of hatching is performed by the male and female sitting alternately. See 'Nature,' 22nd March, 1883.—ED.

trees, where, of course, the colour cannot be protective, yet the eggs retain the family peculiarity. Here we see natural selection apparently ruled out of court, and mental receptivity as the sole cause of the variations in the one specified direction. The eggs of the other members of the family are, from their situation, inaccessible, and it therefore seems very questionable whether the factor of natural selection has operated at all in the case of the eggs of this group. We find very different degrees of development of the blotches. In one clutch of the Sparrow Hawk (*Accipiter torquatus*) one egg was white, a second smudged, and the third well blotched. In a clutch of the Goshawk (*Astur approximans*), again, one egg was smudged, one smudged and blotched, and the other blotched. Similar gradations are to be observed in the average colour of the species. The eggs of the Harriers (*Circus*), which lay on or near the ground, and generally among thick scrub, and those of the Crested Hawk (*Baza subcristata*), which builds in the holes of trees, are pure white; and we have gradually more and more colour introduced, until the climax is reached by the Brown Hawks (*Ieracidea berigora*) and Kestrels (*Tinnunculus cenchroides*).

Great irregularity, and much variation amongst individuals, characterise eggs which derive their colour from changing and varying appearances. We obtain thus a natural explanation of the infinite variety of colouring in the eggs of the rapacious birds, and of such birds as the Magpies and the Sparrows.

Many birds continue to protect their eggs themselves, consciously or unconsciously. Some, as the Partridge, will cover up the eggs when they leave the nest. The Grebes lay eggs which are at first white, but become stained by mud from the body of the sitting mother bird, usually brown, and gradually browner, a tint well in keeping with the colour of the nest of dead reeds and leaves. Many of the sea birds, too, by fouling their eggs, no doubt materially assist in preserving them.

The English Cuckoo commonly chooses the nests of Larks or of Wagtails for its egg. When found in the nest of a Lark, especially of a Tit-lark, the egg is very dark; and when found in that of a Wagtail, much lighter. This looks like proof positive of the effect of mental impression in producing the colour of the egg. More rarely, the egg of the Cuckoo is found in other nests, such as that of the Hedge Sparrow. It is most

likely that in this case, the Cuckoo had in the course of nature laid its egg, and not being able to find an appropriate nest near, was driven to make use of that readiest to hand. For nothing could be more conspicuous than the contrast between the colours of the eggs. Our Victorian Cuckoos are likewise eclectics. The Pallid Cuckoo often plants its cream or flesh-coloured and spotted eggs in the nests of Honey-eaters, the eggs of which its own thus resemble. The Bronze Cuckoo patronises the dome-shaped nests of little birds, in which the egg will not be seen, and into which it doubtless conveys its eggs by means of the bill, for the Cuckoo is much too large a bird to obtain entrance into the nest by the tiny opening which serves for the rightful owners. The Brush and the Narrow-billed Cuckoos place their eggs in the nests of superb Warblers and Acanthizas, and the eggs of both are white, with very fine dots.

The subject it will be seen is as yet still entirely in the domain of observation. Experiments are wanting. It is to be hoped that they will be forthcoming. Opportunities exist, notably in the case of the domestic birds, and of birds which breed easily in confinement. But we must not expect too much, to be able to produce extreme effects. Mr. E. B. Poulton's interesting series of experiments on the production of colour in the pupæ of certain British Lepidoptera, show that the capacity for variation in each species is (for a single generation) limited, and that the variations tend in quite definite directions. It is probable, however, that results of sufficient, and perhaps in some cases of striking, interest are to be obtained by careful and systematic experimentation. And the field is open.

A CUCKOO HATCHING ITS OWN EGGS.

[In an article in 'Die Gartenlaube,' vol. xxxvi., No. 25, 1888, Herr Oberförster Adolf Müller, who has the reputation of being a good observer, has detailed his observations in a case which came under his notice of a female Cuckoo incubating and hatching her own egg. The case is so abnormal and interesting that we had intended translating the article for publication in this Journal; but as the Editor of 'The Ibis,' in the last number of that periodical, has saved us the trouble, we may help to make the case more widely known amongst ornithologists by quoting his translation, with due acknowledgment and thanks. In return we may save our contemporary some

trouble by appending a translation of an article by Herr A. Walter, of Cassel (*Journ. für Orn.* 1889, pp. 33—40, in which the views of Herr Müller are seriously questioned and criticised.—ED.]

Herr Müller says:—On the morning of May 16th, 1888, when I was looking over a young plantation in my district of the Royal Forest of Hohenschied, a Cuckoo rose suddenly out of the bushes close to me, which, from its pale brownish colour, I recognised as a female bird. I soon discovered, in a slight depression of the ground near the spot whence the bird flew up, three eggs, which attracted my attention from not being all of the same coloration, and from one of the three being of considerably smaller size than the other two. As I could not recognize the eggs as belonging to any of our smaller birds that breed on the ground, and as the Cuckoo kept flying about me in a curious way, I resolved to conceal myself under a neighbouring hedge in order to watch the bird more closely. After I had been there a few minutes I saw the Cuckoo alight on the ground and crawl towards the place where the eggs were. My idea now was that the Cuckoo was intending to add her egg to the three already there, and I accordingly remained in my hiding-place at least three-quarters of an hour, without seeing the Cuckoo take its departure. This long delay, and the circumstance that no other nesting-bird made its appearance in the neighbourhood, led me to suspect that this must be an exceptional case, and made me very eager to investigate it. I therefore cautiously approached the spot, and soon saw the Cuckoo again rise from the ground. On this occasion, after wheeling round in a half-circle, it retreated further off into the forest. A closer examination of the eggs convinced me that two of them presented no remarkable differences in size or structure, although the ground colour was certainly not the same. I recognized them as Cuckoos' eggs of very fine grain and thin shell. One of them was of the characteristic yellowish white or pale waxy ground colour, with dark brown points and a few streaks and scratches. The second, of the same size, was of a reddish yellow or clay-colour, thickly covered with oil-coloured markings, so that it was something like an egg of the Redbreast. They were at least as large as Yellowhammers' eggs, but more elongated. The most curious egg was the third, which was quite different from the two others. It was very like a Chaffinch's egg, of a

greyish green ground colour, sparingly marked with smaller reddish and larger reddish brown spots, and was remarkable as being thickly spotted at the smaller end instead of the larger. It was not quite so large as a Chaffinch's egg. As I have already stated, the nest was on a patch of bare ground a foot or more in diameter, surrounded by grass and broom-bushes.

After this examination I quickly withdrew to a rather more elevated position in the underwood of the beech-forest. From this spot, with my field-glasses, which I had luckily brought with me, I could survey the ground below me quite clearly. Within six minutes the Cuckoo came back, and after flitting around for some time alighted near the nesting-place, and proceeded with a characteristic waddle on to the nest. For more than an hour and a half I kept the spot in view. During all this time the Cuckoo sat quiet on the nest, so that there could be no further doubt in my mind that it was sitting on its own eggs.

Until the 25th May I left the Cuckoo to sit undisturbed. On the morning of that day I visited the spot again, and, on the bird flying off, found, to my great joy, a young Cuckoo in the nest. Judging from my observations of young Cuckoos, it seemed to have been hatched about five or six days, for the shafts of the quills showed on the wings, traces of feathers were visible on the shoulders, and the eyes had begun to open. On one side of the nest I found the reddish brown and the small egg. The first was crushed in and appeared to be rotten; the second was uninjured, but on attempting to blow it subsequently I found that it was unfertilized, and only contained a partly dried-up and wasted yolk. No doubt, like the injured one, it was an egg dropped during the time of sitting, and not fully developed nor fecundated, as was apparent from its inferior size, very thin shell, and small contents.

In the meanwhile the sitting bird kept circling around me, flying low, at short intervals, a proof that she had great anxiety for her young one. My experiments with this young Cuckoo led me to quite a different result from that which I had previously formed from the behaviour of two others in the nest of a Red-breast. The latter were always restless, continually extending their wings over the back, and one of them occasionally thrust his head and neck so far behind him that he fell over. The bird which I was now observing, on the other hand, kept quite quiet,

with his head and neck on the bottom of the nest. He did not even stir when I touched him with my finger on the back, in which the characteristic depression found in very young Cuckoos was still discernible, nor when I placed an egg or some similar substance on his back. I concluded therefore that the sitting mother must have herself removed the addled eggs, and not the young Cuckoo, as it is wont to do when in other birds' nests.

After this I returned again to my point of observation, but did not succeed in seeing the young bird fed by the old one, as I was disturbed by some people cutting grass in the neighbourhood, and resolved to defer my further observation until a quieter day.

When I returned to the place on the morning of May 26th, I had several times an opportunity of seeing the young Cuckoo fed by the old one with what appeared to me to be green caterpillars. On the same occasion the young nestling was sat upon and warmed by the mother for a long while. When I arrived at the spot I placed myself at my former post of observation, and saw with my glasses the old bird sitting on the nest. For twenty-two minutes I watched her in this situation, when I was surprised to see her suddenly rise from the ground at several paces distant from the nest and fly away. I seized the opportunity of visiting the nest, and found the young Cuckoo lying in the hollow with its eyes nearly quite open. When I approached, it erected the front part of its body, and opened its orange-coloured mouth, uttering its fine piping cry. The space round the nest was thoroughly cleared of excrement,—a striking proof that the mother Cuckoo possesses the ordinary instinct of nest-building birds, that of removing the comparatively large fæces of the young with its bill. About three minutes after I had got back to my hiding-place I saw the old Cuckoo alight on an open spot six or eight footsteps distant from the nest, after which it fed the young with some green substance, apparently caterpillars, as I could see with my glasses, and then covered it with her body again for about a quarter of an hour. The mother left the spot on this occasion again by flying up from the neighbouring place before mentioned, and not immediately from the nest. Within a few minutes she returned with a similar lot of food, and, after feeding the young one, retired in the same way as was before described. After the second return and

feeding, the warming of the young bird was again repeated. After a good quarter of an hour in my hiding-place I left the spot without disturbing the old bird.

All through my period of observation in this part of the forest I had noticed the unusual frequency of the calls of the male Cuckoo. I counted at least six individuals challenging one another with their songs. In the higher wood close by I had listened at short intervals to the furious blows of the wing exchanged in combat by the males and to the call-notes of both sexes. I had an entertaining view of the proceedings of the amorous birds, as I passed on my way shortly afterwards. On the tops of the oaks and pines sat the excited males, with their tails carried high and their wings drooping down, repeating their usual call-notes, among which the ordinary "cuckoo" was often prolonged into "cuc-cuc-koo," and in other cases was shortly and abruptly broken off in the middle. Every now and then they dived into the branches in pursuit of the hens, which were recognizable by their paler and browner coloration. In short, this particular spot in the forest was evidently a special rendezvous of Cuckoos. In spite of the unseasonable weather this day (overcast sky and frosty wind), there was a singing and fighting going on which could hardly have been exceeded in the warmest day of May or June.

Anxious to ascertain the reason of such a concourse of Cuckoos at this spot, I dived into the surrounding wood, which was that from which I had seen the mother Cuckoo bring food for her young one. I discovered here, on a group of oaks, a large colony of caterpillars of *Tortrix viridana*, which were easily seen from a distance hanging by their silky webs, and found also many of them on the leaves. No doubt this colony was the attraction that caused the concourse of Cuckoos.

What I have stated renders it quite clear:—(1) That the Cuckoo, in exceptional circumstances, incubates and hatches one or more of its own eggs, which, in these cases, it apparently lays together in a safe place on the ground without preparing any nest. (2) That the eggs of the same Cuckoo may be very different in colour and markings. If this be so, the purely theoretical idea held in certain quarters that each hen Cuckoo lays eggs of the same colour and markings or of "one peculiar

type," which are destined to be laid in the nests of one particular species of small bird, and are nearly the same colour as those of the foster-mother, and that she only lays them in the nests of this species, falls to the ground.

QUERY—DOES THE CUCKOO INCUBATE ?

BY ADOLF WALTER.*

IN June of last year the 'Gartenlaube' astonished its readers with an article headed "The Cuckoo incubates." This number of the periodical referred to was handed to me by a friend, with the words:—"Here is an important observation; the Cuckoo incubates." I returned the paper without looking at it or asking who the author of the article was, and told my informant that it was either a joke or an invention, and that the Cuckoo was, as everybody knew, unable to incubate. * * * *

I did not think of this article again until I received the July number of the 'Zoologische Garten' containing the same announcement. This caused me to give the article more attention, as its author proved to be the well-known ornithologist Adolf Müller. I was surprised, on reading it, to find that the writer still holds the opinion that the Cuckoo occasionally incubates, although it has been shown, by Dr. A. Brehm and others, that the observation made by Herr Kiessel, who thought he had seen a female Cuckoo sitting on two eggs, was unreliable, and that there was a confusion between the Cuckoo and the Nightjar (*Caprimulgus*). I was still more astonished when I had finished reading the article, which is worded in the most serious manner and with minute details of time and place. I could not but imagine that there was some mistake, for much of what the author relates, and relies upon to support his case, does not seem at all probable. In my opinion the observation can only be regarded as a delusion, and how easy it is to fall into error is only too well known.

Herr Müller says that "this time certainly no voice will be

* For this translation from the 'Journal für Ornithologie' (Jan. 1889, pp. 33—46) we are indebted to Herr A. W. Kappel, who kindly undertook to prepare it at very short notice. For the sake of brevity, we have omitted several dispensable paragraphs.—ED.

raised to support the convenient suggestion that the native Cuckoo has been again confounded with the Nightjar, &c." I am quite willing to concede that few ornithologists would suspect that there was any confusion with the Nightjar in this case, for the character and habits of the Cuckoo are correctly portrayed in the course of the narrative. Nevertheless none of the ornithologists with whom I have been able to discuss the matter believe in the incubation of the Cuckoo; they all consider the report to be an error of observation.

As I have paid much attention to the habits of the Cuckoo, I was asked by several distinguished ornithologists, both verbally and by letter, to publish my opinion of Herr Müller's article in a scientific Journal, and I now do so, although it is not pleasant for me to have to differ in opinion from so eminent an ornithologist. I take it for granted that the July number of the 'Zoologische Garten' is before the reader, or that he at least knows the gist of Herr Müller's observations. I therefore confine myself to recapitulating the heads of the discussion as briefly as possible.

The nest containing three eggs of different size, colour, and shape, was found on May 16th by Oberförster Müller, in his official district of Hohenschied, in a shallow depression on the ground, which was clear of grass and brambles for thirty to thirty-five centimetres. A brownish female Cuckoo had just risen close to this place. Herr Müller drew back quickly, and it reappeared after a few minutes, and alighted not far from the nest. After waiting for three-quarters of an hour, the bird, which Herr Müller assumed was about to lay its egg with the three, was again found near the nest, and now for the first time he recognised the three very different-looking eggs as the eggs of the Cuckoo, which were extremely fragile and thin-shelled. Here I beg to observe that no one can notice the thinness of the shell in an unbroken Cuckoo's egg, especially as, according to Brehm and others, Cuckoos' eggs have not got thin shells. After making this observation Herr Müller quickly retired, and observed from a place of concealment that the Cuckoo flew to the nest again after six minutes, and remained constantly sitting on the eggs during the whole time of observation, which lasted over an hour and a half.

On May 25th, after the Cuckoo had quitted the nest, a young Cuckoo, about six days old, was found in the nest, and not far

from it the two Cuckoo's eggs, a reddish brown one, and a very small one which the female Cuckoo had pushed aside. After Herr M. had repeatedly observed the Cuckoo feeding her young one with little green caterpillars at short intervals (three times in ten minutes), he found on June 10th that the young Cuckoo had left the nest, but it was still close by, and was being fed by its parent.

This shortly is the gist of Herr Müller's "personal observations." Before discussing the matter further, I must express my astonishment that Herr M. has overlooked what would have afforded a better explanation, and lent more probability to his narrative. To begin with, I may mention as a most striking fact that he did not keep the unincubated eggs and egg-shells. Most certainly several of our ornithologists—I need only mention Dr. Baldamus, Dr. Kutter, and Herr W. von Nathusius—would have been able, by examining the egg-shells, to prove whether the eggs which were pushed aside were Cuckoos' eggs or not. In such a remarkable case no naturalist would throw a fragment of an egg away. For my part I carefully preserve such specimens in my collection. I have, for example, fragments to show that the Cuckoo invariably lays similar eggs. Besides, fragments of Cuckoos' eggs are in much request for examination of the shell.

Returning to the discussion, I may observe that Herr M. is frequently in opposition with ascertained fact, and insists on untenable views. Thus he allows his Cuckoo to lay and sit on three eggs of a different colour and size, and avers in effect that one and the same Cuckoo laid them. This is not accurate; for one and the same female, as is the case with other birds, always lays similar eggs, as I am clearly able to prove. Now if all three eggs had really been Cuckoos' eggs (and they were not recognized as such by Herr M. on his discovery of the nest), they must have been laid by three different Cuckoos, which is absurd. Therefore the Cuckoo did not sit on its own eggs, or at most on only one of them. In my opinion, however, these three eggs could not have been Cuckoos' eggs at all,—certainly not the small one, as shown by its small size, its colour, and especially by its brittleness. Cuckoos' eggs are, in fact, not brittle, but uncommonly firm and hard. Who would take for an egg of the Cuckoo that which is thus described by the observer?—"The most curious egg was the third, which was quite different from

the two others. It was very like a Chaffinch's egg, of a greyish green ground colour, sparingly marked with smaller reddish and larger reddish brown spots, and was remarkable as being thickly spotted at the smaller end instead of the larger. It was not quite so large as a Chaffinch's egg."

Of the brittleness of the third and smallest egg the observer says, "On finding the young Cuckoo, the two unincubated eggs, the reddish brown one and the small one, lay by the side of the nest. The first was crushed in and appeared to be rotten, the second was uninjured, but on attempting to blow it subsequently, he found that it was unfertilized, and only contained a partly dried-up and wasted yolk. No doubt, like the injured one, it was an egg dropped during the time of sitting, and not fully developed nor fecundated, as was apparent from its inferior size, very thin shell, and small contents."

An "extremely brittle and thin shell" (as I have before remarked) is not possessed by any Cuckoo's egg, whether large or small; on the contrary, no egg of any of the foster-parents of the Cuckoo has such a hard and dense shell as that of the Cuckoo itself. If the small egg was so heavily coloured as the observer states, it must have been also fully formed, for the colour is the last stage in the development of the egg as regards the shell.

Already, in 1880, Dr. Kutter, and then Herr Hauptmann Krüger-Velthusen, simultaneously with myself, drew attention to the unusual hardness and firmness of the Cuckoo's egg (see Orn. Centralb. 1880), and subsequently I wrote, in the 9th Jahresbericht of the 'Ausschuss für die Beobachtungsstation der Vögel Deutschlands' (p. 201), concerning a Cuckoo's egg found here in Cassel in 1884, in which the beak of the young Cuckoo was to be seen through the egg. This Cuckoo's egg (which was already perforated by the embryo so that the beak of the young one was visible as a small point) was found in the accidentally destroyed nest of a Hedgesparrow, *Accentor modularis*, with four well-incubated eggs of that bird. Yet twelve days afterwards I was able to empty the egg artificially without breaking it, and it now rests in my collection as a proof of the hardness and firmness of the Cuckoo's egg. On the other hand, the much-incubated eggs of the Hedgesparrow broke on the first attempt to blow them. Not to digress too much from my task of

discussing the extraordinary observations of Herr Müller, I will very briefly mention two more instances of the remarkable strength of the Cuckoo's eggs which I think will be of interest. [Two such instances are then given, and Herr Walter continues:—] I think that I have now sufficiently demonstrated the strength of Cuckoos' eggs, but I can prove just as conclusively that one and the same Cuckoo always lays similar eggs, and consequently that the nest found by Herr Müller could not have contained the entire clutch of one Cuckoo. In proving this I am able to controvert one of the three arguments which Herr Müller uses to support his assertions.

The conclusions which he draws from his own observations are two in number. [These have been already quoted, p. 218.] My observation, however, goes further, namely (3), that the young Cuckoo—contrary to my experience of the young of this species reared by the common small birds—becomes full-fledged in about twenty-one days, whilst young Cuckoos bred in the nests of song-birds, as I have observed, take six weeks to become capable of flight. Doubtless the reason for this rapid maturing of the Cuckoo in the first case is the much abundant supply of food brought by the parent bird. [The meaning here is very obscure.]

The first conclusion of Herr Müller cannot be positively disproved, for the matter stands thus:—If he asserts that he has positively seen the Cuckoo incubating for an hour and a half on the nest, and that he afterwards saw the old Cuckoo feeding the young ones with caterpillars, a denial would be tantamount to accusing him of falsehood. We can only draw our own conclusions from what has been already stated. But as regards points 2 and 3 it can be positively shown that Herr Müller has made a mistake.

For more than ten years I have made repeated observations, and at the annual meeting of the "Allgemein Deutsche Ornithologische Gesellschaft" of Berlin, have proved by exhibition of eggs that the same female Cuckoo always lays similar eggs, so that it is almost superfluous to adduce fresh proofs, or to repeat old ones. I will therefore only refer to my own observations and those of an enthusiastic naturalist, Herr K. Ochs, of Cassel, and allow him to speak for himself.

Herr K. Ochs has made some interesting observations on Cuckoos' eggs, and knows the Cuckoos of the Habichtswald (the

locality of his observations, where he is a landowner) almost as well as he does the Canaries and Goldfinches of his aviary. He knows exactly whether his old friends have returned or not, and whether a new hen Cuckoo has taken the place of an old one that has died. He knows the old females which have returned, partly by their colouring, but more particularly by their eggs, which have always the same marking for the same female, but which vary much from those of other females—each female always returning to the same restricted locality.

As I did not find him at home when I called to talk over the matter with him, Herr Ochs wrote me a letter, which I copy exactly. It runs as follows:—"In consequence of observations made for thirty years on the Cuckoos occurring here annually, I have come to the conclusion, after finding more than 100 eggs, mostly laid in the nest of the Robin, that (1) a Cuckoo returns every year to its chosen haunts; (2) that the eggs of a particular bird remain the same in form, colour, and size; so that the eggs of a new-comer to the locality may be distinguished from those of other Cuckoos by anyone who understands the subject."

[Herr Walter then refers to certain statements of his own made in 1876, at the first annual meeting of the "Allgemein Deutsche Ornithologische Gesellschaft" (Bericht, Allg. Deutsch. Orn. Gesel. i. pp. 17, 34), and to other remarks of his printed in the 'Monatschrift des Deutschen Vereins zum Schutze der Vogelwelt' (1883, p. 36), to show that every female Cuckoo (1) always lays similar eggs, (2) always seeks the nest of the same species of foster-parent, and (3) always returns to the same locality; and he adds that after six years further study he is still of the same opinion. The lengthy paragraphs which follow are chiefly amplifications of former statements, and need not be here repeated.]

He thus concludes:—"With regard to Herr Kiessel's statement I consider it, for many reasons, best to be silent. A. Brehm has already said enough about it. Moreover, Kiessel appears to have been unacquainted with the young of the Cuckoo, for he says in a letter to Herr A. Müller—"The young Cuckoo, when only just hatched, had dark down (*dunkelen Flaum*) on several places, especially on the head and shoulders, like all young birds." But the young Cuckoo when just emerged from the egg, as Herr Müller has correctly remarked, has no down, and is perfectly

white, or rather of a very pale flesh-colour; but even in the course of the second day the back of the head becomes grey, and this grey becomes darker on the following day, and continues to extend.

NOTES AND QUERIES.

Prof. Weismann's Essays on Heredity.—In response to the interest aroused by this subject, a collection of these essays has been translated under the care of Mr. E. B. Poulton, of Oxford. The volume is nearly ready, and will be published by the Clarendon Press.

MAMMALIA.

Threatened Extinction of the Kangaroo.—That there is an extreme likelihood that, unless preventive measures be taken, the Kangaroo will, in the course of a few years, have become a curiosity in its native country, is a statement which will probably be read with some amount of surprise, and perchance incredulity, by naturalists in England. That this assertion is, however, based on fact is proved, not only by the testimony of Australian naturalists, but also by American tanners, who find that, owing to the high prices now obtainable for the skins, large quantities of small unsaleable hides are forced upon the market—a course of action which they are beginning to recognise must inevitably result in the extermination, within a comparatively short period, of the Kangaroo. The following extract from a letter which I have recently received—in my capacity as secretary to the committee now seeking to secure better protection for the native fauna and flora of South Australia—from Mr. R. G. Salomon, one of the largest tanners in the United States, with respect to the desired prohibition of the sale in our colony of Kangaroo-skins under 1 lb. in weight may be of interest:—“I beg leave to say that it is of the greatest importance, not only to South Australia but also to Victoria and to Western Australia, that immediate steps be taken to stop the killing of small Kangaroos, or the total extermination of this animal will be brought about. It would surely be better to stop the killing of the young animals entirely in every part of Australia, by enacting a law which would impose a fine for the killing of any Kangaroos whose skins weigh less than ten-twelfths of a pound. Lighter skins than these are almost unsaleable, and yet there are very large quantities of such forced upon the market. The Kangaroo-skin is mainly used in the United States, and almost all those that are sold to England are resold to consumers in this country. As stated, I am deeply interested in the passing of this law; and shall, on the other hand, do everything possible to induce every tanner in this country to agree not to buy any skins not in conformity with

your restrictions. I think that the strictest co-operation can be established by which we shall succeed in the conservation of the trade, and make it a lasting one. Otherwise this will be absolutely destroyed, for in a few years the Kangaroo will be exterminated." We are now seeking to secure the enforcement of this restriction throughout Australia and Tasmania, and also, at the suggestion of Mr. Salomon, to have a close season declared between January 1st and May 1st; for eighty per cent. of the skins that are obtained in the period covered by these four months are totally ruined, being sunburnt while drying. We shall likewise endeavour to secure total protection in our own colony for the Rock Wallaby, for Kangaroos under three years of age, and for Wallabies (other than the Rock Wallaby) under two years of age. What success we shall have time will show.—A. F. ROBIN ('Advertiser' Office, Adelaide, South Australia).

Daubenton's Bat not in Norfolk.—In the article on this species which appeared in the last number of 'The Zoologist,' it is stated (p. 163) that "at Easton, in Norfolk, it has been noted by Mr. Gurney." This, it appears, is a mistake, the bat found at Easton being the *Barbastelle*. The error arose in consequence of Bell having applied the same specific name to both species, *Vespertilio daubentonii* and *Barbastellus daubentonii*. According to the latest authority (Dobson, 'Catalogue of the Chiroptera'), the *Barbastelle* should be known as *Synotus barbastellus* (Schreber).—J. E. HARTING.

Squirrel breeding in a Church-tower.—While looking about our church-tower one day last month, I was surprised to see a Squirrel run out of one of the loop-holes, and on examining the nest I found three young ones. The Squirrel's nursery has for its foundation an old Sparrow's nest, to which a large quantity of fine dry grass has been added. The choice of the tower for a nesting-place seems the more singular, as an extensive plantation of lofty trees joins the churchyard. In another loop-hole close to the Squirrel's a pair of Kestrels (no doubt those mentioned by me in 'The Zoologist' for 1888, pp. 269, 303) have laid their eggs, and I hope the young ones may be safely reared.—JULIAN G. TUCK (Tostock Rectory, Suffolk).

BIRDS.

Kite and Raven nesting in South Wales.—Within the last two years the Kite and Raven have nested in Brecon. Omitting the exact localities, I may state that both nests were within six miles of the town of Brecon. In the spring of 1887, having seen a pair of Kites soaring over an extensive oak-wood on a steep hill-side, I went, with a friend who is well acquainted with the appearance of the Kite, to try and find their nest. On nearing the place we saw the Kites soaring over the wood, and found their nest without much delay. It was well placed for security, at a height of

about forty-five feet from the ground, on a slim, nearly branchless oak, which at that point divided into three limbs. By climbing another tree, higher up on the slope, we could see three young birds in the nest; they looked about ten days old, and were of a yellowish white colour. The nest was very much like a Crow's, but much larger, and was remarkable in having many loose sticks hanging from its sides. The Raven's nest was placed in an ash tree growing horizontally from the side of a precipitous ravine on a slope of the Brecon Beacons. An aneroid gave fifteen hundred feet as the height above the sea. I went to the nest, which I believe is two years old, on March 22nd of this year, and found it much the same as it was last summer. I went again on April 15th, and noticed the nest had been added to, and re-lined with white wool, and contained three eggs of the light blue variety, and one young bird. The inside of the nest could be well seen from another tree higher up on the cliff. The next day another young bird had appeared, and with difficulty I secured an egg, which proved to be addled. While I was there the two Ravens were in close attendance, soaring overhead, and sometimes perching on the rocks, and one returned to the nest very soon after I left it. The latter is a very large structure, nearly three feet high. It would seem that in twenty-five days the nest had been repaired, four eggs laid, and incubation all but completed.—E. A. SWAINSON, Capt. (Woodlands, Brecon).

[We sincerely trust that the naturalists of Brecon will do all in their power to protect these fine birds.—ED.]

Sand Grouse in Germany.—In a long article extending over thirty-three pages, Dr. Reichenow, in the 'Journal für Ornithologie' for January last, has traced the occurrence of this species in Germany during the year 1888, mentioning all the localities in which, so far as he could ascertain, it had been observed.

Sand Grouse in Middlesex.—As I have not seen any notice in print of the appearance of Pallas's Sand Grouse in Middlesex during the recent immigration of this species, it may be well to record that a little flock of about a dozen birds were seen in this neighbourhood, near Staines Moor, on June 19th, 1888. They were observed at close quarters by a neighbour of mine, who, on seeing in my collection the stuffed specimens which I had procured during the former invasion of this species in 1863, had no hesitation in identifying the species. So far as I know they were not molested, and I am glad to say that no one about here carries a gun in the summer time.—F. BOND (Staines, May 20).

Sand Grouse in Surrey.—The following notice of the occurrence of Pallas's Sand Grouse in Surrey is taken from the 'Graphic' of March 2nd last:—"Pallas's Sand Grouse, which was very plentiful last year, still lingers. A specimen was shot by mistake for a Dove, at Shirley, near

Croydon, the last week of February."—ERNEST SALMON (Clevelands, Wray Park, Reigate).

Sand Grouse in Glamorganshire.—This is an additional species to the Glamorganshire list. Mr. J. T. D. Llewelyn, of Penllergare, tells me that about this time last year, when the Sand Grouse were occurring so frequently all over these islands, a flock of sixteen appeared at Llanrhidian, in Gower, and two were shot (a male and a female) by Mr. S. Davies, of Llanrhidian Farm. The birds remained there only about a week. The two that were shot were stuffed, and may now be seen in the possession of Messrs. H. M. and C. E. Peel, in Swansea. Mr. O. H. Jones, of Fonmon Castle, near Cowbridge, has also written to tell me that a pair of Sand Grouse appeared last year, in the spring, on a farm about three miles from where he lives, and are said to have bred there. The farmer states that he saw them with young ones, but Mr. Jones thinks that there is very considerable doubt as to their having bred.—DIGBY S. W. NICHOLL (The Ham, Cowbridge).

The Firecrest in Cumberland.—As my friend Mr. J. H. Gurney, jun., has taken exception (p. 174) to the record of *Regulus ignicapillus* from Cumberland, on the ground that the specimen is not now forthcoming, I think it right to say that the person who killed the bird is forthcoming, and that he is, and always has been, certain that his bird was a Firecrest, basing his opinion on Yarrell's description. This person (Mr. Graham, of Carlisle,) has a good knowledge of the rarer British birds. He has always stated that he gave the bird to a certain birdstuffer formerly well known in Carlisle. This man—by name Baily—latterly formed a collection of his own; but at the time that the Firecrest was killed he usually disposed of his specimens. Whether this specimen went to Mr. Heysham or not, is not at present known, scarcely any of his letters referring to that period. But we do know that some of Mr. Heysham's best specimens were destroyed by moth, and this specimen may have been among them. At all events, Mr. Graham adheres to his statement that the bird was a Firecrest; and he himself, when first giving the information in writing, correctly described the distinctive points between the Firecrest and the Goldcrest.—H. A. MACPHERSON (Carlisle).

Blue-winged Teal in Cambridgeshire.—On April 24th Mr. L. Travis, the Bury birdstuffer, showed me a duck he had just set up, which had been sent to him in the flesh a few days before from March, in Cambridgeshire with a male Shoveller. A reference to Mr. Saunders' 'Illustrated Manual of British Birds' (p. 422) enabled us to identify it as a mature male Blue-winged Teal, *Querquedula discors*. It has the broad white streak in front of the eye, the brilliant blue wing-coverts, and legs like those of the Shoveller. In answer to enquiries Mr. Travis kindly made

for me, he was informed it was killed near March. I had hopes of being able to trace it to Norfolk.—JULIAN G. TUCK (Tostock Rectory, Suffolk).

Crossbill Breeding in Immature Plumage.—I read with much pleasure Mr. Ussher's notes (p. 180) upon the Crossbill breeding in Co. Waterford, and the more so as Dr. Günther had kindly shown me the birds referred to, a few days before. The interesting point, of course, is to find the male of *Loxia curvirostra* breeding in a yellow dress, and before assuming the red plumage of maturity. Your readers will recollect that Mr. A. C. Chapman found the Pine Grosbeak breeding in immature plumage in the Tana valley, and Mr. Seebohm states that *Carpodacus erythrinus* does the same. I may add that the Lesser Redpoll also breeds in immature plumage, *i.e.*, before the male has acquired the rose-pink breast, which Professor Newton describes as the summer plumage of that species. Among the *Falconidæ* the male Hen Harrier has been proved more than once to breed in immature plumage; and if attention were paid to this point, probably similar facts would be elicited in regard to other species.—H. A. MACPHERSON (Carlisle).

Crossbills Nesting in Suffolk and Norfolk.—I have just received (April 11th) through Mr. Marsden of Gloucester, two nests of Crossbills, five eggs in each, and one hen bird shot from the nest; the one taken at Wrangford, in Suffolk, on April 4th, the other at Westing, in Norfolk, on March 30th. Perhaps they are of sufficient rarity breeding so far south as to be worth recording in 'The Zoologist.'—PHILIP CROWLEY (Waddon House, Croydon).

[The nest of the Crossbill has been found very much further south than Mr. Crowley supposes, as, for example, in Hampshire, at Bournemouth, and in the Holt Forest. In this forest, before the Scotch firs were cut down (in 1838) to allow more room for the growth of the young oaks, Crossbills commonly bred there; and when the fir trees were thrown in the year referred to, four nests and eggs of this species were found amongst the branches, as recorded by Mr. Lewcock, of Farnham, Zool. 1843, p. 189.—ED.]

Bee-eater in Ireland.—On the 2nd May last a male Bee-eater (*Merops apiaster*) was shot at Ballbriggan, Co. Dublin, in beautiful plumage, and in good condition. The stomach contained the remains of bees.—EDWARD WILLIAMS (2, Dame Street, Dublin).

[What a pity it is that these beautiful birds cannot be left unmolested on their arrival, and that one selfish individual should invariably deprive all the naturalists in his county of the pleasure of observing it. We fail to see the use of a "Wild Birds Protection Act," obtained with so much trouble, if those who profess to be ornithologists do not aid in getting it enforced.—ED.]

The Attitude of Grebes on Land.—The attitudes of diving birds when on land are so little known that I make no apology for troubling you with a brief observation on the subject. Yarrell states that Grebes “sit upright on the whole length of the tarsus.” This is illustrated by his figures of the Eared and Slavonian Grebes, which are represented as resting like any of the *Alcidæ* on the tarsus. On May 4th my cousin and I closely examined a Great Crested Grebe, *Podiceps cristatus*, at the fish-house in the Zoological Gardens, Regent’s Park. We found that the bird sat up naturally enough, not with the tarsus resting on and parallel with the ground, but raised at an angle of about $22\frac{1}{2}^{\circ}$. It is clear, therefore, that Yarrell had in his thoughts the *Alcidæ*, and that he was mistaken in ascribing their action to the Grebes.—H. A. MACPHERSON (Carlisle).

Late Stay of Bramblings in Suffolk.—Bramblings have remained in Suffolk later than usual this year. On April 17th a fine male, which looked very dark in colour, was feeding under some beech-trees near the house. A week later there were two male Bramblings in the flesh in a shop in Bury; one was in ordinary winter dress, but the other had the head almost black, and differed from any other which has ever come under my notice, in having the part of the back which is usually white, of a bright canary yellow. This curious variety is now in my collection. On April 25th my gardener, who is a very keen-sighted observer, saw a pair here.—JULIAN G. TUCK (Tostock Rectory, Suffolk).

Audacity of Jackdaws.—Jackdaws abound here in the old trees, and have become so mischievous, destroying all the Blackbirds’, Thrushes’, and other eggs (to say nothing of game) that, rather reluctantly, I ordered their numbers to be reduced. The next day, or nearly so, my shepherd saw a Jackdaw plunder a Kestrel’s nest near the house, that I have each year tried to protect, and take the eggs. The bird dropped one, and in order to identify it, I directed the man to bring me the broken egg-shell, which he did; and I found it to be a Kestrel’s. This attack on a hawk’s nest, although the Kestrel is not a bold bird, still shows a Jackdaw’s audacity to be considerable.—W. OXENDEN HAMMOND (St. Alban’s Court, near Wingham, Kent).

Jackdaws Nesting in old Magpies’ Nests.—In some small plantations near here Jackdaws have lately taken to occupying the Magpies’ nests. In May, 1887, I found in these plantations four newly-built nests of the Magpie, but from one of these the Magpies had been ejected by a pair of Jackdaws before they had completed their nest; the Jackdaws had lined the nest and laid eggs therein. In 1888 I did not visit these woods. On May 7th of the present year I found there were six old nests of the Magpie, each tenanted by a pair of Jackdaws, and one pair of Magpies had built a new nest, and up to that time kept possession of it for themselves.

The nests are situate at the top of tall Scotch and larch fir-trees, and have been plentifully lined by the Jackdaws with sheep's wool and other materials. I believe Jackdaws are very rarely found nesting on the open boughs of a tree, and that they have never been known to actually build for themselves in such a situation. Is any correspondent of 'The Zoologist' aware of any such instance? In the present case, when the Jackdaws have succeeded in driving all the Magpies away, they will either have to build for themselves or else change their quarters.—E. W. H. BLAGG (Cheadle, Staffordshire).

[Several instances of Jackdaws building nests in trees will be found recorded in 'The Field' of May 22, 1875, and 'The Zoologist,' pp. 185, 823, 9572.—ED.]

Eggs of the Grey Wagtail.—On May 11th, I found five eggs of the Grey Wagtail, very different from the ordinary form of the eggs of this species, which is, I should say, an egg with a yellowish underground, thickly covered with rather darker markings. The eggs in question have the underground quite white, and are spotted with grey, very much like eggs of the Pied Wagtail. Has this variety been found before? I have never seen such eggs, nor can I find mention of them in any works on Natural History I have consulted.—E. W. H. BLAGG (Cheadle, Staffordshire).

[The question naturally suggests itself, "Are they eggs of the Grey Wagtail?" Our correspondent does not state that the birds were seen at the nest, or offer any evidence of correct identification.—ED.]

Early Nesting of the Little Grebe in Co. Dublin.—On the 2nd April I discovered a nest of the Little Grebe, *Podiceps minor*, containing five eggs. It would seem therefore that some of these eggs must have been laid at the end of March. Is not this a very early date for the nesting of this bird? Mr. Miller Christy, in his little book on 'Birds-nesting,' gives the time of nesting of this bird as from May to July. One of the eggs was accidentally broken by me, but I have the remaining four, and there can be no doubt as to the identity of the species. The nest was in the usual situation on the outskirts of some reeds, floating and almost level with the surface of the water, and was thoroughly soaked, the eggs lying in the wet interior. Contrary, however, to my usual experience with the nest of this bird, the eggs were wholly uncovered, and are consequently much cleaner than the generality of the eggs of this bird which I have seen.—J. J. DOWLING (1, Fingal Terrace, Howth Road, Clontarf).

Ornithological Notes from Lowestoft.—The following notes were made last year at Herringfleet Hall, near Lowestoft. Several Ring Ouzels in immature plumage were observed about the hedges and on the common in the middle of September, and up to about October 8th, after which date they disappeared. Mr. Pyecraft, a birdstuffer in Yarmouth,

informed me that an Osprey was shot on Fritton Lake during the second week in September. A Jack Snipe was shot by Mr. L. Peto, on September 25th near here, and I shot one myself on the marshes near St. Olave's Station, on September 26th, a somewhat early date for their appearance. On October 17th, while Snipe shooting on the "rands" near St. Olave's Station, my retriever caught a Spotted Crake, and brought it to me alive. It was a good specimen, a hen bird, and remarkably fat. I flushed two others on the same ground the same day. I flushed a Short-eared Owl out of some long grass while snipe-shooting in the marshes near St. Olave's Station, October 27th. I observed a Buzzard, apparently the Common Buzzard, in the woods surrounding the Fritton Lake, daily from about August 4th to the 16th, after which it took its departure. About May 29th, Mr. Bunn, birdstuffer, Lowestoft, received for preservation a female Sand Grouse that was picked up dead on the shore near the town; the ovaries were not at all developed. On May 30th, Mr. Sheals, birdstuffer, Belfast, received one that was killed at Killough, Co. Down. On May 31st, Mr. James Sutton wrote me that two Sand Grouse, also females, killed by the telegraph wires, were in the hands of the Sub-curator at Durham. A beautiful specimen of another hen bird that was shot at Blundeston, near Lowestoft, is now in my possession. A nest of the Shieldrake, containing fresh eggs, was taken by a friend of mine on the sandhills near Burnham, Somersetshire, August 23rd, which seems to be an unusually late date at which to find fresh eggs. A Snow Bunting was killed at Cromer on October 29th. In a letter received by me from Mr. W. E. Baker, dated Tilney, All Saint's, Norfolk, October 29th, 1888, he says:—"I think there must have been an unusual number of Hawfinches this year with us, as I found six nests containing eggs and young in one day. The Sand Grouse have not yet left Norfolk, as I saw a fine pair at one of our local birdstuffers last week, in full plumage and in splendid condition, as also a Ring Ouzel."—E. A. BUTLER, Lieut.-Col. (Herringfleet Hall, near Lowestoft).

Kestrel's Nest on a Wheat-stack.—A pair of Kestrels have layed in a wheat-stack this year as they did last year, and on the same farm, so probably they are the same birds. Two eggs were found, while the stack (one of four) was being thrashed, about the beginning of May. The stacks were by the road-side, about 300 yards from the farm buildings. I am glad to say that the Kestrels on this farm are not molested, except by such an accident as thrashing the stacks, in which they seem so fond of laying their eggs. About 400 rats and six weasels were killed in these four stacks, and it seems wonderful, therefore, that the hawks' eggs were not eaten by them.—GEORGE E. LODGE (5, Verulam Buildings, Gray's Inn).

Strange Capture of a Golden Eagle.—During the last week of April, as Mr. Alexander Shaw, farmer, Oldtown, Stratherrick, on the estate of

Captain Fraser of Farraline, was going round among his sheep stock about four o'clock in the afternoon, he came on two Golden Eagles near the edge of a birch wood. They were lying on their sides, and at first sight Mr. Shaw thought they had been trapped, but on closer examination he found they were engaged in a desperate combat with each other, and had got their talons so closely locked together that he approached and placed his feet on them, and, holding one of the birds by the wings, managed to secure it. He made an effort to retain the second bird, but it ultimately made its escape. Mr. Shaw stuck gallantly to the one bird, and, holding it firmly by the wings, forced it in front of him to the nearest farm-house, where he threw a bag over its head, and made it captive. Strange to say, Mr. Shaw escaped without the slightest injury, although the bird frequently struck at him. Hearing of the peculiar capture, I purchased it from Mr. Shaw, and sent it to the Zoological Gardens, Regent's Park, London. When despatched, the bird was quite lively, fully grown, and in excellent plumage.—THOMAS G. HENDERSON (Inverness).

Weight of Woodcocks.—Having seen a letter of Mr. Harcourt's in 'The Zoologist' of April last about the weight of two Woodcocks shot by his gamekeeper, it may interest him to know that on the 29th October last I shot one in this neighbourhood that weighed just over 1 lb. The softness of the ground cannot have had much to do with the size of this one, it being before the time of much frost. I have killed a good number of Woodcock at different times, over 100 one season in the west of Scotland, but this is the largest I remember. I regret that I did not verify the sex.—F. P. JOHNSON (Castlesteads, Brampton, Cumberland).

Woodcocks.—The following notes on Woodcocks in Ireland may be of interest to Mr. E. W. Harcourt:—In the south of Wexford, Woodcocks have been more scarce than usual this year, and in 1888 also they were scarce. They never visit this part of the county in large numbers, but are more frequent in the north, where some breed, I believe yearly. The best bag on record in the north of this county (at Wilton) in one day was sixteen and a half couple; in 1887 thirty-five cocks were killed in two days; in 1886 nineteen in one day, but I am told there must have been seventy birds seen. I heard that in Meath cocks were a little scarce, and this appears to apply to Waterford also.—G. BARRETT-HAMILTON (Kilma-nock House, New Ross, Co. Wexford).

Cirl Bunting in Glamorganshire.—For the last few weeks, so Mr. W. Allen tells me, a pair of Cirl Buntings have come regularly to pick up crumbs and corn in front of the windows of the Rectory at Porthkerry. He thinks that they intend building close by. Mr. Allen sent a notice of the occurrence to 'The Field,' which appeared in the issue of May 4th.—DIGBY S. W. NICHOLL (The Ham, Cowbridge).

Golden Oriole in Kent.—On April 21st I saw in Westerham Park, Kent, a male specimen of *Oriolus galbula* feeding in company with two or three Thrushes. I watched it for nearly half an hour, hoping to see a female Oriole, but failed to detect one. I have abstained from recording this rare visitant, trusting to give it a chance of life, until it had overcome the fatigue of migration.—JOHN T. CARRINGTON.

The Great Grey Shrike in Holderness.—This somewhat local bird was met with last April at Arram Hall, near Hornsea, the residence of Mr. Thomas Bainton. It visits us, though sparingly, towards the end of autumn, returning to the north of Europe for the breeding season.—PETER INCHBALD (Hornsea, near Hull.)

Bittern in Devonshire.—On January 15th a Bittern, *Botaurus stellaris*, was shot in the parish of Bickington, about eight miles from Barnstaple, and was taken to Mr. Rowe, the taxidermist, of this town, at whose shop I had an opportunity of inspecting it.—J. G. HAMLING (The Close, Barnstaple).

Kite in Suffolk.—A male Kite was taken at Eriswell, in Suffolk, on November 16th last. This is the same bird which is referred to last December in two issues of 'The Field,' under the heading of "The Kite in Norfolk."—JULIAN TUCK (Tostock Rectory, Suffolk).

Little Gull in Cornwall.—On February 21st, whilst out on the sand-flats between Hayle and St. Ives, a friend of mine observed two specimens of the Little Gull (*Larus minutus*), one of which he was fortunate in shooting for me, a good specimen of a young bird.—F. STANSELL (Staple-grove, Taunton).

REPTILES.

Lizard swallowed and rejected alive by a Viper.—Mr. R. H. Ramsbotham, Waterside, Todmorden, has sent to the British Museum, for examination, a Viper and a Lizard in spirit, with the following remarks:—"This adder was caught at Trowbers Warren, Sussex, on April 24th, 1889, about noon. It was kept in this bottle without spirit till the following morning, between 9 and 10, when the bottle was filled. Immediately after this was done, the Lizard (which is still in the bottle, and has not been touched) crawled out of the snake's mouth, and was quite lively for a short time." We have thus in this observation three facts well worthy of record:—(1) That Vipers do occasionally swallow Lizards, although their food normally consists of small rodents. (2) That in this instance the snake did not avail itself of its poison-apparatus in seizing its prey. (3) That a Lizard retained life for nearly twenty-four hours in the gullet of a Viper. The Lizard is an adult female *Lacerta vivipara*.—G. A. BOULENGER (Natural History Museum, Cromwell Road).

MOLLUSCA.

Limnæa involuta probably a Variety of *L. peregra*.—The question broached by Mr. More (pp. 154 and 155 *ante*), as to what is now known as *L. involuta* being merely a variety of *L. peregra*, I may point out, is not new. Adams, on p. 35 of his 'Collector's Manual of British Shells' (1884), broaches the question, but, without giving any reasons, simply remarks, "It is probably a variety of *Limnæa peregra*." I would like to ask Mr. More on what physiological or other grounds is it conceivable that the scanty supply of lime-salts and of food-stuff in the Lough could produce an *involuted* spire? If the smallness of the mountain tarn and the isolation of *involuta* have anything to do with its conversion into that form from *L. peregra*, then I would point out that there seems to me here a contradiction. I presume that for the sake of the exactness of experiment Mr. Waller kept the *involuta* Mr. More sent him isolated, and also I presume the tank—or whatever he used—was somewhat smaller in its capacity than Lough Crincaum. Then, taking the supposition that these two conditions obtained in Mr. Waller's experiment, and taking also the supposition that the isolation and the smallness of the mountain tarn may have produced, or have helped to produce, the conversion of *L. peregra* into *L. involuta*, we have the anomaly of similar causes producing two diametrically opposite effects—in one case the conversion of *L. peregra* into *L. involuta*, in the other the reversion of *L. involuta* into *L. peregra*. In this, I consider, lies the futility of the evidence advanced by Mr. More in favour of the theory he promulgates. Again, supposing that the scarcity of lime-salts and of food-stuffs in the Lough may have produced, or have helped to produce, the conversion of *L. peregra* into *L. involuta*, I may point out that there exists a thin and small variety of *L. stagnalis* (called *var. fragilis* by Jeffreys) which may be as legitimately considered to be produced by the scarcity of lime-salts and of food-stuffs in the medium in which it lives, yet it does not possess an involuted spire. Against this supposition, however, I would point out a statement for which Prof. Rolleston and Mr. W. Hatchett Jackson ('Forms of Animal Life,' 1888, p. 127) are answerable:—"The thickness of a shell does not depend upon the amount of lime in the waters in which the animal dwells, but rather on the workings of its tissues, modified by surrounding influences, whether chemical or non-chemical. This may be readily seen by a comparison of the dense shell of a Pearl Mussel, *Unio margaritifera*, from the mountain-streams of Westmoreland, with the thin shell of *Anodonta* from Oxford waters, much richer in lime." And even if here these authors are speaking specially of the Lamellibranch shell, yet there is no reason why it should not equally apply to the shell of a Basommatophor. The very fact that Mr. Waller fed his *involuta* upon water-cress lends a decided assumption to a belief that he accidentally

included a nidamental mass of *L. peregra* (or even a few detached eggs of this species, which would be easily overlooked) among the food introduced. And if *L. involuta* is merely a variety of *L. peregra*, then I should be inclined to suppose that reversions to ancestral conditions would be found in the Lough. It would be interesting to know whether *L. involuta* differs in its internal anatomy from *L. peregra*, for this would settle at once their specific distinctness or the reverse, and if I could obtain any live specimens of the former I would be willing to examine them in this relation; the fact that the contour, &c., of their bodies, when externally examined, are alike, experience has taught me to regard as of very little weight for diagnostic purposes. So far, taking into account what I have stated above, with the almost alpine distribution of *L. involuta* and the differences in the shell between it and *L. peregra*, I must still maintain the opinion I have long held of the specific distinctness of *L. involuta* from *L. peregra*.—J. W. WILLIAMS (Mitton, Stourport, Worcestershire).

Testacella haliotidea (var. *scutulum*) in Renfrewshire.—More than six years ago I requested a gardener of my acquaintance to pick up for the Paisley Free Museum as many varieties of slugs as he could find. He promised to do so, and it was not long before he gave me several, among which was one of *Testacella haliotidea*, which I recognised from the figures in Jeffrey's, Forbes and Hanley's, and Dr. Gray's works. I desired him to procure for me, if possible, a few more. In a short time I had twelve from him. These I kept for some months alive, but as we were busy getting up a large addition to our Museum, they were neglected and died, but the shells were saved for the Museum. The thring being over and the place well filled, I desired to procure specimens to preserve in spirits; for this purpose, in January, 1889, I spoke to another gardener, and showed him figures of the slugs. Soon he sent me sixteen fine specimens; these I had the pleasure of exhibiting alive at one of our monthly Natural History meetings. I have preserved in spirits a few of the most marked specimens, as well as their eggs; and, thinking that I might again lose the species, I have allowed the remainder to get loose in a garden near at hand.—MORRIS YOUNG (Curator, Paisley Free Museum).

CRUSTACEA.

Athanas nitescens in Ireland.—I do not think that this pretty little crustacean, so like a miniature lobster, has yet been recorded as Irish. In 1869, when collecting for the Royal Dublin Society, in the West of Ireland, I captured this rare species, in a rock-pool, on the small island of Magdara, which is noted also for a very interesting old chapel ruin. It lies a short distance to the south of Roundstone, Connemara.—A. G. MORE (74, Leinster Road, Dublin).

SCIENTIFIC SOCIETIES.

 LINNEAN SOCIETY OF LONDON.

May 2, 1889.—Mr. C. B. CLARKE, M.A., F.R.S., in the chair.

Messrs. H. B. Hewetson (of Leeds), M. B. Slater and T. W. Shore were admitted Fellows of the Society; and Messrs. C. Hedley, T. W. Girdlestone, and E. E. Prince were elected. Prof. W. Pfeffer, of the University of Tubingen, was elected a Foreign Member.

With reference to a recent exhibition, by Mr. D. Morris, of leaves of different species or varieties of plants included under *Erythroxylon Coca*, Lamarck, Mr. Thomas Christy made some remarks on the leaves of a variety from Japan. These he described as brittle and thin, with hardly any trace of cocaine, though yielding 8 per cent. of crystallizable substance. The thicker leaves of the Peruvian plant yielded more cocaine, though at first rejected on account of their more glutinous nature.

Mr. John Carruthers read a short paper on the cystocarps, hitherto undescribed, of a well-known sea-weed, *Rhodymenia palmata*, upon which remarks were made by Mr. G. Murray and Mr. A. W. Bennett.

The second part of a monograph of the *Thelephoreæ* was communicated by Mr. G. Massee.

Mr. Mitten contributed a paper on all the known species of *Musci* and *Hepaticæ* recorded from Japan. An interesting discussion followed on the character of the Japanese Flora, in which Mr. J. G. Baker, Dr. Braithwaite, and Mr. G. Murray took part.

The meeting adjourned to May 24th.

 ZOOLOGICAL SOCIETY OF LONDON.

April 16, 1889.—Dr. A. GÜNTHER, F.R.S., Vice-President, in the chair.

The Secretary exhibited a pair of a fine large Buprestine Beetle of the genus *Julodis* (*J. Ffinchi*), obtained by Mr. B. T. Ffinch near Karachi; and a Mole-cricket, *Gryllotalpa vulgaris*, sent by Mrs. Talbot from Bagdad.

Mr. Sclater made some remarks on the animals he had noticed during a recent visit to the Zoological Gardens of Rotterdam, Amsterdam, and Antwerp.

A communication was read from Mr. A. H. Everett, containing remarks on the zoo-geographical relationships of the Island of Palawan and some adjacent islands. In this paper it was contended that Palawan and the

other islands intervening between Borneo and Mindoro form an integral portion of the Bornean group, and do not naturally belong to the Philippine Archipelago, with which they have hitherto been treated. The writer founded his contention upon the grounds (1) that the islands in question are connected with Borneo by a shallow submarine bank, while they are separated from the Philippines by a sea of over 500 feet depth; and (2) that a comparison of the Bornean and Philippine elements in the fauna of Palawan, so far as it is known, shows a marked preponderance of the former over the latter element; while the Philippine forms are also more largely and more profoundly modified than the Bornean species. This fact indicated that they had been longer isolated, and consequently that the fauna of Palawan was originally derived from Borneo, and not from the Philippines, though a considerable subsequent invasion of species from the latter group had taken place.

A communication was read from Mr. Oldfield Thomas, containing an account of the mammals of Kina Balu, North Borneo, from the collections made on that mountain by Mr. John Whitehead in 1887 and 1888. The species represented in Mr. Whitehead's collection were twenty-one in number, of which six had proved to be new to science.

Mr. G. A. Boulenger read the second of his communications on the fishes obtained by Surgeon-Major A. S. G. Jayaker at Muscat, on the east coast of Arabia. The two collections recently received from Mr. Jayaker contained examples of eighty species not included in Mr. Boulenger's former list.

May 7, 1889.—Prof. FLOWER, 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 April, and called attention to a young male Sinaitic Ibex, *Capra sinaitica*, from Mount Sinai, presented by Sir James Anderson; and to a young male of the Lesser Koodoo, *Strepsiceros imberbis*, from East Africa, presented by Mr. George S. Mackenzie.

Mr. Sclater exhibited and made remarks on a living specimen of an albino variety of the Cape Mole, *Georychus capensis*, lately presented to the Menagerie by the Rev. George H. R. Fisk.

The Secretary read a letter addressed to him by Dr. E. C. Stirling, of Adelaide, containing a copy of his description of a new Australian burrowing Mammal, lately published in the 'Transactions of the Royal Society of South Australia,' and promising to send to the Zoological Society a more complete account of the same animal.

Mr. Seeböhm exhibited and made remarks on the skin of a male example of *Phasianus chrysomelas*, which had been transmitted in a frozen state from the Trans-Caspian Provinces of Russia.

A communication was read from Col. C. Swinhoe, containing descriptions of seventy-five new species of Indian Lepidoptera, chiefly Heterocera.

A communication was read from Rev. O. P. Cambridge, containing the description of a new Tree Trap-door Spider from Brazil, proposed to be called *Dendricon rostratum*.

Mr. F. E. Beddard read some notes on the anatomy of an American Tapir, *Tapirus terrestris*, based on a specimen lately living in the Society's collection.

A communication was read from Prof. Bardeleben, of Jena, on the præpollex and præhallux of the Mammalian skeleton. The author recorded the presence of a two-segmented nail-clad præpollex in *Pedetes*, and that of a two-segmented pisiform (post-minimus) præhallux in *Bathyergus*. He also stated that he had discovered vestiges of the præhallux and præpollex in certain Reptilia. He then passed to the consideration of the Mesozoic *Theriodesmus* of Seeley, and denied the existence of the *scapho-lunare* of that author, while he produced good reason for believing the same observer's second *centrale* to consist of two elements, and his præaxial *centrale* to be the basal element of a præhallux.

Mr. Oldfield Thomas read the description of a new genus and species of *Muridæ* from Queensland, allied to *Hydromys*, which he proposed to call *Xeromys myoides*.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

May 1, 1889. — Mr. FREDERICK DU CANE GODMAN, M.A., F.R.S., Vice-President, in the chair.

Mr. Walter F. H. Blandford, B.A., and Mr. John W. Downing, were elected Fellows; and Dr. Neville Manders and Mr. Arthur Cant were admitted into the Society.

Mr. W. L. Distant announced the death of Dr. Signoret of Paris, one of the Honorary Fellows of the Society.

Dr. Sharp exhibited male and female specimens of an abnormal form of *Rhomborhina japonica*, found in Japan by Mr. G. Lewis. They exhibited a contraction of the thorax, which was much narrower than usual at the base, so that the mesothoracic epimera were entirely exposed. Dr. Sharp also exhibited a small collection of Coleoptera made by Dr. N. Manders in the Shan states, Upper Burmah; this collection contained several new interesting forms, the most remarkable being a small Heteromorous insect bearing a considerable resemblance to *Rhysodes*. Amongst the specimens was an example of *Batocera roylei*, which he had retained in a relaxed condition, so that the Fellows might have an opportunity of hearing its stridulation; this was produced in a very audible manner by the base of

the prothorax passing backwards and forwards over a striated space at the base of the scutellum.

Mr. C. O. Waterhouse exhibited, for Mr. Frohawk, a series of wings of British Butterflies, prepared in accordance with a process (described by Mr. Waterhouse in the Proc. Ent. Soc. 1887, p. xxiii), by which they were denuded of their scales so as to expose the neuration.

Dr. P. B. Mason exhibited cocoons of a species of spider,—*Theridion pallens*, Black.,—from Cannock Chase, distinguished by the presence of large blunt processes on their surface.

Mr. H. Goss exhibited, for Mr. N. F. Dobrée, a number of scales of *Coccidæ*, picked off trees of *Acacia melanoxyton* and *Grevillea robusta*, growing in the Market Square, Natal. These scales had been referred to Mr. J. W. Douglas, who expressed an opinion that they belonged to the Fam. *Brachyscelidæ*, and probably to the genus *Brachyscelis*, Schrader. He said that most of the species lived on *Eucalyptus*.

Captain H. J. Elwes exhibited a long and varied series of *Terias hecabe*. He remarked that all the specimens which had strongly defined chocolate markings were taken in the cold and dry season, and that those which were without, or almost without, markings were taken in the hot and wet season. Capt. Elwes further observed that he believed that many specimens which had been described as distinct were merely seasonal forms of this variable species. Mr. W. L. Distant, Mr. F. D. Godman, Prof. Meldola, Mr. H. T. Stainton, and Mr. G. Lewis took part in the discussion which ensued.

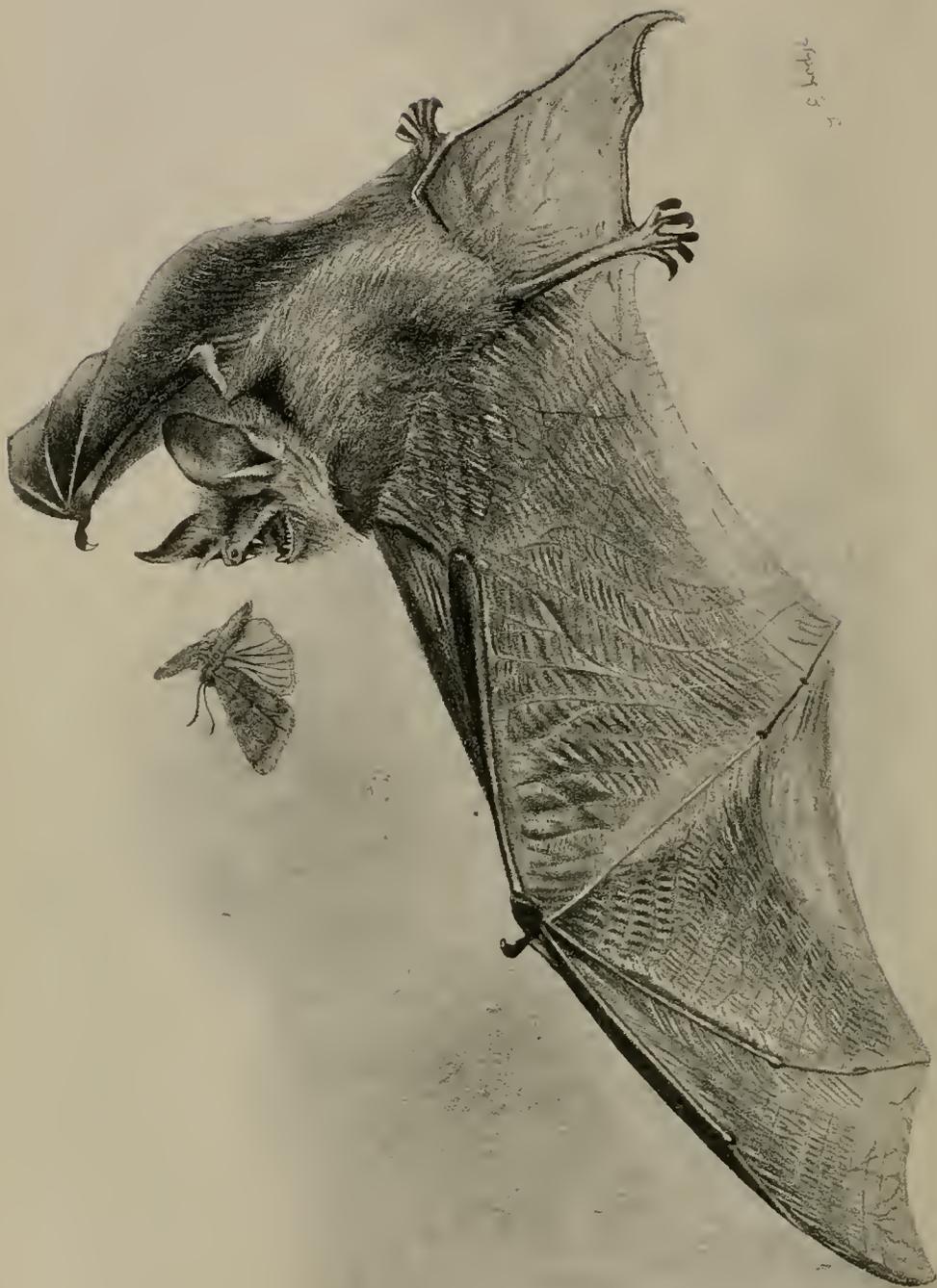
Mr. W. Dannatt exhibited specimens of *Thaumantis Howqua*, West, from Shanghai.

Mr. H. Burns exhibited, and made remarks on, a number of nests of living ants of the following species, viz., *Formica fusca*, *Lasius alienus*, *L. flavus*, *L. niger*, *Myrmica ruginodis*, *M. scabrinodis*, &c. One of the nests contained a queen of *L. flavus* which had been in the exhibitor's possession since September, 1882.

Mr. G. C. Bignell communicated a paper entitled "Description of a new species of British *Ichneumonidæ*."

Mr. A. G. Butler communicated a paper entitled "A few words in reply to Mr. Elwes' statements respecting the incorporation of the Zeller Collection with the General Collection of Lepidoptera in the Natural History Museum." Capt. Elwes, Mr. Stainton, Mr. Godman, and others took part in the discussion which ensued.—H. Goss and W. W. FOWLER, *Joint Hon. Secs.*





Natterer's Bat
Vesperugo nattereri.

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NATTERER'S BAT, *VESPERTILIO NATTERERI*.

BY THE EDITOR.

PLATE III.

TWENTY years ago, when living a good deal in West Sussex, we often saw this Bat flying about the oak trees on the outskirts of the woods. It appeared earlier in the day than the other local species, even making its appearance before sunset. It was by no means shy, but allowed so near an approach that, as we stood motionless against the tree trunk around which it was feeding, it would pass within a few feet, and enable us to identify the species without killing it. In Middlesex, also, when residing at Kingsbury, we had many opportunities of seeing and handling Natterer's Bat, specimens of which were procured at Hampstead, the Hale, Edgware, and Stanmore. Subsequently, on noting its occurrence in many other parts of England, Wales, and Ireland, we came to the conclusion that it cannot be so rare a species in the British Islands as is generally supposed.

The name "Reddish-grey Bat," bestowed upon it by Bell ('British Quadrupeds,' 2nd ed., 1874, p. 54), has always struck us as not very appropriate, the dorsal surface of the specimens obtained by us being very pale yellowish grey, and the under parts nearly white. Its colour and size, as well as the length of the ears (about as long as the head), made it easy to distinguish it on the wing from either the Pipistrelle or the Long-eared Bat,

the only two species in the localities where we observed it with which it could be confounded.

Its flight when feeding was by no means rapid, though on leaving one tree for another at a little distance it flew much faster, though never so rapidly as the Pipistrelle or high-flying Noctule.

So far as could be ascertained without actual examination of the prey captured, its food appeared to consist principally of small Diptera and Micro-lepidoptera, which it captured not only on the wing, but snatched off the leaves on the outside branches of the trees with great dexterity. Just as a dog will "bolt" a rabbit and catch it before it has gone many yards, so this Bat would disturb a small moth and seize it within a few inches of the leaf or twig on which it had been resting. An entry in an old note-book reminds us of a particular day in autumn (Aug. 24) when we watched one of these Bats, at 3 p.m., flying round an almost leafless oak, much slower than a Pipistrelle, and at a lower elevation. On another occasion we watched one for some time hawking for flies round an old pollard ash, quite early in the afternoon, while the sun was still shining. Its dexterity was remarkable, and as we called to mind the well-known lines in Collins's "Ode to Evening,"—

"Now air is hush'd, save where the weak-eyed Bat
With short shrill shriek flits by on leathern wing,"

we were forced to the conclusion that the poet had hardly done justice to its powers of vision. The "short shrill shriek" admirably describes its vocal effort, and no better verb than "flit" could be found to describe its movements on the wing; but for "weak-eyed" we should prefer "keen-eyed," as depicting more truthfully its really marvellous powers of sight. Indeed, were it not gifted with excellent vision it would scarcely be able to get a living by the chase of small and active insects on the wing.

Its usual abode by day is preferably the hole of a tree, often in a wood, being what may be termed a woodland species;* but it has also been taken from the rafters of a cottage (Bell's edition of White's 'Selborne,' i. p. 34); from a hole in a bridge, four feet above the water's edge (Zool. 1853, p. 4012); from a hole in a

* Bats have their peculiar haunts, like birds; the Pipistrelle haunts the neighbourhood of houses, and the Barbastelle loves water.

wall (A. Newton, Zool. 1853, p. 3804), and from the roof of a church (Bell, Brit. Quad., 2nd ed., p. 55).

Like other Bats it is gregarious, and has occasionally been found in large colonies. A notable instance of this is mentioned in 'The Zoologist' for 1853 (p. 4012), where Dr. Kinahan records the fact of 27, 35, and 53 having been counted while issuing from one and the same hole in the abutment of Tankards-town Bridge, which crosses the River Barrow at Levitstown, on the confines of Kildare and Queen's County.

The almost entire disappearance of Bats during the winter, unless tempted forth by unusually mild or warm weather, has led to the belief in some quarters that they migrate like birds, though it is certain that their absence in most cases is to be accounted for by their hybernation. But something very like migration has been observed, if not actually proved. It has been ascertained by Blasius that Bats not merely seek for a change of locality, but that they do so with such regularity that it becomes, in his opinion, a "migration." Bell, apparently loth to accept this view, remarks (*op. cit.*, p. 9), "May we not suppose that the migration of Bats observed by Professor Blasius was the mere unconscious appearance, night after night, of these creatures at a spot somewhat removed from that of the previous night, thus following the twilight, rather than what may be properly termed a migration?" There is other evidence, however, besides that of Blasius, to which he has not referred.

Spallanzani discovered that in Italy a great many Bats, especially *Vespertilio murinus*, migrate at the approach of cold weather. At Pavia there are no grottoes nor caverns to which they can retire, and not a single *Vespertilio* could be found in winter, though no pains were spared in searching for them. The latest date at which he observed Bats flying at Pavia was Nov. 2, when the thermometer was at 55°. Another species, *V. equinus*, was seen at Modena on Nov. 4th. None were then observed again until March, when the temperature was 45°, and then *V. equinus* had not reappeared, the weather being too cold for it; for some species are quite torpid at a temperature which others are able to endure without their muscular energy being diminished.*

* Spallanzani, 'Rapports de l'air avec les êtres organisés,' ii. p. 125.

In Sussex Mr. William Jeffery has observed a great increase in the number of Noctules in August, and supposes that they are moving southwards then.

Mr. A. J. Clark-Kennedy, on May 23rd, 1874, about 5 p.m., saw a flight of twenty-seven large Bats, flying steadily in a north-easterly direction, at Little Glenham, Suffolk.*

That Bats are able to find their way back to their old haunts, just as Swallows and Martins have been proved to do, has been shown by Mr. Gyles, of Kilmurry House, Waterford, who by way of experiment captured several Pipistrelles alive, on an island in the River Suir, and, carrying them to a distance, liberated them separately on the mainland. Each of them, after making one or two circuits in the air, went off in a direct line for its home, notwithstanding there was a bright sun shining at the time, and a strong wind blowing against them.†

On these points (migration, and homing instinct in Bats) there is room for much interesting experiment, and it would not be difficult to catch and mark Bats, just as Swallows and Martins have been marked, by fastening lightly round one of the hind feet a thin bit of silver wire, before restoring it to liberty. On discovering the haunt of a colony a number might be caught and marked, and carried some miles away. It would be easy to revisit the place and ascertain whether any of those marked had returned; and under favourable circumstances this might be done without disturbing them much, for the silver wire being fastened to the hind feet, it would be readily seen, as the Bats hang suspended head downwards.

Another point of interest, upon which it would be desirable to have more information, is the precise nature of their food. We know that, in this country at least, Bats are exclusively insectivorous. But on what particular insects do they chiefly prey? With the Noctule the little hairy cockchaffer, *Amphimalla solstitialis*, is said to be a favourite food. Mr. D'Urban has observed that in Devonshire the Pipistrelle comes out in March, about the time the spring *Noctuidæ* appear at the catkins of the sallows, and that it picks these moths off the blossoms as it flies past. Mr. Bond has seen the Serotine taking moths off

* 'Zoologist,' 1874, p. 4075.

† Note on "Homing Instinct in Bats," 'Zoologist,' 1883, p. 173.

the blossoms of the blackthorn. When the shallows are in bloom the Long-eared Bat catches several species of *Tæniocampa* which feed on the blossoms, and Doubleday watched this species picking moths off the flowers in his garden. Couch also has seen it take a fly off a leaf without alighting.* When dealing with the larger Lepidoptera they bite off the wings close to the body and drop them, eating only the body; and the haunt of a Bat may sometimes be discovered by the quantity of insect wings lying just below.

The present distribution of Natterer's Bat in the British Islands cannot be stated in a few words. So much attention has been bestowed of late years on the *Chiroptera* that even in the second edition of Bell's standard work (1874) the records of the occurrence of this species are very incomplete. In our annotated copy of that work, without much trouble, we have been able to add some thirty additional localities for *V. Nattereri* to those mentioned in the text, and there are doubtless others which have escaped notice. Briefly speaking, it may be said that Natterer's Bat is found in England and Wales from Cornwall to Durham, and from Norfolk in the east to Merionethshire in the west,—a pretty wide distribution. In a few counties, it is true, it has hitherto escaped observation, but its discovery in these is probably only a question of time, now that such close attention is paid to the fauna of particular areas, although we should not expect to hear of it in the mountainous parts of England and Wales. Its occurrence in the following counties has been vouched for by good observers:—

CORNWALL. — At Looe, Sept., 1852 (Couch, 'Zoologist,' 1853, p. 3937†; 'Cornish Fauna,' 2nd ed., 1878, p. 2).

DEVON. — No mention is made of this Bat in any of the Devonshire Catalogues by Turton and Kingston, Bellamy (1839), Brooking Rowe (1863), D'Urban (1875), or Parfitt (1877). In our annotated copy of Bell's work, however, we find a memorandum of its having been noted at Torquay by Mr. Gurney, though he has no recollection of it.

DORSET.—Ensbury, Borrer (Zool. 1874, p. 4127).

* 'Zoologist,' 1843, p. 343.

† His observations on Bats (*l. c.*), extending over seven pages, are worthy of attention.

- HANTS.—New Forest, Brockenhurst (Bond), Hamble Church, near Southampton (Kelsall), and Selborne (Bell, ed. White's 'Selborne,' i. p. 34).
- ISLE OF WIGHT.—Bonchurch (Bury, More, Bond, Borrer), Ventnor (Hadfield).
- SUSSEX.—Cowfold, Henfield, St. Leonard's Forest (Borrer), Balcombe, Three Bridges (Bond), Poynings (Oxford Museum), Midhurst, Nigh Woods, Rogate, West Grinstead, and Hellingly (Harting).
- KENT.—Chislehurst (Bell), Tudely near Tunbridge (Hadfield, Zool. 1857, p. 5664).
- ESSEX.—Epping (Doubleday, Zool. 1843, p. 6), Colchester (Yarrell, Jenyns). Said to be common around Colchester in houses and buildings in summer; in cellars and caverns under the Castle in winter; sometimes in wells clinging to the brickwork (Laver, 'Trans. Essex Field Club,' vol. ii. p. 160).
- MIDDLESEX.—Hampstead (Bond), The Hale, Edgware, and Stanmore (Harting). In London (J. E. Gray, Zool. Journ. 1825, p. 108). Some years ago we received one which had flown into a house in Thayer Street, Manchester Square; others procured in the neighbourhood of London are preserved in the British Museum.
- BERKS.—Godstowe (*vide* Kelsall, more information wanted).
- OXFORD.—Charlton-on-Otmoor, "not uncommon" (O. V. Aplin), Begbroke Church (Kelsall).
- CAMBRIDGE.—Swaffham Prior (Jenyns, Man. Brit. Vert. An.).
- NORTHAMPTON.—Lilford Hall, Oundle; Achurch, Pilton Church (Lord Lilford, Zool. 1887, p. 64).
- SUFFOLK.—Elveden, near Thetford (Newton, Zool. 1853, p. 3804), Blaxhall (Rope).
- NORFOLK.—Norwich (Bell), Framingham Pigot, near Norwich Stevenson, Zool. 1871, p. 2752; Southwell, Trans. Norf. and Norw. Nat. Soc., vol. i. p. 73, and vol. iii. p. 667). "By no means rare in Norfolk, frequenting houses and outbuildings" (*l. c.*). Near Sparham (Norgate).
- LEICESTER.—Gumley (Matthews, Zool. 1885, p. 216).
- WARWICK.—Arrow, near Alcester (Tomes; *vide* Bell, *op. cit.*).
- WORCESTER.—Dripshill, Upton-on-Severn (Jenkinson, Zool. 1857, pp. 5590, 5664).

STAFFORD. — Near Burton (Garner, 'Nat. Hist. Staffordshire,' p. 244).

SHROPSHIRE. — At Eyton, once (Eyton, Ann. Nat. Hist. 1840, p. 396).

MERIONETHSHIRE. — Harlech Castle, July 1835 (Thompson, P. Z. S. 1837, p. 52; Nat. Hist. Ireland, vol. iv. p. 2; and Kelsall, Zool. 1887, p. 346).

LINCOLNSHIRE. — Rare, once near Grainsby, in July, 1876 (Caton-Haigh, Zool. 1887, p. 143).

YORKSHIRE. — Oakwell Wood, Birstal (Denny, Ann. Mag. Nat. Hist. 1840, p. 385; Clarke and Roebuck, Handb. York. Vert., p. 4). Harefield Wood, near Pateley Bridge (Zool. 1884, p. 173).

DURHAM. — On a tree in Hoffal Wood (Meynell and Perkins, Cat. Mamm. Northumb. and Durham, p. 163),

So far as we are aware Natterer's Bat has not been met with in the three northernmost counties of England, namely, Northumberland, Cumberland, and Westmoreland; and evidence of its occurrence is wanting for the following counties, namely, Lancashire, Cheshire, Derby, Nottingham, Bedford, Huntingdon, Rutland, Herts, Bucks, Surrey, Hereford, Gloucester, Somerset, and Wilts; though it is very likely we may have overlooked records for some of these counties.

As regards Scotland this Bat is said to have been found near Edinburgh (*cf.* 'Proc. Glasgow Nat. Hist. Soc.,' vol. iv.); and a specimen procured at Inverary, Argyllshire, was presented to the British Museum by his Grace the Duke of Argyll.

In Ireland it is reported to have been obtained near Enniskerry, Co. Wicklow (Mangan, 'Report Nat. Hist. Soc. Dublin,' 1844, p. 18), and near Dublin (McCoy, Ann. and Mag. Nat. Hist., vol. xv., first series, 1845, p. 270; Leith Adams, Proc. Roy. Dublin Soc., 1878; and Barrington, 'Guide to Co. Dublin, its Geology, Fauna, &c.,' 1878, p. 90). In the summer of 1853 nine full-grown specimens were taken by Dr. Kinahan and Mr. F. Haughton, from a hole in Tankardstown Bridge, which crosses the River Barrow near Levitstown, on the borders of Kildare* and Queen's County (Zool. 1853, pp. 4012, 4013).

* As regards Kildare see 'Dublin, Nat. Hist. Review,' vol. vi., 1859.

In April, 1883, Mr. J. F. Darling captured a specimen of this Bat in the woods of Castlefreke, Co. Cork, the seat of Lord Carbury (Zool. 1883, p. 294). When first observed it was flying about in the sunshine, at 2 o'clock in the afternoon, and being observed to catch some prey, with which it alighted on a tree trunk, it was seen to be munching the body of a large moth, which it pushed into its mouth with its thumbs.

Finally, there is a specimen of Natterer's Bat in the British Museum (Natural History) which was procured in the Co. Longford, and presented by Mr. G. E. Dobson, the author of the excellent 'Catalogue of *Chiroptera* in the British Museum.' As the dimensions and dentition of this Bat may be found described in this Catalogue, as well as in Bell's work above quoted, it seems unnecessary here to repeat the description. Attention, however, may be particularly directed to the large size of the ear (about as long as the head), and to the long, narrow, lanceolate tragus, which is about two-thirds the length of the auricle.

Possibly some of our readers may be able to name localities for this Bat in some of the counties above mentioned, respecting which at the present time we are without information.

THE PRODUCTION OF COLOUR IN BIRDS' EGGS.

BY ARTHUR H. MACPHERSON, B.A.

THE last number of 'The Zoologist' contains a very interesting paper by Mr. A. H. S. Lucas, suggesting that the influence of the surroundings on the parent bird during the formation of the shell affects the colour of the egg.

This "mental receptivity" is considered as a cause of variation, and the hypothesis ingeniously applied to many cases. But it seems to me that many difficulties arise. In the case of birds whose eggs vary very much, it is nearly as hard to explain the variations by the hypothesis of Mr. Lucas as by "protective" or "sexual selection."

Take the stock instance of the Guillemot. We have here infinite variations in the colour and markings of the eggs. It is supposed that the same bird lays similar eggs each year; but it is, apparently, not known for certain whether the faculty of laying an egg of a given colour is hereditary, nor to what extent (if any)

the eggs of (say) a blue-egged Guillemot are affected by mating with one that comes of (say) a brown-egged family.

At any rate Mr. Lucas says (p. 209), "Individuals at the present day are influenced in part by the surroundings, but mainly restricted by the tribal habits of generations." So the hypothesis in question assumes that the faculty of laying eggs of a given colour is hereditary, but capable of being varied to a certain extent in each case by the action of external objects on the brain of the parent bird. How are we to reconcile the extraordinary variety of colour in the eggs of this bird with the assumption that the colour is inherited by the race through many generations? Guillemots breed in large colonies. Surely in the course of generations, if the coloration of the eggs were determined mainly by a principle of heredity, the eggs in any given colony would gradually assume a more or less definite type, as in the case of other birds living together and interbreeding. It is evident that no one of the many varieties referred to is sufficiently superior to the others to have been "seized on" by Nature and transmitted by the principle of heredity.

"Mental receptivity," as stated, may explain slight variations in eggs; but if applied to more marked variations, we must in these cases conclude that the effect of the surroundings on the individual bird is sufficiently strong to counteract any variations which Nature might have intended it to transmit; in other words, a bird whose eggs at the present day are found to vary considerably is influenced not merely in part, but mainly, by its surroundings.

We are to suppose that hen Guillemot No. 1, about twelve hours before laying each egg, is so much influenced by the colour of the sea that she lays a greenish or bluish egg; No. 2 is so affected by the appearance of sea-weed that her egg is covered with brown, green, or black markings, resembling sea-weed; and so on. And here again many questions naturally arise. For instance, what effect has the colour of the first egg laid, or rather the causes which produced that colour, on eggs subsequently laid? If none, how are we to support the assumption that each bird always lays similar eggs? Is her nature such that she is always impressed by the same objects?

When we come to birds which lay bright blue eggs, as the Hedgesparrow, it is impossible to believe that the colour is

caused solely by a continuous contemplation of the blue vault of heaven.

In the case of the Cuckoo, it seems to me that matters are not much clearer than they were before. No suggestion with regard to the colour of the eggs of this bird has yet been made which is not full of difficulties.

Dr. Romanes has remarked:—"We cannot imagine the Cuckoo to be able consciously to colour her egg during its formation in order to imitate the eggs among which she is about to lay it; nor can we suppose that, having laid an egg and observed its colouring, she then carries it to the nest of the bird whose eggs it most resembles." Still the latter supposition is perhaps easier to believe than most of the suggestions, especially when we consider how very little is known as to birds and colour.* Any experiments in this direction would be sure to lead to interesting results, for birds are æsthetically much more highly developed than mammals.

Then there is Prof. Newton's suggestion ('Animal Intelligence,' p. 307), that "there is very reasonable probability of each Cuckoo most commonly placing her eggs in the nest of the same bird, and of this habit being transmitted to her offspring."

This view seems to require—

- (1) A Cuckoo to have a favourite bird in whose nest to lay her eggs;
- (2) An egg resembling the egg of that bird; and
- (3) Both these characteristics to be hereditary.

And, apart from the criticisms put forward by Dr. Romanes on this hypothesis ('Animal Intelligence,' p. 308), would not this state of affairs, if true, result in considerably greater variations than are usually found among Cuckoos? Except one well recognized variety of the young bird, Cuckoos seem to vary very little. Would not several generations of Cuckoos all brought up by (say) Hedgesparrows, and fed to a great extent on Hedgesparrows' food, result in a well-marked variety, even though the difference between the food of a Hedgesparrow and (say) a Shrike were not sufficient to cause a strong difference to show itself

* 'Animal Intelligence,' p. 307. This suggestion was made by Mr. Harting in an article on the Cuckoo published in 'Science Gossip' for May, 1870, and subsequently reprinted in 'Sketches of Bird Life,' 1883.

immediately? We know that a Bullfinch fed on hemp-seed and a Canary on Cayenne pepper become black and orange respectively. Mr. Wallace, too, has given (I think in 'Tropical Nature') a remarkable instance of change of colour, caused by food, in a Brazilian parrot.* Not much is known on the subject, still I cannot help thinking that in this case of the Cuckoo we should soon have well-marked varieties; unless we are to believe that the impossibility of always finding the desired nest, and the mating with birds brought up by a different species, would counteract this tendency.

Nor do I think that Mr. Lucas helps us much. According to his view the Cuckoo determines beforehand what nest to lay its egg in, looks at the eggs therein contained, and has such a vivid impression of their appearance during the period of formation of the shell, that the egg which she eventually lays resembles those in the nest.

The Cuckoo has so often been discovered carrying its egg in its bill, apparently searching for a nest in which to deposit it, that evidence would first be required to show that the bird had previously examined the eggs of the nest in which she intended to lay her own.

Prof. Newton, in Yarrell's 'British Birds' (ed. 4., vol. ii., p. 403), says that the supposition that the colour of the egg can "in any mysterious way be affected by the action of external objects on her perceptive faculties," is "wholly unreasonable." And certainly Mr. Lucas's view does seem to be somewhat far-fetched.

If we take the latest List of British Birds, and look through it from the Missel Thrush onwards, besides the two obvious generalisations with regard to the eggs and nests (*viz.*, that birds which build in holes are brightly coloured, and that eggs laid in holes are colourless), it is remarkable that the brightly coloured eggs are laid by birds at the top of the list; the plain coloured eggs by those at the end of the list. The brightness of the colour of the egg may be roughly taken to indicate the development of the æsthetic faculties of the bird, as shown by singing and the nest-building instinct.

* This statement as to *Chrysotis festiva* is said to need corroboration. *Vide* Semper's 'Animal Life,' p. 67.

Are we to explain this by saying that the lower forms of birds, appreciating only the simple colours of such things as bare ground and sea, lay eggs whose colour is the result of the effect of these things on the parent's brain ; while the higher forms, capable of being impressed with more brilliant and complicated surroundings, on account of their higher æsthetic faculties, therefore lay eggs more beautifully coloured and marked ? And if so, is it all unconscious ? It is almost impossible to ascribe the proceedings of the Cuckoo, as suggested by Mr. Lucas, to a course of purely unconscious actions. But if there is consciousness about it, we must ascribe the varieties in the eggs of such birds as the Guillemot to the variety of objects which attract the attention of different Guillemots.

Is one egg streaked because the bird which laid it was more influenced by the contemplation of a piece of dry sea-weed than by any other neighbouring object ? Once admit an element of consciousness, and there is no knowing where to stop. But without following the hypothesis of Mr. Lucas to its results, let us look at the root of the whole matter.

Do external objects around the hen bird really affect the colour of her eggs ?

Let us apply the theory, as Mr. Lucas asks us, to " birds which breed easily in confinement."

The Common Rock Dove is a natural instance. What can be more different than the surroundings of these three—*Columba livia* nesting in a cave in a rocky cliff by the sea ; a semi-wild Pigeon nesting on a pillar of St. Paul's ; and a pair of Fantails in an open wicker cage in a ladies' drawing room ? Yet their eggs are all alike—quite white.

Take the Canary. It is stated in ' The Gentleman's Recreation,' published in 1677, that Canaries were at that time regularly imported from Germany. If so, surely the egg in the course of over two hundred years might be expected to have altered in appearance considerably. Ought it not to be brown, from the colour of the interior of its cage ? or reddish, from the sand in its tray ? But such is not the case.

I would not, then, go so far as to say that external objects have no influence upon the colouring of the eggs laid by a bird, for, undoubtedly, mental and nervous conditions frequently produce chemical bodily changes ; but at present there

seems very little on which to base such assertion. And if the influence exist at all, it can, at the most, only form one of many causes which combine to produce variations such as those which Mr. Lucas has tried to explain.

SEALS AND SEALERS.

BY THOMAS SOUTHWELL, F.Z.S.

It is very difficult, when writing for a purpose, to avoid extremes, and, when it happens that the purpose which inspires the pen is one of kindly feeling for a class of animals so harmless and beautiful as the Seals, it is hardly a matter of surprise that a tender-hearted lady should express somewhat strongly the pity she feels so acutely. Every lover of Nature can but sympathise with and admire the sentiments which have prompted Lady Blake to denounce what she so feelingly deploras; but when, in her recent article in the 'Nineteenth Century,' she stigmatises as "savages" a class of men employed in an arduous and dangerous, but legitimate industry, such as that followed by the St. John's Seal-hunters, she certainly does these bread-winners an injustice. By her own showing the employment is one of extreme peril and privation, from ice, storm, frost, and exposure, and if the remuneration last season, in the case of the most successful voyage ever known, that of the 'Neptune,' did not exceed £13 15s. per man, poor indeed must be the general return for so great an expenditure of energy and endurance.

As well might Lady Blake stigmatise as savages the large number of respectable men who gain their daily bread by the occupation of slaughtermen as the poor sealers of St. John's, who, however revolting their calling may be, are equally inoffensive members of the community, and—not to justify one cruelty by another—the misery inflicted in the daily slaughter of calves and pigs must far exceed that inflicted every season on the Newfoundland ice-fields. The writer does not know personally a single St. John's sealer, but he does know several who attend the Greenland sealing, and he would be sorry to regard men as "savages" who have, on their own petition, obtained enactments which have rendered impossible, in the present day, what were undoubtedly the most cruel features in the Greenland sealing as formerly prosecuted.

One of these "savages," well known to your readers as a contributor to this Journal, was recently decorated by Her Majesty with the Albert medal for distinguished bravery in saving life in the Greenland Seas.

In the main Lady Blake's account of the *modus operandi* of the St. John's sealing is unquestionably correct, and on her article being read over to an old Newfoundland sealer there was very little to which he took exception; but although admitting that such practices as Lady Blake describes as general, were certainly possible, he maintains that they were very exceptional.

Those who attended the International Fisheries Exhibition of 1883 will remember the series of models and drawings of the departure of the sealers from St. John's, their meeting with the Seals, killing, flenching (or "skulping" as it is called by the sealers), and the hauling the skins to the ship: these were stated, by those conversant with all the operations, to convey an excellent idea of what really takes place when the vessel has got among the Seals; and how, under these circumstances, such scenes as are depicted by Prof. Jukes could occur, it is impossible to imagine, for it is as certain that no captain would encumber the decks of his vessel with three hundred dead and dying Seals as that the men would never incur the labour of dragging them to the ship: Prof. Jukes describes what he saw, and therefore it must have happened, but it is difficult to account for. The first thing after killing all the Seals within his reach, which the hunter does, is to divest them of their skins and blubber; this is easily effected whilst the carcass is warm, but should it become frozen it is a matter of some difficulty: these skins, with the blubber attached, are dragged, perhaps many miles over the ice, to the vessel, and it may readily be imagined the men do not burden themselves with an ounce more than is absolutely necessary. Lady Blake refers to this mode of bringing in the "tows" at p. 520. It is certain therefore that the state of things described by Prof. Jukes does not apply to the present day; and let us trust that in this respect, if in no other, more humanity is displayed by the sealers.

At p. 514 Lady Blake says that not more than six or seven steamers leave St. John's, and that the largest steamers belong to Dundee. As a matter of fact, there were nineteen British steamers at the St. John's sealing last season; four owned from

Dundee, three Greenock, six Liverpool, and six Newfoundland; the two largest, the 'Esquimaux' (466 tons) and the 'Neptune' (465 tons) belonging to Dundee and Liverpool respectively, and, as no vessel arrived in port earlier than the 8th of April, no second voyage was possible. The total number of Seals taken by these nineteen vessels, including the great catch of 42,242 by the 'Neptune,' was 210,810, a number far short of 500,000.

There are no "floe" on the Newfoundland coast, the ice being broken up by the swell into "pack ice" long before it reaches the coast, and it is on portions of this ice known as "pans" that the young Seals are produced, the old Seal visiting the water not through a hole bitten or scratched through the ice (p. 516),—an impossibility,—but by open spaces between the different pieces forming the pack. The statement that the Harp Seals yield more oil than the "Hoods" is not borne out by actual results. These are small matters apparently; but if Lady Blake has been misinformed in small matters, we may assume that some of her other information is equally inaccurate.

It is unhappily a fact, as Lady Blake states, that "trading interests" in the present day, whether in "smashed birds" for ladies' hats or in Seal skins, override all other considerations, and in the struggle for existence (only those engaged in it know how severe it is) it must be so; the Seal-fisheries are an established fact, and the Seal-hunter—however much we may regret his mode of earning his bread—will always remain a Seal-hunter so long as there are Seals to hunt, and his occupation can no more be suppressed than that of the slaughterer of oxen, sheep, and swine. The whole animal world is a complex system of cruelties, in which one form preys upon another as its only means of existence, and man, as the strongest, subjects all creation to his necessities or pleasures. Education may in time ameliorate the sufferings of the lower animals at our hands, and has doubtless done much in that direction already. The whole question resolves itself to this—Are the Seals to be killed at all? If so, as a matter of absolute necessity, their fate must be a cruel one, and let us by all legitimate means try to alleviate it as much as possible; but I fear this is not to be accomplished by any system of "putting down," or applying terms of opprobrium to those who are striving to provide for their families as honestly as they can.

ON THE FORMER NESTING IN ENGLAND OF THE
OSPREY, *PANDION HALIAETUS*.

BY THE REV. H. A. MACPHERSON, M.A.

DID the Osprey breed in England in the olden days? Prof. Newton and Mr. Seebohm both give the suggestion a decided negative (*cf.* Yarrell, ed. 4, vol. i., p. 33; Seebohm, B. B., vol. i., p. 57). But I think that, when all the evidence to be adduced is laid before them, they may admit that the Osprey used to nest in the neighbourhood of the English Lakes. The witnesses that I can cite are few, and their statements short; their evidence therefore may be given in full.

Francis Willughby comes first. He says distinctly that the Osprey breeds in Westmoreland. "There is an aery of them in Whinfield Park, Westmoreland, preserved carefully by the Countess of Pembroke" ('Ornithology,' p. 21). This refers to 1676, or a little earlier; but so excellent was the care taken of the birds that, in 1787, Clarke, in his 'Survey of the Lakes,' again recorded the existence of these birds in the old locality. "The Osprey I have seen," says he: "there was a nest, a few years ago, of this bird in Whinfield Park: they seem to be of the Hawk kind, and are about the size and colour of a Magpye; in what manner fish are charmed by them let others tell, for I cannot: I saw one fly into the rock at the Giant's Cave, and on its crossing the river there, the fish sprang to the top and remained six or eight seconds as if intoxicated" ('Survey of the Lakes,' p. 190). Clarke's other notes prove that he was a good sportsman and a keen observer; in all likelihood he had never seen Willughby's statement.

This is, briefly, the case for one eyrie. Two independent witnesses call the birds "Ospreys," and the first states that the birds were thought rare enough to need protection, which explains the preservation of the race.*

* Mr. A. G. More stated, in his essay on 'Distribution of Breeding Birds,' that Willughby mentioned a nest of *H. albicilla* in Whinfield Park, but does not seem to have enquired whether that estate included any precipices on which that Eagle could nidificate. As a matter of fact it does *not*, having been originally a wild heath; in Clarke's time it was reclaimed, divided into farms, "the rabbits destroyed, and the deer circumscribed in narrower bounds; by which means the red-deer are much diminished in number" ('Survey of the Lakes,' p. 5). Doubtless the Ospreys of Whinfield Park

My two next witnesses allege, as I understand them, that a pair of Ospreys bred in the Ullswater district under their own observation. The Rev. Wm. Richardson, a good naturalist and accurate withal, in 1793 drew up a sketch of the Zoology of the Ullswater District, for insertion in Hutchinson's 'History of Cumberland.' In this he quotes Berkenhout's description of the *Falco haliæetus*, Osprey, or Fishing Eagle. He adds, "The Osprey, or Fishing Eagle, is frequently seen fishing; he is very bold, and in pursuit of his prey will dart down within forty yards of a man." He then notices the Whinfield Park birds mentioned by Willughby, and shows that he did not understand that author, who speaks of it as "the *Ossifragus*, or Sea Eagle." But if he had been a little more careful, he would have seen that Willughby anglicised the name as the "Osprey," though no doubt wrong in his synonyms; Dr. Heysham erred in like manner. Heysham, then the most accomplished naturalist in the north of England, included in his Catalogue of Cumberland animals the Sea Eagle, *Falco ossifragus*. This he distinguished from both the Golden and White-tailed Eagles; I have no doubt that the Osprey was the bird he meant to indicate.

Richardson has already told us that the Osprey regularly fishes Ullswater. Dr. Heysham says, "I am not certain whether the Sea Eagle breeds at present in Cumberland or not, but a few years ago there used to be an annual nest in the rocks which surround the lake of Ullswater, and the great Trout of that lake has been taken out of its nest, upwards of ten pounds weight; it however frequently visits this country." This statement supports Richardson. But could this "Sea Eagle" be anything else but the Osprey? It was not the Golden Eagle, for that species is not piscivorous; besides, Dr. Heysham expressly distinguishes it from the Golden Eagle. But was the "Sea Eagle" identical with the White-tailed? This is negatived by the details that he furnishes of the latter species. I do not deny that Golden and White-tailed Eagles then existed in our lake area; I am certain

nested in Scotch firs, as they still do in Sweden. Another fact *inconsistent* with Willughby's birds being White-tailed Eagles is that the Countess "preserved" them. Most assuredly no one in the Lake District would preserve *Eagles* at a time when the parish authorities paid head-money for them as destructive vermin.

they did. But I claim that the Osprey was their neighbour. Dr. Heysham distinguishes between the food of the "Sea Eagle" and that of the White-tailed Eagle. Of the former, he says that "its food is principally fish." Of the latter, he says that though it sometimes feeds on fish, yet "it feeds chiefly on land animals," thinking no doubt of young lambs and carrion, which in Scotland constitute the chief food of this Eagle. I hope that the passages cited may clear up the confusion that has existed between the Osprey and the White-tailed Eagle, among our lake hills.

Before I take leave of the subject, allow me to cite one more witness to the former presence of the Osprey in the north of England.

The late Mrs. Howard, of Corby Castle on Eden, about 1831, published privately two volumes of personal Reminiscences. Writing of the banks of Eden (vol. i., p. 97), she says,— "We will descend the Sandwalk to the right of the Tempietto, where observe, among others, the Osprey Eagle tree,—an old oak so called from having been the resort of these voracious birds, which feast on Salmon." This suggests that a third eyrie may possibly have existed long ago in the north of Cumberland. During the last half century a good many Ospreys have doubtless visited our faunal area; but though my records date from 1837, and refer to all parts of our district from the Solway to Furness, the list of Ospreys that have been shot locally is a small one as compared with other parts of England.

NOTES AND QUERIES.

MAMMALIA.

The Noctule and Serotine Bats in Kent. — *Vesperugo noctula* is particularly abundant here; one day in May I counted sixty-eight emerge from a small opening at the upper gable of my house. On May 17th I counted fifty-seven from the same place, and during last week they came out at 8 o'clock in the evening exactly. On the 19th I waited for them from half-past 7, and they came out as usual at 8; I shot three of them as they flew away, and they were all females. This evening, being cloudy and raining, they came out exactly at the same time. They emerge from their dormitory in rapid succession, and in about five minutes they are all

out; they fly very rapidly, and go away across the marshes that are opposite my house for some considerable distance. The other evening, immediately after their flight, I walked nearly a mile into the marshes to see if I could meet with them, but they were either too high to be observed or had flown further away. As we have been favoured with bright sunshine and fine evenings, it might appear that their distant flight was in consequence, but they have flown away exactly the same the last two evenings that have been dull and wet. I have observed them at the same time of the year on previous years, and have noticed them as late as September. A few years ago (April, 1884) my son cut off the dead branch of an old walnut tree, in the hollow of which we found eight Bats of this species that were all males: it would be very curious if the males hibernate in one place and the females in another. [On this point see Zool. 1874, p. 4194, ED.] These Bats are remarkably uniform in size and appearance; the three I shot the other evening measured each exactly fourteen inches in expanse of wings. I have noticed also, in my neighbourhood, the Serotine Bat, which rather exceeds in size the former species; and the Pipistrelle, which is the common small Bat of the neighbourhood,—one of the first to appear in the evening all through the summer months, and even in mild weather in winter. The other Bat often met with is the Long-eared Bat, which is very particular in its choice of evenings for flight, or else comes out later; it is found in less abundance here than the Pipistrelle, but I have met with it in the wooded parts of Kent in old houses, in such abundance that you might hive a hatful of them as they hung down clustered together from the rafters of the house. I have heard of the Greater Horse-shoe Bat in East Kent, but have not myself met with it.—GEORGE DOWKER; Stourmouth House, Wingham, Kent. [It has been procured at Dartmouth and in Canterbury Cathedral.—ED.]

BIRDS.

Peculiarity in the Bill of the Norfolk Plover.—In 'The Field' of Dec. 4th, 1880, and in his 'Rough Notes on British Birds,' Mr. E. T. Booth has pointed out that the male Norfolk Plover, *Ædicnemus crepitans*, when adult, has for a short time in the spring two small knobs at the base of the upper mandible. In May, 1872, he met with two birds thus adorned on the Sussex downs. One of them is stuffed in his collection at Brighton, and a figure of the head is given in 'The Field' (*l. c.*) and in 'Rough Notes.' No other naturalist seems to have observed this feature in the Norfolk Plover, though what may be called an item of evidence is mentioned in 'The Zoologist' for 1882 (p. 295), which, so far as it goes, is favourable to Mr. Booth's theory. The Norfolk Plover being in the Schedule of protected birds, it has been almost impossible (and very rightly so) to obtain examples, but two having been killed by hawks during the first days of

May the desired opportunity was afforded for examination. Both birds were males, by dissection, and neither of them had any trace of the knobs on the bill, the surface of the upper mandible being quite level along its ridge. On April 25th I examined a live Norfolk Plover, which was supposed to be a male, and it also had no knobs on the bill, but this is not conclusive, for the sex was not definitely ascertained. On the other hand, a knob—as large as in the plate referred to—was distinctly visible in a male which was unfortunately shot near Holt, in Norfolk, on or about the 20th of May last, and was discernible seven days after the bird was stuffed. I was told by Mr. Dack, who mounted it, that when fresh the knob was rounded, but that in a week's time it had become shrivelled, though still quite apparent. This bird, however, had only one knob on the bill, not two as in Mr. Booth's figure, though in the same position, *viz.*, on the ridge of the upper mandible and almost at its base.—J. H. GURNEY, JUN. (Keswick, Norwich).

Hybrid Waterfowl.—In the Newcastle Museum there may be seen the skeleton of a hybrid Swan bred between a female Whooper, *Cygnus ferus*, and a male Mute Swan, *C. olor*. In this hybrid, which was reared on Gosforth Lake, in Northumberland, the trachea does not enter the sternum, which nevertheless is slightly hollowed as if to receive it. A year or two ago I was shown in London a supposed hybrid between a Black Swan and a Mute Swan, and a similar hybrid was once reared in County Cork (Proc. Zool. Soc. 1847, p. 97). A hybrid between a Wild Swan and a Goose has been described (Ann. Mag. Nat. Hist. xii. p. 119), but it is doubtful if it was such. My father has a hybrid between an Egyptian Goose and a domestic Duck of the Penguin breed. No birds are more liable to hybridism than Ducks, especially in confinement, and no two kinds interbreed more readily than the Pintail (*Anas acuta*) and Mallard (*A. boschas*). I have had two examples of this cross, and many years ago I believe my father had several of them alive, though unfortunately none of them are now in existence. A rare cross is that between Wild Duck and Sheldrake: of this cross a duck and drake, as we are informed in Hele's 'Notes about Aldeburgh,' were killed near that place in January, 1864, and it was suggested by a writer in 'The Field,' that as this cross had been successfully bred at Saxmundham, the pair may have escaped from there. The only other instances known to me are a drake obtained at Cambridge by Mr. Whitaker, and given by him to Mr. William Borrer, and a brood which, according to Messrs. Harvie-Brown and Buckley ('Fauna of the Outer Hebrides,' p. 102), were bred in North Uist.—J. H. GURNEY, JUN. (Keswick, Norwich).

Habits of the Cuckoo.—A pair of Cuckoos have this year chosen a position for their spring operations in my garden well suited for observation. The nest is a Hedgesparrow's, in a bush near a pigsty. There

were two eggs in it when my gardener saw both the Cuckoos invade it. The female turned out one of the eggs, and laid her own in the nest, the male bird sitting in an apple tree close above. The egg was of a deep reddish hue, and therefore not resembling those of its foster parents. The Sparrow afterwards laid two more eggs, and her three nestlings were hatched at the same time as the Cuckoo. Two days afterwards my gardener, who was occupied in the pigsty, heard "a very curious noise," and from his place of concealment saw both the Cuckoos near the nest. The male bird went to the nest, took out the young Sparrows one by one in his beak, flew to a rail close by, and dropped them alive on the ground. When the destroyers of domestic peace had departed, my gardener replaced two of the Sparrows; but the Cuckoos returned almost immediately, and the young ones were again ejected by the same process. Both old Cuckoos continued to show an interest in their progeny for some time, coming early every morning and two or three times each day, and at first actually fed it. Recently, however, their visits have been less frequent. The young bird is now fledged, and more than fills the nest. It is assiduously tended by the Sparrows, who feed it from a twig close above the nest,—and is as savage as a Hawk. Its only beauty, when in its callow state, was the deep orange of the inside of its huge gaping mouth, which will be more than large enough to hold an egg of the size of two from which it sprung, should it in after years wish to entrust its offspring to the care of a Wren. The dark grey (almost black) pencillings on its rich brown feathers make it now a handsome bird. My gardener has been a bird-fancier all his life, and has a practical knowledge of bird-lore which many might envy. He has seen many Cuckoo's eggs, but all of them of a reddish hue; has known them laid in Robin's nests, where they would be less distinguishable from the foster-parent's egg than from a Hedge Sparrow's, but has never seen one like the latter. As I know that there are many theories as to the proceedings of the Cuckoo, some of them based upon insufficient evidence owing to the rare opportunities of actually seeing what occurs, I venture, at the suggestion of our friend the Rev. A. C. Smith, to send you this statement.—HENRY A. OLIVER (Westgreen House, Winchfield).

Nesting of the Little Grebe.—With regard to the note on the early nesting of the Little Grebe (p. 231) I find, on referring to the 'Proceedings of the Marlborough College Natural History Society,' that eggs of this species have been frequently taken in that neighbourhood during the first few days of April, and in 1882 were found as early as March 16th. In 1883 I found a nest of this bird on the Kennet, near Marlborough, containing eggs during the first week in April, and remember seeing the same nest, in the middle of the following term (in June, I think), with another clutch of eggs,—evidently a second brood.—ARTHUR H. MACPHERSON.

Starlings in the City.—A pair of Starlings, which have lately been seen in the neighbourhood of Christ Church, Spitalfields (situated close to, though really outside, the City boundary), have this year bred in the steeple. I have to-day (May 27th) seen their nest, containing two half-fledged young birds, on a narrow ledge protected by a weather-board, just above the clock. On the same ledge, which is not more than two yards long, there were also three Pigeons' nests,—two containing eggs, and one a young bird.—J. H. KEEN (Church House, Spitalfields).

Ornithological Notes from Mayo and Sligo.—Although the Sandwich Terns appeared earlier than usual,—on March 19th,—the cold and wet stormy weather drove them out of the estuary, and until the 24th I did not see them again, when a pair returned to fish in the channels; but the main flock did not make its appearance until some days later. The very stormy and unusually wet weather of this spring had a remarkable effect on our smaller summer visitors, both in retarding their return to their summer haunts and in lessening the numbers that usually visit this locality. Rain or hail fell on eighteen days during the month of March, and on nineteen days in April, while the thermometer seldom rose beyond 50° or 53° in the latter month; and up to the 23rd of May rain has fallen on eighteen days also. I did not hear a Willow Wren until April 29th, and, strange to say, it is the only bird of this species singing in our woods, though in former seasons several could be heard singing all about the place; and another singular fact worth mentioning is, that not a Chiffchaff has visited us this season: we had only one bird last season, though in previous years several used to frequent our woods and plantations of about fifty acres in extent. I saw a Swallow on May 1st, and heard a Whimbrel, *Numenius phæopus*, on the same day. The Corn Crake was heard on the 9th, and the Spotted Flycatcher on the 10th, but not a Whitethroat was heard until the 22nd. The Cuckoo was also late, but being from home I was unable to record the date when first heard. I heard the Common Sandpiper, *Totanus hypoleucus*, on the Bunree River, near Ballina, on the 13th, and saw a pair at the same place on the 20th; and saw Swifts for the first time on May 11th. On April 5th, in order to observe what birds were about the estuary, I went down to Bartragh and the Moyne Channel in my punt, seeing four Wigeon and a Great Northern Diver (in winter plumage) near the island of Baunross; and on the Moyne Sands a flock of twenty-four Sheldrakes and about two hundred Godwits, *Limosa lapponica* (none of them showing any trace of the red summer plumage), a few small lots of eight or ten Curlews, three Grey Plovers, and a few Knots and Turnstones. In the Channel and in Killala Pool I saw five Great Northern Divers; and lying on the point of land running out into the Channel, nearly opposite the old abbey, a herd of fourteen or fifteen large Seals, all of which shuffled into the water before I could get within

150 yards of them, though afterwards many showed their heads above water when watching the punt, even approaching within 50 or 60 yards before their curiosity was satisfied. The great flock of Godwits let me get so close that I knocked over a few with an ordinary shoulder gun, and never saw birds in finer condition, one of those killed weighing fourteen ounces and measuring seventeen inches in length. On April 10th, resting on a sand-bank close to the shore here, I observed twelve Wigeon and a large number of Bar-tailed Godwits; and again, a month later, on May 10th, I saw fifty or sixty of these birds, with a few Knots and Whimbrels, resting on a point of the shore outside one of my fields here.—ROBERT WARREN (Moyview, Ballina).

Crossbill Breeding in Immature Plumage.—I read with surprise the remarks of your correspondent, Rev. H. A. Macpherson, in the last number of 'The Zoologist' (p. 229), on the Common Crossbill breeding in immature plumage. Surely it ought, now, to be well known to ornithologists that the "yellow dress" of the Crossbill is the mature plumage of the adult male. In the first, immature, plumage the young Crossbills, male and female, are spotted. At the first moult, as is proved by a specimen in the Hancock collection in the Newcastle Museum, the young male takes the red dress, after which, in all succeeding moults, it acquires in the males a greenish yellow or orange-yellow dress. The male bird, therefore, observed at the nest by Mr. Ussher was in a very mature plumage, and certainly not in immature dress. The large collection of stuffed birds and skins of this species in the Newcastle Museum confirm the opinion of all those authors—as Temminck, Selby, J. Hancock, and others—who contend, and have stated, that the Crossbill acquires and wears the red dress at the first moult only, and at all after moults the male plumage assimilates to the colour of the female, but is more yellow and brilliant. Linnæus said of his *Loxia enucleator*, "Junior ruber; senior flavus," and this assumption of the red plumage by the young males before acquiring the yellow dress is probably true of all the species allied to the Common Crossbill.—RICHARD HOWSE (Curator of Newcastle-upon-Tyne Museum).

Nesting of the Ringed Plover.—In 'The Zoologist' for 1886 (p. 418) I noticed what I deemed at that time to be an abnormal instance of nesting on the part of our common Ringed Plover, *Charadrius hiaticula*. Having passed a portion of this spring at Wells, Norfolk, I have had frequent opportunities of following up this subject. The main body of the "Stone-runners," as they are locally called, settle down to nesting early in April, and resort in numbers to the long ridges of shingles and gravels near the sea, where, after scratching several holes, they finally select the one in which the eggs are deposited. Many of these nesting-sites, being

below the reach of the highest tides, are sadly pillaged by the men and boys who travel along the beach, and very few of the clutches laid on the shingles below high-water mark are hatched off. Later in the spring, apparently taught by experience, many pairs of Ringed Plovers move inland to the marshes. These marshes, intersected by innumerable tidal creeks, extend over an area of many thousand acres, along the North Norfolk shore: they are composed of deep beds of homogeneous stiff clays, devoid of stones, and containing few fossils, what there are being shells of Mollusca now living in the adjoining seas. The surface of these alluvial mud-beds supports a vegetation composed largely of *Statice limonium* and *Atriplex littoralis* (locally called Crab-grass): in the months of July and August these marshes present a very pleasing appearance, for then the *Statices* are in full bloom, and their blossoms spread—for miles and miles—a shade of delicate lilac over the long low shore. In favoured localities amid these marshes, various species of birds find suitable breeding-places. Redshawks hide their beautiful eggs in tufts of grass; the Lapwing lays hers in the open; whilst the Common Tern, *Sterna fluviatilis*, and the Ringed Plover likewise nest there in considerable numbers. On the 2nd of June, this year, without any very careful search, we found two Redshank's nests, with the full complement of eggs; a Lapwing's nest, with four eggs; seven Common Terns, each with three eggs; and four nests of Ringed Plover, each containing four eggs, in an area not exceeding two acres in extent. These four nests of the Ringed Plover were placed in circular depressions scraped out of the soil, and in each case the eggs rested on a fairly substantial nest made up of the leaves and stems of *Atriplex littoralis*. Not a quarter of a mile off many Ringed Plovers were nesting on the shingle, and there not a trace of grass or plant was used in the construction of their nests, which were merely depressions scraped in the gravel, and, as usual when the eggs are incubated in such situations, fragments of shells were placed under them. Thus within a short distance we find the same species of bird adopting two very distinct methods of nest-making. On thoroughly dry and pervious shingle ridges the birds deposit their eggs on the surface. When the marsh is selected, the eggs are raised from the cold and damp mud by a substantial nest of dry plant stems. The Common Tern adopts a similar course on the sand-hills and shingle; its eggs are laid in bare depressions, sometimes a stalk or two of marram grass being laid in or about the hole. On the marshes a fairly large nest is built, and in those I have examined the stems and dried last year's blossoms of *Statice limonium* were chiefly used in their construction. I am glad to say that I have not seen a better show of birds breeding on Wells marshes for several years than this season, and this is doubtless owing to the fact that the Lord of the Manor, the Earl of Leicester, has ordered egg-gathering to be discontinued in the

area over which he exercises manorial rights: consequently the tenants now rigidly prohibit the taking of eggs from the marshes on any plea whatsoever. I trust that the senseless and indiscriminate plundering of eggs that formerly took place will now be entirely put a stop to.—H. W. FEILDEN (West House, Wells, Norfolk).

Pellets disgorged by Flycatchers.—While watching a Spotted Flycatcher, which had built a nest on the outside of one of the corridors of this house, I remarked that the bird was looking somewhat uncomfortable. It sat on an iron balustrade, with its feathers ruffled and its neck extended. In a minute or two it rejected from its mouth a pellet about the size of a horse-bean, and then hopped away apparently much relieved. Upon my picking up the pellet I found it to be composed of a mass of beetles' wings and other entomological curiosities, amongst which the wing-case of a brilliant green beetle was very conspicuous. I have not observed, in the ordinary descriptions of the Flycatcher, any note of this peculiar habit. If it is common there could be no difficulty, as in the case of the Owl, of indicating with some precision the nature of its food, and perhaps of clearing the character of this charming and useful little bird from the aspersions with which vulgar report has sometimes assailed its character,—namely, its destruction of bees and cherries. My object in writing this note is to endeavour to draw from the readers of 'The Zoologist' further information on this subject.—E. W. HARCOURT (Nuneham Park, Abingdon).

[We have long been familiar with the fact that Flycatchers—like Hawks and Owls, Shrikes, Rooks, and other birds—reject the indigestible portions of their food in the shape of "pellets," or, as they are termed by falconers, "castings." Those of the Flycatcher, from their small size, are troublesome to find, unless the bird is closely watched, but a careful analysis of their contents would doubtless lead to some interesting results.—ED.]

Blackbird and Thrush laying in same Nest.—On April 20th a Thrush's nest was found by the gardener at Westbrook, Godalming, in which were two Thrush's and three Blackbird's eggs. The hen Thrush was on the nest; this was built in an Acacia tree, and was about ten feet from the ground. I may add that there is no likelihood of its having been tampered with.—HENRY BENSON (Farncombe Rectory, Godalming).

Variety of Eggs of Grey Wagtail.—I fear your editorial remarks about my Grey Wagtail's eggs (p. 231) will cause your readers to be sceptical about them. I omitted to state that I saw the old birds in order that my note should not take up too much space. I am well acquainted with this bird, which breeds regularly in several localities about here. I discovered the nest by seeing both old birds fly to it; it was then empty.

On that day week I visited the nest again, on which the hen bird sat until I nearly touched her, and both cock and hen then flew round me while I was taking the eggs. These are as I described them, all of them very similar; the shells smooth and well formed, and do not show any signs of the bird being in bad health when she laid them. In the last (fourth) edition of Yarrell's 'British Birds' the ordinary yellow variety is the only one mentioned.—E. W. H. BLAGG (Cheadle, Staffordshire).

Sand Grouse in Yorkshire.—Four Sand Grouse were seen in a cornfield on the edge of Manshead Moor, five miles S.E. of Todmorden, about the middle of June, 1888, and all the birds (two males and two females) were shot by a man named Stocks. The place where the birds were killed is about 900 feet above sea-level. The Sand Grouse seen by James Sutcliffe (misspelt Stancliffe in Zool. 1889, p. 2) was on the open moor, 1200 feet above sea-level, the greatest elevation I have seen recorded for Sand Grouse in this country.—ROBT. J. HOWARD (Fern Bank, Blackburn).

[The wanton destruction of two pairs of these birds in the nesting season is really too bad, and it is to be hoped that the "Act for the better protection of the Sand Grouse" will be enforced, and that the shooter may be made to pay the full penalty, £4 and costs.—ED.]

The Sand Grouse in Mecklenburg (Germany).—In the 'Archiv des Vereins der Freunde der Naturgeschichte in Mecklenburg,' 1888, Herr C. Struck, of Waren, has a paper (pp. 175—184), "Ueber Steppen oder Fausthühner (*Syrhaptus paradoxus*) in Mecklenburg," in which, after referring to the earlier appearance of the bird in 1859, 1862, and 1863, he traces its occurrence at several localities in the Duchy of Mecklenburg between the dates 18th April and 6th August, 1888.

***Loxia curvirostra*, var. *rubrifasciata* (Bonap. & Schl.), in Ireland.**—Among other Crossbills sent to me for preservation, obtained at Edenderry, King's Co., in March, was a bird remarkable for two pale reddish bars across the wings. This I forwarded to Prof. Newton, who very kindly sent me the following information, which I quote from his letter:—"I cannot remember having ever seen a Crossbill similar to the one sent; but in the wing-markings it essentially resembles the figure of the male given in pl. 5 of Bonaparte and Schlegel's 'Monographie des Loxiens,' under the name of "*Loxia curvirostra rubrifasciata*," though it does not so well agree with their description, which states that the adult male of this form has the wing-coverts tipped with reddish (*rougeâtre*), whereas in your specimen, as well as in the figure (at least in my copy) the tips are buff. Nevertheless I have little doubt your bird belongs to this form, in which the colour of the tips seems to vary from bright to dull red, and hence may occasionally be also buff. I cannot regard it as a distinct species, as has been done by C. L. Brehm, who named it ('Naumannia,' 1853, p. 194) *Crucirostra*

rubrifasciata,* but I agree with Bonaparte and Schlegel in considering it a variety of the common *Loxia curvirostra*." This form, I believe, is new to Britain, and is in some respects not unlikely to be mistaken for a White-winged Crossbill.—EDWARD WILLIAMS (2, Dame Street, Dublin).

Notes from Western Australia.—My last letter to 'The Zoologist' was, I believe, chiefly concerning an overland trip to the southern part of this colony. I returned to this district at the end of March, 1888. During the previous summer there had been unusually heavy and welcome rains; this river (the Minilya) ran through, as did the Gascoyne, which had not done so for nearly four years. The Minilya does not empty itself into the sea, but into the vast salt marshes behind the coast sand-hills. Natives assert that in a very wet season they have seen these two rivers join by way of these marshes before any Whites were here. On a large lake-like pool formed by the overflow of the Minilya, forty miles below this, we saw great numbers of Black Swans. We counted more than four hundred on one-half of the pool. Both eggs and young of this bird have frequently been obtained here by the owner and men at the station adjoining. The so-called "Crested Partridge" mentioned in a former communication, and which I was unable to see during my first visit here, proves to be the Rust-coloured Bronze-wing Pigeon, *Lophophaps ferruginea*, a most elegant and striking bird, and on first view certainly more like a partridge than a pigeon. It may be found along this river, especially where the nature of the ground is rocky, in considerable numbers, but not in flocks. When courting, the male—with plume erect and tail-feathers widely spread out like a fan—presents a striking appearance, and is usually very fearless; in fact, I have frequently had both sexes running round me within arm's length. The eggs, two in number, are placed on pebbly, or even rugged, ground, with no sign of a nest. I have found them laid quite in the open, though sometimes a bush partially shelters them. Gould infers from this that the young of this species are able to run soon after leaving the egg. We kept two young in the house here a little time; when found they must have been upwards of a week old, and on the second day of their imprisonment they could only feebly waddle round their cage. Early in October I took a trip across to the Lyndon River, and from thence to the Lyons, nearly as far as Mount Augustus. On the latter river this bird was plentiful, and I secured some fresh eggs. The large pools of water on the Lyons abounded with aquatic birds: among them Pelicans (*Pelecanus conspicillatus*), Cormorants, White Egrets (*Herodias melanopus?*); and various Ducks—among them the Teal (*Anas punctata*), Pink-eyed Duck (*Mala-corrhynchus membranaceus*), and Whistling Duck (*Dendrocygna Eytoni*).

* By an oversight, this word was misprinted *bifasciata* in the 4th edition of Yarrell's 'British Birds,' ii. p. 201, foot-note.

There were also great numbers of the Straw-necked Ibis, *Carphibis spinicollis*, a bird which all colonists here agree has only once been previously seen in the district. These birds I first observed last May, feeding near the stock-yards and houses; then they betook themselves more to the rivers and water-holes, though often met with in great flocks on open flats. The Gascoyne River has also been visited by great numbers of these birds. They were in a most emaciated condition on their arrival, and great numbers died. Others, however, were in better condition, or else speedily grew fat, for I found one day, on shooting three, they were quite as much as I cared to carry a quarter of a mile. Though not nearly so numerous as they were a few months ago, many still remain, but though they have been here eight months I cannot hear of their breeding. Most of the natives here regard it as a new bird. A species of Laughing Jackass (*Dacelo cervina?*) is abundant on the Lyons and Gascoyne Rivers, but curiously enough does not occur on the Minilya; I believe it is also found on the Lyndon. Emus have been wonderfully plentiful this season: these birds prolong their time of laying very much; eggs were brought in here in May, and early in December last I came upon a party of ten young ones with their parents; the former were certainly not a fortnight old. The reason may be that the first clutches of eggs are often taken by natives. Migration goes on here to a considerable extent among several species of birds, but it is difficult to make exact notes in a new country. During the months of October and November great numbers of what from Gould's description must be, I think, the Letter-winged Kite, *Elanus scriptus*, appeared here. Many died from some cause which I could not ascertain, and very few are now to be seen. When in Carnarvon, last November, I saw some young Magpies that a teamster had brought down the river with him: it was the same species as occurs in the southern portion of this colony, and I previously imagined the Murchison River to be its northern limit. It is a curious fact that many species of bush quadrupeds completely died out here some years ago; their unoccupied habitations may be seen all over the bush. The Kangaroos in this district were almost totally exterminated some years when so many natives succumbed to the "measles": they say the Kangaroos and other species contracted this disease. It is, however, certain that some species have died out entirely; others are now increasing again. Many species of birds here lay whenever a good rain falls, no matter what time of year.—THOMAS CARTER (Minilya River).

Uncommon Birds in Skye.—Although the Greater Spotted Woodpecker (*D. major*) has long been known to visit the Shetlands, it has not to my knowledge been recorded from the Hebrides. I ought, perhaps, to say that it has recently occurred in Skye, on at least one occasion. In October, 1886, a male bird was shot near Edinbaue, by Mr. Boyd, the

shooting tenaut, when in company with Mr. M. B. Byles. I received particulars orally from both these gentlemen, and traced the specimen in the ledger of the person who mounted it. It is now in Mr. Boyd's possession in town. Among other birds which have occurred in Skye, but which I was not able to include in my list of the avifauna of that island in 1886, are the following:—Brown-headed Gull, which probably visits us on its way to breed in North Uist, where Mr. J. Mackenzie tells me he has seen it breeding; Bar-tailed Godwit, obtained in mid-winter; Chiffchaff, first observed by myself in April, 1889; Crossbill, detected by Mr. G. S. Dumville Lees; Sand Martin, observed by myself in summer, and by Mr. Lees in autumn; Pintail, Pochard, Scaup, Scoter, Smew, and Pinkfooted Goose; Pallas's Sand Grouse; Quail; Tawny Owl obtained in several quarters; Buffon's Skua and Leach's Petrel. Incidentally, I may say that *no* Glaucous or Iceland Gulls have occurred, to my knowledge, on the Skye coast for three years, though a very sharp look-out has been kept. As the Pintail is rare in the Hebrides, it may be well to state that I myself identified the species.—H. A. MACPHERSON (Carlisle).

Hen Skylark singing in Confinement.—Last year I reared a Skylark (taken when six days old), and after the autumn moult it began to repeat the usual song; I then turned it into one of my smaller aviaries with a pair of *Leiothrix*; it soon got used to the size of its home and flew about freely, being rarely on the ground, and to my surprise frequently using a ledge and sometimes a branch as a perch, its long hind toe being used as a support, exactly after the manner of perching birds; at intervals, and usually when my older caged Skylark was singing, this bird would commence the same song, which, however, terminated abruptly whenever a *Leiothrix* dashed down near to it. On June 16th I heard it singing, and, not having examined it minutely, I naturally concluded that it was a cock bird; but on the following day it laid an egg upon the grass in the aviary, and thus decided its sex beyond question. I should be glad to know whether anyone else has ever heard of a hen Skylark singing.—A. G. BUTLER (Penge Road, Beckenham).

Congenital Blindness in Birds.—I hope you may think the following sufficiently interesting for publication in 'The Zoologist,' of which I am always a most interested reader. While on a visit to a country rectory near Pontefract, a chicken six weeks old, of the ordinary barn-door variety, and one of a brood of a dozen or so, was pointed out to me as being almost, if not quite, blind. On examining it I found it to have double congenital cataract. Both lenses were so opaque that it could only have had the smallest possible amount of vision, if any. One could pick it up without any attempt on its part to escape, and it was quite unable to find its food, which had always to be put immediately under its bill. It was small and weakly as compared with others of the same brood. One knows that

cataract is not uncommon in dogs and cats among domestic animals, but I have not yet met with, or heard of a case, more especially of congenital cataract, in any bird.—ALLAN MACNAB (King's College Hospital).

[We remember to have met with a case of congenital cataract in a Wild Duck, and published a note on the subject at the time. See 'The Field,' Sept. 30th, 1871.—ED.]

Hedgesparrow trying to mate with a Garden Warbler.—One of my larger aviaries contains the following birds:—A pair of Yellowhammers, a Reed Bunting, Hedgesparrow (female), Garden Warbler (male), Meadow Pipit (male), a Grey Wagtail and a Pied Wagtail. The Yellowhammers recently built in an *Arbor vitæ*, and during the progress of the building, which occupied them four or five days, I frequently noticed my Hedgesparrow following the Garden Warbler about and trying to entice him to pair with her; on one occasion I noticed her behaving in a similar manner towards the Pied Wagtail, but both birds treated her with the utmost indifference; the Meadow Pipit however strutted about in the greatest excitement, and tried in every way to make up to her, though she constantly gave a peck whenever he advanced near to her. Whether she has at last succeeded in gaining the affections of the Garden Warbler I cannot say, but she has deposited a clutch of eggs in the Yellowhammer's nest and is sitting steadily upon them, so that the evicted tenants have had to start afresh.—A. G. BUTLER (Penge Road, Beckenham).

FISHES.

Motella cimbria on the Norfolk Coast.—Mr. Arthur Patterson, of Great Yarmouth, has sent me a sketch and description of a Four-bearded Rockling, *Motella cimbria*, which he found amongst the refuse left by the drawnetters on Yarmouth Beach, on May 23rd last. Its total length was $8\frac{3}{4}$ inches, and from its stomach he took a full-grown brown shrimp. I am not aware that this species has been previously observed on the Norfolk coast.—T. SOUTHWELL (Norwich).

[This fish, from the coasts of Northern Europe, must be regarded as rare around the British Isles. It was first noticed as British by Parnell, who found it in the Firth of Forth, and has been recorded from Banff, Aberdeen, St. Andrew's, Falmouth, and Penzance. We have not heard of its previous occurrence on the east coast of England. There is a good figure of it in Day's 'British Fishes' (plate 88) from a specimen eleven inches long. He states (i. p. 317) that the longest-recorded British specimen measured fourteen inches.—ED.]

BATRACHIA.

Bullfrog preying on Natterjack.—On April 27th, 1889, I visited the sand-hills near Southport, and captured about sixty Natterjacks to turn

down in my garden. These Toads are very plentiful there, and the sound of their bellowing love-calls was audible at a distance of a quarter of a mile. It would be difficult to estimate their number, but on the area we inspected there must have been tens of thousands. Of those I put in my garden some climbed a wall eight feet high and made their way to the flashes at the back, where I trust they will become localised. I placed a few in a case adjoining a case of American Bullfrogs, and noticing the latter eyeing them in a greedy way, I placed one amongst them; it was promptly devoured. I then put in some more, and one Bullfrog ate four Natterjacks in about six minutes; as the toads were full-grown, his meal was a good one. I have had some difficulty in providing food for my Bullfrogs, but find that they will eat raw meat if it be cut into strips about two inches long and then moved before them as if alive; if it be left motionless they will not touch it. It may be interesting to record that last week I noticed an Edible Frog, *Rana esculenta*, eat a full-grown *Salamandra atra*. I was the more surprised as I have bred *S. atra*, *S. maculosa*, *Molge cristata*, and *M. vulgaris* in the same case for some months without noticing anything of the kind; although the Common Newts were becoming fewer, I thought they might have escaped through the wire cover of the case, but after seeing where *S. atra* went, I have no doubt the Newts had suffered a similar fate. I feed these frogs with earthworms, and occasionally insects, upon which diet they thrive and have spawned in captivity. On May 11th I found a female *S. atra* dead on the bottom of the case. She had died in the act of parturition; the tail of the young one protruded nearly an inch; I extracted it, and found it had reached the adult form. Last June some *S. maculosa* brought forth their young in the gill state, some being born in the tank and others on the floor of the case: the latter died, the former flourished, and I have one still in the gill state, now nearly three inches long; it is just beginning to show the brilliant yellow markings of the adult. Some two weeks ago, on moving an old tree-root in my garden, I found a *Salamandrina perspicillata*, evidently one of a number which had escaped from their case last summer, and had managed in its snug retreat to survive our northern winter.—

LINNÆUS GREENING (Birch House, Warrington).

MOLLUSCA.

Mollusca in the neighbourhood of London.—On May 16th I took a white variety of *Bulimus obscurus* from a nettle-covered bank between Hampstead Heath and Hendon. It was the only form of this species I could find, and I searched the bank well, for I knew that this snail had not hitherto been recorded for Middlesex; at any rate it is not so recorded in Taylor and Roebuck's 'Census of British Land and Fresh-water Mollusca.' [It is recorded in Cooper's List.—ED.] On the very

same bank *Helix cantiana* (Mont.) and its white variety live in hundreds, I might almost say in thousands. One specimen of *Succinea putris* (Linn.) was found, a large quantity of *Arion ater* (Linn.) and Lehmann's var. *brunnea*, with *Limax agrestis* (Linn.) [chiefly belonging to Draparnaud's *sylvatica*] and *Hyalinia cellaria* (Müll.), *Helix rufescens* (Penn.), *H. rotundata* (Müll.), and *H. hispida* (Linn.). In company on the nettles with *Helix cantiana* live also *H. hortensis* (Müll.) and *H. nemoralis* (Linn.), but not in such great profusion. Of the former of these the yellow variety (Moquin-Tandon's *lutea*), with the band-formula of 00000, are the most common; there is also present the white variety with a band-formula of 12345 (Moquin-Tandon's *albida*). Of the latter, the flesh-coloured variety (Roebuck and Taylor's *carnea*) is the most common, and those of the band-formulæ of 00000, 00300, 123(45), 12345; others are also present, as the yellow variety (Risso's *libellula*), with band-formulæ of 00300, 00345, and 12345, and the tawny-coloured variety (Moquin-Tandon's *Petiveria*), with band-formulæ of 12345 and 00000.—J. W. WILLIAMS (Mitton, Stourport).

The Basal Coloration of the Shells of *Helix hortensis* and *H. nemoralis*.—Shell-workers have no doubt observed, as I have oftentimes done, the difference in colour from the general body colour of the basal portion of the body-whorl in these two species. Thus, in the white variety of *H. hortensis* there is generally a basal coloration of light yellow, and in the flesh-coloured variety of *H. nemoralis* (which Roebuck and Taylor have called var. *carnea*) there is generally a brownish basal coloration almost identical in colour with that forming the body-colour of the variety which Moquin-Tandon has called *castanea*. And not to mention other instances, which will occur to the reader, there is, even in the yellow form of these two species, a deeper coloration of yellow in the basal portion of the shell. These are of adult shells. But in young shells, and in those which have only recently become adult there is no difference of colour shade to be noted between the basal portion of the shell and the portion above and directly around the periphery. The basal coloration is then, I think, not congenital, but acquired, and I throw out the suggestion that it is due to the action of moisture, from the snail drawing that portion of its shell continuously over damp earth. And the ground I have for this suggestion is that I have observed the flesh-coloured variety of the shell of *H. nemoralis* become of that brownish tinge (which is found normally at its basal portion) from the unlimited action of damp in the course of two weeks. It will be remembered that the loved haunt of these snails is a nettle-covered hedge-bank, and it will be generally found that the soil in which nettles grow is of a soft, moist character.—J. W. WILLIAMS (Mitton, Stourport).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

June 6, 1889.—Mr. CARRUTHERS, F.R.S., President, in the chair.

Dr. John Anderson, Mr. J. G. Baker, Dr. Braithwaite, and Mr. F. Crisp were nominated Vice-Presidents.

Mr. Digby S. W. Nicholl was admitted a Fellow; and the following were elected:—The Marquis of Lothian, Messrs. W. Williams, C. S. Wild, and W. Schaus.

Prof. Martin Duncan exhibited under the microscope some beautifully mounted preparations of the ambulacral tentacles of *Cidaris papillata*, and drew attention to the fact, previously unrecorded, that the tentacles of the abactinal region of the test differ in form and character from those of the actinal region. The latter have a well-developed terminal disk, and are richly spiculated; whereas the former have no disk, but terminate distally in a pointed extremity with very few spiculæ. Mr. W. P. Sladen made some remarks on the significance of this dimorphism with reference to its archaic character, and its relation to the primitive forms of Echinoids and Asteroids.

Mr. Narracott exhibited a singular fasciated growth of *Ranunculus acris*, found at Castlebar Hill, Ealing.

Mr. H. B. Hewetson exhibited under the microscope a parasite of Pallas's Sand Grouse, *Syrrhaptes paradoxus*, taken from a bird shot in Yorkshire, and described as a species of *Argas*. Mr. Harting pointed out that an apparently different parasite, from the same species of bird, had been recently described by Mr. Pickard Cambridge (Ann. & Mag. Nat. Hist., May, 1889), under the name *Hæmaphysalis peregrinus*.

Dr. Cogswell showed some examples of Jerusalem artichoke and potatoe, to illustrate the spiral development of the shoots from right to left.

Governor Moloney, C.M.G., of the colony of Lagos, exhibited a large collection of birds and insects from the Gambia, the result of twelve months' collecting in 1884–85. The birds, belonging to 134 species, had been examined and named by Capt. Shelley. Amongst the beetles, of which 89 species had been collected, he called attention specially to *Galerita africana* and *Teffus megelii*, and to the Rhinoceros and Stag-horned beetles. Of butterflies there were 90 species, amongst which the most noticeable and characteristic were the *Acreeas* and the pale green *Eronia thalassina*, said to be typically Gambian. The moths, of which some 220 species had been brought home, were named by Mr. Herbert Druce, and several had proved to be new or undescribed. A portion of this collection had been exhibited at the Indian and Colonial Exhibition of 1886, but had since been carefully

gone over and named, and was now exhibited for the first time in its entirety. Mr. Herbert Druce alluded to some of the Lepidoptera which are most characteristic of the Gambia region; and Mr. Harting made some remarks upon the birds, pointing out the wide geographical range of some of the species which had been collected.

Mr. Clement Reid exhibited several specimens of fossil plants from a newly-discovered Pleistocene Deposit at South Cross, Southelmham, near Harleston.

Mr. D. Morris exhibited specimens of the fruit of *Sideroxylon dulcificum*, the so-called "miraculous berry" of West Africa, belonging to the *Sapotaceæ*. Covered externally with a soft sweet pulp, it imparts to the palate a sensation which renders it possible to partake of sour substances, and even of tartaric acid, lime-juice, and vinegar, and to give them a flavour of absolute sweetness. The fruit of *Thaumatococcus*, *Phrynium Danielli*, possessing similar properties, was also shown, and living plants of both had lately been received at Kew from Lagos, through Governor Moloney.

Mr. Thomas Christy exhibited living plants of *Antiaris toxicaria* (the Upas-tree) and *Strophanthus Kombe*, both of them poisonous, to show the similarity of the foliage.

On behalf of Dr. Buchanan White, a paper was then read by Mr. B. D. Jackson, entitled a "Revision of the British Willows."

The meeting adjourned to June 20th.

ZOOLOGICAL SOCIETY OF LONDON.

May 21, 1889.—Prof. FLOWER, C.B., LL.D., F.R.S., President, in the chair.

Mr. Selater exhibited and made remarks on a mummied Falcon (probably a Kestrel) from a tomb at Thebes, procured by Mr. A. G. Scott; and some photographs of groups of Sea-birds and Seals taken on the shores of Antipodes Island, Antarctic Ocean.

Mr. Selater also called attention to a specimen of a Leaf-insect living in the Society's Insect House, which had been received from the Seychelles, and presented by Lord Walsingham. It was not quite fully developed, but was believed to be referable to *Phyllium gelonus*, Gray.

Mr. Martin Jacoby read a list of the species of Coleoptera of the families *Crioceridæ*, *Chrysomelidæ*, and *Galerucidæ*, of which specimens had been collected in Venezuela by M. Simon, and gave descriptions of the new species.

A communication was read from Mr. A. G. Butler, containing the description of a new extinct genus of Moths belonging to the Geometrid family *Euschemidæ*, based on a fossil specimen obtained from the Eocene

Freshwater Limestone of Gurnet Bay, Isle of Wight. This insect was named *Lithopsyche antiqua*.

Mr. W. F. Kirby read a paper containing descriptions of new genera and species of Dragonflies, chiefly from Africa, in the collection of the British Museum.

Dr. Hans Gadow read a paper on the taxonomic value of the intestinal convolutions in birds. After pointing out the different forms assumed by the intestinal convolutions in this class of animals, and suggesting a nomenclature for them, the author proceeded to give the outlines of a classification of birds based solely on this part of their structure, and to show the differences and resemblances of the various groups.

June 4, 1889.—OSBERT SALVIN, 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.

Mr. H. E. Dresser exhibited and made remarks on some eggs of the Adriatic Black-headed Gull, *Larus melanocephalus*, and of the Slender-billed Gull, *Larus gelastes*, which had lately been obtained at their nesting-places in the marshes of Andalusia by Col. Hanbury Barclay and himself.

Dr. G. J. Romanes read a paper on the intelligence of the Chimpanzee, as shown in the course of experiments made with the female Chimpanzee called "Sally," which has been living several years in the Society's Menagerie.

A communication was read from Signor F. S. Monticelli, containing notes on some Entozoa in the Collection of the British Museum.

Mr. Sclater read a list of the birds collected by Mr. George A. Ramage (the collector employed by the joint Committee of the Royal Society and the British Association for the exploration of the Lesser Antilles) in Dominica, West Indies, and made remarks upon some of the species.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

June 5, 1889.—The Right Hon. Lord WALSINGHAM, M.A., F.R.S., President, in the chair.

Mr. W. M. Christy, of Watergate, Emsworth, was elected a Fellow of the Society.

Mr. S. Stevens exhibited a specimen of *Acrolepia assectella*, Zeller, included in a lot of *Tineidæ* purchased by him at the sale of the late Mr. A. F. Sheppard's collection, and determined by Mr. Stainton. He also exhibited, for comparison, a specimen of *A. betuletella*.

Mr. J. J. Walker, R.N., exhibited a collection of Lepidoptera made in 1887 and 1888 in the immediate vicinity of the Straits of Gibraltar. The collection included sixty-eight species of butterflies, of which thirty-six were

obtained on the Rock of Gibraltar itself, and the remainder on the European side of the Straits, and about 160 species of moths.

Dr. P. B. Mason exhibited a number of specimens of a South-European species of Ant—*Crematogaster scutellaris*, Oliv. He said that the specimens were all taken in the fernery of Mr. Baxter, of Burton-on-Trent, and had probably been imported with cork.

Mr. O. E. Janson exhibited a pair of *Neptunides stanleyi*, a species of *Cetoniidæ*, recently received from Central Africa, and described by him in the February number of 'The Entomologist'; also some varieties of *N. polychrous*, Thoms., from the Zanzibar district.

Dr. N. Manders exhibited a number of Lepidoptera collected by himself in the Shan States, Upper Burmah; also a collection of Lepidoptera made by Captain Raikes in Kárenni.

Mr. M'Lachlan exhibited over 400 specimens of Neuroptera, being a portion of the collection formed in Japan by Mr. H. J. S. Pryer. They represented nearly all groups (excepting *Odonata*, now in the hands of Baron De Selys). Some of the *Ascalaphidæ*, *Panorpidæ*, and especially *Trichoptera*, were of great beauty; notably amongst the latter was the curious moth-like genus *Perisoneura*, M'Lach.

Dr. Sharp exhibited the peculiar cocoons of an Indian moth, *Rhodia newara*, Moore; these were the cocoons possessing a drain at the bottom in order to allow water to escape, already described in the 'Proceedings of the Zoological Society' for 1888, p. 120, where, however, their great resemblance to the pods of a plant had not been alluded to.

Mr. Enock exhibited, and made remarks on, specimens of *Cecidomyia destructor*, bred from American wheat.

Mr. W. Warren exhibited a bred specimen of *Retinia posticana*, Zett., from Newmarket; also specimens of *Eupithecia jasionata* and *Gelechia confinis*, bred by Mr. Gardner, of Hartlepool.

Mr. C. O. Waterhouse exhibited and explained a number of diagrams illustrative of the external characters of the eyes of insects. A discussion ensued, in which Mr. M'Lachlan, Mr. Verrall, Lord Walsingham, Mr. Jacoby, Mr. Kirby, and others took part.

Mr. A. G. Butler communicated a paper entitled "Descriptions of some new Lepidoptera-Heterocera in the collection of the Honble. Walter de Rothschild." He also contributed a second paper entitled "Synonymic Notes on the Moths of the earlier genera of Noctuites."

Dr. Sharp read a paper entitled "An Account of Prof. Plateau's Experiments on the Vision of Insects." Lord Walsingham, Mr. Jacoby, Mr. White, and Mr. Waterhouse took part in the discussion which ensued.—
H. Goss, *Hon. Secretary.*

NOTICES OF NEW BOOKS.

Bird-Life of the Borders: Records of Wild Sport and Natural History by Moorland and Sea. By ABEL CHAPMAN. 8vo, pp. 286. With numerous illustrations. London: Gurney and Jackson. 1889.

If we have delayed until now to notice this very pleasantly written volume, it has been from no want of appreciation of its merits. It is the sort of book of which we should like to see a good many more; not a compilation from the works of other writers on birds, but written from the author's personal experience of the border moorlands, with which as a sportsman and a naturalist he is evidently well acquainted.

It has been our good fortune to spend a fortnight in May on a Northumbrian moor, and, after three seasons' Grouse shooting upon another moor in the same county, we are able (though with far less experience than our author) to testify to the fidelity of his descriptions of the haunts and habits of moorland birds.

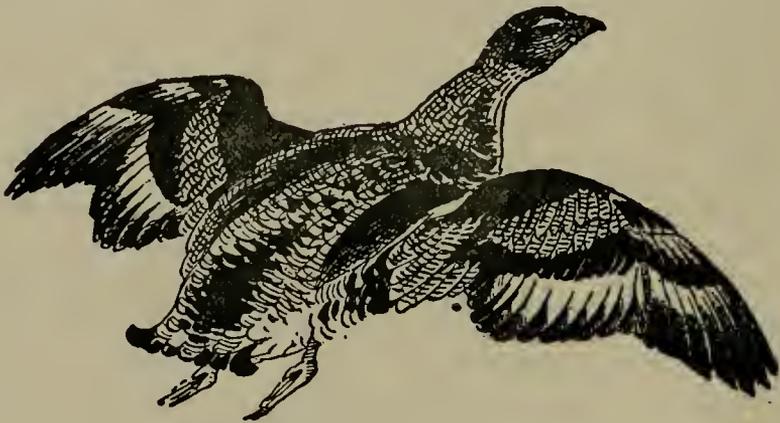
In pursuit of Grouse, Plover, and Snipe we have shot over various moors in England, Wales, Scotland, and Ireland, with "all sorts and conditions of men," and have been struck with the want of acquaintance which many display with any birds but those which are the immediate object of pursuit. It seemed to us that some of them have made little use of their opportunities, and have failed to realize more than half the pleasure of a moorland walk. We can well believe that such a walk in company with Mr. Chapman would be a very different matter, and we shall be much mistaken if those who go northwards in August with gun and rod do not thank him for the instruction they will derive from a perusal of his book.

Nor will it be of interest only to those to whom such scenes are unfamiliar. Experienced sportsmen may borrow useful hints from the author's narrative of success and failure, and will find in his descriptions many a reflection of their own experience.

As a specimen of Mr. Chapman's style (though to readers of 'The Ibis' it must be already well known) we give a couple of extracts from the volume before us,—one relating to a "game bird," the other to a "wildfowl."

Here is a description of the English haunts of the Black Grouse, *Tetrao tetrix* :—

“ Whilst in August one’s eye rests day after day upon an almost unvarying, unbroken sea of purple heather, glorious in its fullest bloom, with its golden pollen streaming away in a little cloud to leeward of the course of dog and man ; now our sport, in search of Black-game, lies amidst widely different scenes, no less wild and hardly less beautiful. Stretches of rolling prairie-land, of rough grass, rush, and bracken, interspersed here and there with straggling patches of natural birch and hazel, take the place of the heather ; and instead of wide-spreading moors, one now rambles along tortuous little cleughs, shaggy with lichen-covered birch and rowan-tree, or up the rugged course of a steep-sided rocky glen, the favourite haunt of young “ grey,” and many of which are amongst the most exquisitely wild and charming nooks ever carved out by Nature. In these sequestered spots, as a September sun shines brightly through the scattered birches, upon the masses of bracken and variegated foliage below, amongst which the setters are bustling about, their russet coats in sharp contrast with the dark rushes and paler fern, surely one has as fair a scene as eye need wish to rest on.

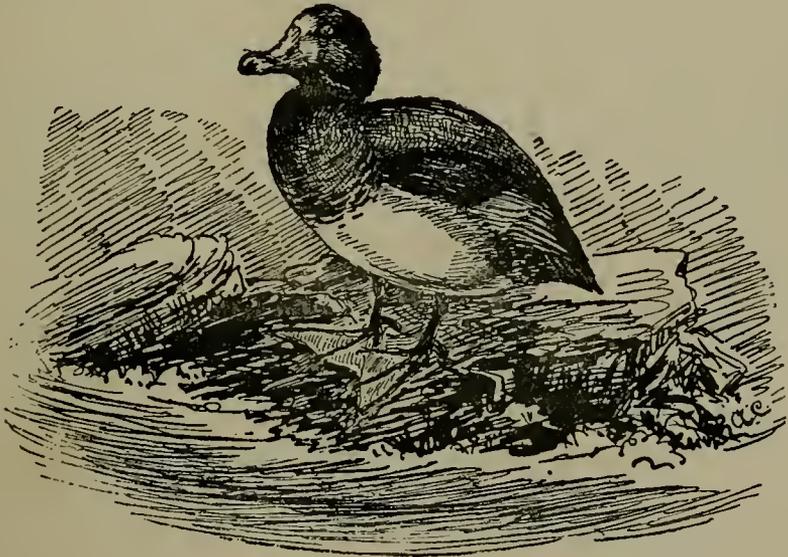


YOUNG BLACKCOCK. September 1.

“ Young Black-game are among the slowest of game-birds in attaining maturity. They are hatched early in June, but cannot be considered full-grown till the end of September, and during their four months of adolescence are certainly the “ softest ” and most tender of all the game-birds—a curious contrast with their strong and hardy nature when adult. Even when half-grown it is quite common to see a young Blackcock, if put up two or three times on a wet day, become so draggled and exhausted as to be unable to rise again.

“ The habits of young Black-game are precisely analogous with their tardy bodily development. All through their protracted adoles-

cence, and during August and September, they are the very tamest of birds. Then all at once they appear to gain a sudden accession of strength and wildness; their timid skulking nature is discarded along with the weak, little, pointed, ruddy tails of their nestling plumage, and in a few weeks, even days, the young Blackcock, from being the tamest, becomes the wildest, of all our game-birds. * * * By the middle of September the young Blackcocks are nearly full-grown, and about three parts black, with spreading tails. At that period they separate themselves from the young Grey-hens of the brood, and for a time become quite solitary. Being then scattered singly over a wide extent of rough country, they are less easy to find than to get at, for, though nearly full-sized, they lie extremely close in beds of bracken and rushes, or in the "white grass" or patches of heather. Towards dusk they begin to feed on the seeds of rushes, especially the "spratt" or flowering rush, and being then temporarily gathered together, are much wilder than during the day. They continue "on feed" till it is quite dark.



YOUNG MALE SCAUP. November.

"This (mid-September) is the season when young Black-game afford by far the finest sport over dogs; for though they lie close, and offer easy shots, they require a great deal of hunting for; and a bag of perhaps eight or ten brace of well-grown handsome young birds, varied by a few brace of moor-partridge, and an odd Grouse or two picked up on the outskirts of the heather, is a very satisfactory day's work."

The haunts of the Scaup, *Fuligula marila*, are thus described:—

"The favourite feeding-grounds of the Scaup is over rocks where

seaweed grows luxuriantly, and where they dive among the long waving tangles in search of the various shell-fish and their spawn, and the host of minute forms of marine life which abound in such places. Owing to this preference, their company is often confined all through the winter to certain localities,—usually about the harbour entrance, or a rocky bay adjoining the open sea; hence they are less frequently met with than the Golden-eyes, which are scattered in odd pairs all over the sandy channels of the estuary. Moreover, such places as alluded to are not very accessible to punts; the water is too deep, and the long inward roll of the sea, even when smooth, is dangerous for these low-sided craft, to say nothing of the difficulty of using a big gun, when one moment half the fore-deck is buried in a great oily, sloping swell, and the next the gun points heavenwards, far over the heads of the fowl. I have taken a punt, in broad daylight, within forty yards of nice packs of Scaup in such situations, but never could work a shot to advantage for the above reasons.

“Besides the places where, as above indicated, the main bodies of the resident Scaup Ducks take up their winter-quarters, one frequently meets with small bunches of half-a-dozen or so inside harbour, especially about the “scaps,” or mussel-beds (whence probably their name), and even on the edge of the ooze, where they occasionally vary their shell-fish diet with a feed of sea-grass. They always, however, keep afloat, or nearly so: it is very seldom one sees a Scaup or Golden-eye go on to dry land, nor (on the coast) have I ever heard either species utter a note.

“Scaup are the tamest of all the Duck tribe, and—exactly the reverse of the Golden-eye—they continue throughout the winter as tame and as easily approached as when they first arrive in October. On seeing a pack of them, one can shove the punt close in upon them, and then, if scattered, can wait securely till they arrange themselves nicely to receive the charge. Scaup are also among the toughest of birds, and the most tenacious of life. At least half the cripples usually escape, and any that are captured alive it is all but impossible to kill. I have seen, when the bag was emptied on to the kitchen floor, a couple of Scaups, which had appeared as dead as door-nails, return to life and flutter vigorously round the room. Even when killed, however, they are of no value, being the strongest, nastiest, and most utterly uneatable Ducks I ever tried.”

We are indebted to the publishers, Messrs Gurney and Jackson, for the reproduction of two of Mr. Chapman's illustrations, selecting those which illustrate phases of plumage not figured and hardly noticed by previous writers on British Birds.



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THE FINWHALE FISHERY OFF THE LAPLAND COAST IN 1888.

BY ALFRED HENEAGE COCKS, M.A., F.Z.S.

THE total take in 1888 again shows a considerable diminution from the preceding season. My friend Capt. G. Sørensen (Harbourmaster of Vardö), for the first time, has apparently forgotten to send me a list of the whales killed,* so that my returns for the Finwhaling during 1888 are more imperfect than usual; as, besides gaps, my information concerning a few of the companies may not include the last whale or two killed at the extreme end of the season. If, however, we allow (to make even numbers) 13 beyond the numbers recorded at the end of this paper, the total only amounts to about 730, or probably from 120 to 130 less than the total obtained in 1887, which in its turn was 100 less than the total in 1886.

The number of Companies (in spite of a few changes) remains the same as in 1887; the number of whalers was greater by three, or—as I am not sure that two of the vessels were in commission before the latter part of the season—the increase is perhaps more correctly stated as *one*.

The falling off in the numbers of each of the three species of Rorqual appears, as far as my returns go, to have been about

* As it takes a month to receive a reply from Vardö, I did not write a reminder to Capt. Sørensen, because I could not tell but what the next post might bring me the desired information.

proportionate, while the only apparent increase is in Humpbacks, a tolerably sure sign of the scarcity of the two larger species.

The numbers obtained by two Companies may be specially noted:—Yeretiki, the easternmost of the whaling stations, 23 whales, against 60 in the previous year, the principal falling off being in Common Rorquals: and Sörvær, in West Finmarken, no Blue Whales, against 17 in previous season; Common Rorquals *increased* by nearly five times; the unprecedented catch of 110 Rudolphi's Rorquals in 1887, was last season reduced to the yet extraordinary number of 60; and Humpbacks 11, against 4 in 1887.

The chief point of interest about the season's operations was the killing of a Blue Whale off Vardö, early in July, which had one side considerably enlarged, and whose vertebral column was said to be distorted. There was no external mark to explain the circumstance. After it had been flensed the "krang" was sold to one of the guano factories, where, on cutting into the enlarged side, there ensued considerable effusion of blood and matter, followed by the finding, between two of the ribs, a small harpoon, or "bomb-lance." The point of interest consists in the fact that this is undoubtedly of American manufacture, and that the whale must have received this unpleasant guest somewhere on the American side of the Atlantic, and subsequently crossed the ocean. The lance is $16\frac{5}{8}$ (English) in. long, and $\frac{7}{8}$ in. diameter, and bears the inscription engraved, "E. PIERCE'S PAT. JUNE 1, 69."* It unscrews into three main sections and four interior smaller pieces. Capt. Sörensén, in whose custody it was at the time of my visit to Vardö, kindly allowed me to photograph it, and I sent a copy to Prof. F. W. True, of the U. S. National Museum, Washington, asking him to be so good as to give me any information in his power as to place of manufacture, and in what whaling trade such pattern was used. Prof. True has very kindly taken considerable trouble about it, and has furnished me with the following particulars, in a letter dated May 24th:—

"Soon after receiving your letter, I wrote to Mr. Eben Pierce regarding the harpoon, and obtained from him some very interesting papers, copies of which I enclose.

"The harpoon is of the kind which in America is called a bomb-

* The figures looked like C D, but no doubt represent the date as above.

lance. We have one of exactly this pattern in the Museum. The wires which are to be seen in the left end of the shaft are not part of an electrical apparatus,* but belong to the guiding-wings, which are wanting in the specimen photographed. I enclose a copy of some notes on the construction of this bomb, contained in the late Mr. J. T. Brown's 'London Fisheries Exhibition Catalogue,' a copy of which you may not have at hand.

"Mr. Pierce's statement that he has never sold any of these bombs to the Norwegian whalers is, it seems to me, of much importance. The Scotch whalers, if I have properly understood your reports on the whale fishery, do not chase the Finback Whales, while, on the other hand, our Provincetown whalers *do* capture them, and use these explosive bombs for the purpose. It is possible, therefore, that the individual from which the Pierce bomb was taken was shot at by one of our whalers, and afterwards crossed the Atlantic to the coast of Finmarken.

"We do not yet know very much about the Finback Whales that frequent our Atlantic coast, and I have been intending for some time to visit the stations in Massachusetts, with a view of gathering some new information regarding them."

The extract enclosed from the 'London Fisheries Exhibition Catalogue' is as follows:—

"U.S. of America.—E. 'The Whale Fishery and its Appliances.' By James Temple Brown. Washington, 1883, p. 59."

"PIERCE'S BOMB-LANCE.—Main portion, or powder chamber, brass tubing; anterior end provided with nipple for percussion-cap and time-fuse. Rear end, or tail-piece, composition metal; fluted sides, with longitudinal slots for reception of the wings. Guide-wings, sheet brass, fastened to brass wires; closed by a brass ring when placed in the gun, and expand radially from a common centre when discharged. Lance-point, composition metal; four cutting edges; recessed, containing a hammer secured by a wooden pin, which is broken by the concussion of the explosion of the charge, and explodes the cap on the nipple in the end of the shank, communicating the fire to the magazine by means of the time-fuse. Button, sole leather, fastened with a screw. Length, 19 inches.† New Bedford, Massachusetts, 1882. 56355. Manufactured and presented by Captain Eben Pierce. Used

* As we in Vardö had conjectured.

† The difference in the length of the Vardö example is probably to be accounted for by the absence of the "guide-wings." Possibly also the 1882 pattern may vary from that of 1869.

with Pierce & Eggers' Shoulder-gun. Made in three sections. The lance is loaded by detaching the rear section, and capped by detaching the cutting-point."

It is only necessary to give brief extracts from the papers referred to as received by Prof. True:—

Capt. Eben Pierce, in a letter dated New Bedford, Feb. 28, 1889, says, "In reply to yours about bomb-lances I would say I have never sold any lances to the Norwegians. I have sold them to the Scotch whalers." As the name Blue Whale leaves the identity of the whale in doubt, I will mention that although I did not see the individual, yet the name Blue Whale in Norwegian (I believe I was the first to adopt it in English) always signifies *Balænoptera Sibbaldii*. The present instance proving that this species also occurs on the American side, it is probably identical with either the *Sibbaldius tuberosus* or *tectirostris* of Cope.

The bomb is considered to be one of the first manufactured by Capt. Eben Pierce, of New Bedford (Massachusetts), and he has some of this patent still on hand. "He is still engaged in their manufacture, but on an improved plan, and are those mostly used in the Arctic by American whalers." "Sometimes some careless persons fire these bombs into the whale without being loaded, and in this case they do not explode, but remain in the whale for years in their perfect state. This bomb never contained poison, but simply powder."

Capt. Berg, of Syltefjord, and Capt. Hoff, of Jarfjord, send the following notes of fœtuses found during the last season, the observations of each being distinguished by the letters (B) and (H):—

				Norw.		
				ft.	in.	
Common Rorqual,	May 19	...	...	4	0	(B)
"	June 2	...	...	4	5	"
"	July 16	...	...	8	1	"
"	" 20	...	...	3	0	"
"	" 28	...	...	4	6	(H)
"	Aug. 4	...	...	5	4	(B)
"	" 20	; probably between 5 and 6 feet, but quite decomposed, as the whale had been killed five days when flensed.				(H)
Rudolphi's Rorqual,	July 26	...	...	8	1	(B)
"	Aug. 6	...	...	3	6	(H)
"	" 15	...	...	8	8	(B)

Two fœtuses of the latter species were found at Pasvig on August 10th, one measuring 6 ft. and the other about 5 ft.

Capt. Sörensen (now Harbour-master of Vardö) believes that Common Rorquals pair in December or January, and generalises to the effect that fœtuses of this species are from 6 to 12 inches in April, and from 6 to 10 feet in August, and are from 16 to 20 ft. long at birth. He is also of opinion that Blue Whales have no fixed time for pairing, as fœtuses may be found at the same date of from 1 to 20 feet in length.

There seems little doubt that whalers do not as a rule lose much through not coming earlier to the fishing quarters, as the only report I have of whales seen on the passage north is from Capt. Hoff, who reports, "On the 16th March a pair of Humpbacks seen half a (sea ?) mile from land, outside Gamvig-Mehavn, and no whale seen besides them on the passage north from the 6th to 17th March." But he goes on to say, "A quantity of Common Rorquals and Humpbacks seem to have been under the land about Vardö, and on the Murman coast, in the month of February."

"Did not see whales congregated in any large numbers. Rudolphi's Rorquals, up to fifty together, were observed forty English miles north of Tanahorn on 24th July, and sixty English miles N.N.W. of Nordkyn on 20th August."

"The whales have this year remained constantly far out at sea, especially between twenty-five and sixty English miles from land, as the fishing, so far as the East Finmarken vessels were concerned, has been constantly outside the Nordkyn, and the North Cape; and only of short duration, and occasionally, to the eastward of Tana. Common Rorquals were scarcely obtained to the eastward of Vardö, and only a few Blue Whales to the eastward by Norwegian boats. The season has been uncommonly stormy right throughout until the second half of July, but, on the contrary, calm and beautiful weather the greater part of August."

Capt. Berg (Syltefjord) writes, "The months of April and part of May were unusually cold in Finmarken this year, the temperature of the sea being especially very low, to which we attributed the poor "Loddefiske" (= Capelan* fishery), and also

* *Mallotus arcticus*.

that the whales kept so far out to sea, generally about twenty to forty miles off shore; and the weather being also very unsettled at the time, the whalers had a very poor chance. We caught only four whales in April, two in May, and three in June: there was no great quantity of them all these months between the North Cape and the Murman coast. About the middle of July I first observed any shoal of whales—between Tana and Baadsfjord, thirty miles off shore; and here Blue Whales, Common Rorquals, and Humpbacks were represented. We caught eight whales between the 15th and the 22nd of that month. During the first days of August there were also several whales of these different species off the Nordkyn. After the 20th of August very few whales were seen; on my last cruise (August 27th and 28th), between the North Cape and Vardö, I only saw three stragglers (Common Rorquals), about forty miles north of Nordkyn. We left our station at Syltefjord on the 30th of August, having stayed there since the 21st of March.”

Capt. M. C. Bull (of Sörvær, on Söröen, West Finmarken), writes:—“Blue Whale: very few examples seen, none obtained. Common Rorqual: there were several at the end of May, seven to eight (? sea) miles off Söröen, and thus by the 5th of June we had obtained thirty. Rudolphi's Rorqual: were under the coast in July, but not in such large numbers as in 1887. The weather in 1888 was unusually stormy, with high seas. For ten days from St. Hans' Day (= 24th June) we had so heavy a gale that the vessels had to lie in harbour. The weather was unusually cold. The temperature of the water so low that the Capelan, which usually come under land at the end of March and April, died in consequence; so we from our whalers observed thousands upon thousands of barrels of dead Capelan outside Söröen, right up to North Cape. The cod fishery was thus pursued first in May; but a small quantity was caught, as the fishermen went home early. The fishermen believed that the reason why the Capelan died was that the water was so foul from the whaling factories that the fish could not live in it. They were ignorant that the temperature of the water could have any influence on the fish.”

The fishermen always maintain that the whales (or at least one or more species of them) pursue the shoals of Capelan, and, swimming round them, force them into compact masses and

gradually drive them close in shore. The Cod likewise, wishing to prey upon the Capelan, follow the driven masses towards the shore, and so come within reach of the fishermen. They are fully persuaded that if the whales are in turn harried at this time, they will shift far out to sea, and the Capelan being no longer frightened towards the coast by their gigantic pursuers, the cod fishery will fall off, and that it has even already begun to do so.

All this the whalers deny *in toto*, and, so far as I can judge, with reason: for even allowing that the shoals are rounded up by whales, to afford them a more complete mouthful, is it likely that the survivors will rush away for miles towards the land because they have been alarmed by the apparition of the gigantic jaws of a Rorqual? Is it not rather in the nature of such small fish to be content with a flight at best speed of a few yards, or, as we are speaking of the open sea, of a few fathoms?

However, this question—so constantly brought forward by the fishermen—was considered of such serious consequence (considering the enormous value to the country which the cod fishing represents) that Prof. G. O. Sars, of Christiania University, went up to Finmarken last summer to investigate the matter at first hand; and there I had the pleasure of making his acquaintance. Capt. Bull has kindly sent me a copy of his 'Report to the Department for the Interior, from Prof. Dr. G. O. Sars, on the practical scientific investigations set on foot by him in the summer of 1888, concerning the sea-fisheries, also concerning the close season for whales in Finmarken. Christiania, 1888.'

As it is impossible to quote his arguments *in extenso*, I will merely say that he acquits the whaling of any damage to the fisheries, a conclusion in which I fancy most people (except the fishermen) will agree with him.

On the passage out from England across the North Sea, on August 3rd, when 140 miles N.E. $\frac{1}{2}$ N. (magnetic) from the Spurn, saw at least three whales heading about S.S.E., which were probably feeding. I could not identify them with certainty, but believed them to be Rudolphi's Rorquals. From their dark colour the choice lay between this species and Humpbacks. Directly afterwards saw two (at least) Common Rorquals (almost certainly) heading about S. by W., so as almost

to meet the others. These last were travelling, and not feeding.

On the afternoon of the 5th, a little to the north of Molde (off Ulsunet), saw four Ospreys; and on the 8th, at Vol Sund Tarn (the entrance to Namsen Fjord, twenty English miles S. of Namsos), saw an Osprey fishing for Coalfish, in company with a number of Lesser Black-back, Herring, and Common Gulls. Also a Killer, *Orca gladiator*, and what was probably a Lesser Rorqual; and my friend Mr. Henry Balfour, who was with me, thought he saw a third smaller Cetacean (if so, probably a Dolphin).

On the evening of the 9th, at the mouth of Salten Fjord, passed a school of mixed Cetaceans, chiefly Dolphins, and among them one (or more) that we took to be Pilot Whales, *Globicephalus melas*, and probably a Lesser Rorqual.

Prof. Collett having (as mentioned in 'The Zoologist' for 1888, p. 106) called my attention to the species of Dolphin commonly met with along the Norwegian coast, I was especially glad to find last year two newly-stuffed specimens of *Delphinus albirostris* in the Thronhjelm Museum; for one may see a Cetacean over and over again at sea, and obtain near and comparatively clear views of it, but, unless one has also the opportunity of examining specimens on shore, one's ideas of it are tolerably certain to remain somewhat hazy.

By the opportunities above mentioned, and especially on the following day (the 10th), between Kjeö and Lödingen, between Græsholmen and Harstad, and near Havnvig, we had unusually good views, including plenty of jumping, and we quite satisfied ourselves that in each case where we could see clearly, the Dolphins were *D. albirostris*, and all apparently were the same species.

At Bugten (Capt. Grön's), in Busse Sund, was lying the krang of a Killer (no doubt *Orca gladiator*) which had been taken by one of his whalers. Total length, 22 ft. 2 in. Fin said to have been barely 1 foot high. Nose to parietal ridge, 3 ft. 3 in. Breadth of nasal bones (1 inch behind last tooth in upper jaw, and immediately in front of orbital process), 1 ft. 2½ in. Greatest width of skull (zygomatic arches), about 2 ft. 6 in. Length of flipper, about 3 ft. 1 in.; breadth of ditto, 1 ft. 7½ in. Span of flukes, 5 ft. 5½ in. (probably rather more when

fresh). Notch between flukes fully $2\frac{1}{2}$ in. deep. Width of flukes, at eight inches from central line of vertebral column, 1 ft. 7 in.

Capt. I. Bryde told me that on one occasion (two or three years ago), when towing a Blue Whale to his factory in Busse Sund, he fell in with a small school of these marine wolves, and by the time he reached the sound they had pretty well stripped the blubber, and even the flesh, off the whale.

The last live whales that I saw were three Blue Whales going south into Varanger Fjord, about opposite Ekkerö, on August 20th.

The dead whales included several Common Rorquals, of one of which I took the following notes at Evensen's Factory at Vardö, on August 21st:—

Male, 71 English feet long. Left upper and lower lip jet-black. Right lips enamel- or milk-white. The colour of the inside of the lower jaw on each side, the contrary to the outside. The right side was already flensed, but the white certainly extended much further round to the side than on the left side. Black above. Whole under side, except left side of chin and last twelve feet of tail, white; the black on the keel being grey-black, and shading off somewhat gradually. The small, or tail about one foot from flukes, only measured about fifteen or sixteen inches transversely. The ridges on the under side white, the furrows nearly all black.

On the 20th passed Capt. Hoff on the Hvalen, in Varanger Fjord, towing a very light-coloured Common Rorqual and a small black-bellied Humpback. Another Humpback (a male) on the same day, in Busse Sund (Capt. Grön's), was white-bellied, and nearly the whole of outside of flipper was white; a patch of black, about a foot wide, near the middle of the under side. A female Rudolphi's Rorqual, also lying there, was blue on the under side, with hardly any white.

In the list on the next page the changes in Companies, &c., are marked by *italics*.

THE BEARDED TITMOUSE.

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

THE Bearded Titmouse, *Panurus biarmicus* (Linn.), was first discovered by Sir Thomas Browne, the learned physician of Norwich, in Charles the Second's time, but not until after he had written his 'Account of Norfolk Birds,' in which no mention of it occurs. Subsequently, in a communication to John Ray, he described it from an example which had been shot in an osier-car, probably on the Norwich river. Norfolk is now its last home, including the north of Suffolk, and these are the only two counties in which it still breeds, the Broad district, where alone it may be found, extending over an area of little more than twenty miles.

So scarce, however, has this bird become that I am sorry to say I have been on Norfolk Broads scores of times without seeing one, and this is the experience also of others besides myself. The marshmen would have strangers believe that this scarcity is owing to hard winters, but their own cupidity is really the chief cause of the decrease, for they know full well the market value of the eggs. The truth is, as Messrs. Lubbock, Stevenson, and Booth have pointed out, the Bearded Tit is a much hardier bird than its frail appearance would lead one to expect.

At Hickling Broad there is not one where ten years ago there used to be twenty. Joshua Nudd, a weighty authority in such matters, estimated the number this year (1889) on Hickling Broad and Heigham Sounds at two pairs, and four pairs on Horsey Broad adjoining, a sad contrast to the time when they were so plentiful that in one morning's search he could find forty fresh eggs; but then Nudd could not resist taking them, thus practically killing the geese which laid these golden eggs. For years there has been a trade in them, the recognised price being fourpence apiece, and this is enough to tempt a Norfolk marshman to leave his legitimate occupation of mowing sedge at 10s. a week and take to "egging."

There is a partial remedy for this state of things, though there are some objections to it: if the proprietors of the Broads would allow the reeds to grow instead of cutting them, we should

have high and thick covert which would be an asylum that would defy the dealers, and where many a nest would escape detection. Reeds are worth £6 a load, but the expenses of cutting them are considerable, and there is much less thatching now in Norfolk with reeds than used formerly to be the case.

Since the drainage of Salthouse Broad the Bearded Tit has ceased to nest anywhere on the Norfolk coast, and it is possible that the examples obtained of recent years at Cley by Dr. Power, and at Burnham by Mr. Richford, and by others at Blakeney and Morston, were migrants which had crossed the German Ocean. Lord Leicester informs me that within his recollection they used to breed at Holkham, adjoining Burnham, but they have long ceased to do so. I am sure examples may still be met with occasionally by the coast if sought for, but there will never be sufficient numbers to compensate for the losses sustained on our inland waters.

In regard to habits, I must confess that, notwithstanding a somewhat extensive acquaintance with this beautiful little bird, I am able to add but little to what has been already written about it. On looking over my entries of the dates of nesting I quite agree with the late Mr. Stevenson that this bird is an early breeder. I once saw young ones as big as their parents in the middle of June, and at the same time an incomplete clutch of fresh eggs, which makes me think they may sometimes breed three times in a season, the first clutch being generally hatched in April. But, to prevent misconception, I should observe that the dates referred to are dates of nests *found*, not *taken*, for I have never taken one myself, nor have I ever shot a bird.

A more beautiful object than a male Bearded Tit clinging to a reed-stem it is difficult to imagine. Except in the vicinity of their nests they are decidedly shy; it is only then, as a rule, that they flit across open spaces, and sometimes unfortunately, in their anxiety for their eggs, they betray their whereabouts. They are very unsuspecting when they have young, going straight to the nest in the presence of spectators, but having instinct enough to approach by creeping instead of flying; and a similar habit has been observed in the Coal Titmouse. I have been surprised sometimes, when walking with Joshua Nudd, to notice how often he heard the note when neither of us could see the bird; long experience in looking for them had sharpened his

ear. If there is any wind they do not show themselves; a very little is enough to wave the tops of the reeds and keep them at the bottom; it is also difficult to hear their notes unless it be a still day, for they are not loud at any time, although described by many persons as shrill. One who has kept them in confinement syllables the ordinary call-note thus: "tjunk, kjunk, tjink, tjink." Another circumstance which renders them difficult to see is their protective tawny colour, so like the old brown reeds of the preceding year. Their long tails have earned them the local appellation of "Reed Pheasant," another local name being "Maish [*i. e.*, Marsh] Pheasant." Occasionally the natives of Hickling and the neighbourhood allude to them as "Maish Tits," but I do not attach much importance to local names, except in particular cases.

The flight of the Bearded Tit may be described as somewhat laboured and slow; it flits rather than flies, and never seems to rise into the air. The head is held high, and the tail, which certainly must incommode the bird, has the appearance of being partly spread. There is nothing in this to distinguish these birds from our woodland Titmice, from which they are by no means so dissimilar as some writers would have us believe.

The Rev. Richard Lubbock has remarked that in cold weather they sometimes nestle closely together upon the same reed, in the same manner as does the Long-tailed Titmouse; and a fenman brought him as many as six, which had been killed at one shot just before dark, when they were thus huddled together ('Fauna of Norfolk,' 2nd ed. p. 56).

The nest is generally placed about a foot above the level ground, and never in any way suspended, the tallest and oldest reeds being generally selected for its support, but a nest may occasionally be found in a cluster of sweet gale (*Myrica gale*), *Carex*, and alder. The nest is made of the brown leaves of *Arundo phragmitis*, and always lined with its feathery top; I think I have seen sweet gale interwoven in the fabric also. The inside diameter is about 2·8 in., and the eggs are not incommoded by a bit of reed sticking through the bottom. Yarrell alludes (vol. i. p. 516) to the nest being placed in a tuft of grass or nettles, but nettles do not grow on our Broads, and a tuft of grass, unless it was very rank marsh-grass, is not a likely place in which to find a nest. No one can think

Yarrell's woodcut of either nest or bird very good ; the bird is depicted with a double moustache, and the head erroneously appears to be of the same colour as the back. The outline, however, is good, and I have somewhere read that it was sketched from life by the late Mr. Blyth.

The eggs are generally six in number, though I have found seven, white, with irregular specks and short wavy lines of brown, with a pink or golden tinge about them when perfectly fresh, but showing a dark zone when incubated, owing to the shell becoming opaque. Joshua Nudd once found two nests on the Broads, one on the top of the other, each containing seven eggs. On another occasion he found twelve eggs in a nest, but in this case two birds claimed ownership, as he suspected, from seeing two hens close to the nest. I have seen the cock bird fly off the nest, though the fact of its taking any part in incubation is doubted by a good authority.

The plumage is almost too well known to ornithologists to require description. All the hen birds which have passed through my hands have had some trace of the black markings on the back, but Messrs. Sharpe and Dresser state ('Birds of Europe,' vol. iii., p. 60) that it is ultimately lost. One partly in male plumage, and with a trace of the black moustache, lived and laid eggs in the aviary of Mr. Keulemans, and it is just possible that some such specimen may have suggested the remarks of the authors just mentioned. For a long time after quitting the nest the young have black backs, and this is visible a long way off when flying ; the back is also quite black when they are in the nest, the immature plumage in this respect being very distinct from that of the adult.*

The nestling when just hatched is blind, and even when only one day old has a brilliantly coloured mouth, which brilliancy consists of four rows of black and white spots raised on the surface of the palate, which is red. How long the young present this remarkable appearance I do not know, but it is not lost until after they have left the nest.

* In this plumage the young bird looks so different to the adult that it was once regarded by Bonaparte as specifically distinct, and described by him as *Calamophilus sibiricus* ('Comptes Rendus,' 1856, p. 414).—ED.

NOTES ON THE REPTILES OF BARBADOS.

BY COLONEL H. W. FEILDEN.

THE island of Barbados emerges from the Atlantic Ocean, some hundred miles to the eastward of the chain of the Lesser Antilles, being separated from the islands of St. Lucia and St. Vincent, its nearest neighbours, by an oceanic depression of not less than a thousand fathoms; to the southward, between Barbados and the continent of South America, similar depths are found, whilst to the eastward it rapidly descends into the profound abyss of the Atlantic. Geologically speaking, Barbados is a true oceanic island in the sense that it has not been connected with a continental area since the introduction of its present flora and fauna. A remarkable feature in the formation of Barbados is that no volcanic rock, so far as I am aware, protrudes through the basement series, which consist of sedimentary rocks, which are supposed to be either late Eocene or Miocene. Their exact age has not been satisfactorily determined, but they will in all probability be found to correlate with the rocks of Trinidad and the South American continent. Resting unconformably on these rocks are deep beds of true oceanic ooze, similar, we may suppose, to those which cover the floor of the Caribbean and Atlantic areas, and on these oceanic oozes the coral covering of the modern island of Barbados has been built. It is therefore impossible to escape from the conclusion that the older Eocene or Miocene rocks, which now form the basement series of the island, must have participated in the prodigious downthrow of the Caribbean area, to a depth of at least 1000 fathoms, in order to bring the floor of the ocean into harmony with its present depths. By no other train of reasoning can we account for the vast accumulations of oceanic ooze now resting on the oldest rocks of Barbados. When the process of upheaval which brought the modern island of Barbados into existence was sufficiently advanced, the reef-forming *Zoantharia* commenced building the coral-reefs, which, in the shape of coralline limestone, now forms a capping over six-sevenths of the island, down to the sea-level, beyond which the same process of reef-building is still proceeding. The only portion of the island not covered by coralline limestone is the north-east

section (Scotland District), where the coral-capping has been removed by subaërial denudation. The elevation of Barbados from the ocean, though intermittent, as shown by the numerous lines of old sea margins, rising one above the other, appears to have been progressive since the time when the structure of the coral polypes first emerged, and which at its highest point now stand at an elevation of over 1000 feet above present sea-level. If this outline of the geological structure of the island of Barbados be correct, its fauna ought to bear out the conclusions arrived at.

An examination of the Reptiles inhabiting the island of Barbados points to their recent introduction. They are by no means numerous, consisting, so far as I have discovered, of one species of Snake, four species of Lizards, a single species of Toad, and a Tree-frog. The Snake, *Liophis perfuscus*, Cope (P. Ac. Phil. 1862, p. 77), is the only puzzle, for, so far as we at present know, the species is restricted to Barbados, and the transport of a Snake by natural causes over a wide expanse of ocean offers considerable difficulties. The introduction and restriction of the venomous Fer-de-lance, *Craspedocephalus lanceolatus*, to the islands of Martinique and St. Lucia, its original habitat being, I understand, the South American continent, is equally remarkable. Two hundred and thirty years ago, when Ligon wrote his history of Barbados, *Liophis perfuscus* appears to have been extremely numerous, and though innocuous, very troublesome to the settlers; from its habit of crawling up through the windows of the dairies and drinking the milk, he mentions how they were obliged to build their milk-houses with projecting ridges to keep out these unwelcome intruders. At the present day, owing to the high state of cultivation, little harbour is left for Snakes, and in a space of twelve months I only succeeded in obtaining two adult specimens and two young. The introduction and great increase of the Mongoose must have assisted in the destruction of the Snake, and it may be predicted that before many years have elapsed, the species will be extirpated from the island. The young are almost black in colour, and very different to the adult, and hence has arisen the belief which I have heard in Barbados that two species of Snakes inhabited the island.

Of the four species of Lizards found in Barbados, the Gecko, or "Wood-slave," *Hemidactylus mabuia*, Mor., has an almost

world-wide distribution in the tropics, and its occurrence in Barbados may be easily accounted for, as it is known to be transported in ships. *Mabuia agilis*, local name "Scorpion," is rather rare in Barbados; it chiefly affects damp and rushy situations. I procured it from Graeme Hall Swamp and Chancery Lane; it occurs over the greater part of Tropical America, and its transport either by the agency of man, or by individuals, or eggs, on floating trees from the South American continent may be readily conceived. *Anolis alligator*, the pretty little Common Green Lizard of Barbados, is special to the Lesser Antilles. Naturalists have subdivided it into almost as many species or varieties as the islands it inhabits; lately Mr. S. Garman, an American naturalist, has given the Barbados form the specific name of *Anolis extremus* (Bull. Essex Inst. vol. xix. 1887). It must be remembered that no animals appear to have a greater aptitude, when cut off from the parent stock, in assuming specific variations than Lizards. The introduction of *Anolis alligator* into Barbados would probably be concurrent with the advent, from some other island of the Lesser Antilles, of the prehistoric men who first grounded their canoes on its shores, for this Lizard may be often seen sunning itself on boats hauled up on the beach, and individuals often take an involuntary cruise in the fishing-boats. *Centropyx intermedius*, Gray, the largest and handsomest Lizard in Barbados, where it is known by the name of "Guana," probably a corruption of Iguana, and not, as I have heard in Barbados, from its having been introduced by the guano-laden ships, has likewise received specific rank at the hand of Mr. Garman as *Centropyx copii*. Whether the difference between the Barbados form and the South American race is sufficiently distinct to entitle it to specific rank I would not venture to determine, but Mr. G. A. Boulenger, who has examined the specimens I brought from Barbados, informs me that there is not the slightest difference between them and the typical specimens of *Centropyx intermedius*, Gray. It is very remarkable, as I am likewise informed by Mr. Boulenger, that the large series of *Centropyx intermedius* in the British Museum from South America consists only of females, and the specimens I brought from Barbados are of the same sex. Apparently the male is undescribed, and I take this opportunity of suggesting to some of my kind friends in Barbados that a series of males, preserved

in strong spirits, would be an acceptable donation to our National Institution. The species is quite common at Chancery Lane, though I was informed that the Mongoose had taken to devouring it. Sir R. Schomburgk, in his 'History of Barbados' (p. 679), gives a list of ten species of Lizards as occurring in Barbados; he simply enumerates a certain number of species, without giving any particulars. I am afraid that little or no reliance is to be placed upon this formal catalogue.

The little Tree-frog, *Hylodes martinicensis*, Tschudi, is undoubtedly a very recent introduction; twenty years ago, as I am credibly informed, it was quite unknown. It is now spread over the entire island, and until the ear gets accustomed or deadened to it, the monotonous incessant chirping of this Frog throughout the night, during rainy weather, is enough to drive a person distracted. This Frog is found in Martinique, St. Kitts, Saba, Dominica, and Porto Rico, and doubtless in many others of the islands. Its transport to Barbados, along with plants, or by the direct agency of man, was to be expected.

There can be no question that the Toad in Barbados, *Bufo marinus*, L., vel *B. aqua*, Daud., is an importation of recent years. Schomburgk, writing in 1848, notes:—"I have been assured that this species, which is so common in Demerara, was introduced from thence about fifteen years ago. It has increased most rapidly, and is now to be met with in as large numbers as in Demerara." There is certainly no falling off in the stock at the present time, as this Toad is ubiquitous throughout the island and countless. It is found in the islands of Grenada, St. Lucia, St. Kitts, Martinique, Montserrat, Jamaica, and Nevis, into all of which islands it has probably been introduced either by accident or on purpose, for it is said to be an exterminator of mice and to keep off rats.

I have already recorded in this magazine (1888, p. 236) the interesting fact of an Alligator being transported alive on the trunk of a tree from the continent of South America to Barbados in 1886. I do not refer to the marine reptiles which frequent the shores of Barbados, because their visits do not possess the same zoo-geographical interest as the question of the introduction of the terrestrial ones.

THE MANATEE AT THE ZOOLOGICAL GARDENS.

BY PROCTER S. HUTCHINSON, M.R.C.S.

ONE of the recent acquisitions of the Zoological Society is the curious Manatee. This animal, which comes from Demerara, may be seen in a warm-water tank in the Reptile House of the Gardens. It is the South-American species, *Manatus americanus*, of which one specimen has been in the Gardens before, but unfortunately died in about a month, probably from the water being insufficiently warmed.

The Manatees belong to the Order Sirenia, or Sea-Cows; besides this species there are two others, the Floridan, *M. latirostris*, and the African, *M. senegalensis*. The Halicore, or Dugong, having tusk-like incisors and no nails on the flippers, and Steller's Sea-Cow, *Rhytina Stelleri*, entirely without teeth, belong to other genera of the same Order: the latter animal, which inhabited Behring's Straits up to the end of the last century, but is now believed to be extinct, was twice as large as a Dugong or Manatee, but of similar habits.

The Manatee, like the Whale, is not, as many erroneously suppose, a fish, but a mammal, suckling its young and having warm blood. It agrees with whales in the absence of mid-limbs and the possession of a horizontal tail-fin, but differs in the conformation of its nostrils, which are never used as blow-holes, though they can be opened and closed at will by means of a valve. We might apply to it what Trinculo says of Caliban:—

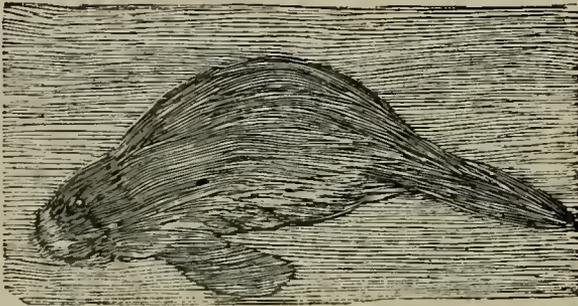
“What have we here? a man or a fish? . . . Warm, o' my troth!

I do now let loose my opinion; hold it no longer. This is no fish, but an islander.”

It has a rounded head, very small eyes, no external ears, a pair of anterior flippers, which it can move in all directions, with small nails on them; no hind limbs, and a broad flat tail, horizontal, not vertical like fishes. The lips are covered with stiff bristles, but the skin is thick and almost hairless. There are several skeletons of Manatees both in the College of Surgeons and the British Museum, and at the latter place a fine skeleton for comparison of *Rhytina*. From these it will be seen that their bones are very thick, and that they have the great peculiarity of only six cervical vertebræ instead of seven, a feature only

present in one other mammal, namely, Hoffmann's Sloth: this does not apply to the Dugongs or to *Rhytina*.

It was noticed that the Manatee formerly in the Zoological Gardens was unable to move when its tank was dry, from which it may be inferred that its habits are entirely aquatic, and that it cannot progress upon land. It inhabits the shores and rivers of Eastern South America and Western Africa, feeding exclusively on water-weeds. The animal now in the Gardens is fed on lettuces. In its motion through the water there are none of the lateral movements characteristic of Seals; the flexions of the body are vertical. It puts the tips of its flippers into its mouth somewhat like a cat licking its paws.



The Manatee is said to have been trained to come to a call, for though having no external ears there is a small outer opening for the ear, with a drum and ossicles, differing essentially from fish, which have only internal ears and no drum, and not receiving definite sounds. It is hunted by the Indians of South America for food, the flesh being highly prized, and described as resembling pork; it also furnishes a clear oil, which does not become rancid. Above is a sketch of the animal now in the Gardens; it is a young one, and has yet to grow considerably.

It will be noticed that there is no trace of hind limbs externally, and in the skeleton only two small girdle bones represent them. Like the Whale, it has to come to the surface of the water from time to time to breathe; in the tank at the Gardens it comes up every two and half minutes.

The South American Manatee which lived for some time in the Westminster Aquarium was described in 'The Zoologist' of 1878 (p. 285), from which some facts in the above account have been taken. To this the reader may be referred for a description of the very singular mode of feeding in this animal, effected by

the action of lateral lip-pads, the jaws moving horizontally instead of vertically. This indeed is the most curious point to be noted in the anatomy of the Manatee, and is well worthy of observation by naturalists while the opportunity is still afforded of seeing a living specimen. The annexed figure of the animal's mouth, viewed from the front, was drawn while it was opening its lips to enclose pieces of lettuce.



ON THE SURVIVAL OF *NOTORNIS MANELLI* IN WESTERN OTAGO.*

BY JAMES PARK, F.G.S.

UP to the present time only three specimens of this remarkable bird have been secured, and, as the opinion has been expressed by some naturalists that it is now quite extinct, I have prepared the following notes, collected during the progress of various explorations in Otago, as tending to show that it not only exists, but is probably as numerous now as when the colony was first settled by Europeans.

I may mention at the outset that the genus *Notornis* was founded by Professor Owen in the year 1848, upon portions of a skull and other parts of the skeleton of a large Rail discovered at Waingongoro by the Hon. Walter Mantell, while exploring at that place for Moa-bones. These fossils are all that now remain to testify the existence of the *Notornis* in the North Island, where it was known to the natives as the Moho.

By a strange, and at the same time most fitting, coincidence, the first two specimens of the *Notornis*, or Takahe as it was called in the South Island, were secured by Mr. Mantell in 1849. The first of these was captured by a party of sealers at Duck Cove, Resolution Island, in Dusky Sound; and the second by the Maoris on Secretary Island, opposite to Deas Cove, in Thompson Sound. Both of these were forwarded to England, and are now in the British Museum in London.

After a lapse of over thirty years the third specimen was

* From the 'Transactions of the New Zealand Institute,' vol. xxi. (May, 1889), pp. 226—230.

captured by a party of rabbiters about the beginning of 1880, on the Maruroa Flat, on the east side of Lake Te Anau. This bird was also sent to England, and at the present time probably adorns the shelf of some foreign museum. Since the above date no fresh example of the *Notornis* has been secured, although much time has been spent in the search around Lake Te Anau.

My first acquaintance with this bird dates back to 1881. During the months of January and February of that year I was engaged, with Mr. A. McKay and Mr. John Buchanan, on a geological and botanical exploration of the Wanaka country. On the 20th of January we struck our camps at the forks of the Matukituki, opposite Mount Aspiring, and proceeded up the south branch of that river to Cascade Creek, a distance of eight or ten miles. Here we pitched our tents, at an altitude of 2000 feet above the sea, in the shelter of the *Fagus* bush which covers all the slopes of the surrounding mountains and the greater portion of the river-flats.

Shortly after dusk our attention was attracted by the call of a strange bird which approached within a few chains of our camp, uttering at short intervals a loud booming note. Now, we were all pretty familiar with the calls of the different birds usually met with in the high lands of Otago, but the call of this bird was quite unlike any of them. We knew also the booming note of the Bittern, which, although like this in kind, was left far behind both in volume and intensity. Besides, this was a high, mountainous, bush-covered country, ill adapted for this bird, which usually frequents raupo-swamps and creek-banks. After some deliberation we arrived at the conclusion that this was the *Notornis*, a determination subsequently borne out by facts which came under my own observation.

The next evening, with Mr. McKay's assistance, I lit a large bright fire in the bush, about four chains from the camp, knowing from experience that birds of nocturnal habits were often attracted by the light of a camp-fire. Retiring a short distance from the fire, we awaited the result. As we anticipated, in less than half an hour our friend of the previous evening approached, uttering his booming note as he walked about. We now crawled towards the fire, making as little noise as possible in passing over the dry twigs and leaves lying upon the ground. When we

drew near, the bird retreated from the opposite side of the fire, and when we withdrew it again approached. This manœuvre was repeated several times without any success on our part; but at the same time it should be mentioned that the bird, by its movements, exhibited no signs of haste or alarm.

On several occasions we were probably within four yards of it, and at these times when it uttered its note we could distinctly feel the ground vibrate beneath us. We, however, failed to catch a glimpse of it, as in the intense darkness of the forest this was quite impossible, excepting it chanced to get between us and the fire, which it carefully avoided doing.

The next day I examined the scene of the previous night's adventures, and found that the clear space below the matted branches of the scrub under which the bird had eluded us was about twenty inches high, thus affording a means of approximately determining its height.

The *Notornis* remained in the vicinity of the camp during our stay at this place, being evidently more curious than alarmed at our presence. He generally sallied forth at dusk and retired at daybreak, his deep note completely dwarfing the cries of the Kiwi and noisy Kakapo.

On the 29th January we struck our tents and returned to our old camping-ground near the forks of the Matukituki. Shortly after dusk of this evening we heard the note of a *Notornis*, and, proceeding up the south branch to the upper end of the gorge, I disturbed the bird under a sand-bank close to the river. On examining this spot I found that it had scraped a shallow hole in the dry sand, after the same manner, and probably for the same purpose, as the common barn-door fowl.

The river-flats at this place, situated about 1700 feet above the sea, are covered with a scanty mixed bush, affording but little cover; the ground, however, is thickly strewn with large masses of rock which have fallen from the steep cliffs on the south side of the river, and below which the *Notornis* no doubt found shelter during the day-time.

The next evening I again proceeded to the upper end of the gorge, where the *Notornis* announced his arrival by his loud note. Knowing where to look for it, I approached the bank as cautiously as possible, but, just as I looked over, it scampered away as fast as it could run.

On this occasion I was fortunate enough to catch a passing view of it, although in the uncertain starlight I could only make out its general outline. It must be remembered that it was only in sight a few seconds; but the impression it left upon my mind at the time was that its colour was very dark, and its height about that of a full-grown Turkey. An important fact to be noted here is that, although I got within a few feet of it, the bird made no attempt to fly, but ran away very swiftly, and without making any sound or cry of alarm. There can be little doubt that with a sharp dog I could easily have caught it; but, unfortunately, we had no dog attached to our camp at this time.

Seven years now elapsed before the *Notornis* again came under my observation. At the beginning of this year I visited Dusky Sound for the purpose of examining the mineral deposits discovered there by Mr. William Docherty, the well-known prospector. On the day after my arrival—the 5th of January—I accompanied Docherty to his pyrrhotine lode on the lower slopes of Mount Hodge, situated about a mile from the beach. Shortly after commencing the steep ascent we heard the deep booming call of a bird, which I at once recognized as similar to that of the strange bird I had heard in the Matukituki Valley in 1881. After listening for a while I expressed my belief that this was the *Notornis*. Docherty, however, stoutly denied this, stating that he had often heard the same sound, which was what he called in his own words “a volcanic noise in the bowels of the earth.” Without stopping to argue the point, I pressed along, hoping to see the bird, which appeared to be somewhere on our path. The ascent at this point was very steep, our track being along the right bank of a precipitous rocky stream. In a few minutes we got so close to the bird that there could be no doubt whatever as to the organic origin, so to speak, of the sound, which seemed to proceed from the crop of the bird. I now told Docherty to keep quiet for a little, and he would soon see the cause of the booming, at which he became very excited, and shouted loudly that nothing would convince him it was not a “volcanic noise.” I need hardly state that we heard nothing more of this bird that day.

On returning to the hut in the evening my field-hand informed me that when he was fishing off the point close by he had heard a Takahe in the bush, in the direction in which I had been

during the day. On asking him what he knew of that bird, he said he was one of the party of rabbiters who caught the Takahe near Lake Te Anau in 1880 ; and, as he had often heard the call of that bird and its mate, which, by the way, was never captured, he was quite sure the booming note which he had heard during the day was that of a Takahe. In view of the determination I had previously arrived at, I considered this evidence conclusive that this was indeed the *Notornis*. I may mention that this was the first occasion on which I heard the *Notornis* spoken of as the Takahe, the only name by which it was known to my field-hand.

That same evening, and every successive evening afterwards during my stay at Dusky Sound, I heard two Takahas in the bush at no great distance from the hut. In the course of my various excursions in this sound I heard the Takahe at the following places, not including those already mentioned :—In the left-hand branch of Docherty's Creek, not far from the open country ; at the north end of Cooper's Island ; in a gully on the southern slopes of Mount Pender, apparently not far from the beach ; and on the south side of the sound, about opposite the upper end of Cooper's Island.

It will be remembered that the first specimen of *Notornis*, secured by Mr. Mantell, was captured at Duck Cove, Resolution Island, a distance of some seven miles from Cooper's Island ; and the second at Secretary Island, in Thompson's Sound, about thirty miles further up the coast. After a lapse of over thirty years a third specimen was captured in 1880, near Lake Te Anau ; and the following year it was heard in the Upper Matukituki Valley, behind Mount Aspiring, by myself and others of an exploring party ; and now, again, in the beginning of the present year, at Dusky Sound, by myself and others. When passing through Wellington some four months ago Docherty informed the Hon. Mr. Mantell that he had recently seen a *Notornis* at Dusky Sound. He said he came upon it in the bush close to the beach, and that it flew some distance on to the water, and then made back to the shore.

I think I have said enough to show that the *Notornis* still exists in the lonely sounds and mountain-recesses of Western Otago, in places far removed from the ordinary haunts of men. That it is gradually becoming extinct is no doubt quite true, but, whatever the cause, it can hardly be said to be on account of the

inroads of man. Its extinction is, possibly, partly due to scarcity of food, and partly to a process of natural decay which is no doubt in a measure induced by the effects of the first.

So recluse and retiring in its habits, it is probable that few if any further additions will be made to the three specimens of this bird already secured, unless special efforts be made in this direction; and, though this may entail a considerable expenditure of time and energy, the object is one deserving the support of every true naturalist.

NOTES AND QUERIES.

The late Surgeon Francis Day, C.I.E., F.L.S., F.Z.S. — On the 10th July, at Cheltenham, after a long and painful illness, there passed away a naturalist who has long been known as a leading authority in this country on all that relates to fish and fish-culture. To our readers doubtless Dr. Day's name will be chiefly familiar in connection with the latest work on British Fishes which he published in parts between 1880 and 1884, and his volume on British *Salmonidæ*, which appeared only two years ago (1887), to say nothing of the many papers which he contributed to the 'Proceedings of the Zoological Society,' 'Journal of the Linnean Society,' 'The Zoologist,' 'The Field,' and 'Land and Water,' as well as to the 'Transactions of the Cotswold Naturalists' Field Club and Cheltenham Natural Science Society,' of which he was President at the time of his decease. But it was as an authority on the Fishes of India, Burma, and Malabar that he first made his mark, and acquired a reputation which on his retirement from the Madras Army as Deputy Surgeon-General, led to his appointment as Inspector-General of Fisheries for India, a post which he held until 1877, and which gave rise to the publication of many valuable Reports. His standard work on the Fishes of Malabar appeared in quarto in 1865, although two years previously he had published his first book, which he called 'The Land of the Permauls; or Cochin, its past and its present.' It was not until 1878 that he was able to complete his great work on the Fishes of India, the publication of which had been commenced in 1875. This important work did for ichthyologists what Jerdon's 'Birds of India,' to some extent, did for ornithologists. It gave them a comprehensive view of the Fish Fauna of India, Burma and Ceylon, and supplied a vast amount of information on many species which were either previously undescribed or very imperfectly known. As a contribution to zoological science, however, it is much superior to Jerdon's work. The species are more skilfully diagnosed, the synonymy properly worked out,

and—most important of all—a large number of the species described are accurately figured. Beautiful as many of the drawings are, and carefully lithographed by Mintern Brothers, whose work in this respect it would be difficult to excel, it is to be regretted that the Government of India did not afford that financial support which would have admitted of the plates being coloured. This indeed would have been a boon, for everyone knows how gorgeous are the hues of tropical fishes, and how very evanescent these colours are. But we have much to be thankful for in the work as it stands, with the Supplement to it which appeared only last year.* Still more reason have we to be grateful that the author's life was spared long enough to enable him to furnish Dr. Blanford, as editor of the new 'Fauna of British India,' with the MS. of two volumes on the Fishes, one of which has just been published, in which we shall happily find the latest views of the most competent authority on Indian Ichthyology. During the last few years of his life much of his time was spent at Howietown with Sir James R. G. Maitland, whose successful efforts there to establish a fish-farm and school for fish-culture were considerably aided, we may assume, by the knowledge and practical advice which Dr. Day was well able to bestow, until failing health caused him to return to his home at Cheltenham. Foreseeing that the end was near, Dr. Day resigned himself with calmness to the inevitable, and with that liberality which always characterized him through life, he made valuable presents of books from his library (including bound volumes of his collected papers) to the Linnean and Zoological Societies, of which he was a Fellow, and a series of fishes from his large collections to the Natural History Museum, in furtherance of the science which he had made a lifelong hobby. His death will be a loss not only to ichthyologists in all parts of the world with whom he was in correspondence, but to many a poor fisherman in this country in whom he took interest, and to whom when occasion offered, he delighted to do "a good turn." A certain brusqueness of manner sometimes caused him to be misunderstood by those who did not know him well, and a warm temperament led to his resenting such misunderstandings, instead of trying, as others might have done, to remove them. Nevertheless, beneath this brusque exterior there was a kind heart and a genuineness of purpose which one could not but admire. If his teaching, ichthyologically speaking, was not always couched in the clearest language, at least one felt sure that his statements might be relied upon, so anxiously did he strive to be accurate in what he wrote. His acquaintance with the literature of his subject, combined with long practical experience, enabled him not only to correct the mistakes of other authors, but to make very important additions to the Natural History of

* We understand that the entire stock of this work, with the Supplement, is now in the hands of Mr. Wheldon, 58, Great Queen Street.

Fishes, both indigeuous and exotic, supplying information when it was most needed in volumes which must for a long time to come remain standard works of reference.

MAMMALIA.

Distribution of Daubenton's Bat in Britain.—To the summary of records of this species given in 'The Zoologist' for May last (pp. 161, 162), one or two other instances of its occurrence might be added, so that this volume may contain about as much as is known on the subject. There is a specimen from Devonshire in the British Museum (*vide* Dobson's Catalogue of the *Chiroptera*). It doubtless occurs on the Isis between Oxfordshire and Berkshire, for in some notes by the late Mr. H. Norton in the 'Midland Naturalist' for 1883, the Whiskered Bat is described as flying low over the water there in large numbers—a description which can only apply to this species, the author being well acquainted with the Pipistrelle and Noctule. Mr. W. Jeffery, of Ratham, has shown me a specimen of this bat which was taken in Surrey, and there is perhaps no harm in referring to records so recent as those for Leicestershire (Zool. 1885, p. 216), Lincolnshire (Zool. 1887, p. 143), and Merioneth (*tom. cit.* p. 346). I have a specimen taken at Hereford last year. Garner records it for Staffordshire, Sir Oswald Mosley for Derbyshire (Nat. Hist. Tutbury), and Mr. Jenkinson for Worcestershire (Zool. 1857, p. 5661). Lastly, in 'Science Gossip' for 1885, is an account of a specimen taken in Renfrewshire, which devoured tinned fish in captivity.—J. E. KELSALL (Fareham, Hants).

Distribution of Natterer's Bat in Britain.—It may be convenient to collect here some records of this bat which were overlooked in the preparation of the list given in the last number of 'The Zoologist' (pp. 242—248). Its occurrence in Devonshire was noted in 'The Field' for 1874 in Mr. Newman's "Collected Observations on British Bats," and at Sawtry, in Huntingdonshire, in 'The Zoologist' for 1843. The specimen procured at Godstow (Berks), referred to on p. 246, is in the Oxford University Museum, and was formerly labelled as *V. Bechsteinii* (Zool. 1884, p. 483). This mistake was excusable on the part of its captor, the late Mr. H. Norton (who was not book-learned on the subject, though a keen observer), for he would have found the rarer species described in Bell's 'British Quadrupeds,' and its characteristics are mostly those of *V. Nattereri* somewhat exaggerated. The same observer should have the credit of finding Natterer's Bat at Begbroke Church, Oxfordshire. He described it under some fantastic name as occurring there, and there is a drawing of it in his MS. notes, which were kindly shown to me by Mr. A. H. Macpherson, and are now in the hands of Prof. Westwood, of Oxford. I visited this church on May 28th, 1885, and found a specimen of Natterer's Bat dead in the belfry, and heard others squeaking in a hole out of reach. He wrote that they "issued from

the church and spread themselves into the adjoining trees," and that they were so delicate as generally to be killed by the stroke of his butterfly-net, so that he only procured one alive; but perhaps these were only the young. Mr. F. Bond has written me word of its occurrence in Gloucestershire. The Kildare (Tankardstown) record is a mistake; see Dublin Nat. Hist. Review, vol. vi. 1859. The bats taken there proved to be *V. Daubentonii*, which (as the Editor remarks on p. 162) is our most aquatic species, not the *Barbastelle* (p. 242, note).—J. E. KELSALL (Fareham, Hants).

[Mr. Kelsall is right. For "*Barbastelle*" (p. 242, note), read "*Daubenton's Bat*," whose aquatic habits were commented on in the article on the latter species (pp. 162, 163). When noticing the occurrence of *Natterer's Bat* in Hampshire (p. 246) we unintentionally omitted to state that Mr. Edward Hart had found it to be not uncommon at Christchurch, whence some months ago he was good enough to forward a living example, from which Mr. Lodge's figure of the species was drawn for our last number (Pl. III). Mr. H. A. Macpherson reminds us that Cumberland need not have been omitted from the list of counties in which this bat has been found, inasmuch as its occurrence there has been recorded by him in the 'Transactions of the Cumberland and Westmoreland Nat. Hist. Assoc.' for 1887 (p. 43). It is there stated that early in August, 1886, a colony of *Natterer's Bat* was discovered by Mr. A. Smith in an outhouse at the Gasworks at Castletown, a few miles from Carlisle, whence three living specimens were forwarded to Mr. Macpherson, one of which escaping in a room afforded him an opportunity of making some observations on its powers of flight, which he described as graceful and buoyant. Mr. Duckworth afterwards saw one which had strayed into a room at Castletown, and was probably one of those previously evicted from the outhouse already referred to, whence others were subsequently procured.—ED.]

BIRDS.

Stock Dove nesting in Co. Antrim.—On April 30th last I discovered the nest of a Wild Pigeon in a secluded part of Lord Massereene's demesne not very far from the town of Antrim. The nest, which consisted of a few twigs, and fronds of the oak polypod fern, was placed on the earth in a hole in the fringe of a water-worn bank. It contained two fresh eggs, much smaller and more oval in shape than the eggs of the Ring Dove, *Columba palumbus*. I concluded they were the eggs of the Stock Dove, *C. ænas*, and, as this bird is of very rare occurrence in Ireland, I drew attention to the matter in one of our local papers. In reply I received a letter from Mr. R. Lloyd Patterson, Secretary of the Belfast Naturalists' Field Club, suggesting that I should forward the eggs for identification to London. This was accordingly done, and one of the eggs in question was, I understand, submitted by him to you and to Mr. Grant, of the Natural History

Museum, with the result that both referees expressed themselves satisfied that it was an undoubted egg of the Stock Dove.—J. GORDON HOLMES (Vicar of Antrim).

[The egg referred to was forwarded by Mr. R. Lloyd Patterson, and from its size and shape, as well as from the description of the nesting-place, we have no doubt it was that of a Stock Dove. This is not the first time that this bird has been ascertained to breed in Ireland. The late Lord Clermont found a pair nesting in a crevice of a rocky hillside between Louth and Armagh, and it has also been found breeding in the Co. Down. See 'Zoologist,' 1877, p. 383.—ED.]

The Extinct Starling of Reunion (*Fregilupus varius*).—Time alone can prove whether we are right in calling the *Fregilupus* an extinct species, for many people have imagined that the bird still exists in the interior forests of the Island of Réunion; but as year after year passes by, and no specimens are discovered, we fear that we must class the Starling of Réunion, along with the Dodo and other birds of the Mascarene Islands, as having been exterminated by the hand of man. The earliest mention of the *Fregilupus* is believed to be that of Flacourt, who, in an account of a voyage to Madagascar, speaks of a bird called the "Tivouch," found in Madagascar, Bourbon, and the Cape, and described as being "black and grey, with a fine crest." The species was for a long time supposed to inhabit the Cape, and Montbeillard calls it the "Huppe noire et blanche du Cap de Bonne Espérance." Its crested head and curved bill were evidently the cause of the bird being called a Hoopoe, as was done by most of the older writers, until Levaillant in 1806 put it down as a *Merops* or Bee-eater. The latter author knew of eight specimens at least, two in the Paris Museum, one in the possession of each of the following persons,—MM. Gigot Dorey, Mauduit, l'Abbé Aubry, M. Poissonier, one in the collection of M. Raye at Amsterdam, and one in Levaillant's own collection. The fate of most of these specimens is unknown at the present day; they have doubtless decayed or been destroyed, as the mode of preservation of animals at the beginning of the century was by no means perfect. In 1833 a very fine specimen was sent by Mr. Nivoy to the Paris Museum, where lately we saw it, along with a more ancient individual, doubtless one of the two known to Levaillant. The same Museum also possesses two specimens in spirit. The only representative of the genus *Fregilupus* in this country has hitherto been a skeleton in Prof. Newton's possession. This individual was shot in 1833 by the late Jules Verreaux, who gave it to Prof. Newton. We are happy to announce, however, that the Trustees of the British Museum have recently acquired a very fine example of this extinct Starling, one too which, curiously enough, was not known to Dr. Hartlaub when he gave in 1877 the list of specimens supposed to exist in Museums. The bird now in the Natural History

Museum has been acquired from the well-known Riocour collection at Vitry-la-Ville. This famous collection, the work of three generations of the Counts de Riocour, consisted of a series of excellently mounted specimens, forming a choice little Museum which it would be hard to excel. The grandfather of the present Count was the founder of the collection, and was an intimate friend of Vieillot and the old French naturalists at the beginning of the century. Nearly all the specimens of that age are named by Vieillot, several of whose types are in the Riocour collection; and Dr. Günther has been successful in securing these also for the cabinets of the British Museum. A more interesting link with the past than this collection of the Counts de Riocour can scarcely be imagined, and we are glad to know that in the hands of Mr. Boucard, who is now the owner of the collection, it will receive the kindly consideration which such a famous Museum deserves. Writing in 1877, Dr. Hartlaub, in his 'Vogel von Madagascar's,' gives a list of the specimens of *Fregilupus* known to him, as follows:—Four in the Paris Museum (two stuffed and two in spirits); one in the Caen Museum; one at Leyden (old and bad); one in the Stockholm Museum: one in the Museum at Florence; one in the Pisa Museum; one in the Genoa Museum; one in the Turin Museum; and one in the collection of Baron de Selys-Longchamps. Sir Edward Newton likewise knew of two specimens in the Museum at Port Louis in Mauritius, and there is also the skeleton in Prof. Newton's possession; so that, with the one recently added to the British Museum, there are probably sixteen specimens in existence. The Italian Museums received their specimens from the same source, *viz.*, from Prof. Savi at Pisa; and some of those in other Museums are from the same source. Count Salvadori has published a very interesting article on the *Fregilupus*, in which he informs us that Savi received several specimens from a Corsican priest named Lombardi, and that these specimens were given away by Savi in the most generous spirit, as he appears to have retained only a single specimen for the Pisa Museum. Like other insular forms, the *Fregilupus* seems to have courted extermination by its very tameness and ignorance of danger. The late Mr. Pollen stated, in 1868, that the species had become so rare in Réunion that when he visited the island not one had been heard of for ten years, though it was still believed to survive in the forests of the interior. The old people who remembered when the birds were still common told him that they were so stupid and fearless that they could 'easily be knocked down with sticks. The extinct *Necropsar rodericanus*, Sclater, was the representative of *Fregilupus* in Rodriguez (*cf.* Günther and E. Newton, Phil. Trans., vol. clxviii. p. 427), and its nearest living ally of the *Fregilupus* is probably *Falculia* of Madagascar, but there is also considerable affinity to *Basileornis* of Celebes and Ceram. An excellent account of the osteology of the genus was given by Dr. Murie in the

'Proceedings of the Zoological Society' for 1873.—R. BOWDLER SHARPE (in 'Nature').

Thrush's Nests without the usual Lining.—On April 7th last I found two nests of the Song Thrush, both containing eggs, and neither of them having any of the usual lining of rotten wood or mud. They were exactly like the nest of the Blackbird. Some years ago I found a similar nest of the Thrush. The only mention I can find of such nests is in 'The Zoologist' for 1887 (p. 268), where Mr. Whitaker records having found three similar nests.—E. W. H. BLAGG (Cheadle, Staffordshire).

Jackdaws nesting on open Boughs.—Mr. Blagg's query (p. 231) as to whether Jackdaws actually build their nests on open boughs, is one which I have for a long time been puzzled with. When on a visit in Leicestershire, in 1882, I was surprised to see that two or three pairs of Jackdaws had taken possession of some nests in the middle of a small rookery, and I was unable to decide whether these nests had been built by the Jackdaws or only appropriated by them. I hardly think they will independently build their nests on open tree-boughs [but see editorial note, p. 231.—ED.], and in the case just cited I came to the conclusion that the scarcity of their favourite nesting-resorts was the cause. If I mistake not Mr. Blagg's country is rather hilly.—C. E. STOTT (Lostock, Bolton).

Stone Curlew breeding in Notts.—I am glad to say that there have been two pairs of these birds nesting this summer within a few fields of my house; and though one nest was accidentally destroyed by the plough, I feel sure the other pair got safely off with their young.—J. WHITAKER (Rainworth, Notts).

Little Bittern in Sussex.—A female specimen of *Ardetta minuta* was brought to Mr. Bristow, taxidermist at St. Leonard's-on-Sea, for preservation, about the second week in May. It was shot near the Lifeboat House, in the Guildford Level, near Rye Harbour. Mr. Dresser, in his 'Birds of Europe,' makes no mention of its ever having been obtained in Sussex; but Yarrell (4th edition) includes this county amongst others in which it has been met with.—THOMAS PARKIN (Fairseat, High Wickham, Hastings).

Goldeneyes at Rainworth, Notts.—One Sunday, in February last, on looking out of my window, I was delighted to see, within twenty yards of the house, a pair of Goldeneyes on the water here. I had the pleasure of watching them for more than half an hour, during which time they were constantly diving, and seemed by their actions to be obtaining plenty of food. On going out a short time afterwards, they rose and flew away to the west. From what I could see they were both in immature plumage.—J. WHITAKER (Rainworth, Notts).

Nesting of the Lesser Black-backed Gull.—Owing to absence from England I have only recently read Mr. Willis Bund's article (p. 131) on

“A Nesting-place of *Larus fuscus*.” Last year I visited the breeding-quarters of the Lesser Black-backed Gull at a spot situate on the N.W. coast of England, and very similar in position and character to that described by your correspondent. The place in question is an extensive peat moss, about two miles from the coast, and inhabited by large numbers of Hares, Red Grouse, and a few pairs of Curlews. The Lesser Black-backed Gulls numbered about a hundred pairs; their nests were formed of rough grass, and usually placed under bunches of heather: at the time of my visit, the end of May, they all contained the full complement of three eggs,—brown in ground colour, spotted and streaked with black. Probably owing to their being unmolested, very little variation was observed in their colouring, and in this respect they presented a great difference to the eggs of *Larus fuscus* on the Farne Islands, which show an endless diversity of ground colour and markings. I may add that the moss referred to above, like that mentioned by Mr. Willis Bund, is in the track of tourists, but is strictly preserved, and therefore fairly secure from molestation.—T. H. NELSON (Redcar).

Wood Sandpiper in Suffolk in June.—On June 12th I put up a Wood Sandpiper from a marsh at Aldeburgh, Suffolk, about half a mile from the railway-station. Two days afterwards I saw a flock of five at the same place, and had a good view of them through a glass. Having in former years shot this bird several times at Aldeburgh, I recognized the note and appearance on the wing at once. — JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Scops Owl in Co. Wexford.—A specimen of the Scops Owl, *Scops giu*, was obtained at Foulk’s Mills, Co. Wexford, on May 31st last, by Mr. F. R. Leigh, who has presented it to the Irish collection in the Science and Art Museum, Dublin.—EDWARD WILLIAMS (2, Dame St., Dublin).

Plumage of the Crossbill.—I am surprised to hear that the Curator of the Newcastle Museum still pins his faith to the obsolete heresy that the *adult* dress of *Loxia curvirostra* is of necessity a yellow dress. My own views on the subject may be right or wrong; but they were formed after an examination of a number of specimens, at a time when I was specially studying the *Fringillidæ*. At that time I referred to every authority I could lay hands on; and nothing pleased me better than a paper contributed to ‘The Intellectual Observer’ by the late Mr. Wheelwright, whose long residence in Sweden and Lapland had enabled him to acquire a large series of skins of this species. But Mr. Howse has only to refer to the second volume of the fourth edition of Yarrell (p. 202) to find that Prof. Newton, with every desire to give due weight to Mr. Hancock’s opinion, has there stated that the view that the yellow dress is the normally adult dress of the Common Crossbill must be set aside as “a

misconception." Mr. Seebohm approaches the subject with an obvious desire to weigh all opinions; but all that he can say in favour of Mr. Howse's heresy is this, which I admit, that "yellow males occasionally occur in a wild state, and are possibly old and barren birds" ('British Birds,' vol. ii., p. 36). I quote these opinions chiefly to justify myself in the eyes of your readers. Mr. Howse is hardly accurate in describing the nestling plumage of *Loxia curvirostra* as "spotted." I have had living nestlings in my possession, and the skins of others lie now before me; in these the lower parts are streaked or striated, but not "spotted."—H. A. MACPHERSON (Carlisle).

Montagu's Harrier in Suffolk.—About the middle of June last an adult female Montagu's Harrier, *Circus cineraceus*, was shot by a keeper at Risby, near Bury St. Edmunds. It had been noticed about the place for some time. Mr. Travis, who showed me the bird soon after he had mounted it, told me that the ovary contained well-developed eggs.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Hybrid between Sheldrake and Wild Duck.—Mr. Gurney's note on hybrids between the Sheldrake and Mallard is hardly complete without a reference to a passage in Thompson's 'Natural History of Ireland,' where similar facts are narrated. That author refers (vol. iii., p. 70) to a male of the Common Sheldrake kept "at the Falls near Belfast," which paired with a female Common Duck for two or three successive years, producing a handsome progeny. Thompson appears to have been the first British ornithologist to record this cross; the late Mr. R. Gray was the first Scottish ornithologist to do the same, and it was in 1867 that he examined the North Uist birds mentioned by Mr. Gurney, though he only recorded the fact in the 'Birds of the West of Scotland' in 1871. I remember having some conversation with Mr. Gray about the facts, which I also enquired into, for my own benefit, of Mr. Mackenzie, who knew something of them. Sheldrakes are often domesticated in the North of England, but I have never yet come across the hybrid of these two species myself, and there can be no doubt of its extreme rarity.—H. A. MACPHERSON (Carlisle).

Abnormal Eggs of Grey Wagtail and Blackbird.—Having noticed Mr. Blagg's description (p. 231) of eggs believed to belong to the Grey Wagtail, I send for your inspection two clutches of six eggs each, taken by me on May 18th, 1888 (a second clutch), and on April 4th, 1889, respectively. In each case I saw the Grey Wagtail leave the nest myself. No other Wagtails frequent my stable-yard and offices where this bird breeds. I have taken two clutches, of six eggs each, from this bird for two years,—that is, twenty-four eggs,—all similarly coloured, and she has hatched and reared (or is now rearing) a third clutch of eggs similarly

coloured. The Grey Wagtail breeds commonly in Ireland, in some places more commonly than the Pied, but seldom lays more than five eggs, and I have never known one lay eggs of this type of colouring before. [The peculiarity of these eggs consists in their being more heavily marked than usual, with a greater confluence of colour towards the larger end.—ED.] I also send for your inspection and observation four Blackbirds' eggs, samples of four clutches of three eggs each, taken from the same neighbourhood, and those taken this season from the same gentleman's demesne near Cappoquin. They were taken respectively April 10th, 1885; April 26th, 1889; May 4th, 1889; and May 20th, 1889. Of these the first two clutches were taken before incubation had commenced, but the last two were partly incubated. I saw the Blackbird sitting on the third clutch (three eggs only being then laid) on April 28th, though it was not taken until May 4th, so that it could not have been laid by the same bird which produced the clutch of April 26th. These facts show that in the locality where these eggs were found there is more than one Blackbird, and has been one at least, since 1885, which lays clutches of three eggs like those forwarded, and which are almost or altogether devoid of green ground-colour.—R. J. USSHER (Cappagh, Co. Waterford).

Drumming of the Snipe.—On June 15th, when ascending Ettrick Pen, in Selkirkshire, I had a good opportunity of observing the actions of a Snipe while "drumming," and should like to draw the attention of the readers of 'The Zoologist' to the appearance of the tail as distinctly seen through a pair of powerful binoculars. I do not know that I can better describe the general appearance of the tail than by saying that it resembled a fan about three-fourths expanded, with the outermost ray on each side detached along its entire length from the succeeding one, and pulled well away from it, so as to leave a considerable space between their opposing edges. It is to the outstanding position of these outer rectrices that I wish particularly to call attention. The fan-like expansion of the tail has often been pointed out, but I cannot find that anyone has noticed the existence of a clear space between the outermost feathers and those next them; indeed Mr. Hancock ('Catalogue of the Birds of Northumberland and Durham,' p. 107) takes it for granted the latter will overlap the former, and uses the assumption as an argument against the "tail" theory of the sound. It is of course possible, but I think highly improbable, that the bird I saw had lost the second feather on each side of the tail. If further observation should show that the appearance I have described is always present during the "drumming" of the Snipe, the fact may possibly help to throw some light on the vexed question, the mode in which the sound is produced.—WILLIAM EVANS (18 A, Morningside Park, Edinburgh).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

June 20, 1889.—Mr. CARRUTHERS, F.R.S., President, in the chair.

Messrs. A. Denny, R. Miller Christy, and John Fraser were elected Fellows.

Dr. H. Trimen exhibited specimens and drawings of the Tuberculated Lime of Ceylon, and made some interesting remarks thereon.

Governor Moloney, C.M.G., of the colony of Lagos, West Africa, exhibited an extensive collection of butterflies and moths, the result of twelve months' collecting during the rainy season; the former comprising representatives of 65 genera and 158 species; the latter, 78 genera and 112 species, had been named and arranged by Mr. Herbert Druce. A few Chelonians belonging to the genera *Trinonyx*, *Sternotharus*, and *Cinixys*, were also exhibited, and a remarkably large block of resinous gum, which, in the opinion of Prof. Oliver, was referable to some species of *Daniellia*, and which had been found in Ijo country. As an article of commerce, it possessed the advantage of requiring a heat of 600° F. to "run" it, so as to unite with linseed oil in the manufacture of varnish. In addition to these specimens, Governor Moloney exhibited some long-bows and cross-bows obtained from chiefs of Ibadan from some battle-field in that neighbourhood, and used by natives 300 miles from the coast-line. A discussion followed, in which Dr. Anderson, Mr. D. Morris, and Mr. Harting took part.

Prof. Stewart next exhibited some skulls, adult and immature, of *Ornithorhynchus paradoxus*, and explained the very curious dentition of this animal, upon which Dr. Mivart and Prof. Howes made some critical remarks.

A paper was then read by Dr. John Anderson, F.R.S., on the Mammals, Reptiles, and Batrachians which he had collected in the Mergui Archipelago, and concerning which he had been enabled to make some interesting field-notes. Attention was particularly directed to a new Bat (*Emballonura*), and to the occurrence on some of the islands of *Pteropus edulis*, besides a Wild Pig, Musk-deer, Grey Squirrel, and a Crab-eating Monkey (*Semnopithecus*) which hunts along the shore in search of crustacea and mollusca. Some remarks were made on Rhinoceros going out to sea, and on a Crocodile being found twenty miles off the coast.

A communication was read from Mr. Charles Packe on a remarkable case of prolonged vitality in a Fritillary bulb.

The meeting (the last of the session) was brought to a close by a most interesting demonstration on "animal locomotion" by Mr. E. Muybridge,

who illustrated his remarks with projections on the screen—by oxygen-hydrogen light—of instantaneous photographs taken by him, to which motion was imparted by means of the zoo-praxiscope.

ENTOMOLOGICAL SOCIETY OF LONDON.

July 3, 1889.—The Right Hon. Lord WALSINGHAM, M.A., F.R.S., President, in the chair.

The Rev. W. A. Hamilton (Calcutta), and Mr. H. W. Vivian (Glenafon, Taiback, South Wales), were elected Fellows of the Society.

A letter was read from Mr. E. J. Atkinson, Chairman of the Trustees of the Indian Museum, Calcutta, in which assistance was asked from British entomologists in working out various orders of Indian insects.

The following motion, which had previously been unanimously passed at the meeting of the Council, was read to the Society:—"That papers containing descriptions of isolated species widely remote in classification or distribution, are, as a rule, undesirable for publication, as tending to create unnecessary difficulties for faunistic or monographic workers." Mr. M'Lachlan, Mr. Jacoby, Mr. Elwes, Dr. Sharp and others took part in the discussion which followed.

Mr. J. W. Slater exhibited a doubtful specimen of *Arctia mendica*, L., which appeared as if it might prove to be a hybrid between that species and *A. lubricipeda*, L.

Mr. M'Lachlan, on behalf of Prof. Klapálek, of Prague, who was present as a visitor, exhibited preparations representing the life-history of *Agriotypus armatus*, Walk., showing the curious appendages of the case. Prof. Klapálek, in answer to questions, described the transformations in detail. A discussion followed, in which Mr. M'Lachlan and Lord Walsingham took part.

Mr. H. J. Elwes exhibited a specimen of an undescribed *Chrysophanus*, taken in the Shan States, Upper Burmah, by Dr. Manders, which was very remarkable on account of the low elevation and latitude at which it was found; its only very near ally appeared to be *Polygonmatus Li*, Oberthur, from Western Szechuen, but there was no species of the genus known in the Eastern Himalayas or anywhere in the Eastern tropics.

Mr. G. T. Porritt exhibited a remarkable series of *Arctia mendica*, L., bred from a small batch of eggs found on the same ground at Grimescar, Huddersfield, as the batch from which the series he had previously exhibited before the Society was bred. This year he had bred forty-five specimens, none of which were of the ordinary form of the species: as in the former case, the eggs were found perfectly wild, and the result this year was even more surprising than before.

Mr. R. W. Lloyd exhibited specimens of *Harpalus cupreus*, Steph., and *Cathormiocerus socius*, Boh., recently taken at Sandown, Isle of Wight.

Mr. O. E. Janson exhibited a fine male example of *Theodosia howitti*, Castelnau, a genus of *Cetoniidæ* resembling some of the *Dynastidæ* in the remarkable armature of the head and thorax. The specimen had recently been received from N.W. Borneo.

Mr. W. White exhibited specimens of *Heterogynis paradoxa*, Ramb., and stated that this insect represented an extreme case of degeneration, the mature female being only slightly more developed than the larva, the prolegs being quite atrophied. Lord Walsingham made some remarks on the subject.

Mr. W. Warren exhibited bred specimens of *Tortrix piceana*, L.

Mr. T. R. Billups exhibited a fine series of the very rare British beetle, *Medon* (*Lithocharis*) *piceus*, Kr., taken from a heap of weeds and vegetable refuse in the neighbourhood of Lewisham on May 19th; and specimens of *Actobius signaticornis*, Rey, and *A. villosulus*, Steph., taken in company with the above. Mr. Billups also exhibited specimens of *Eulophus damicornis*, Kirby, belonging to the *Chalcididæ*, bred from pupæ found by Mr. Adkin attached to the leaves of lime-trees at Oxshot, Surrey, but the host was unknown.

Mr. W. F. Kirby read a paper entitled "Descriptions of new species of *Scoliidæ* in the collection of the British Museum, with occasional reference to species already known."

Mr. J. B. Bridgman communicated a paper entitled "Further additions to the Rev. T. A. Marshall's Catalogue of British Ichneumonidæ."

Mr. J. S. Baly communicated a paper "On new species of *Diabrotica* from South America."—W. W. FOWLER, *Hon. Sec.*

NOTICES OF NEW BOOKS.

A Monograph of the Weaver Birds (Ploceidæ) and *Arboreal and Terrestrial Finches* (Fringillidæ). By EDWARD BARTLETT, Curator of the Maidstone Museum. Parts I.—III., 4to. Published by the Author. 1888—89.

FOLLOWING the example of several modern ornithologists who have issued expensively illustrated volumes on special groups of birds, Mr. Edward Bartlett has commenced the publication of a Monograph with the title given above. Three parts are now before us, and bear evidence of considerable labour and painstaking compilation on the part of the author.

The plan of the work is to give, as far as possible, after the English and scientific names of each species a very full synonymy, with a reference to notable figures, followed by the French, German, and native names by which the bird is known in its real home, and a list of localities where it has been met with. This is followed by a description of the male, female, and young (if known), and an account, so far as can be given, of its habits, nidification, and distribution. The number of pages devoted to each species varies according to its rarity or otherwise, and extends from two to four or five pages, accompanied by a coloured plate, drawn and lithographed by Mr. Frohawk.

It has become the fashion of late years in monographs of this kind to work out the synonymy to an extent that is perfectly appalling, and in our judgment wholly unnecessary. In the case of a bird which is comparatively little known, or concerning which little has been previously published, it is doubtless convenient to give references to those authors who have written upon it, but in the case of such well-known species as the Java Sparrow, the Virginian Cardinal, and the common House Sparrow, it seems to us preposterous to print three or four quarto pages of synonymy, including references to the most ordinary text-books with which every ornithologist should be familiar, and to trifling allusions in papers of no particular value. Pages thus filled are quite unreadable, and, considering the cost of printing, would be more useful if devoted to other and more important points in the bird's history. As they stand, they are of no great use to scientists who know where to look for such information if required, and cannot be of interest to the general reader. When we say that the synonymy in this case is overdone, we indicate what appears to us to be a fault in Mr. Bartlett's work, though doubtless this, after all, is a matter of opinion. In other respects, the author is to be congratulated upon the way in which he has brought together such information as he has been able to collect concerning the life-history of every species of Finch and Weaver-bird included in his Monograph.

From a study of the localities in which the Virginian Cardinal has been obtained, Mr. Bartlett finds that the distribution from north to south, and east to west, covers about 3,698,000, or nearly 4,000,000 square miles; in this area the bird becomes very variable in size and colour, the more southern forms being the

smaller and richer coloured, while the northern is larger and paler. Mr. Robert Ridgway has remarked that this difference between the two geographical races is most obvious in the females, adding that this is the case with all the climatic or local forms into which the species is "split up."

The account furnished by Mr. Hubert D. Astley of the breeding of a pair of these birds in a state of liberty in England is very interesting. Briefly stated, it appears that they escaped from a large pheasantry, where they had been confined for two years, and soon became acclimatized. They got out on May 15th, and three days later Mr. Astley observed that a nest had been commenced in a very bare yew tree. It was very frail, with no foundation, merely bits of dead grass and some old pieces of rush, lightly interwoven, the whole structure being decidedly small for the size of the bird. Exactly a week after their escape the first egg was laid. It was rather larger than a Sparrow's in size, and dirty white in colour, with large blotches of reddish brown, chiefly at the larger end. Five eggs were laid in as many consecutive days, and four young birds were eventually hatched, the period of incubation being fourteen days.

We have referred to the coloured plates by Mr. Frohawk. Some of these strike us as being somewhat flat, but the later ones are much better, the artist evidently having improved with practice.

In concluding our notice of Mr. Bartlett's Monograph, we would venture to suggest that, considering that most of the species dealt with are favourite cage-birds, some information upon their proper treatment in captivity, with hints as to food, &c., would be particularly acceptable to owners of aviaries, and might result in attracting as subscribers many who, in the absence of such information, would regard the work as deficient from their point of view. Works of this class are naturally costly, owing to their size, and to the number of coloured plates which they contain, but tending as they do to the material advancement of zoological science, we trust that this Monograph, like those which have preceded it, will meet with the cordial support and encouragement which it deserves.





Peter Smit del. et lith.

Mintern Bros. imp.

MUS HIBERNICUS, Thompson.

THE ZOOLOGIST.

THIRD SERIES.

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[No. 153.]

THE SO-CALLED *MUS HIBERNICUS*.

BY THOMAS SOUTHWELL, F.Z.S.

PLATE IV.

AT p. 36 *a* of their recently published 'Fauna of the Outer Hebrides' (as noticed in 'The Zoologist' for June), Messrs. Harvie-Brown and Buckley report the occurrence of this animal in the Outer Hebrides, and invite a consideration of its geographical range and the *status* of the creature itself. I shall be glad, therefore, to be allowed to give, as briefly as possible, some observations with regard to three individuals which appeared to me to agree with Thompson's *Mus hibernicus*, and which were killed in 1882 at Norwich, as already described by me in the 'Transactions of the Norfolk and Norwich Naturalists' Society' (vol. iii. p. 419).

On August 13th, 1881, an example of *Mus alexandrinus*, which I exhibited at a meeting of the Norfolk and Norwich Naturalists' Society, was killed at a wharf in that city; no others, so far as I am aware, were obtained at that time, but shortly after I was told that there were very uncommon Rats sometimes seen in that neighbourhood, and I asked (fully expecting that there were other Alexandrine Rats there), in the event of any being killed that I might be allowed to see them. On March 25th, 1882, my friend Mr. Utting sent me a Rat which in general appearance as to colour and texture of the fur, and elongated muzzle, very much resembled *M. alexandrinus*, but both in



size and length of tail approached *M. decumanus* : this I will call No. 1. On March 27th I received No. 2, which also resembled *M. alexandrinus* in having the upper jaw much longer than the under, but the total length of the head and body much exceeded that species, and the tail was shorter. The feet were strongly tuberculated ; eyes, large, bright and black ; general colour slate-black ; hair long and coarse ; a somewhat triangular or heart-shaped spot of white on the chest, and the fore feet white. No. 1 had not the white chest mark. A third specimen, received on May 9th, closely resembled No. 2, and had the white chest mark, but was even more robust. This last I sent to Mr. J. W. Clark, of Cambridge. Mr. Eagle Clarke's figures in the 'Fauna of the Outer Hebrides, which I am glad to hear are to be reproduced in 'The Zoologist,' might have been drawn from Nos. 2 and 3, above described.

But for M. de l'Isle's assurance that he could not induce *M. rattus* (which he considers specifically identical with *M. alexandrinus*) to breed with *M. decumanus*,* I should at once have regarded these Rats as hybrids between the Alexandrine Rat—an example of which had already been obtained from the same locality—and *M. decumanus*, and I am now strongly of opinion that such was the case ; more than one generation had probably intervened in the seven months since the occurrence of the former species, and perhaps a further infusion of the native Rat would account for the greater similarity to the latter species. I am further inclined to this opinion from the examination of two Rats killed in the same neighbourhood in 1883, in which the apparent mixture of Alexandrine blood was slighter still. It may be that M. de l'Isle's experiments at interbreeding under more favourable circumstances would have proved more successful.

The sporadic occurrence of the recorded examples of the so-called Irish Rat, both as to time and locality, also tends, in my opinion, to show that the variety arose from the crossing of the Brown Rat with another species, whether it be *M. rattus* or *M. alexandrinus* appears to be a matter of indifference ; probably both the Irish and the Orkney examples arose from a cross

* M. de l'Isle's paper will be found in the 'Annales des Sciences Naturelles' for 1865, pp. 173—222,

between *M. rattus* and *M. decumanus*, and in the Norwich case it seems likely that *M. alexandrinus* was the intruder.

For comparison I give below some corresponding measurements in the Common Rat (a very variable quantity, but I give Mr. Eagle Clarke's figures), of one of the Norwich specimens, of *M. alexandrinus*, and of Mr. Clarke's *M. hibernicus*.

	<i>M. decumanus</i> , Clk.	Norwich Rat.	<i>M. hibernicus</i> , Clk.	<i>M. alexandrinus</i> .
	In. lin.	In. lin.	In. lin.	In. lin.
Length of head and body	9 1	8 7	8 5	6 8
„ ears	0 9	0 8	0 8½	1 0
„ tail	7 1	7 1	7 5	8 2

Mr. Eagle Clarke's measurements of *Mus alexandrinus* seem to have been taken from an unusually fine animal; those given by me were from an adult male, the largest I have ever seen.

ON THE METHODS ADOPTED IN NEW ZEALAND FOR THE DESTRUCTION OF RABBITS.*

BY COLEMAN PHILLIPS.

I WISH to place on record the facts connected with the outbreak of rabbit-disease in the South Wairarapa, and the methods by which the rabbit-pest was conquered in that district, as a guide for other places, especially insular lands of the globe.

Early in the year 1884, finding that our poisoning operations to reduce the pest were proving futile, and not caring to erect rabbit-proof fencing around my land to protect myself from my neighbours, I determined upon calling the settlers together for the purpose of simultaneously taking proper measures to grapple with the evil. The pest had been worst with me during the years 1881-83, but by 1884 I had personally managed to get it down so far as my own run was concerned. The settlers met upon the 19th April, 1884. A voluntary system of simultaneous action was resolved upon, and I am pleased to be able to say now, in the year 1889, that the pest has been thoroughly conquered over the whole district. The rabbits now only require watching, as they are watched in any country of Europe.

* From the 'Transactions of the New Zealand Institute,' vol. xxi. (May, 1889), pp. 429-438).

The measures the neighbours adopted were simultaneous poisoning with phosphorized grain and the simultaneous turning-out of the natural enemy, chiefly the ferret. A few of us had been previously poisoning, and breeding and turning out ferrets, and some of us the domestic cat; but the Hon. Mr. Waterhouse was the first to turn out ferrets, some four or five years previously. In 1886 Mr. E. J. Riddiford preferred turning out stoats and weasels upon the land, and I think he turned out two to three hundred (one hundred stoats and two hundred weasels). From 1878 to 1888—say in the ten years of the pest—the measures taken, therefore, to grapple with the evil were hunting and shooting with dog and gun, poisoning with phosphorized grain, and the turning-out of cats, ferrets, stoats, and weasels. Seeing that we were turning out the natural enemies, I induced the settlers not to make use of traps. At the present moment so little is this question understood that a reference to Mr. Bayley's (the Chief Rabbit Inspector of the colony) Annual Report for 1888 will show that the Government and every Rabbit Inspector are willingly allowing the use of traps in every other district of the colony. Of course this is almost fatal to the natural enemies. The use of traps must be absolutely prohibited. With regard to rabbit-proof fencing, I always thought it a weak thing, and I would have nothing to do with it. I preferred to reduce the pest upon my neighbours' runs as the best method of protection for my own land.

Time ran on; the rabbits were disappearing fast, the lands were becoming clear; and now a rather great factor of suppression appeared—I suppose I may say the greatest of all—*viz.*, disease—bladder-worm or tape-worm of the dog, concerning which the facts are as follows:—Early in the year 1886 I had noticed that my rabbitier's pack of dogs were looking miserably-poor, half-starved, mangy skeletons. I spoke to the man, and told him that I could not allow him to keep his dogs in that condition. (I had now only one pack of dogs employed: formerly, in 1882, I had four. I think I sent home about one-quarter of a million skins during the pest.) I had previously noticed that a neighbour's pack of dogs were in much better condition, and that neighbour's rabbitier had told me that he gave his dogs areca-nut to relieve them of worms. I advised my rabbitier to give his dogs the same medicine. And, although

Professor Thomas, in his late report, tells me that I did wrong in giving the dogs this medicine, yet must I, from practical experience, say that to it, and the consequent dissemination of pieces of the tape-worm all over the run during the last two years, can I alone attribute the thorough infection of my land with bladder-worm or rabbit-fluke. The diseases of liver-rot, scab, and lice also appeared. The few rabbits that I have remaining are now nearly all diseased. I may perhaps have been wrong in administering monthly doses of the medicine—two-monthly doses would have been better; but that the mistake was not fatal is proved from the fact that the run now is thoroughly infected with the disease. I therefore still advise runholders in the South Island to each use a pack of dogs, feed them upon raw rabbit during the week and boiled rabbit upon Sundays, and give them two- or three-monthly doses of areca-nut. For I must respectfully ask scientific men, like Sir James Hector and Professor Thomas, to concede a little to practical experience in this special matter, seeing how great the evil really is to be contended with. (A reference to Professor Thomas's report will show that that gentleman lays great stress upon the efficacy of the winter poisoning in my district. All I can say is that the winter poisoning did us very little good. Under it the rabbit-pest was as bad as ever.)

About eight or nine months since my rabbitier informed me that he had applied to the New South Wales Government for the reward offered for a proper method of suppressing the pest in Australia. His suggestion was, infection with venereal. I did not believe in this, and considered in my own mind that the disease I had upon the run would be a better thing for Australia. We often discussed the matter amongst ourselves. The rabbits had disappeared like magic. Surely the remedies we had taken would apply to Australia. As to the ferret, I was not at all satisfied with its action. It did not appear to have done nearly the good that I had anticipated. The cats were doing as much good, I thought. I placed as little reliance upon the ferret as I did upon poisoning or rabbit-fencing. The ferrets died off rapidly from distemper. They did not appear to at all increase in sufficient numbers to cope with the evil. Although a gill-ferret littered in large numbers, yet the young ones did not appear to survive. But they had done a certain amount of good.

(Consequently I still advise their use. I would say this, however: that they must not be relied upon in the South Island for the high snowy lands.)

I therefore determined to apply for the reward myself, and I sent one of the diseased rabbits to Sir James Hector to ask his opinion. That gentleman replied favourably. He had previously received two specimens of the disease from the Wairarapa, and he had himself seen a virulent disease of some kind amongst the rabbits in North America. Sir James had previously spoken to me about this disease that he had observed, and he therefore made up his mind definitely to identify it, upon receiving this third specimen from me, with the North American disease. Professor Thomas differs from this view, and says that the tapeworm is not the same—that it is totally distinct. It may be so, and Sir James Hector may be wrong. Our rabbit is not the same animal as the jack-rabbit of North America—a sort of hare; but, nevertheless, I wish to record my thorough appreciation of Sir James Hector's services in identifying the disease so far as he did. Sir James did not know which animal acted as host in passing the particular worm that is here. I said it was the dog. We had all along observed it coming from the dog. Neither Sir James Hector nor Professor Thomas thought it could be the tame dog, although Professor Thomas was careful to express no decided opinion. It will be observed upon reference that Sir James Hector thought it came "probably from the wild dog and cat." Of course we have wild dogs, and I have turned out many cats, which have thriven remarkably well; and these may have started the disease: but the tame dogs certainly do carry it on, and they will spread it readily in the South Island. The cats may also spread it, as there are at least a hundred cats upon my run now. The disease only requires to be started upon the runs in the south or elsewhere to perform as good work as it performed with us in the Wairarapa.

My letter to the Colonial Secretary of New South Wales, applying for the reward, found its way into the newspapers of Australia, and immediately I was told by many of my fellow-settlers in the Wairarapa that the disease was no new thing; that some of them had observed it two, four, even six years ago; that they had it upon their runs, and other diseases as well, such as liver-rot, mange, scab, and lice. The generality of them said

the disease (bladder-worm) was no good, and wondered at my taking any notice of the matter. Many of them, and the general number of rabbit-men and Maoris, considered that the bladders were caused by gunshot wounds. Even the other day, when I was bringing a good specimen of the disease down to Sir James Hector, the Maoris, clustering round the box, remarked, "Ah! that rabbit was wounded." All this evidence points to the one fact that for six years past this disease has been silently at work upon the runs of Wairarapa, and to it may be attributed, just as much as to the winter poisoning or the ferrets, the further great fact that in the Wairarapa the rabbit-pest has been conquered. (I attribute the subjection of the pest to the three things acting in combination.) The mange, itch, or scab had also been observed upon my own and the neighbouring runs; but the rabbiters considered that such rabbits had been scorched or badly burnt in the many fires lit to clear off the scrub. Liver-rot had also been observed, especially upon Mr. Tully's run—a run celebrated for the bad state of the rabbit-pest there, but which I am happy to say is now almost clean. Prof. Thomas's interim report does not say whether liver-rot is attributable to bladder-worm—or rabbit-fluke, as Sir James Hector named it: I fancy it is.

Now, let us leave detail and go into principles. Let us see what this bladder-worm really means. Let us take an atlas of the earth, and inquire into the reasons why the four great continents of Europe, Asia, Africa, and America are free from the rabbit-pest, and why it is so bad in Australia and New Zealand. If my course of reasoning is found to be sound, then, surely, M. Pasteur's proposed mode of suppressing the difficulty with cholera-microbe solution will be found to be as absolutely useless as our winter poisoning, and very far indeed removed from the right method of cure. I use the words "absolutely useless" in this sense: that it will be no good M. Pasteur sweeping off the rabbits by millions if they breed up again, and have to be again swept off. Under the winter poisoning we are sweeping off the rabbits in New Zealand at the present moment at about fifty millions a year.

And, first, it will be remembered by members of this Institute that last year I read a paper upon "A Common Vital Force." The reasoning in that paper has furnished me with matter for

clearing up the present question. My argument is as follows—and Professor Thomas, before sending in his full report, will do well to think over what I am about to say, and to amend his summary of conclusions at the end of his interim report lately presented to Parliament:—

The rabbit appears to have started in Africa. Negro legends all point to it as the cunning animal, just as our legends point to the fox. From Africa it passed to Asia and Europe, as European lands emerged from the sea. (I consider Africa the oldest continent, geologically, and the negroes the oldest race of men, ethnologically.) From Asia it passed into America, or the jack-rabbit there may have been in America coterminous with the rabbit's existence in Africa or Asia. With the rabbit went the stoat, weasel, ferret, cat, dog, fox, wolf, and other natural enemies. I am speaking now of many thousand years ago—long before men ever appeared upon the face of the earth, but still while the four present great continents were continents, and Australia and New Zealand isolated.

And these animals, which we call the natural enemies, were specially sent by nature to watch the rabbit and prey upon it, and prevent its excessive increase. Thus the common vital force always acts. One order of creation is not allowed to take possession of the earth—another checks it; and so the balance of utility is preserved.

Sir James Hector, thinking as I think, stated some months since that soon there would be no rabbits in New Zealand. I would point out to Sir James that in saying that he has gone too far. Nature checks excessive increase, it is true, but nature does not willingly allow any one order of creation to be exterminated. On many an estate at home there will still be found, after a thousand years of experience, the fox, the stoat, the weasel, the dog, the cat, and the rabbit side by side. Trap off the ground-vermin, as it is called, and the rabbit will rapidly increase; so that any idea of our depending entirely upon bladder-worm or any disease must be abandoned. The rabbit will never be exterminated now from the lands of Australasia. Nor is it advisable for us to exterminate it.

But there is a great distinction between the rabbit as an animal and the rabbit as a pest. Nature carefully makes this distinguishment in all living things. Only those things came to

this planet of use to it, as its climatic conditions proved favourable to their reception, and each thing carried with it its own check from excessive increase. The general check (this course of reasoning supposes space to be filled with germs, and other planets inhabited) is a worm of some kind. For when any living thing becomes too thick—be it man, sheep, rabbit, pig, horse, ox, or other animal—immediately the land becomes infected by the excessive excreta of itself or its natural check. I rather fancy that its own excreta first starts the check, which rapidly spreads by means of the host. In the sheep we see it when we say that the land becomes sheep-sick. Upon such lands the hoggets get the lung-worm, and die off. So that, supposing we tried our best to keep but one animal running constantly upon one set of lands, the end would be that that animal would dwindle down to very few indeed. In the case of the rabbit, its own intestinal worms, or the intestinal worms of the natural enemy, are always ready to infect the lands and guard those lands against entire occupation. And so determined is nature to do this, that away up in the arctic regions, where the rabbit, jack-rabbit, and hare can go in comfort, being furred animals, there is it followed by the stoat changed into an ermine. The stoat puts on a warmer coat, and follows the rabbit even to the poles. For that reason stoats are alone to be relied upon by our Government here for suppressing the plague in the high snowy lands of the South Island.

Now let us look at the atlas, and see the position of Australia and New Zealand. What is it? Disconnection from the four great continents. Here there were neither rabbits nor any natural enemy (I allude to the end of the secondary period in geology, when Australia is supposed to have been separated from the mainland). The land was clean from either. Lately we have brought the rabbit, and, finding no check either against itself or against it as a pest, it rapidly developed into the pest form. Neither ferret, stoat, weasel, fox, nor wolf was here to infect the lands with the tape-worm eggs, and so the rabbit throve and multiplied. The dog alone was here, and in the Wairarapa the dog appears to have carried out nature's law of check. My accidentally giving the dogs areca-nut but assisted nature's law.

Of course, I do not say that the tape-worm I use is the worst

form of tape-worm. There are two hundred and fifty different kinds of tape-worm, and I have no doubt that the tape-worm of the fox and wolf is a far more virulent disease than the tape-worm of the dog. But then I do not like to introduce such animals into Australasia amongst our sheep. The Hon. Randall Johnson tells me that a proposition comes from Africa for us to use here the civet-cat and the meer-kat. (The civet-cat is closely allied to the aard-wolf.) But, again, I say that I do not like introducing here more ground-vermin than are absolutely necessary. I find that I have succeeded with the dog, cat, ferret, stoat, and weasel. What necessity is there to introduce anything further yet awhile? I feel almost sure that these animals will perform the work for Australasia. At any rate they should be tried before introducing any of the other animals. We never know how the *feræ naturæ* develop in these new lands. These require *their* check just as much as the rabbit requires its check: hence my aversion to their introduction. Had the dog, cat, and ferret been capable of performing the work of suppression, I would never have introduced the stoat and the weasel into the Wairarapa. At any rate, if we have to concede to the full extent of the round of nature's law, let us wait until population becomes a little more dense with us, to impose the proper check of man.

From all this it will be seen how totally wide M. Pasteur is from the truth, and how little dependence can be placed upon purely scientific reasoning in dealing with this question.

That the rabbit multiplies itself rapidly upon insular lands of the globe is seen from two instances recorded in history. In A.D. 1 the inhabitants of the Balearic Isles petitioned the Roman Emperor Augustus for assistance in subduing a rabbit-pest there. Two legions of the Roman army were sent to get the plague down. It is evident now, from my course of reasoning, that these islands wanted the natural enemy.

Also, in the case of one of the Canary Islands, or Teneriffe. Prince Henry of Portugal, I think, sent some rabbits to one of them, and the inhabitants had very great difficulty in subduing the pest. I am a little uncertain as to the facts in this case, but I remember meeting with it some time since, accidentally, in the course of reading. This case, and the former one of the Balearic Isles, and New Zealand and Australia, are exactly alike.

A narrow view of this question is therefore quite inadmissible. We can but look at it from the point of view I suggest—*viz.*, with an atlas of the globe before us. Hitherto we have regarded the matter too narrowly in New Zealand, and M. Pasteur's remedy, strange to say, is too narrow also.

With regard to rabbit-fencing: I do not object to rabbit-fencing, but I consider it a waste of money. The best and most sure fence is the egg of the tape-worm upon the grass. The calculation for each dog is as follows: 1 × by 100 tape-worms, × by 100 segments, × by 1000 ova.

As to the expense of the remedy, the beauty lies in its cheapness. Supposing the owner of each run in the South Island got but two of my diseased rabbits, and fed those rabbits to two hungry dogs in his pack, and then went steadily hunting over his land, the moist lands would quickly become infected with the tape-worm eggs. The rabbits would eat them and get fluked, and soon the whole pack of dogs would be infected. The dogs would then infect the whole of the lands. Whether the ferrets, stoats, and weasels also carry the worm about I cannot say. I firmly believe they do; but I have all along been quite certain that the tame dog does so, and I think the cat also. Neither Sir James Hector nor Professor Thomas are able to tell me anything about this; so I can but be guided by my practical experience. This is why I object to rabbit-fencing. I wish free open fences for the dog and natural enemy to disseminate the tape-worm ova.

With regard to the danger of the sheep becoming fluked, I have never heard of a single case of the sort in the Wairarapa during the six years the disease has evidently been silently at work amongst the rabbits. Nor do I think that the bladder-worm of the rabbit can possibly infect the intestines of the sheep. Each order of nature has its own check. This can be seen from the fact that there are some two hundred and fifty different sorts of tape-worm. The rabbit might carry the proper sheep-fluke about in occasional instances, but I do not think that the sheep could possibly carry the rabbit-fluke about. At any rate, my sheep have been running upon my badly-infected, rabbit-fluked lands, and no instance of death has yet occurred.

I need scarcely point out the severity of any tape-worm disease. A few years since seven hundred thousand pigs died

near Chicago from trichinosis: last year a score of thousand hoggets died from lung-worm in the southern portion of this North Island of New Zealand; millions of sheep die in England from sheep-fluke. These are but instances of the severity of nature's laws. And nature's proper laws are continuous; not like M. Pasteur's remedy, or our own winter poisoning. How well do we know here that the rabbits grew proof against the poisoned grain, and refused to take it! So will the rabbits grow proof against cholera-microbes. Even a few fowls in each hen-roost always escape the ravages of chicken-cholera. Again, there were, and are still, many places in the South Island where we could not lay the poisoned grain. This escape from poison and disease, and these inaccessible places, yearly afford bases for the rabbits to breed up again. But there is no escape from bladder-worm or liver-rot.

With respect to the time the disease takes to effect the death of the rabbit, Professor Thomas mentions thirteen and twenty-one days after infection. We have always thought it took longer, but Professor Thomas thinks that he can make the disease even still more fatal. This is good news; but I do not think there is any necessity for it to be more fatal than it is. My run is clear now from the pest. I keep but one rabbit and a pack of dogs over twelve thousand acres, and he catches about twenty-five rabbits a week. He could look after twenty thousand acres just as easily as twelve thousand. (I do not think his time thrown away in regularly going round the run. He saves his wages in other directions.) I am, however, indifferent what disease is selected, provided one of nature's true remedies is applied. As to any disease like cholera suddenly sweeping off millions, I do not believe in its applicability to our present circumstances. Too much virulence would do harm.

In the use of so many dogs there is, of course, a danger of some dogs going wild. I should recommend the Government to publish the resolutions the settlers arrived at in my district, in 1884, upon this question. We are now through the rabbit-pest, and I do not think the wild dogs have killed a thousand sheep during the last four years over a million acres. Still, there are a few dogs gone wild in the bush, which we occasionally hear and see; but these can easily be got if the search for them is properly gone about. Prevention in this matter is better than

cure. I prefer this danger to the introduction of the fox or wolf tribe.

There is some talk of this rabbit-disease attacking man in the form of hydatid. So it will. Hydatid from sheep attacks a few persons in Australia. Hydatid from the dog attacks a few of the Iceland people. I do not think much of these things. People cannot give up eating rabbit or mutton, or keeping dogs. To do that is the true remedy for the alarmists, and it is impracticable.

I would repeat that Professor Thomas does not draw the same conclusions from the mode of conquest of the pest in the Wairarapa that I draw. The winter poisoning had little or no effectuality. The ferrets worked well only in isolated places; in other places they would not live at all. But the three things acting in combination—*viz.*, the poisoning, the natural enemy, and these diseases—effectually did the work of suppression. The poisoning swept off the millions; the ferret, cat, stoat, and weasel ate the young ones left; and then this bladder-worm and liver-rot attended upon all and completed the cure: but the poisoning itself was of little good. Herein it will be seen that practical experience is better than scientific theory. I hope Mr. Thomas, after reading this paper, will amend his interim report in the proper direction. It is not because the tape-worm here may not be exactly the same tape-worm that sweeps off the jack-rabbit in North America that Sir James Hector was wrong in the application of the general principle. That principle is that the excess of every order of life is held in check by some particular worm.

On the other hand, I must say that I saw far more from my ten years' practical experience in reducing the pest than Sir James Hector or Professor Thomas could tell me about it. Combining these things with M. Pasteur's proposals, I must be excused for doubting scientific conclusions. Sir James Hector proposes the introduction of the kit-fox here: I think such a step would be wrong and unnecessary yet awhile. My opinion is that the wolf and fox tribes are the natural enemies of the sheep. We are clear of sheep-fluke now in Australasia, and I have no wish to introduce it. The bladder-worm hydatid of the rabbit and sheep hydatid are luckily two distinct things.

With respect to complete rabbit extermination, I wish to say

that it will be most inadvisable to attempt such a measure ; and if it is attempted in Australia it will not succeed.

I am told that I am making too much of these diseases, and that specially favourable circumstances aided me in suppressing the pest in my own district. Those who say this do not see the importance of the principle contended for. So great is that principle that I have offered to reduce the rabbit-pest to a minimum in the South Island of this colony if I am allowed four years in which to do it. For that was the time it took me to reduce the pest in the South Wairarapa.

ORNITHOLOGICAL NOTES FROM NORFOLK.

BY J. H. GURNEY, JUN., F.Z.S.

IN continuation of my former Reports (p. 134), the following are the most important notes made during the first half of the year 1889 :—

On Jan. 9th a Sand Grouse, *Syrhaptēs paradoxus*, was taken alive at Southrepps, and placed by my father in a cage with another previously obtained. The beak and skin round the eyes in spring lost their greenish tone, and by June had acquired a blue tint, which was brightest when the birds were excited.

On Feb. 5th Capt. Applewhite sent a Dabchick choked by a "Miller's Thumb," *Cottus gobio*, from Pickenham : the fish was firmly fixed with the tail projecting, in which position Mr. Gunn has since preserved it with the bird. On Feb. 18th I procured a Cormorant at Cley, where another was shot on the 14th, and a third shortly before that. This is not a very common bird in Norfolk. Mr. Southwell and I saw two on Hoveton Broad as late as May 16th.

About the beginning of April it was remarked that a duck at Keswick, in rather more than half male plumage, was evidently supposed by its companion—a pure-bred decoy-drake—to be a male, and accordingly he commenced a system of bullying, while his own mate looked on placidly, the supposed drake all the time fleeing from the pursuer, proclaiming her sex with loud "quacks." On April 19th, at Brooke, a Woodcock was sitting on four eggs in a large wood of 163 acres, composed entirely of oak, with an extensive undergrowth of stub. It was so tame

that a sketch was made of the sitting bird in the presence of four witnesses. The nest was in the midst of a spreading oak stub, and was composed entirely of the leaves of this tree with a few of the Woodcock's body-feathers, and measured inside six inches across; the eggs all pointed towards one side, and it was noticed that the flank-feathers of the bird were much extended when she was sitting.

On May 12th a large flock of Dotterel, *Eudromias morinellus*, appeared on Yarmouth Denes: Mr. G. Smith thinks he saw at least a hundred, and some of them were very tame, permitting a near approach. About May 13th Ospreys were shot at Weybourne and Salthouse, and soon afterwards a large hawk—supposed to be another Osprey—was seen at Hempstead. On May 22nd Mr. W. E. Baker showed me a Hawfinch's nest containing four eggs; and on further search we discovered, in the same wood, another nest of this species containing five eggs, besides two unfinished nests and one of last year. It was gratifying to find these rare birds so plentiful, and we left all the eggs untouched, to the gratification of the old Hawfinches, who were too shy to do more than peer at us from a distance. One of the nests was in a whitethorn, one in an elder, and three in maple trees, at altitudes varying from ten to twenty feet. In one part of this wood there is a great deal of grey lichen growing, chiefly on maple, which is possibly the attraction to the Hawfinches, for I do not remember to have seen a nest which had not some lichen in it. Many Chaffinches nest in this wood, as does also the Tree Sparrow, *Passer montanus*, and Chiffchaff, which last is, strange to say, a rare bird in Norfolk. Even such a veteran collector as my friend Mr. Norgate has only met with a few nests of the Chiffchaff in the course of a long experience. On the same day (May 22nd) Mr. Baker proposed a visit to a small wood of spruce fir and oak, where there were about fifty Heron's nests: I climbed up to several of them, all of which contained young, and found their chief food to be eels. In one nest there was an eel eighteen inches long, in another a roach. Some of the nests were more than four feet in diameter; as they were decidedly odoriferous, I only stayed by them long enough to observe that several contained four occupants, and others only three. The most cup-shaped were fully six inches deep, but others were mere shallow platforms, yet tightly woven. No doubt they become

much flatter after the young are hatched. Below the second Heron's nest which we inspected was a Sparrowhawk's nest, containing five eggs, the distance between the two being not more than four or five feet. There were no remains of fur or feathers about the Hawk's nest (which was not a small one), and merely some of its own down in the lining. A little further on we found a Jay's nest, and three nests of the Carrion Crow, a bird which is getting very scarce in most game-preserving districts. One was in an oak tree, and two of the young Crows, apparently oppressed by the heat (for it was a very warm day), were craning their long necks over the edge of the nest with wide-open mouths, which we could see from below were bright red; the second nest was unfinished, and the third held two young Crows, still quite blind, with disproportionately large red mouths. The cup of this nest was four inches deep and a foot across, lined with wool, a piece of black cloth, and two pieces of newspaper; it was built on the flattened top of a leaderless spruce fir, thirty feet high.

Mr. Baker informs me that he has every reason to believe that the Curlew has nested more than once on the Sandringham estate, where there is a good tract of ling strictly preserved by H.R.H. the Prince of Wales. One of the keepers, named Salmon, found a nest with eggs there. Salmon knows the difference between the Norfolk Plover, or Stone Curlew, and *Numenius arquatus*, and is aware that the former only deposits two eggs, and does not lay them in the ling. This is the first intimation received of the Curlew nesting in Norfolk.

On June 28th a keeper showed me the nest of a Reeve, *Machetes pugnax*, which he had found in the early part of May, and which then contained four eggs. Unfortunately at the time of my visit there were only the broken shells, indicating, as he supposed, the work of a Marsh Harrier, *Circus æruginosus*, which had come after his decoy-ducks. As we were leaving the place we stumbled on another nest with four eggs, beautifully hidden in green rush-grass, nowhere more than a foot high. The eggs, which were very handsome, all pointed inwards, their four small ends meeting. The diameter of the nest was 3.3 inches, which is less than that of a Redshank; it was constructed of dead bents of *Eleocharis multicaulis*, mixed apparently with *Triglochin palustre*. For this identification I am indebted to Mr. A. H. Evans, who knows all the plants of the locality. A "run" made

by the old bird led almost up to the nest, from a distance of twelve yards, and on the other side there was another "run" not so long. I have seen many similar "runs" made by Redshanks and Water Rails. As I was anxious to identify the eggs beyond all doubt, we retired to some distance, and after some time had the pleasure of seeing the Reeve return to the nest.

THE HABITS AND HOME OF THE WANDERING
ALBATROSS, *DIOMEDEA EXULANS*.*

BY A. REISCHEK, F.L.S.

THIS noble bird may justly be called the king among the sea-birds. Many times during my sea-voyages have I admired its flight and easy sailing over the waves, as it followed our vessel, hundreds of miles from the nearest land. Its power of flight surpasses that of most birds, and is easily accounted for by the unusual development of the muscles of the breast and wings, the latter being equal to, if not stronger than, those of the eagle. It is worthy of remark that the quills of the wing are spread or brought close together according as the bird is rising or falling in its flight. The steering is done not with the tail alone, but also with the broad webbed feet. These, when a straight course is being followed, are stretched out, and nearly concealed under the tail; but when a quick turn is required their position is altered, and the webs are spread in such a manner as to greatly assist the bird in turning. When there is little wind and the ocean is calm, Albatrosses have great difficulty in rising from the water; when there is a swell they run along the water and rise with a wave. When alighting, on nearing the surface they bend the head back, curve the wings upwards, beating the air with numerous laboured strokes, then, straightening their feet, they let themselves fall. They are fast swimmers, but cannot dive. Their food, which consists chiefly of some of the lower forms of marine life found floating on the surface of the ocean, they scoop up with their bill in the same manner as Ducks.

* From the 'Transactions of the New Zealand Institute,' vol. xxi. (May, 1889), pp. 126—128.

I had long been anxious to visit their breeding-haunts, but had no opportunity of doing this until January, 1888, when I was afforded the privilege of accompanying the Government steamer 'Stella' on her yearly cruise among the islands to the south of New Zealand. After visiting Stewart Island and the Snares, the steamer's course was directed towards the Auckland Islands, and on the 25th January we anchored in Carnley Harbour. Having ascertained from Captain Fairchild that the vessel would not leave until the following evening, I at once prepared for an expedition to the hills, on which I was informed that Albatrosses were then breeding; and at 4 o'clock in the morning the chief officer put me ashore. The first creatures I met were several Sea-lions sleeping in the long grass, over which I almost fell. They gave discontented growls at being disturbed and driven from their lair, sitting up on their haunches and gazing at the intruder with their large eyes, showing their white canine teeth all the time. Moving onwards I had a dreadful scramble through dense low scrub interspersed with holes and swampy places, but at last I gained the hills above. My exertions caused me to suffer greatly, being far from well through overwork on the west coast of the South Island. After climbing over hills for about three miles I came to a slope where a colony of Albatrosses had established a breeding-place. The birds were scattered about among the tussock-grass, sitting on their nests, and from their white plumage could be easily distinguished from the vegetation at a great distance. I found that their nests are always placed on sloping ground, and always on the most exposed side of the hill. They are composed of earth and grass cemented together, and are built in the form of a cone. They are usually about two feet in diameter and about eighteen inches high. Outside they are surrounded by a shallow drain, intended to carry off the surface-water. Within is placed a single egg. This is white, with a few brown spots on the broad end, and measures about 5·5 inches in length by 3·1 inches broad. In most cases I found the female on the nest, the male bird standing close to her, and occasionally feeding her. I noticed that sometimes the male relieved the female, but they never both leave the nest until the young one is able to defend itself against the Skua Gull, *Lestris parasiticus*. This rapacious bird devours every egg or nestling left unprotected. While

taking the measurements of the first nest I came to I laid down the egg beside me, when a Skua darted at it and destroyed it. They were so bold that they frequently came close enough for me to hit them with a stick.

On my approaching an Albatross's nest, the old bird seldom left it, but set up a croaking noise, clapping its mandibles together and biting at the intruder. After turning it off and taking away the egg, it returned and sat on the nest as before. The eggs were quite fresh on the 25th January, and good for eating when fried. There appears to be a difference in the time of laying at the different islands, for at Campbell Island, considerably to the south of the Auckland Islands, their eggs were nearly all hatched by the end of January, while at Antipodes Island, a little to the north again, they had hardly begun to lay at the beginning of February.

The Albatross takes five years to become fully mature, and in each year there is a slight change of plumage. The young, which are hatched in February, are covered with snow-white down, and a beautiful specimen in this stage exists in the Otago Museum. In the following December they lose their down, and the plumage is of a brown colour, with white under the wings and on the throat. In the second year the plumage is the same, except that there is more white on the throat and abdomen. In the third year there is still more white, although mixed with blotches of brown, the under parts, however, being nearly all white. The wings and tail remain dark brown. In the fourth year they very nearly acquire the full plumage. The male is white, with a few very fine dark specks, except the wings, which are dark brown. In the fifth year they reach their full growth, and the mature plumage is displayed—white, with blackish brown wings. The measurements are as follows:—Total length, from the tip of the bill to the end of the tail, 3 ft. 3 in. Bill, 7 in. Tail, 7·25 in. Whole wing, from 4 ft. 10 in. to 5 ft. 10 in.; primaries, 1 ft. 8 in. Whole leg, 1 ft. 10½ in.; tarsus 4·5 in.; middle toe, 7 in. The female is much smaller, as can be seen at once from the specimens exhibited.

Notwithstanding the ease and grace of the Albatross on the ocean, on the land it is a most clumsy and helpless bird. Its walk is slow and waddling, like that of a Duck, and it cannot

take flight from a level piece of ground. It is for this reason that these birds have been gifted by nature with the instinct of making their nests on the slopes of mountains, for by running down-hill, and labouring hard with their wings, they can at last acquire momentum sufficient to raise themselves in the air. Once there they exhibit their true power, and are seen to the best advantage.

THE GREAT BLACK WOODPECKER IN ENGLAND.

By REV. CLEMENT LEY.

[IN our review of 'Notes on the Birds of Herefordshire,' collected by Dr. Bull, which appeared in 'The Zoologist,' 1888 (pp. 277—280), we noticed a statement to the effect that "there could be no doubt of the Great Black Woodpecker having been observed on several occasions in Herefordshire," and quoted (p. 279) the evidence on this subject adduced by the Rev. Clement Ley, of Ashley Parva, Lutterworth, Leicestershire. Mr. Ley having since published a long letter on the subject in the 'Hereford Times,' intended as a reply to certain critics who seem to have imagined that there was some mistake in the identification of the birds seen by him, we reprint this letter for the benefit of our readers who may not have seen it, omitting only, for the sake of brevity, three paragraphs which are not material.—ED.]

ON the subject of my own observations of this bird in England, I have not for some time asked for space in the columns of the 'Hereford Times.' The causes of my silence have been partly that no re-statement of those observations would of itself add force or credibility to my first statement; partly because I have entertained the hope that some other naturalist would in course of time have been able to confirm my evidence by his own observations; and, after all, one single piece of positive evidence from any thoroughly capable and veracious observer will outweigh many pages of negative criticism. I was not anxious to appear in any hurry to reply to any hostile remarks. From the moment that I first heard the note of this bird in England, and still more from the time that I first saw the bird, I anticipated even more general disbelief and more severe denunciations than my statements have in fact received. The man who has been so fortunate, or so unfortunate, as to see a prodigy not once, but twice, should either hold his peace or should expect to meet

with such unbelief as I myself should perhaps bestow upon him, were he other than myself, or not an intimate acquaintance. So that my critics have perhaps, in the main, done as they would be done by. I shall in this letter refer to no criticisms of 'The Birds of Herefordshire,' the work of my old and valued friend Dr. Bull, except in so far as these criticisms relate to certain observations of mine therein recorded.

* * * * *

I adhere to every statement made by me concerning English and foreign birds. But it may be due to some readers that I should add a very few particulars concerning my observations of *Picus martius*, and one brief explanation of a statement, disbelieved, concerning *Jynx torquilla*. I am not going to weigh the evidence of Capt. Mayne Reid (Zool. p. 196); and I know nothing of what befell Mr. D. R. Chapman at Belmont, or of the reasons why he seems to be slightly ignored.

It is through necessity that this letter is almost entirely egoistic. The only witnesses who in my company had an excellent view of *Picus martius* in England were Mr. E. W. Du Buisson, M.R.C.S., of Castle Street, Hereford, who permits me to state that he has a vivid recollection of the occurrence, and believes he can still point out the tree in Ruckhall Wood in which we watched the strange visitor,—and in 1876 my daughter, who retains a similar recollection of this bird as we saw it at Mount Edgecumbe, in Devonshire. But although these witnesses were at those dates keen young naturalists, and well acquainted with the appearance and the notes of the three well-known British Woodpeckers, they were each at those respective dates only about ten or twelve years of age,—too young, perhaps, to add much weight to my testimony, in the thoughts of my critics. I heard the cry of *Picus martius* twice, unmistakably, at Pengethley Gorse, Ross; once, unmistakably, in the parish of Fownhope; once, dubiously, distant and uncertain, on the Little Doward. For myself, I possessed the faculty, which I still retain (though my ornithological rambles are probably over), of never forgetting the note of any bird which I had once heard; together with the barbaric habit of tracking silently, at home or abroad, through brambles and leaves, those animals whose voices I had heard, but not as yet identified, until this habit became no longer necessary. But there is one barbarous deed which I never committed, though

very frequently carrying a gun. I never slew a very rare though probably indigenous bird. It might be well, if it were possible, to extirpate such writers as the 'Athenæum' critic of Dr. Bull's work, the advocates of the ceaseless pop-gun,—men destitute of any enthusiasm for living nature, whose eyes and thoughts do not travel beyond the four walls of a museum bird-room; men who publicly state that they will believe nothing until they see the bleeding form of a fresh-killed specimen; men, the polar antitheses (I trust Prof. Huxley may not see my adjective) of that great observer who, having killed a Crossbill partly by accident,—in, I think, the Shrewsbury Garden,—could not for years persuade his tongue to tell the sad story. No Wild Birds Protection Acts, none of the intelligence of those few landlords who strenuously preserve to the best of their ability all rare wild birds on their property, can, I fear, be a match for these antagonists of Nature. I fear that my words will do nothing to cure this evil. I believe, however, that what has twice happened will probably happen again. If it be true that all the evidence with respect to the occurrence of *Picus martius* in England previous to my own sight of this bird is unsatisfactory, then certainly what I saw is to me wonderful. But it is not so wonderful as it might appear to other people. Possibly not one man in a million residing in England can recognize the note of *Picus martius* (and had I not recognized this I should not in England have seen the bird). Selecting the men who would recognize the note, I am inclined to question whether one of them is likely to have possessed those habits and that mode of life which led me to recognize the bird. Still, we have to deal with generations, not living men; and the question of antecedent probabilities is complex, and scarcely calls for algebra here.

One of your correspondents, whom I will treat as anonymous, refers to me as writing romance. Had his scientific reading been a little more extensive than it has been, he would not, perhaps, have used this term. As it is, he is one whose personal acquaintance I should much like to make, to whom I should like to show my birds' eggs, with whom I should like to discuss (were it not for the waste of his valuable time) the notes, habits, and anatomy of every British bird. Now this writer, as a comparison, it seems, with my plain statements, tells some story of an acquaintance, who was not only romantically deceived and a

deceiver, but actually could not distinguish, by the mere sense of touch, the eggs of one of our *Columbidæ* from the eggs of one of our *Picidæ*. Can your readers swallow that, Sir? Then we have another correspondent, writing something about the incidence of solar rays upon the back of a Rook, making the latter look to him like a Wood Pigeon. Does he really believe that any naturalist has not observed that kind of phenomenon; the like of which, when the sun shines, you must have seen on almost any day on a slated roof? Can he, having gone to a museum, actually suppose that any sane man can have mistaken *Picus martius* flying at less than twenty yards distance toward the north-east of the observer, the sun being in the west, for any other bird? There is a good deal else of what I will dignify with the name of dust, not equalling rubbish, which a camel's-hair brush would sweep away in two or three strokes. I shall not use the brush, not simply because it would be a waste of my time, but because it would encroach upon your space.

As regards the forty eggs of the Wryneck, obtained from the same nest-hole, the offspring of the same mother, taken I believe in about forty consecutive days (see Bull's 'Birds of Herefordshire,' p. 97), I should mention that many of them were shown to me by the late J. Skyrme in his then valuable collection. The latest laid of them were extraordinarily small. I regret that I have no notes of measurement. These eggs ought to be, and probably are, existent somewhere. He gave me the account of how they were obtained; but this had been previously communicated to me by the experimenter, Dr. Powell, of Fawley Court, and the hole from which he had taken them was shown to me. I believe him to have been perfectly honest, and a careful observer. Anyhow the experiment was an old one, as I should have thought the critic ought to have known. Any of your readers, by making a series of such experiments, with patience, care as to hours, &c., will probably easily beat the record. I have seen something more surprising—a Song Thrush trying to sit on eighteen eggs. I know nothing about their parentage, but there was no mistaking the species of the parents. There was mud and clay all about the place, and there was no footprint of any human intriguer. Of the thirteen eggs which I removed, some were almost fresh; others had undergone incubation, not, I think, of more than five days.

* * * * *

What I have written about my own observations, I have written in simple honesty, well knowing that, like some sister virtues, honesty must be often for the present disbelieved. I appeal to one witness, who seems in no hurry to answer any bird-call, but who will probably answer it one day, *Picus martius* himself.

THE SOLWAY FISH HATCHERY.

EIGHT years ago Mr. J. J. Armistead, who had acquired extensive experience as a pisciculturist in the English Lake district and elsewhere, was led to establish a fish hatchery on the lands of Kinharvie, in the parish of New Abbey,—one of some half-dozen that exist in Scotland,—and the interesting and novel industry has flourished and grown apace in his skilful hands. To the untrained eye the site was a very unpromising one—for the most part a rush-covered meadow; but to the specialist it presented several important advantages. Most notable of these was the command of a water-supply not only constant and abundant, but of various quality, for the natural element of the fish is as diverse in its constituents and capabilities as the natural element of the plant. A water altogether admirable for hatching purposes may be totally unsuited for the rearing of plump fish, and *vice versâ*. With the Pow Burn on the one hand, and the Tannoeks Burn and other small streams meandering through the wood on the other, and a copious and unfailing spring conveniently at hand, Mr. Armistead is able to make choice of the kinds best suited for his various experiments. The configuration of the ground is also favourable, permitting of the construction of a series of ponds at slightly differing levels, and thus facilitating the leading of the water-supply from the one to the other. In the course of the few years that Mr. Armistead has held it on lease—and during great part of which he laboured under the disadvantage of residence at Douglas Hall, fifteen miles distant—the appearance of the land has been greatly transformed, and if it does not yet quite “blossom as the rose,” it gives abundant promise of soon doing so. And now that he has acquired it by purchase from Lord Herries, we may expect the work of improvement and extension to receive a greater impetus from

“the magic of property.” That the sense of security conferred by possession is exerting its natural influence was apparent on a recent visit, from the operations in progress and the plans which we learned are in contemplation.

The busiest season of the year at the fishery—the hatching time—is over. On the occasion of the writer’s visit a comparatively few ova, taken from late fish, remained upon the grills, some being those of salmon; but a good many of the immature fry were still on hand. Here we see Nature not only assisted, but in part we may say superseded by art. The fish are spawned by hand, and the after stages of incubation and rearing the fry take place under artificial conditions. The hatchery proper is a long stone and lime building, fitted up with numerous narrow and shallow wooden boxes, through which there is kept up a constant circulation of the purest water. These are in the first instance filled with little grills, which are frames full of glass tubes, on which the ova is deposited, and as the season progresses they become the home of the fry in various stages of development. The naturalist has the opportunity of following the progress of the young life with the closest observation from the time that the first faint indication of vital form tinges the semi-transparent mass of the egg until the fish has emerged, appearing like a minute tail attached to a ball of disproportionate size, and until this ball or sac, with which Nature has provided for its sustenance during an infancy of three months, has been absorbed, and the tiny fish has become a feeding, self-supporting animal, ready, after several weeks of probationary training, to be set up in life on his own account. The boxes occupied by the fry present a very animated appearance, shoals of thousands reposing in a dark, inert-looking mass on the gravelly bottom; then suddenly dissolving into as many active, quick-darting atoms, when disturbed, or when attracted by the offer of food. It is in the fry stage, of course, that the greatest quantities are sent out from the fishery. This season quantities have been dispatched to all parts of the country, literally from Land’s End to John o’ Groats’. Ova is also supplied from the fishery in considerable quantities, consignments having been sent even to the Antipodes. For the transit of yearling fish zinc tanks are provided, of circular and tapering form, with a smaller inverted can on the top, filled with ice, the drip from which preserves an equal temperature in the

water below. These carriers, while extremely suitable for conveying yearlings, will not do for fry, which require water of a higher temperature, and these are all sent out in glass vessels specially made for the purpose, resembling carboys. The angle of the water with the glass has been duly considered, and when properly filled, a rotary motion is caused during transit, which is as a running stream to the little fish. Orders are less frequently received for larger fish, and only recently a consignment of fish averaging 2 lbs. each was despatched to a gentleman who wished to provide immediate sport. A large business is done in yearlings, which are made a special feature at the Solway Fishery.

The fish are reared in a series of ponds, many of them like broad trenches, others of larger dimensions and square in shape. The number permits of a perfect classification both as to species and age. The largest pond area at present immediately adjoins the hatchery and Mr. Armistead's residence; but a range of small ponds has been constructed on the crest of the rising ground at the further end of the field. It is intended to extend them along the whole face of the slope, and also to erect a second hatching-house in their vicinity. To secure a proper water-supply for this series of ponds has involved no small labour and outlay. The Pow Burn was tapped half-a-mile distant, a rough caul being thrown across it to dam it back at the place, and an aqueduct of that length has been constructed through the wood. Much of the cutting was through granite, and blasting had frequently to be resorted to. The work of pond construction has, however, been greatly facilitated by the retentive nature of the ground, which renders unnecessary the puddling or concreting of the bottom.

Gratifying, and in a measure surprising, results have been obtained in the cultivation of fish; not only larger individual specimens being reared than are to be met with under more strictly natural conditions, but gradual and constant improvement in their produce, and consequently in the general standard of the breed, being secured by the selection of ova only from perfectly healthy and well-grown fish. The Loch Leven Trout, the American Trout, the Windermere Char, and the Common Trout have received special attention at the hands of Mr. Armistead, and the most satisfactory results have attended his experiments with and careful rearing of them. A draught of the net in

any of the ponds brings to hand a sparkling mass of fine, healthy fish; among the older ones are a number of remarkable size. Perch, Tench, and other species are also reared; and there is a pond devoted to Gold-fish, with a small colony also of Leather Carp, reared from American fish. He has it in contemplation to try a series of experiments with our own Salmon, with a view to acclimatize it in the fresh water, and produce, as the Americans have done, a landlocked variety, which the owner of a pond or stream may always have at command.

Of course where so many fish are kept in a limited area they have to be artificially fed. Twice a day, and oftener in summer, animal food of various kinds is thrown to them; and on a warm day it is an animated sight to see the surface of the ponds all a-ripple and sparkling with bubbles caused by the continual leaping of their numerous tenants. Crustaceans and even Tadpoles reared "on the premises" go to supplement the hand-feeding in their season. A nursery of aquatic plants is also maintained for the sustenance of fish-life.

The situation of the fishery is somewhat remote,—two miles from the postal and telegraph station at New Abbey, and four from the railway, at Killywhan,—but an ample supply of good water and other facilities far more than compensate for this. The site, too, is a very pleasant one, under the shelter of the fine wood of larch and fir that stretches up towards Kinharvie House, with the New Abbey hills and the Waterloo monument in the background, and a fine view of Criffel and the Solway commanded by the climbing of a gentle eminence, whence the privileged visitor is sure to carry away the pleasantest memories of a personal kind.

NOTES AND QUERIES.

Death of Mr. Frederick Bond.—On the 10th August, at Staines, where he had resided for many years, our dear old friend Frederick Bond passed quietly and peacefully away, in the seventy-ninth year of his age. He will be much missed by everyone who knew him, but by none more than by the present generation of ornithologists and entomologists, to whom he was truly a guide, philosopher, and friend. When it is remembered that he helped to found 'The Zoologist,' in 1843, and contributed to its pages at intervals from that date to the present year (his last note, on the

Sand Grouse in Middlesex, having appeared in the month of June last), it will be evident that we have lost in him no ordinary supporter. His life-long experience as a field naturalist enabled him, when appealed to, to give most valuable information, and we feel sure that very many readers of this Journal will share the Editor's profound regret at his demise. A man who has done so much for British Zoology as the late Frederick Bond deserves more than a mere passing notice of his death, and we reserve for a future number a memoir of one whom it has been our privilege and pleasure to know for more than a quarter of a century. In preparing this tribute to his memory, we need scarcely say that we shall be grateful for any suggestions from friends, or for the communication of facts that might be usefully mentioned.

Destruction of Game and so-called Vermin.—All that is not "game" is "vermin," according to most keepers: both are destroyed, the one because it is "game," the other because it is "vermin," and what an enormous destruction of animal life is the result! During the shooting season of 1888 the following species were killed on the Austro-Hungarian crown lands of Salzburg:—294 Stags, 1505 Roe-deer, 1270 Chamois, 3562 Hares, 3 Marmots, 178 Capercailzie, 176 Black-game, 222 Hazel Grouse, 9 Ptarmigan, 471 Pheasants, 1237 Partridges, 40 Quail, 65 Snipe, 10 Woodcock, and 357 Wild Duck. Besides these there were destroyed 980 Foxes, 252 Martens, 72 Polecats, 9 Otters, 11 Wild Cats, 76 Badgers, 9 Eagles, 22 Owls, and 770 Hawks of various kinds. Years hence, when some of the wild creatures here mentioned will have become extinct, the above will be an interesting, though melancholy, record of man's propensity for destroying life.

BIRDS.

The Swannery at Abbotsbury.—This famous Swannery, of which an illustration is given in Mr. Mansel-Pleydell's 'Birds of Dorsetshire,' has been so often mentioned in 'The Zoologist' that readers will doubtless be interested to hear of a recent lawsuit concerning it, in which judgment was delivered by Mr. Justice Kekewich on the 10th August last. It was an action by the Earl of Ilchester, the owner and Lord of the Manor of Abbotsbury, in Dorsetshire, for an injunction to restrain the Defendants Rashleigh and others from trespassing on Chesil Bank and the Fleet, which were alleged to be part of the estate. It appeared that Chesil Bank united Portland with the mainland, and extended from Portland Roads in a north-westerly direction to Abbotsbury, where it joined the coast line. Between this bank and the coast there was a piece of water called the Fleet, extending from Portland Ferry Bridge to Abbotsbury, a distance of about nine miles. At Abbotsbury end there is a Swannery, which existed in Queen Elizabeth's time, and contained several hundred swans. The Plaintiff

claimed the land covered by the Fleet, the Chesil Bank, the wildfowl decoy, and the Swannery. On December 26th, 1887, the Defendants, who represented the fishermen on the coast, it was said, came up the Fleet in boats, penetrated into the Swannery, fired off guns, and made violent noises, which disturbed and frightened the birds, the result being that several flew away. The Plaintiff then brought this action simply to establish his right to the Swannery, the Fleet, and the Chesil Bank, but he had no intention to interfere with the fishing industry, and, in fact, he had conceded the right of the Defendants and other persons having lawful occasion to cross the Fleet in that part which was outside the Abbotsbury parish, and to use the eastern portion of Chesil Bank for hauling their boats, dragging their nets to shore, and drying them, &c.; but he objected to their navigating the Fleet west of Abbotsbury stone, where the Swannery was. The Defendants contended that they were entitled to use all parts of the bank and the Fleet, and that the Fleet was an arm of the sea, subject to the influx and reflux of the tide, and was navigable, and was therefore *jus publicum*, or public property: but, if that were not so, they had acquired the right to use it by custom. The Plaintiff contended, however, that the tide had no perceptible effect upon the water in the north-western portion of the Fleet, and it was not navigable, being only two feet deep and thick with weeds, and he denied the alleged custom, as watchmen had been constantly employed by him to warn off people who came up that portion of the Fleet. The Earl of Ilchester and several witnesses gave evidence in support of the Plaintiff's case, and a great deal of documentary evidence extending back to a distant period was adduced to show that the Fleet and the Chesil Bank was part of the Abbotsbury estate. On the part of the Defendants, evidence was given to the effect that they did not fire off guns or disturb the swans on the occasion mentioned, and they submitted that they had been accustomed to use all parts of the Chesil Bank for fishing operations, and to pass over the whole of the Fleet; that the Fleet was navigable; that it was influenced by the tides from end to end, and that therefore it was an arm of the sea and open to the use of the public. At the conclusion of the arguments, his Lordship reserved judgment. Subsequently, in giving judgment, he reviewed the evidence at length, and the numerous authorities bearing on the subject, and said that the action was brought by the Plaintiff to restrain the Defendants from trespassing on the Chesil Bank and the waters of the Fleet west of the Abbotsbury stone, which he claimed as his property. The Defendants contended, however, that it was an arm of the sea, and was subject to the ebb and flow of the tide, and, being navigable, the public had a right to use it. On that point, his Lordship drew attention to the fact that witnesses had been called who had stated that the western portion of the Fleet was dry land at some periods, and therefore it could not be said

to be navigable. As regards its being an arm of the sea and subject to the tides, he thought the scientific evidence showed it was not. If the depth of the water differed from time to time, it was caused by the streams that ran into it, and the percolation of the sea through the Chesil Bank. He came to the conclusion that the Plaintiff had made out his claim to the western portion of the Chesil Bank and the Fleet, and he must, therefore, restrain the Defendants from trespassing on the waters of the Fleet west of the Abbotsbury stone, and also the western portion of the Chesil Bank above high-water mark. He was glad to say that in granting the injunction he was not interfering with the fishing industry carried on by the Defendants.—Injunction accordingly against the Defendants, but without costs.

Crossbill breeding in Immature Plumage.—In replying to my note (p. 263), Mr. H. A. Macpherson tries (p. 313) to lure your readers away from the statement at issue. His point is this:—"The interesting point, of course, is to find the male *Loxia curvirostra* breeding in a yellow dress, and *before assuming the red plumage of maturity.*" In the words *italicised* it is assumed by Mr. Macpherson that the young male Crossbill wears the yellow dress before acquiring the red dress, and that this yellow dress is immature, an assumption directly at variance with the opinions of the most careful observers. Here, first, is the admission or opinion of Professor Newton (Yarrell, 4th ed. ii. p. 200):—"By September the young cocks have lost much of the striped (*sic*) appearance, and at their moult begin to assume the red plumage of maturity," &c. This statement agrees fully with Mr. J. Hancock's observations, and it implies also that the red dress (or, as it may be styled, the marital dress) of the young males is donned at their first moult. Next, in the 'Ornithologie Européenne,' by Degland (vol. i. p. 177), are these words:—"Des jeunes mâles, tués le 15 Août près de Lille, étaient en mue, et offraient quelques plumes rouges sur les parties inférieures. A l'âge d'un an cette couleur est plus ou moins dominante." Admitting, also, the correctness of the observations recorded by Mr. Dresser ('Birds of Europe,' vol. iv. p. 128), that young males do sometimes moult directly into the yellow or greenish yellow dress, yet how, even with this admission, can the bird in the yellow dress observed by Mr. Ussher have been, as Mr. Macpherson says, in the immature plumage. But, as stated by Mr. J. Hancock ('Birds of Northumberland,' p. 50), male birds in the yellow dress have been observed breeding in the same locality with other pairs, the male being in a red dress. To suggest, as Mr. Macpherson quotes, that these yellow males are barren birds, without first having carefully examined the state of the sexual organs of freshly-killed specimens in the breeding season, is merely jumping at a conclusion, and is most probably as inaccurate as Mr. Macpherson's statement that the yellow dress is the dress of an immature male. But enough. The criticism about my use of the word "spotted" is perhaps best replied to by asking

what Latin word would Linnæus have used if he had had the chance of describing the young of the Common Crossbill in the first plumage? Would it have been *maculosus*, *lineatus*, or *striatus*? It satisfies me to think that he would have used the first of these three words. A spot may be of any shape, longitudinal, triangular, square, or irregular as in the Spotted Woodpeckers. "Obsolete heresy" is something I cannot comprehend, but in the present state of our knowledge the word "heresy" is a term that ought not to be used by searchers after or lovers of truth. Let the word and its associations be "obsolete."—RICHARD HOWSE (Museum, Newcastle-on-Tyne).

Food of the Shearwater.—Some little time ago the writer described in 'The Zoologist' (1888, p. 374), how he had seen Shearwaters, *Puffinus anglorum*, feeding on small fishes, in company with Herring Gulls, *Larus argentatus*, a circumstance in keeping with the fact that he had found the digested remains of fish in the stomachs of some of these birds killed on land. Mr. Gawen, however, expressed the opinion (*tom. cit.* p. 426) that the birds in question had swallowed "fish offal." Mr. R. Warren then (p. 470) added the weight of his experience to that of the writer, who, rather than press his views unduly, preferred to wait for further evidence. This has now been obtained. An example of *P. anglorum*, shot in his presence by Mr. F. P. Johnson, proved to contain only the remains of fishes, so small that they could not have been taken in any net but a muslin one. The bird in question was one of a flock which had been observed for some days, and the observers, both of whom have studied *P. anglorum* for eight or nine summers, felt satisfied that its companions were fishing in the same way. There is no evidence, so far, that anyone has ever seen a Shearwater swallow a fish. Under ordinary circumstances, they certainly catch their prey on the wing, as Terns do, and their movements are too rapid to allow an observer to detect their seizing their prey, to say nothing of the fact that they almost always fish in a breeze where the water is a little ruffled. All through the long summer days their beautiful evolutions may be studied within the Inner Hebrides, and at nightfall their weird cries resound across the water.—H. A. MACPHERSON (Carlisle).

Sand Grouse in Nottinghamshire.—The flock of seventy or more Sand Grouse which arrived here during the last week in April, 1888, remained until the end of October, when they left, and have not returned. Every care was taken of them, and as the ground suited them in every way, one would have thought they would have remained here. One pair nested, and two eggs were taken. Though this has been mentioned in 'The Field,' I think a notice should appear in 'The Zoologist.' In addition to this flock, four other lots were seen in different parts of the county.—J. WHITAKER (Rainworth, Notts).

Conviction under the Wild Birds Protection Act.—The Society for the Protection of Birds during the Close Season has made a start and

obtained a conviction at Newmarket, against a man named Fenn, of Isleham. The Society's officer, in July last, went to the premises of this birdcatcher, and there found huddled together, in all the dirty misery it was possible for them to be in, Blackbirds, Thrushes, Linnets, Plovers, and other birds, all of which had been recently captured during the close time. The man was convicted and fined 15s. It is to be hoped that the conviction will operate beneficially, and the law may continue to be enforced by the Society, of which we should be glad to hear more.

Golden Oriole in Derbyshire.—A beautiful male specimen of this bird was shot just over the county boundary at Creswell, Derbyshire, on May 13th. Why will not people observe the Wild Birds Protection Act, and give this and other beautiful birds a chance to stay and nest here?—J. WHITAKER (Rainworth, Notts).

Great Crested Grebe breeding in Scotland.—I have this year discovered in the South of Scotland the nest and eggs of the Great Crested Grebe, *Podiceps cristatus*. As I am not aware that this bird has been recorded to breed in Scotland, a note of the occurrence may be of interest.—ROBERT H. READ (Cutheart, Glasgow).

[Selby states (ii. p. 394) that this bird breeds on a few of the *northern* Scottish lakes, but does not specify any locality. This is not confirmed by Messrs. Harvie Brown and Buckley (p. 245), and Robert Gray, in his 'Birds of the West of Scotland' (p. 405), adds nothing to this bare statement.—ED.]

REPTILES.

Addendum to the List of Reptiles found in Barbados.—In the August number of 'The Zoologist' (pp. 295—298) is published a list of the terrestrial reptiles of the island of Barbados, in which I stated that only one species of snake is found there. This statement has now to be modified. Mr. G. A. Boulenger, on examining the small collection of reptiles from Barbados that I submitted to him, reported that it only contained one species of snake, *Liophis perfuscus*, Cope. I was then under the impression that Mr. Boulenger had seen all the reptiles collected by me in Barbados; but, through an oversight on my part, another small snake had got astray amongst some bottles containing Barbados mammals. This specimen has since been handed over to Mr. Boulenger, who identifies it as *Stenostoma bilineatum*, Schleg., hitherto known from Martinique and Guadeloupe. Mr. Boulenger remarks in a letter to me that the habits of the *Stenostomatidæ* being very much those of earthworms, they may easily be transported in mould. This little snake is certainly very rare in Barbados; but its existence is known to some of the planters, for Mr. T. E. N. Dean, of St. Nicholas, mentioned to me that there was a second species of snake or slow-worm found in the island,—black, and a few inches long,—generally under heaps of decayed leaves or litter, and that the coloured people call it

the "Seven-year Snake," as he or she who kills such a one is supposed to obtain remission of sins for a like period! When I obtained a specimen of this little reptile in Barbados I thought it was a second species of snake, and remained under that impression until my collection had been critically examined, when it proved, so far, only to contain one species, and I wrote accordingly (*vide antea*, p. 296). I have now to modify that statement, and to express my regret that carelessness on my part caused the omission of *Stenostoma bilineatum* from my list of Barbadian reptiles.—H. W. FEILDEN (West House, Wells, Norfolk).

FISHES.

Greater Flying-fish off the Cornish Coast.—During the second week of July last the crew of a fishing-boat, the 'Little Gleaner,' when ten or twelve miles off the Lizard, on drawing their mackerel-nets, found a Flying-fish, *Exocetus volitans*, Day, entangled in the meshes. It measured $14\frac{1}{2}$ inches in length, and was in good condition.—MATTHIAS DUNN (Mevagissey, Cornwall).

MOLLUSCA.

Mollusca of Stourport and District.—The following list of species taken by me last Whitsuntide at Stourport, may form an interesting addendum to what is already known concerning the molluscan fauna of Worcestershire:—*Limnæa glabra* (Müll.), very plentiful in a ditch on Hartlebury Common; some very large specimens also in a ditch in a field on the Severn side belonging to the Coney Green Farm. *Planorbis spirorbis* (Müll.), in the same ditch on Hartlebury Common, and also in Hillage Pool. Out of Hillage Pool I also took *L. peregra* (Müll.), with its vars. *ovata* (Drap.) and *labiosa* (Jeff.), *Bythinia tentaculata* (Linn.), *B. leachii* (Shepp.), *Valvata piscinalis* (Müll.), *Ancylus oblongus* (Lightfoot), *Planorbis umbilicatus* (Müll.), *P. carinatus* (Müll.), *P. vortex* (Linn.). *Limnæa palustris* (Müll.), *Sphærium corneum* (Linn.), *Anodonta anatina* (Linn.), and *Unio tumidus* (Phillippon). *Succinea elegans* (Risso) and *S. Pfeifferi* (Rossm.) were common on the sedges round the pool. Typical specimens of *Helix arbustorum* (Linn.), with vars. *pallida* (Taylor) and *marmorata* (Poff.) were common at Lincombe Bay, and on a nettle-covered bank at the base of Stagbury Hill. At Lincombe Bay I also took fine examples of *Succinea putris* (Linn.) and *S. elegans* (Risso), which were living on the nettles near the Severn in company with *Helix sericea* (Müll.), *H. hispida* (Linn.), *H. rufescens* (Penn), *H. rotundata* (Müll.), *Helix nemoralis* var. *carnea* (Roeb. and Taylor), with band-formulæ of 00300 and 123(45), *Helix hortensis* var. *lutea* (Moq.), with band-formulæ of 00000, 12345, 123(45), and var. *albina* (Moq.), with band-formulæ of (12345), 12345, 1(234)5, *Hyalinia cellaria* (Müll.), *H. alliaria* (Müll.), *Clausilia rugosa* (Drap.), and *Cochlicopa lubrica* (Müll.). In the "Deep Meadow" near the Severn at Stourport I found *Succinea putris* (Linn.), *S. elegans* (Risso), *Arion subfuscus*

(Drap.), *Limax lævis* (Müll.), *Hyalinia fulva* (Müll.), *H. nitida* (Müll.), *Physa hypnorum* (Linn.), and *Carychium minimum* (Müll.). In my note on "Shells round London" (p. 270), *Arion ater* var. *brunnea* (Lehm.) should have been *Arion ater* var. *brunnea* (Roebuck).—JOSEPH W. WILLIAMS (Mitton, Stourport).

SCIENTIFIC SOCIETIES.

ZOOLOGICAL SOCIETY OF LONDON.

June 18, 1889.—Prof. FLOWER, C.B., LL.D., F.R.S., President, in the chair.

The Secretary exhibited (on behalf of Mr. J. F. Green) a very fine example of the Common Eel, obtained from a pond in Kent, and measuring upwards of four feet in length.

Mr. B. B. Woodward exhibited and made remarks on a drawing representing a living example of *Ærope kaffra*, a carnivorous snail from the Cape Colony. Mr. Woodward also exhibited an example of a fossil shell from the Eocene of the Paris Basin (*Neritina schmideliana*), and a section of it showing the peculiar mode of its growth.

Mr. Eadward Muybridge, of the University, Pennsylvania, exhibited a series of projections by the oxyhydrogen light, illustrative of the consecutive phases of movements by various quadrupeds while walking, trotting, galloping, &c., and of birds while flying.

A communication was read from Professor Giglioli, containing the description of a new genus and species of Pelagic Ganoid fish from the Mediterranean, proposed to be called *Eretmophorus kleinbergi*.

Lieut.-Col. H. H. Godwin-Austen read the first of a proposed series of papers descriptive of the land-shells collected in Borneo by Mr. A. Everett, with the descriptions of new species. The present paper treated of the *Cyclostomaceæ*.

Capt. G. E. Shelley read a list of birds collected by Mr. H. G. V. Hunter in Masai-land during the months of June, July, and August, 1888. The collection (which Mr. Hunter had presented to the British Museum) consisted of examples of ninety-four species, seven of which were described by the author as new to science.

Mr. P. L. Sclater gave a further description of Hunter's Antelope, *Damalis hunteri*, from specimens obtained by Mr. H. C. V. Hunter on the river Tana, Eastern Africa.

Mr. F. E. Beddard read a paper on the freshwater and terrestrial Annelids of New Zealand, with preliminary descriptions of new species.

A communication was read from Mr. H. W. Bates, containing descriptions of some new genera and species of Coleopterous insects collected by

Mr. Whitehead during his recent visit to Kina Balu. The collection was stated to comprise an unusual proportion of new and remarkable forms.

This meeting closed the session.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

August 7, 1889.—The Right Hon. Lord WALSHINGHAM, M.A., F.R.S., President, in the chair.

The Rev. John Walley, of Wuhu, China, was elected a Fellow; Professor Charles V. Riley, of Washington, United States, was elected an Honorary Fellow in place of the late Dr. Signoret, of Paris; and Colonel Swinhoe and the Rev. F. D. Morrice were admitted into the Society.

Mr. Walter F. Blandford exhibited a specimen of *Cardiophorus cinereus*, Herbst, taken at Tenby, and remarked that the species had rarely, if ever, previously been found in the United Kingdom. Mr. C. O. Waterhouse said he believed that there was a specimen in the collection of his late father and also another specimen in the collection of the British Museum.

Mr. Waterhouse stated that the British Museum had just received from the Rev. Arthur Elwin, of Hangchow, China, a luminous larva about $1\frac{1}{2}$ in. long and $3\frac{1}{2}$ lines broad, which he believed to be one of the *Lampyridæ*.

Lord Walsingham exhibited specimens of *Conchylis degreyana*, M'Lach., bred from seed-heads of *Plantago lanceolata* at Merton, Norfolk; also a specimen of *Tineidæ* allied to the genus *Solenobia*, probably belonging to *Dissoctena*, Staud., but differing somewhat in the structure of the antennæ. Lord Walsingham remarked that the specimen was taken by himself at Merton on the 31st July last, and that the species was apparently undescribed.

Mr. Meyer-Darcis exhibited a collection of Coleoptera, comprising specimens of a species of *Loethrus* from Turkestan; *Julodis globithorax*, Stev., from the Caucasus; a new species of *Julodis* from Kurdistan; *Cardiaspis Mouhotii*, Saunders, from Sikkim; *Carabus smaragdinus*, Fisch., from Siberia; *Julodis ampliata*, Mars., from Aintab, Asia Minor, and a variety of the same from Kurdistan; and *Julodis luteogramma*, Mars., from Syria, and a variety of the same from Kurdistan.

Mr. H. Goss read extracts from letters from Mr. R. W. Fereday, of New Zealand, and Sir John Hall, K.C.M.G., relating to a number of Lepidoptera collected recently at sea, about half way between the River Plate and Rio, at a distance of over 250 miles from land, in about 30° S. lat. and 46° W. longitude. It was stated that the ship was surrounded by swarms of moths. Mr. J. J. Walker, R.N., observed that he had seen a large number of insects at sea about 150 miles off the coast of Brazil, and he referred to other records of the capture of insects at sea in Darwin's 'Voyage of the Beagle,' and Dr. Copping's 'Cruise of the Alert.' The discussion was continued by Dr. Sharp, Lord Walsingham, Mr. White, Mr. Kirby, and others.

Mr. E. Meyrick read a paper entitled "On some Lepidoptera from New Guinea," and exhibited the species therein described. He stated that the specimens were derived from two sources, *viz.* (1), a portion of the collection received by the Society from Baron Ferdinand von Müller, F.R.S., and collected by Mr. Sayer when accompanying the Australian Geographical Society's Exploring Expedition; and (2), a number of specimens collected by Mr. Kowald near Port Moresby, and obtained from him by Lord Walsingham.

Mr. Blandford read a letter from Mr. Wroughton, of Poona, Deputy Conservator of Forests, asking for assistance in working out certain Indian Hymenoptera and Diptera in the collections of the Bombay Natural History Society. Lord Walsingham, Colonel Swinhoe, and Mr. Moore made some remarks on the subject.—H. Goss, *Hon. Secretary.*

NOTICES OF NEW BOOKS.

Catalogue of the Marsupialia and Monotremata in the Collection of the British Museum (Natural History). By OLDFIELD THOMAS. 8vo, pp. 400, Plates I.—XXVIII. Printed by order of the Trustees.

Catalogue of the Chelonians, Rhynchocephalians, and Crocodiles in the British Museum (Natural History). New Edition. By G. A. BOULENGER. 8vo, pp. 311, Plates I.—VII. Printed by order of the Trustees.

It is highly satisfactory to mark the steady progress which is being made in the preparation of the Catalogues of the Zoological Collections in the British Museum, and the important additions which are being constantly made in almost every branch of Zoology.

Since the year 1843, when the late Dr. Gray brought out his 'List of Mammalia in the Collection of the British Museum,' no general account of the Marsupials in that collection has been published, whilst nearly all the other Orders of the Class have been made the subjects of continuous study and revision. This seeming neglect, as explained by Dr. Günther in the Preface to the above first-mentioned Catalogue, was chiefly due to the appearance in 1846 of two works, *viz.*, Waterhouse's standard work on these Mammals, which in the course of the following

twelve years was supplemented by Gould's 'Mammals of Australia.' Both these works had a direct relation to the collection in the British Museum, and for many years seemed fully to satisfy the needs of zoologists. The collection, however, grew apace like that of the other Mammalia, no opportunity being lost of making such additions as were required to complete the series, and the number of specimens appear now—after the lapse of some forty years—to be about trebled. Especially in the course of the last three or four years, during which time the 'Catalogue of the Marsupialia' has been in progress, the collection, chiefly through the efforts of Mr. Thomas, has received many important additions.

The specimens now enumerated amount to 1240 Marsupials and 64 Monotremes, making 1304 in all. Of this total, 173 are preserved whole in spirits, while the osteological collection of skeletons and skulls amounts to 703. Apart from the mere number of specimens, however, as the value of zoological collections depends so largely upon the possession of types, it is important to note that in the Marsupialia and Monotremata alone the British Museum possesses more type specimens than all the Continental Museums put together. Here are the figures:—British Museum, 74; Paris, 21; Leyden, 8; Genoa, 7; Christiana, 5; Vienna, 4; Berlin, 3; Munich and Copenhagen possessing only one each. This wealth of types is, no doubt, in a great measure due to the possession of the late Mr. Gould's collection of Australian mammals (which contained not only a complete set of the types of the many species described by him, but also a fine series of all the Australian mammals he obtained) and the collections of Sir George Grey, from South Australia, and Mr. Ronald Gunn, from Tasmania.

From this it will be seen that, in the preparation of the Catalogue before us, Mr. Thomas has had much valuable material upon which to work,—material which he has taken care to supplement by visiting the principal Continental Museums for the purpose of examining the types there, and other important specimens in these two Orders of mammals. The result is a very valuable Catalogue, useful not merely as an enumeration of what may be found in the National Museum, but because it embodies double synopses of the genera and species of the Marsupialia and Monotremata which will enable students to

identify specimens either from their external characters or from the skulls alone. The introductory remarks on dentition, and upon the method of measurement adopted by the author, are well considered, and deserve careful perusal.

In striking contrast with what has occurred in other groups of Vertebrates, the increase of known species of Chelonians, says Mr. Boulenger, "has been very slight within the last twenty years." In fact Mr. Boulenger's Catalogue contains a much smaller number of species than did the late Dr. Gray's 'Supplement' to his 'Catalogue of Shield Reptiles,' published in 1870. This, no doubt, is due to the different views held by the writers as to what ought to constitute specific characters, and partly also to a better understanding at the present day of the amount of variation to be found within given forms.

In the volume before us, with the title above given, we find a complete revision of both higher and lower groups, the synonymy carefully worked out, clear synopses given of the genera and species, with half-a-dozen well-executed plates and numerous woodcuts. It need scarcely be said that, embodying, as it does, the most recent views of classification and nomenclature, this volume will of necessity supersede all previous Catalogues of the Chelonians and Crocodiles which have emanated from the British Museum.

A Catalogue of Canadian Birds; with Notes on the Distribution of the Species. By MONTAGUE CHAMBERLAIN. Sm. 4to, pp. 143. St. John, N.B. (McMillan, 98, Prince William Street).

A Systematic Table of Canadian Birds. By MONTAGUE CHAMBERLAIN. Large 4to, pp. 14. St. John, N.B. (same publisher). 1888.

ALTHOUGH neither of these works can be accurately described as "new books," having lain for some months on our table, we have no doubt that they will be "new" to many of our readers, and some allowance may be made for the delay in noticing them on the ground of foreign publication, which generally implies delay in transit.

Some authoritative work on the Birds of Canada has long been wanted, the very few volumes hitherto published on the

subject being quite unimportant and not very trustworthy, the best perhaps being Mr. McIlwraith's 'Birds of Ontario.' Canada, in fact, has done nothing hitherto for Ornithology, and even the Reports of the Geological Survey do not help us in this direction. While we know in a general way what species occur there, and something of their distribution, many problems of much interest in relation to North American birds can only be settled satisfactorily by means of extensive field-work and large series of specimens collected in the great regions north of the United States. It is to be hoped, and indeed expected, that for this research Mr. Chamberlain's book will pave the way. He has furnished a carefully prepared Catalogue of such birds as are known with certainty to occur in Canada, and although for the sake of brevity he has omitted all synonyms, and even descriptions of species, some useful notes are given upon nearly every bird mentioned. We are not sure that it was wise to omit descriptions of size and general coloration, which might be very briefly noted, for, although assuredly such information is to be found in many excellent text-books on North American birds, travellers and collectors as a rule are not disposed to carry many books about with them, and to find what they want in a handy volume—say double the size of Mr. Chamberlain's Catalogue—would be a great boon.

The object of the present work, as stated by the author in his Preface, is to bring together the names of all the birds that have been discovered within the boundaries of the Dominion, from the Atlantic to the Pacific, and north to the Arctic Ocean; to present these in the system of nomenclature and in the sequence now generally adopted by American ornithologists, and to give (briefly) the geographical distribution of each species.

The book is nicely and clearly printed on good paper, and is a decidedly welcome addition to ornithological literature.

In the 'Systematic Table of Canadian Birds,' by the same author, printed on larger paper, and on one side of the page only, we are enabled to see at a glance the exact position which any given species occupies in the scheme of classification, the headings of the columns—which extend across a very wide page—being "Family," "Subfamily," "Genus," "Subgenus," "Species," "Subspecies" (if any), and "English Name." The sportsman, for example, who may desire to know what "game

birds" are to be met with in Canada, will find a list of them—twenty in number—on page 6; and the wildfowler may see at a glance, on page 3, what ducks, geese, and swans are likely to reward his search along the coast or on the inland waters. Thirty-five different kinds of Ducks, a dozen different Geese, and two species of Wild Swan, ought to tempt many an English sportsman to try Canadian waters.

Report on Bird Migration in the Mississippi Valley in the years 1884 and 1885. By W. W. COOKE. Edited and revised by Dr. C. HART MERRIAM. 8vo, pp. 313, and Map. Washington, 1888.

THE present Report, which has been prepared by Prof. W. W. Cooke, with the assistance of Mr. Otto Widmann and Prof. D. E. Lantz, is the first fruit of the co-operative labours of the Division of Economic Ornithology of the Department of Agriculture and the Committee on Bird Migration of the American Ornithologists' Union. It consists of two parts: (1) an introductory portion, treating of the history and methods of the work, together with a general study of the subject of Bird Migration, including the influence of the weather upon the movements of birds, the progression of bird-waves and causes affecting the same, the influence of topography and altitude upon migration, and the rates of flight in the various species; and (2) a systematic portion, in which the five hundred and sixty species of birds known to occur in the Mississippi Valley are treated serially, the movements of each during the seasons of 1884 and 1885 being traced with as much exactness as the records furnished by the one hundred and seventy observers in the district permit.

The chapters entitled "The Relation of Migration to Barometric Pressure and Temperature," and "A Study of the Bird-waves which passed up the Mississippi Valley during the Spring of 1884," are worthy of the most careful perusal; and the articles on the Kingbird and Purple Martin, in the systematic portion of the Report, are particularly instructive. Indeed we feel no hesitation in expressing the belief that the present Report is one of the most valuable contributions ever made to the subject of Bird Migration.

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A RAMBLE ROUND SIMLA.

BY J. C. ANDERSON.*

I WILL suppose that you have a short holiday in October or November and find yourself at Simla. The first want you will feel—at least I always did—was to get out of it without unnecessary delay: those distant snows and forests are too alluring. Some preparations must, however, first be made. In the first place, you must have dogs. Any dog with a nose will do, and it is strange how many dogs have noses, though few of them know it. A fox-terrier, or bull-terrier, trained to use his nose and thoroughly well in hand, is as good for this work as a spaniel or setter,—better I think in many respects, as he is lighter and not so easily fatigued on those steep rocky hill-sides; on the other hand, it must be admitted, he has usually a way of helping himself to pheasant that has to be guarded against. The best dog out of a regular pack of all sorts that it fell to my lot to see was a tiny, mean-looking, yellow *pai*,—the most veritable cur you ever set eyes upon,—and yet with a nose that was truly marvellous, combined with a judgment that would have adorned the Bench. A shikaree, too, you will want—a man who can work the dogs, and who has some knowledge of the country and the sport to be found there. Tents, of course, if you are going to leave the road and the bungalow. They must be small and light,

* From the 'Journal of the Bombay Natural History Society,' 1889, pp. 56—66.



and, like all the rest of your luggage, capable of being carried on mules or on men's backs. If you are going for a short holiday only, with no definite plans made for you by some friend on the spot, I should advise you to stick to the Thibet and Hindoostan high road (a pathway from three to twelve feet in width) on which for over a hundred miles there are good bungalows, distant some ten or twelve miles from each other. Shooting all that you can reach from these bungalows on either side of the road, you may, if you are keen and in good trim, cover a great quantity of very fairly good ground, and you will be incomparably more comfortable than you could be in tents, with the thermometer at nights well below freezing-point. A servant, too, you must have who can cook, and has some experience of marching in those districts and knows the language of the people. And, lastly, a man who can skin birds. Such a man can almost always, I believe, be got in Simla for a salary of Rs. 15 or Rs. 20 a month, and it adds enormously to the pleasure of a ramble in a new country to be able to collect specimens as you go along. It is scarcely worth while in October or November taking a rod with you ; but there is no harm in taking a small trout rod, a few flies, and one or two small flying spoons, which you can get at Luscombe's, of Allahabad, better than anywhere else that I know of. I have not fished myself, being told that at that time of the year it was useless ; but a forest officer, whom I met last November, told me he had just caught several small fish in the Giri, in the direction of the Chor (a big hill not very far from Simla), I think he said with a fly. If your visit should be in May or June, certainly take your fishing-tackle. Both in the Giri to the east and the Sutlej to the west the Indian Trout, *Barilius bola*, and Mahseer (though not of any great weight), are to be caught, and give good sport. So at least I am informed on the very best local authority. At that time of the year, when the upper rivers are full with the melting snow-water, the fish ascend the smaller tributary streams, and descend when the water begins to run fine again at the end of the rains, say in September and October, after which the fish must be looked for in the bigger waters in the plains below. I would advise you to take a rifle, though it is quite possible you may find little or no use for it. It depends, of course, a good deal on the direction in which you go, and how far. If you are simply rambling round about Simla, which is all

that I am now supposing you to intend to do, and nearly all that I can myself pretend to have done, you may not possibly see a four-footed creature bigger than a Jackal or a Fox. By the way, a Simla Fox, *Vulpes montanus*, in autumn (and even more so in winter, I believe) is a beautiful creature. It has a lovely coat and a noble brush, and makes a very handsome rug when properly mounted. There are bears there, and in some places a good many. I have heard of as many as five being shot in one day close to the road. I mean the Himalayan Black Bear, *Ursus tibetanus*; the Brown Bear of Cashmere, *Ursus isabellinus*, is very rarely, if ever now, met with in this neighbourhood, though I believe there was a time, not so very long ago, when it was not so scarce. The Barra-singh of Cashmere, *Cervus cashmirianus*, too, is another animal which used occasionally to be seen in this district, but has been crowded out by the multiplication of guns. Goral, however, *Nemorhædus goral*, a small species of mountain goat, you will find in some places, and those not far from Simla, pretty plentifully I believe. I have heard local sportsmen speak disparagingly of Goral shooting as very tame work, and, to judge by some accounts of it I have heard, it must often be so. My own experience was as small as it well could be; but the one I saw and shot, on the only occasion I ever went after Goral, gave me as pretty an afternoon's walking and climbing on a steep hillside, among oaks and ferns and rhododendrons and grand grey crags, as one could well wish to have. If your larder is low, you will not despise Goral; a saddle of Goral is by no means to be contemned, even if you do not strictly follow the advice a serjeant pensioner gave me, to be "sure and hang it three weeks, Sorr." Tahr and Burrel, and even Ibex, you may meet with if you go far enough; but I will not say how far that may be. I never saw any of them, though I have come across "pugs" (on a retired part of Hattoo, I think) which doubtless belonged to one or other of them,—I could not make out which from my shikaree. It is not your rifle, then, you must depend upon for your sport, but your gun. For this you may always find some occupation pretty well anywhere in that neighbourhood. If you must have big bags, you will almost certainly be disappointed; if you are content with a grand day's walk and a moderate bag, hardly and honestly won, you need scarcely ever be so; and of course it is to the pheasants that you will chiefly look to provide

you with your amusement and fill your larder. Wherever there are trees, or even bushes, though it be on the very roadside, you feel you are not quite safe from one or other of that game and handsome family. The pheasants that you may expect to meet at this season of the year are practically four only, unless, indeed, you go somewhat further afield than I am now contemplating your doing. These are the Monal, *Lophophorus impeyanus*; the Koklass or Pucras, *Pucrasia macrolopha*; the Cheer, *Phasianus Wallichii*; and the White-crested Kalij, *Euplocamus albocristatus*. The handsome Jewar, or so-called "Argus Pheasant" of that region, *Ceriornis melanocephala*, one of the tragopans, is still, I believe, to be met with in the higher regions of forest, somewhat more remote from Simla, but quite as an exception within the region I am now considering. It is a shy bird apparently, of somewhat meditative, if not gloomy disposition, favouring the darkest depths of the remotest forests. Yet curiously, as pointed out by more than one writer on the subject, it seems to be the most easily tamed of all the Himalayan pheasants; while the Kalij, which in its wild state seems scarcely happy far away from the sound of the human voice, is the most difficult to domesticate.

The Monal and the Koklass, and specially the former, are distinctly forest birds, loving the dark dense forests of deodar, juniper, and yew; while the Cheer and the Kalij prefer somewhat more open ground, interspersed with woods of pine, oak and rhododendron, with a thick undergrowth of bushes, ferns, and grasses. The Monal I have not found at a much lower elevation than 7000 feet; the Koklass seldom below 6000 feet; from 5000 or lower to 7000 feet seems to be the favourite region of the Cheer and the Kalij. Though all four birds are now, I believe, universally regarded as Pheasants, you will see from a comparison of specimens that they differ from one another very considerably in character. There is no mistaking the Cheer, with his typically long tail, for anything else than a Pheasant. A cock Cheer in form and feature, though not in colour, differs very slightly from the cock Pheasant of our English covers, and is about the same weight, say $3\frac{1}{2}$ lbs. The Koklass is evidently a near relation, being a typical Pheasant in all respects, save that he is wanting in the long tail-feathers. But the Monal, with his gorgeous blue, green, copper, and bronze tints, his peculiar

upright crest, and his compact thickset body, and strong, short legs, evidently adapted for digging, is obviously as nearly related to the Peacocks as he is to the Pheasants; while you have only to look at the tail of the Kalij to see his relationship to the next sub-family at the other end of the scale, *viz.*, the Gallinæ—comprising the Jungle Fowls, Fire-backs, &c. All four birds seem distinctly to prefer shade to sun and damp to dryness. The neighbourhood of running water seems almost an essential with all of them. In short, such as the fern is in its choice of locality, so is the Pheasant; the two are evidently firm friends. As with trout and many other fish you are pretty sure to take day after day behind the same stone or in the same eddy, so it was I found, not always for any apparent reason, with these Pheasants. There were certain spots, for instance, on the road from Narcanda to Bhagi (which, by the way, passes through one of the grandest pieces of forest scenery I suppose to be seen on any roadside in the world, where the deodars must some of them be quite 200 feet high, with their dark sombre green veiled in many cases from top to bottom in the flame-coloured leaves of the Virginia creeper). There were certain spots on this road where, in my visit of three years ago, I was sure day after day to find a bird or two, in spite of the fate that had overtaken their predecessors at the same spot, it might be only the previous day. On visiting the same locality last November, there, in the very same spots, I nearly always found birds. The Monal, the Koklass, and the Kalij seem to spread themselves pretty indiscriminately over the area where the conditions they require are to be found. It is curiously otherwise with the Cheer. One little valley may hold Cheer, and a dozen all round, where apparently the conditions are precisely the same, may not hold a single one. I have heard of residents of Simla shooting regularly for years together all round the neighbourhood, and never so much as seeing a single Cheer, and then subsequently coming on them by chance one day in some place not previously shot over, though perhaps quite close to Simla, and always thereafter finding them in the same place year after year. I was fortunate enough on this last visit to Simla to be shown one of these haunts of the Cheer, from which three specimens I have were secured. The ground corresponded very accurately with the description of the favourite locality of the Cheer given by Messrs. Hume and Marshall in their well-known

work on the 'Game Birds of India.' The hill-side on which they were found was composed of a number of little cliffs one above the other, each perhaps from twenty to thirty feet high, broken up by ledges on which one could barely walk, thickly set with grass and bushes, and dotted sparingly with more or less stunted trees, with curious roots hanging down the little cliffs and long trailing arms of scarlet creeper. I had a red setter and three spaniels with me. The setter was put to range over the whole hill-side; men were stationed at various points to mark down the birds while we sat on a knoll opposite and looked on, a deep ravine lying between. It was a pretty sight to see the dog working half-way up the hill. Soon there might be seen, scuttling up hill at an amazing pace, across the little open glades between one clump of brushwood and another, a family party of some five or six Cheer, their heads down and long tails drooping. The dog soon overtook and flushed them, and then all eyes were wanted to mark down each bird. The birds have pitched in various places, only a little lower than where they were flushed, having wheeled round to the right and left soon after they had got on the wing. You cross the ravine and ascend the hill on the other side. You find it is much stiffer work than it looked, requiring a good head and a careful use of your feet. At last you get to the destined spot below bird number one, and as close as you can conveniently get thereto—it may be twenty yards or it may be a hundred or more. You have a most insecure footing, and you are not quite sure that your gun going off will not remove you from it; but you mean to have a shot at that Cheer, though you perish in the attempt. The shikaree climbs up still higher to flush the bird with the spaniels at his heels. After a good deal of beating of bushes and inciting of the dogs, a great fluttering is heard overhead, but it may be out of sight. The next moment a mighty rush as of some archangel in a hurry; you spin round, let off your gun, and upset yourself, all in the twinkling of an eye; and if you get that bird it is probably, as Mr. Hume remarks, not the first time you have shot Cheer. If you do not get him, he is again marked down, probably on some lower slope of the same hill, where you may with perfect confidence leave him till you have looked up, by a similar process to that first described, the other birds originally flushed. It is curious how close these birds will sit when put up once or twice. You may leave them half an

hour, and find them under the very bush you saw them pitch in ; and you may beat that bush, or cause it to be beaten, till you are on the point of being convinced the bird must have gone, when up it gets almost under your very nose, and shoots with tremendous velocity down hill. This grand bird is, as I have already stated, even now very scarce in the neighbourhood of Simla, and I very much fear it will soon disappear altogether, its ways and habits laying it open to complete extinguishment more than do those of other Pheasants. The rest, I think, will always be sufficiently able to take care of themselves, a wise Government now protecting them in the breeding season, in common, I believe, with all game birds of that region.

As to the Monal, it is more easy for me to be brief, inasmuch as the bird is now comparatively scarce in any easily accessible part of the neighbourhood of Simla, and it is certainly by no means true now, and of that locality, whatever may have been the case when "Mountaineer" wrote (so often quoted by Mr. Hume and by Mr. Barnes) that "the most indifferent sportsman will find little difficulty in getting the Monal." This is because it has been, and is, so much shot for its gorgeous plumage, a small piece of which, a lady tells me, costs as much as a guinea or more at a fashionable West End bonnet-shop. The man I had with me this year to skin what I shot told me he had himself skinned some two thousand last season for one firm of exporters in Calcutta, the majority of which, I believe, came from the neighbourhood of the Chor—a hill some twenty miles (as the crow flies) from Simla, but somewhat rugged and inaccessible, and removed from any good road. From what little I have seen of this bird I can quite imagine that the best sport with it would be got by shooting it, as suggested by "Mountaineer," with a small rifle—such a rifle as the .320 or .380 bore, Winchester, and which I have lately had an opportunity of proving to be a wonderfully accurate and reliable little weapon. The bird has a habit, when first flushed by dogs, of getting into a bare branch of some lofty tree, and thence abusing with great loquacity the disturbers of its peace. While so engaged, you may approach to within some eighty or a hundred yards of it by using the cover of intermediate trees, and at that distance it affords a good mark for such a weapon. It is difficult to approach near enough for an effective shot with a gun, and the bird is so very wide-awake

(though "Mountaineer" somewhat quaintly assures us that there is nothing of guile in its nature) that, when once on the wing, it seems to have a very good notion of where the guns are, and how they are to be avoided. I once witnessed the sight that seems to have impressed "Mountaineer" so, and small wonder,—a cock Monal, his peacock-crest erect, sailing across a valley, with all his gorgeous plumage shivering and shimmering in the sun with a curious vibratory movement. A very living glittering rainbow it was,—a sight that almost took one's breath away. I was with a companion who did not shoot, and would rather discourage shooting in others. I am happy to say, though, that he could play as good a knife-and-fork-game as any of our party when a Pheasant was on the table. "What on earth is that?" he said. "Why, that is a cock Monal," said I, somewhat testily, a bird he knew I very much wanted to get a specimen of. "And do you mean to say you would be brute enough to shoot that glorious thing?" he asked; and for once I almost doubted whether there might not be something in what he said.

The Kalij and the Koklass I will dismiss with but a few words, not because there is not much to be said about them, or that they are unimportant to the Simla visitor. Quite the contrary is the case. They will form the mainstay of your larder, and give you most of your sport. Both birds, if not old roosters and properly kept (you can hang them well nigh a week at that time of the year), are most excellent eating, every bit as good as an English Pheasant in my opinion. And both give excellent sport. The two are found in somewhat different ground, as I have before stated, but the mode of shooting them is much the same. The guns are below, and the dogs and one or two men above. The ever welcome short bark, followed by a hurried "clinking" of the frightened bird, is heard above; "Ata, Sahib," "Ata, Sahib," rings down through the trees, followed almost instantaneously by a rushing thunderbolt to your right or left, or coming straight for you out of the trees in your front; then somehow your gun goes off, and, if you are on the spot that morning, a crash is heard through the tops of the trees below you, and your faithful retriever is soon seen proudly wagging his tail with the bird in his mouth. You do not very often come across either of these birds collected together in more than twos or threes. Sometimes, however, you will be fortunate enough to light on a regular

“hot corner,” and have five or six down on you more rapidly than you can well load. These are moments to live for. The joy of battle is yours. Every nerve is braced, every sense strung at its highest pitch. You feel you are being stormed, and that you must rely solely on the keenness of your own eye and the steadiness of your pulse. Perhaps, when all is over, you smile at your own excitement: yet many things you may forget before you forget these few moments. Both these birds are amazingly quick on the wing, and almost invariably fly straight downwards,—sometimes, indeed, a bit too straight. It is as much as you can do sometimes to avoid being knocked down by a bird you have just shot. I have had the shikaree at my side bowled over like a ninepin, and rendered considerably foolish in this way. When flushed by dogs alone, both these birds will often at first, especially in the afternoons, perch on some tree, whence they will keep up their excited cackling for a considerable time. This is the moment of your shikaree’s reward; you give him your gun and he stalks *ventre-à-terre* (the favourite attitude of the Duke of Wellington, according to the French books of my youth) through the trees, and “pots” the bird on the bough. It is wonderful what eyes these men have for a bird in a tree; they will often see them in passing without anything having occurred to cause them to expect to see a bird there, and it is almost certain that their efforts to make you also see the bird will be altogether unavailing. Many and many a long day spent on their own account with just one cunning little dog and some old “shooting iron” is, I fancy, the secret of it. On this topic, however, you will not find your shikaree prepared to be over confidential.

Nearly related to the Pheasant is the Red Jungle-fowl, *Gallus ferrugineus*. If you keep to the higher ground, 5000 feet and over, you will not come across this bird; but down in some of the valleys, especially near the rivers (if you are fishing), this bird, I am told, in many places gives good sport.

We come now to the partridges. In this family there is one bird at least that deserves most honourable notice. This is the Chukor or Red-legged Partridge, *Caccabis chukor*, a very near relation of, if not identical with, our friend the “Frenchman,” *Caccabis rubra*. This bird will test all your powers of walking, all your boasted accuracy of shooting, all your endurance, and all your patience. Open, broken ground in the neighbourhood of

cultivation is their favourite resort, on which, while still, they are exceedingly hard to see. If they were not such arrant chatterers they might perhaps have a comparatively great life of it. There must be an awful struggle for "the last word" amongst Chukors. I fancy they must sometimes almost welcome the gun as an occasion for changing the subject. Your shikaree takes base advantage of this little weakness of the Chukor (which, however, they only indulge in early and late in the day while feeding). He sends men out to mark them down very early in the morning, while the grey snows are still asleep, and the stars are flashing their last and brightest in the clear black sky. Poor fellows, wrapped in their blankets, how cold they seem when you come up with them some hour or two later, when the sun is just touching the hill-top! Then, directed by your watchmen, you begin to look up one of the coveys they have marked down for you, working round and below the birds, and then very quietly walking them up. These birds are very strong, and take a good deal of shot. They get up wonderfully smartly, and are off in every direction. If you secure a right or left, you are to be congratulated. Your men all over the ground are on the look-out to mark down the birds which almost invariably separate, and often go some considerable distance before they pitch in some bush clump of grass or scrub. You must lose no time in looking up each group one by one; if you have more than one gun, the guns should separate and divide the walk, as success in making a bag of Chukor depends on leaving the birds no time to regain their composure. Constant and rapid disturbance seems to make the birds a bit "mazed," as they say in Devonshire, and increases your chance. But shoot as you will, and walk as you will, probably you will not be too pleased with your performance when all is over and done,—not at least while you are still a novice at Chukor shooting. A Chukor, I may add, is excellent eating. The only other Partridge I recollect seeing on these hills is a very handsome little bird,—one of the wood partridges, *Arboricola torqueola*. It is essentially a forest bird. You may expect to find it where you would find the Pheasant. I shot one in the Bhagi forest: it was dusk, the bird was alone, and it flitted through the trees and pitched on a bare bough, some fifty yards off, in such a way that I almost thought it must be some species of Owl. My shikaree told me these birds were pretty numerous in that neighbourhood,

but I cannot remember having seen more than that one. Other Partridges, as well as Quail, are to be got in the lower regions of the valleys.

The last game bird I will mention is our old friend the Woodcock, *Scolopax rusticola*. This bird is occasionally met with near Simla as early as the end of October or beginning of November, when working for the Kalij Pheasant; but it is then, at any rate, decidedly scarce. I do not doubt that a few weeks later there must be a good number of them scattered about in the neighbourhood, but the forest in most places is so extensive that the birds are hard to find. In the not very distant Kulu Valley, I have been told, on the best authority, that the Woodcock shooting in the winter is first-rate. Such, then, is the sport you may expect to find in a ramble round Simla.

If time had allowed, I should like to have said something as to the delights there prepared for the artist and the botanist. Without being exactly either, your daily ramble is a continual feast to the eye. You are gladdened by the red and golden autumn tints of the chestnut, the walnut, the wild pear, and wild cherry; the deep dark green of the deodar is here and there aflame with the scarlet Virginia creeper; the soft grey of the steep crags, ever and anon breaking the monotony of the dark forest, is a perfect marvel of mosaic in purple and madder, carmine and orange,—scarlet, green, and ochre. Under foot it is well nigh in some places all fern, the maidenhair and the exquisite parsley fern being the most conspicuous: on the open hill-sides you recognize your old friend the silver-stemmed raspberry, and the bright yellow and scarlet clumps of the barberry; you stoop to pick a lingering wild strawberry beautifully powdered with white crystals of frost, or a modest white violet, or mauve marguerite; and when the day's delights are at last all over, and the last lingering flush has left the snows, you are back at your bungalow, where a roaring wood-fire awaits you; you have a good dinner of Welsh mutton (it is nearly as good) and roast pheasant, smoke the pipe of peace, muse or talk a bit over the cheerful flame, pile on the logs, and tumble into bed.

ON A NEW DEER, *CARIACUS CLAVATUS*, FROM CENTRAL AMERICA.*

BY FREDERICK W. TRUE.

IN Messrs. Salvin and Godman's 'Biologia Centrali-Americana,' Alston enumerates four species of Deer as inhabitants of the region between Texas and the Isthmus of Panama. These are *Cariacus macrotis* (Say), *C. virginianus* (Boddaert), *C. toltecus* (Saussure), *C. rufinus* (Bourcier et Pucheran). Of these, the first three belong to the subgenus *Cariacus*, as defined by Sir Victor Brooke, and the fourth to the subgenus *Coassus*.

It is now my intention to add to the list of Central American Deer a fifth species, which, as I shall presently show, presents a superficial resemblance to the species of the subgenus *Coassus*, but belongs in reality to the subgenus *Cariacus*.

The description is based upon a good series of specimens in the National Museum, including young and adult individuals of both sexes. The species never acquires branched antlers, and I have therefore chosen for it the name of *Cariacus clavatus*.

Description.—Stature medium; antlers simple spikes, directed backwards nearly in the line of the face. In general appearance and colour like *C. virginianus*. A small metatarsal gland present. Hoofs yellowish at the extremity.

Male, young, summer pelage.—General colour bright chestnut. Head greyer than the back. A white spot on each side of the rhinarium, succeeded by an oblique dusky brown band, which reaches from the nostril to the margin of the upper lip, and is continued by a spot on the margin of the lower lip. Behind the dusky band is one of whitish grey, which is merged into dark grey posteriorly. The latter colour is strongly tinged with chestnut on the cheeks, temples, and forehead. The median line of the face is occupied by a dusky brown band, which extends backwards nearly to the line of the eyes. The forehead is occupied by a broad crest of long reflexed hairs, which in the mass are darker than those of the face. The individual hairs are brownish grey at the base, darker near the tip, where this colour is succeeded by a ring of light yellow, more or less

* Proc. U. S. Nat. Mus. 1889, pp. 417—424.

reddish; the tips of the hairs are dusky brown. There is a whitish grey ring around the eye, conspicuously lighter than the grey of the face. The outer surface of the ear is for the most part grey, but there is a rather large area of nearly pure white at the base of the posterior free margin, and another smaller area at the base of the anterior margin. The latter is continued inside the ear by a fringe of long white hairs, which grow shorter upwards, and are replaced about the tip of the ear by short hairs closely set. The posterior inner margin of the ear is clothed with short hairs, which are more or less tawny at the base of the ear, but white at its tip. These characters are much less clearly observable in the summer coat than in the winter coat. In the former, the hair of the back of the ear is often entirely rubbed off, and the inner side is only scantily clothed. The back is of a nearly uniform light chestnut or tawny colour. The hairs are grey at the base, and grow darker above. The tips are black, while between this colour and the grey is a chestnut or tawny ring. On the flanks the basal half of the hairs is whitish, and the distal half pale chestnut, without a black tip. The hair on the buttocks is the same, but is fully $2\frac{1}{2}$ inches long. The colour of the tail above is tawny, like the back, but the hairs are dark brown in the basal half. The hair of the under side of the tail, the perinæum, the scrotum, the inside of the thighs, and the abdomen nearly to the navel, is long and pure white. The tawny colour of the flanks extends without interruption over the chest. The median line of the breast is dusky brown. The neck is pale greyish chestnut, the grey colour being due to the fact that the grey of the lower part of the hairs is mingled with the colour of the upper parts of the same. The jaw and throat are white, except that there are, as already stated, two dusky brown spots on the margin of the lower lip. The colour of the upper surfaces of the body is continued on the legs. The proximal half of the inside of the fore legs is pure white; but distally there is little difference in the colour of the inner and outer surfaces. The same is true as regards the distal half of the hind legs; the inside of the upper hind leg, however, is paler than the outside, but is not pure white. The hairs of the tarsal gland are pure white; of the very small metatarsal gland, scarcely lighter than that of the surrounding tawny-grey area, so that this gland is only with much difficulty to be found.

Male, winter coat.—As in other species of *Cariacus*, the winter coat is grey instead of tawny, the general colour being that commonly known as “pepper-and-salt.” Behind the navel, as far as the penis, the colour is tawny rather than pure white. The tarsal gland is surrounded by blackish hairs, but outside of these, anteriorly, there are some white hairs. The surrounding area is tawny-grey. On the upper side of the tail the hairs are all dusky brown at the base and tawny at the tip. Legs grey.

Skull.—Compared with *C. virginianus*, the forehead of *C. clavatus* is flatter. The level is maintained as far as the proximal end of nasals, beyond which it dips down, so that the nasal bones are more curved than those of *C. virginianus*. The skull is much deeper in front of the eyes in *C. clavatus* than in *C. virginianus*; the eyes are larger, the lachrymal bone also larger and its free margin more convex, while the lachrymal pit is shallower. The orbital processes of the frontal and malar, forming the back of the orbital ring, are much the broadest in *C. virginianus*, and are more transverse. The pedicels of the antlers are directed upwards much more in *C. clavatus* than in *C. virginianus*. The tube of the exterior auditory meatus is much larger in the former than in the latter, and extends beyond the superlying ridge of the squamosal, so that it is plainly seen upon looking down upon the skull from above. The tube of the internal meatus is also prolonged in *C. clavatus* and ends in a sharp point.

Antlers.—The antlers of young males of *C. clavatus* are simple, slightly curved spikes. The burr is small and moderately rugose. In a young individual from Tehuantepec, No. 9442, and in No. 14212, the antlers are more or less triangular in section. In the adult males, like No. 13038 from Costa Rica, the antlers are slightly lyrate, considerably compressed laterally, and sharply pointed. The burr, though broad, is in some cases not distinctly marked off from the beam, and the rugosities extend up the anterior surface of the latter along the basal two-thirds in antlers which are little worn. The right antler of No. 13038 is deformed, the beam being bent over backwards and downwards, so that the tip is on a line with the burr. In No. 13040 the antlers are abnormal; the beams are straight, slender, and smooth, and are distinctly marked off from the burr, somewhat as in the Roebuck (*Capreolus*). In No. 14212 the antlers are of

typical form, but the upper half has been worn perfectly smooth by rubbing.

Affinities.—Were it not for the difference in age among the specimens now before me, it might be thought that they were merely the young of some known species with branched antlers. That such is not the case becomes evident upon examination of the skulls. In the largest male skulls the teeth are those of the second or permanent set, and the crowns of the same are well worn. Furthermore, the sutures of the base of the skull are obliterated by ankylosis and the pedicels of the antlers are much enlarged. There can be no doubt that this is the skull of an adult individual.

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The question of whether *C. clavatus* may not be identical with some previously described species having simple antlers merits more serious attention.

It must be taken into consideration at the outset that in dealing with species having simple horns we are debarred from employing one series of characters which are universally used in distinguishing between the different groups of Deer with branched antlers, namely, those drawn from the form of the antlers themselves. While it is fitting, for example, that the species of *Dama* should be separated from the *Cervus* group, on account of the difference in the form of the antlers, if for no other reason, it will not, on the other hand, be logical to bring together into one group all species possessing simple antlers; for, on account of their very simplicity, these antlers lack tangible characters. We are forced, therefore, to turn to other parts to find the means of discrimination.

It is unquestionable, I believe, that this new Deer belongs to the genus *Cariacus*, but the question as to which subgenus of the group it falls in remains to be answered. Our first inclination would be to place it in *Coassus*, on account of its lacking branched antlers, but, as we have just pointed out, it is unsafe to trust to this negative character. In fact, on account of other characters which we will now consider, *C. clavatus* cannot be placed in that subgenus.

In Sir Victor Brooke's Revision of the Cervidæ,* four

* Proc. Zool. Soc. 1878, pp. 883—928.

subgenera of *Cariacus* are recognized. These are *Furcifer*, *Blastoceros*, *Cariacus*, and *Coassus*. The first two of these groups I shall be obliged in the present connection to regard as sections of the subgenus *Cariacus*, for, aside from the form of the antlers, I find no tangible characters in Brooke's diagnoses by which the species may be distinguished from those of *Cariacus*. The small amount of material which I have been able to examine seems to warrant such a disposition of them. *Coassus*, on the other hand, presents many characters which distinguish it from *Cariacus*. In Sir V. Brooke's valuable diagnoses four differential characters may be found. These are as follows:—In *Coassus* (a) the auditory bullæ are less inflated than in *Cariacus*; (b) the rhinarium is ample, as in *Cervulus*; (c) the facial profile is more arched than in *Cariacus*; and (d) the stature is small. In the first three of these characters our new species agrees with *Cariacus* rather than with *Coassus*. The fourth character, relating to stature, is perhaps scarcely worthy of consideration as a subgeneric distinction; it is a matter apparently correlated with the small size of the antlers. To bring together our new Deer and the various species of *Coassus*, on account of their small size, would not be more logical than to approximate two large species merely on the score of their common magnitude.

Leaving size out of consideration, therefore, *C. clavatus*, judged by the diagnoses of Sir Victor Brooke, belongs in the subgenus *Cariacus*. I now desire to bring forward three additional characters which this new Deer possesses in common with the known species of the subgenus *Cariacus*, and which separate it from *Coassus*.

It is pointed out by Sir V. Brooke that in the Deer of the New World the vomer extends backward in the nasal cavity, dividing it into two completely separated compartments. Upon examining the vomer in the different species of the subgenus *Cariacus*, *C. virginianus*, *macrotis*, &c., I find that the posterior end of the superior *horizontal* plate, while it covers the presphenoid, does not extend over the suture between the presphenoid and the basisphenoid. The free posterior margin of *vertical* plate is falcate, and in old individuals the attenuated extremity of the same curves backward, and touches, or actually grows into, the surface of the basisphenoid. In *Coassus*, on

the contrary, the horizontal plate of the vomer extends back far enough to cover the suture between the presphenoid and basisphenoid, and the free posterior margin of the vertical plate is straight or only moderately emarginate. In *C. clavatus* the form of the vomer is that of *Cariacus*, and not of *Coassus*.

As a second distinguishing character, I find that in all the species of the subgenus *Cariacus* the osseous walls of the external auditory meatus are incomplete in the centre behind, while in *Coassus* the vacuity occurs much higher up. In this, as in the last character, *C. clavatus* shows a relationship to species of the subgenus *Cariacus*.

The third character to which I shall call attention relates to the arrangement of the hair on the face. The matter of the arrangement of the hair, as Sir Richard Owen has somewhere stated, deserves more attention than it has thus far received. So far as my observations go, the style of arrangement is very constant in individuals of the same species, or in the species of a group. In all the Cats, for example, the hair on the nose, in advance of the eyes, has the tips directed forwards. In all species of *Bovinæ* which I have examined the hair immediately bordering the muffle or rhinarium is reflexed, but that immediately behind has the tips directed forwards. In the horse, as is well known, there is invariably a long and very definitely marked "part" in the hair on the flanks, immediately in front of the hind leg. Examples of this kind might be greatly multiplied, but it may suffice in this place to say that, considering the constancy in the position and form of these "parts" and divisions of the hair, there is, I believe, no reason why they may not be trusted as indications of relationships.

In all the species of the subgenus *Cariacus* I find that the hair on the median line of the head is directed backward without interruption. In *Coassus*, on the contrary, there are in the median line two "poles," or points from which the hair radiates in every direction. One "pole" is on the crown, and the second about midway between the eyes and the rhinarium. In front of the second pole the tips of the hair are directed forwards to the nostrils. In *C. clavatus* the arrangement is that of the subgenus *Cariacus*, the tips of all the hairs in the

median line of the face being directed backwards without interruption.

From the facts adduced it is, I think, proven that our new Deer must be regarded as a species of the subgenus *Cariacus*, with simple horns. We may, therefore, consistently omit all further comparisons with the various species of *Coassus*. There is, however, one species with which our new Deer might be thought to have close relationship, or to be identical. This is the *Cervus capricornis* of M. de Saussure, described in the 'Revue et Magasin de Zoologie.'*

The substance of M. de Saussure's account of this Mexican Deer is briefly as follows:—While hunting he saw, but did not obtain, a Deer of about the size of *C. mexicanus*, armed with large, curved spikes. He at first considered this to be a young Mexican Deer, but was afterwards informed by the native hunters that it was well known to them under the name of *Venado cuernicabra*. They also stated that it was rare, and that it never had branched antlers. Before leaving the country he obtained a single right antler, with a portion of the skull attached, which he believed to belong to this species.

His description of this antler is as follows:—"Il mesure 0·200 m., selon la corde de sa courbure; il est très-divergent, très-arqué, et n'a qu'une seule courbure qui regarde en haut et en dedans; sa base est très-noueuse, sa couronne médiocre, et la seconde moitié de la corne est comprimée, assez épaisse. De plus, ce bois n'est pas grêle, comme les dagues des jeunes; il a plutôt le caractère de la vieillesse."

That this antler did not belong to an individual of our *C. clavatus* is, I believe, quite certain. The terms "très-divergent" and "très-arqué" do not apply to the antlers of our species, but to the dag-antlers of *C. virginianus* and other species of *Cariacus* with branched horns. Furthermore, the length of the antler in a straight line is greater than that of the antlers of our oldest *C. clavatus*. It is a matter of interest in this connection, that among the antlers in the collection of the National Museum is one from Orizova, which corresponds almost exactly to M. de Saussure's description, and furthermore has upon it the original label of the collector, bearing the words "*Venado cuernicabra*."

* 2nd ser. xii, 1860, p. 252.

This antler certainly does not belong to our *C. clavatus*, but appears to be a dag-antler of the Virginia Deer, of which we have many in the collection.

Our species differs from *Cariacus yucatanensis* (Hays) (= *C. acapulcensis*, Caton), in the presence of a metatarsal gland, and in the size and form of its antlers. The latter species, according to Mr. Hays, does not change its colour, which is not true of *C. clavatus*. There is in the collection of the National Museum a male Deer labelled *C. gymnotus*, which was presented by the Zoological Society of Philadelphia, and was supposed to have been derived from South America. It is not clearly distinguishable from *C. yucatanensis*, and also agrees in colour with the grey form of our *C. clavatus*. From the latter, however, it is distinguished by the absence of a metatarsal gland, and by its forked antlers. It is also much darker on the face and back, while the insides of the legs are whiter. The hairs surrounding the tarsal gland are white, and the hair posterior to the navel has the points directed backwards, while in *C. clavatus* they are directed forwards. The hoofs are black throughout in this specimen, but in *C. clavatus* they are yellow horn-colour at the extremity.

It seems to me improbable that *Cariacus toltecus* (Saussure) is identical with *C. yucatanensis*, but rather with *C. sartorii* (Sauss.) (= *Coassus rufinus*, B. & P.). At all events none of these nominal species appear to have any close relationship to our *C. clavatus*.

From the specimens in the National Museum it appears that the range of *C. clavatus* extends at least from the province of Tehuantepec, in Mexico, to Costa Rica; but its presence in Yucatan, British Honduras, and Nicaragua has not been ascertained. There are no specimens from the Pacific Coast of Central America, and it is improbable that the species occurs there.

Measurements of two mounted skins of C. clavatus, in millimetres.—Catalogue No. 16075: locality, E. Honduras; collected by C. H. Townsend in 1887. Sex, ♂: height at shoulder, 732; length of head, 246; of ear from behind, 130; calcaneum to top of hoof, 312; tail with hairs, 239; top of front hoof to knee, 199; depth of hind hoof in front, 37; antler from behind, 88: young. —Catalogue No. 16076: sex, ♀: shoulder, 685; head, 230; ear from behind, 132; calcaneum to hoof, 306; tail with hairs, 238; front hoof to knee, 199; hind hoof in front, 34: young.

MEASUREMENTS OF TEN SKULLS OF *C. CLAVATUS*, IN MILLIMETRES.

Catalogue number.	Locality.	Sex.	Greatest length of skull.	Basal-cranial length (Hensel).	Length of nasals.	Greatest width of skull (between lower rims of orbits).	Length of orbit.	Height of orbit.	Length of upper-tooth row.	Length of lower-tooth row.	Tip of mandible to angle.	Angle to top of coronoid process.	Tip of intermaxilla to end of palate.	Greatest breadth of posterior nares.	Greatest diameter of pedicel of antler.	Length of longest antler from behind.	Postero-superior rim of orbit to base of antler.
*13038	Costa Rica	♂	264	234	83	114	40	40	69	77	193	104	164	24.5	26	104	44.5
+14212	Do.	♂	255	225	77	106	42	42	59	77	194	101	155	25	21	100	45.0
+13040	Do.	♂	252	224	73	103	38	41	64	74	190	97	156	27	26	†63	30.0
+13039	Do.	♂	248	223	73	101	40	38.5	69	77	186	90	156	20	20	96	45.0
§22928	Eastern Honduras	♂	222	195	70	89	35	33	69	—	—	—	140	22	13	51	42.0
||7036	Mirador, Mexico	♂	193	166	53	83	33	31	51	55	140	71	114	21	10	—	42.0
+13042	Costa Rica	♂	191	166	49	78	32	30	46	45	137	64	114	—	—	—	—
+13864	Do.	♀	226	202	62	89	35	37	69	77	173	88	145	21	—	—	—
+13485	Do.	♀	215	194	66	85	33	35	69	76	171	86	140	22	—	—	—
§22829	Eastern Honduras	♀	217	193	65	89	34	35	66	72	161	81	136	23	—	—	—
*13043	Costa Rica	♀	217	193	65	89	34	35	66	72	161	81	136	23	—	—	—

* J. C. Zeledon, collector.

+ William M. Gabb, collector.

† Antlers diseased.

§ C. H. Townsend, collector.

|| Dr. C. Sartorius, collector.

NOTES AND QUERIES.

MAMMALIA.

The so-called *Mus hibernicus*.—We have read with interest Mr Southwell's notes (p. 321) on the singular Rats captured at Norwich, and are quite inclined to think with him that there would appear to be combined in them the characters of *Mus decumanus* and *Mus alexandrinus*, or *Mus rattus*. We have, however, no hesitation in saying that they are not the *Mus hibernicus* of Thompson. Since the account was written by Mr. Clarke for the 'Fauna of the Outer Hebrides,' we have examined about a score of specimens—chiefly in the flesh—of *Mus hibernicus*, and propose shortly to give the readers of 'The Zoologist' the results of our examinations and other investigations. Meanwhile we should be glad to receive information on the occurrence of *Mus hibernicus*, or of black varieties of the Common Rat, *Mus decumanus*, from any part of the British Isles.—
WM. EAGLE CLARKE and GERALD BARRETT-HAMILTON.

Natterer's Bat in North Oxfordshire.—Since the appearance of the Editor's article (p. 241) on the distribution of Natterer's Bat in Great Britain I have discovered the existence of this species in a new locality. The church here is inhabited by a considerable number of bats, which are not infrequently observed by the congregation flitting about the edifice during evening service. These bats annoy our parish clerk considerably. Not long ago he was complaining to me of the mess they made in the church, and I asked him to bring me any he happened to catch. He said he would, but explained that they dwelt during the day in an inaccessible hole in the roof of the nave, and also that a raid made upon them by night some time ago with ladders and bat-fowling nets had been almost entirely unsuccessful. The Barn Owl usually rears its young in the belfry, and no doubt keeps down the number of the bats to some extent; but this year I have not noticed them. Jackdaws and Starlings inhabit the spire, and the Sparrow is of course quartered on the building. The only bat I have hitherto received from the church was brought to me on August 6th, having been captured, just before 6 p.m., while flying about the churchyard among the elms and pollard ashes which stand rather thickly on the south side. Showers had fallen during the day, but it was a sunny afternoon. It proved to be a male specimen of Natterer's Bat, and I can add that my identification has been confirmed by Mr. J. E. Kelsall, who has kindly examined the skin. Bloxham is about fifteen miles, as the crow flies, from Charlton-on-Otmoor, the other Oxfordshire locality of which I sent the Editor notice. The flight of this bat, during the evening it lived in my room, was easy and direct, but rather slow. It refused house-

flies,—the only insects at hand,—but drank eagerly of water offered on the tips of my fingers, which it carefully licked with its tongue. The disposition of Natterer's Bat is rather fierce, and, having bitten, it retains its grip with the tenacity of a bulldog. Having fastened on my finger, and been lifted up by it, on one occasion, it hung suspended by its teeth for fully a minute. It had a shrill, angry squeak, always uttered when it was touched. Although apparently adult, it measured only 9·5 in. in expanse of wings; head and body, 1·9 in.; head alone, ·6 in.; ears, ·6 in.; tragus, ·4 in.—O. V. APLIN (Bloxham, Banbury).

Food of the Long-eared Bat.—In the article on Natterer's Bat (p. 244) reference was made to the slight knowledge we possess of the particular kinds of insects usually preyed upon by the different species of bats in the British list. I have lately been able to satisfy myself that the large-bodied moths, the wings of which are so often found strewn about the haunts of these animals, are eaten especially by the Long-eared Bat. At Great Bourton, the seats in a summer-house were regularly strewn with moths' wings, and, although unable to catch a bat in the building, I felt pretty sure that it was this species, which was very common there. This summer a friend here told me of the number of moths' wings which he found regularly in a small empty outhouse in his garden, and one evening, about the end of July, while we were sitting in the garden, about nine o'clock, we watched two or three bats hawking for insects (probably Lepidoptera, for border and bed were ablaze with attractive flowers), and occasionally disappearing in the direction of the outhouse. On this occasion again I followed the bat, and captured an example of *V. auritus* which was fluttering about the roof. I may add that, as far as I know, bats do not roost in either of the buildings here referred to, but merely retire to them to eat the prey they have caught. In my experience in this neighbourhood, the Buff Ermine (*Spilosoma lubricepeda*), Yellow Underwing (*Triphæna*), and Silver Y (*Plusia gamma*), are more extensively eaten by bats than any other moths.—O. V. APLIN (Bloxham, Banbury).

CETACEA.

Delphinus albirostris in the River Colne.—On the 11th September last a man coming up the river Colne above Wyvenhoe, Essex, came upon seven Porpoises in the shallows of the river, the tide being out. He managed to drive one on shore, and plunged his pocket-knife into its chest as near as he could judge to the heart; eventually killing it he brought it home. I soon after saw it, and found that it was a female specimen of the White-beaked Dolphin, *Delphinus albirostris*, measuring 6 ft. 5 in. in length. This I at once secured, and offered it to the British Museum, as I thought it a pity so good an example of this uncommon species should be destroyed. The Museum authorities having declined it, I suppose it must go to the

melting-pot. This is the first specimen I have seen in this country. Since writing the above I have obtained some other particulars. It appears that Mr. Barton, of Alresford Lodge, was informed by the pilot at the railway bridge at Alresford that there was a school of Porpoises near his house. He shot at several of them from a punt with his rifle, and managed to capture two. One was 9 ft. 6 in. long, and the other 6 ft., both being females. Another which he shot at got into deeper water, and was picked up next day by Harry Barr, a fisherman at Wyvenhoe; this was 9 ft. 6 in. long, the sex not noted. The crew of the yacht 'Valfreyia' captured a fourth, also full-grown, and of this I sent a note. The fifth came into my possession; it was captured by Abraham Collins, of Colchester, and, as I have mentioned, was a female 6 ft. 5 in. long. So that out of a school of seven or nine,—my informant is not quite clear on this point,—five were killed. None of our fishermen have ever noticed similar specimens before, and they all mention the peculiar white beak and belly as distinguishing marks.—HENRY LAVER (Colchester).

BIRDS.

Breeding of Pallas's Sand Grouse in Britain in 1889.—At the meeting of the Biological Section of the British Association at Newcastle-on-Tyne, on Thursday, the 12th of September, Professor Newton made some remarks "On *Syrhaptus paradoxus* as a native of Britain," exhibiting a specimen of one which could not have been more than two or three days old. This bird was caught in the North of Scotland on the 8th of August last, and was received by Professor Newton the next day. He also exhibited a drawing of the same by Mr. Frohawk, which will be reproduced in illustration of the paper he has in preparation for 'The Ibis.' The specimen has been beautifully mounted for the owner by Mr. Cullingford, of the Durham University Museum, and Professor Newton stated that, so far as he knew, it was the first that had been seen by ornithologists.

Sand Grouse in Fifeshire.—Mr. P. Henderson, of 20, Barrack Street, Dundee, writing on August 19th, says;—"The Pallas's Sand Grouse are still on Tent's Muir, Fifeshire. I have seen them several times: they are not in packs, as they were last season, but mostly in pairs, and I think some of them must have bred there. The parties in charge, however, are very reticent in the matter, and I have not been able as yet to get any definite information on this point."

The King Eider (*Somateria spectabilis*) as a Norfolk Bird.—For many years this species had been included in the Norfolk lists, on the authority of Mr. Lilly Wigg, who stated that a female King Duck was killed on Breydon Broad on the 25th July, 1813. The occurrence is mentioned in a MS. book, in the possession of Sir J. D. Hooker, entitled

'Memoranda touching the Natural History of Yarmouth and its environs,' by Sir William Jackson Hooker, Thomas Penrice, Esq., Mr. Lilly Wigg, Rev. Joseph Burrell, Rev. R. B. Francis, and Dawson Turner, Esq., extending from 1807 to 1840. The entry is as follows:—"King Duck. A female shot on Breydon, July 25th, 1813," and is initialled "D. T." Hunt, who was a Norfolk man, and generally referred to any rarity in his native county which came under his notice, does not mention this occurrence in his 'British Ornithology' (title-page dated 1815), nor does he include the species in his list of Norfolk birds contributed to Stacy's 'History of Norfolk' (1829). Messrs. Sheppard and Whitear do not mention it in their "Catalogue of Norfolk and Suffolk Birds," printed in the 'Transactions of the Linnean Society,' and read in 1824 and 1825. The first published notice of the occurrence with which I am acquainted occurs in the 'Sketch of the Natural History of Yarmouth and its Neighbourhood,' by the brothers Paget, published in 1834; and here, strange to say, although the King Eider is mentioned in precisely the words above quoted from the Hooker MS., no mention is made of the Common Eider, which must have been known to the authors of the 'Sketch' as an occasional winter visitant. From that time the King Duck appeared unquestioned in all the lists of Norfolk Birds up to, and including, Mr. Stevenson's "Sketch of the Ornithology of Norfolk," in White's 'Directory' of the county, published in 1864. In 1879 I edited a new edition of Lubbock's 'Fauna of Norfolk,' and after due consultation with Mr. Stevenson and other authorities on Norfolk birds, I thought it best, although reluctantly, to append a note (foot-note 149, pp. 161—2), calling attention to the extremely unsatisfactory claim of this species to a place in the Norfolk avifauna. In addition to the very improbable date (July 25th) of the alleged occurrence, Mr. Stevenson very rightly remarks, "In the days before Yarrell, I question if Wigg, or any one at Yarmouth, would have recognised the female of the King Eider as distinct from the more common species," and with regard to another of Mr. Wigg's rarities, he also calls attention to the fact that "Lilly Wigg was not an ornithologist proper, and yet three of the rarest and most questionable species in the Norfolk list rest almost entirely on his authority—the Red-breasted Goose, the Harlequin Duck, and the King Eider." Mr. Stevenson has retained the Red-breasted Goose for reasons which will be found in the 'Birds of Norfolk' (vol. iii. pp. 39—41), but I had no hesitation in following the authority of his last list in White's 'Norfolk' (edit. 1883), from which both the latter birds are omitted; *Somateria spectabilis* will therefore only be found mentioned in a foot-note at p. 192 of the forthcoming third volume of the 'Birds of Norfolk.' In the autumn of last year the Rev. Julian G. Tuck kindly favoured me with some valuable notes on the birds observed by him at Hunstanton, and mentioned a young male Eider which he saw

in a case at a fish-shop in that town, and which he said appeared to him to differ from other Eiders which he had seen, and especially from a young male Common Eider in his own collection, but as he had no books of reference with him he made a mental note of it as "a rather dark and small Eider," and suggested that it might possibly be an example of the King Eider. I had an opportunity of examining this bird in the last week of July,—unfortunately after my article on the Eider for the 'Birds of Norfolk' had been printed,—and was delighted to find it a young male *Somateria spectabilis*. I lost no time in purchasing the specimen, which I have presented to the Norwich Museum, where I trust it will long remain *en evidence*. The bird was shot off Hunstanton about the middle of January, 1888, and was stuffed by Mr. Clark, of Snettisham, for Mr. Osborne, of whom I purchased it. It was seen alive on several occasions by the Hunstanton gunners, among others by Mr. Tuck's correspondent, Mr. B. Bowler (see 'Zoologist,' 1888, p. 148). There can therefore be no question as to its identity, and it gives me great pleasure to restore the species to a place in the Norfolk list on such satisfactory evidence.—T. SOUTHWELL (Norwich).

The Extinct Starling of Reunion.—Referring to Mr. Sharpe's remarks on this bird (p. 310), I fear there is remarkably little ground for hope that *Fregilupus varius* will ever be seen in the flesh again. Thirty years is too long a time for any bird, particularly a very tame one, to have survived unnoticed on an island only ninety miles long, with a considerable French population, many of whom shoot, and a good number are constantly on the look-out for birds of value. Early in 1875 I passed a month in Réunion, with the express view of investigating this and other matters. It was then believed that the bird might still be found in the forests of the interior (although it had not been heard of for fifteen years); wherefore I availed myself of the services of the best native "chasseurs," and made trips of several days' duration into the most promising forest regions, from about 300 ft. to nearly 6000 ft. above the sea. The French Colonial Government kindly gave me every facility, and authorized me to obtain any specimens I desired,—although it was during the close season,—with their usual courtesy, such as no naturalist, British or foreign, of however high reputation, could hope to meet with in this country. I made the minutest enquiries, wherever I went, of any one likely to throw the least light on my search. I explored the greater part of the island, sufficiently closely to be able to make a tolerably complete and exact map of it; and when I left, it was with the conviction that *Fregilupus varius* was undoubtedly a thing of the past. Certainly this conclusion was only arrived at upon negative evidence; but, after the lapse of nearly fifteen years more, nothing has occurred to shake it, and now I do not expect to hear of anything that will. Mr. Sharpe will excuse me if I correct a small verbal error in his article from 'Nature,' as reprinted in 'The Zoologist' (1889, p. 311), viz., "*Necropsar rodericanum*,

Slater," should be "*Necropsar rodericanum*, Slater" (see Phil. Trans., vol. clxviii. p. 427).—HENRY H. SLATER (Irechester Vicarage, Wellingborough).

Great Crested Grebe breeding in Scotland.—The nest referred to in my last communication (p. 352) was found early in June, floating amongst the sedgy grass on the edge of a small islet on a broad sheet of water, on which were Coots, Ducks, and other water-birds. It contained three eggs, stained a deep yellow-brown. Although quite warm they were entirely uncovered in the nest. One old bird, probably the male, was swimming and diving some distance off, and later on was joined by its mate. Most of its time appeared to be spent under water, and when it came to the surface it was interesting to see how quickly it would glance around in every direction, and at the same time expand the curious ruff or tippet around its neck and erect the two feathery horns on its head. Another pair were breeding in the vicinity; and a Glasgow birdstuffer informs me that he has obtained birds in Scotland during the breeding season for the past two or three years, so that this is probably not the first year they have bred in this country.—ROBERT H. READ (6, Osborne Villas, Cathcart, Glasgow).

[Mr. Harvie Brown writes that he has long considered the fact of the Great Crested Grebe nesting in Scotland to be well established, and is himself acquainted with Scottish localities where it breeds. He thinks Mr. Read is quite right in withholding indication of the precise spot wherein he found the nest above referred to, and although he is not aware that this bird breeds anywhere in Sutherland or Caithness, he is of opinion that the "northern Scottish lakes" of Selby (*cf. antea*, p. 352) include an area "sufficiently explicit for the information of naturalists, or at all events for publication." We quite agree with him that it is not always desirable to make known the precise haunts of birds which are sufficiently rare to attract the attention of unscrupulous collectors, but we think that the *county* at least might be specified, as being more explicit than Selby's expression, "a few of the northern Scottish lakes," and yet sufficiently vague to prevent the possible and probable destruction of the breeding birds.—ED.]

Great Crested Grebe breeding in Scotland.—With reference to Mr. Read's note (p. 352) regarding the breeding of the Great Crested Grebe in Scotland, may I draw attention to Mr. Angus's communication published in the 'Transactions of the Glasgow Natural History Society' for 1885—86 (vol. i., new series, p. 385), in which he mentions having seen on two lochs in Aberdeenshire nests and eggs of this species—at least I infer they were of this species, but I may be mistaken. I am much interested in Mr. Read's note, as I have on several occasions during the last half-dozen years seen Great Crested Grebes during the breeding season on more than one loch in the *East* of Scotland, and have little doubt the birds were breeding, though I have hitherto failed to obtain such substantial proof as

Mr. Read is able to adduce—namely, the discovery of the nest and eggs.—
WILLIAM EVANS (18A, Morningside Park, Edinburgh).

Eared Grebes in Norfolk.—In 'The Zoologist' for 1884 (p. 488), and in the volume for 1885 (p. 480), I reported Eared Grebes, *Podiceps nigricollis*, Brehm, as having been sent me from Hunstanton. Mr. Southwell wrote to me asking me to look carefully at them, and pointing out the difference in the wing of this bird and the Slavonian Grebe, *Podiceps auritus*, Linn. (*vide* Saunders, 'Manual of British Birds,' p. 708). Further inspection showed that while one (that of 1884) was a genuine Eared Grebe, the other was a Slavonian Grebe, which is a much more common bird in Norfolk.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

[It is unfortunate that the specific name of *auritus* bestowed by Linnæus should be found to appertain, not to the Eared Grebe, but to the Slavonian Grebe, which until lately has been generally known as *Podiceps cornutus*. The Eared Grebe, it seems should be distinguished as *P. nigricollis* of C. L. Brehm.—ED.]

Black-winged Stilt in Nottinghamshire.—I have lately purchased for my collection, from Mr. J. Cording, taxidermist, of Cardiff, a fine specimen of this rare bird. It was shot on the banks of the Trent, near Nottingham, by Mr. White, in January, 1888.—DIGBY S. W. NICHOLL (Cowbridge). [An unusual date surely for this species.—ED.]

The Food of Albatrosses, their Measurements, and Geographical Range.—In consequence of our conversation about Albatrosses, I have put down a few memoranda of my own experiences of them. With regard to the food of *Diomedea exulans*, I caught several of these during my voyage to Australia in the sailing-ship 'Anna Robertson,' in the year 1851, and skinned and dissected them. Without exception, I found in the stomach the beaks of large cuttle-fish, apparently Calamaries. The beaks were quite as large as those of large *Octopi*, 4ft. long, which I have dissected; and I have frequently seen the birds lift some large object from the water, which might well have been the animals to which the beaks belonged. A living specimen of *Diomedea melanophrys*, which I kept for some time and brought home, and gave to the Zoological Society, would eat nothing but fish not salted, but he survived a fast of about six days of the voyage, when no fresh fish was procurable. It was December when I passed from the longitude of the Cape of Good Hope to Cape Leeuwin, about the latitude 43° to 45°, and we saw but few Albatrosses till we got to lat. 40°. The first we saw were, I suppose, *D. melanophrys*, and then others of the allied forms, such as *D. culminata*, *D. chlororhyncha*, and also the Sooty Albatross, and Giant Petrel. The number of *D. exulans* increased the further south we went. We had a succession of cyclones, and the birds were in every case caught during the calm preceding the cyclone. No young ones were caught, and all were in

the plumage of the fourth year, fully adult. I have never seen any mention of the beautiful rose-coloured powder which covers the white parts of the adult or nearly adult *D. exulans* in December; this comes off on a handkerchief, but is evanescent, or rather it changes to a dirty brown colour in the preserved skin. In this respect it resembles, to a certain extent, the rose-colour of *Cacatua leadbeateri*, and that on the breast of the Great Red Kangaroo of Australia in the breeding season, though the fading in these animals is less than in the Albatross. The beak is also of a delicate rose-colour at the same season. The furthest north I have ever seen any Albatross is about 5° or 6° north of the Cape of Good Hope. *Diomedea melanophrys* reached this latitude in the autumn in 1885, and the Sooty Albatross a degree or two further south, and I have seen at a distance during the winter *D. exulans* in Table Bay; but I believe they occur further north. With regard to the expanse of wing of these birds, I have never measured an Albatross which was above 11 ft.—I think the exact measurement was 10 ft. 10 in.—in the expanse of the wings; but I have been confidently assured by others that they have measured some as much as 14 ft., and in one instance I was told of one which was 17 ft. across the extended wings. I have but little confidence in these measurements. If a giant race of these birds exists, I suspect it is in the neighbourhood of Cape Horn, as all the accounts of them referred to specimens from that locality.—W. A. SANFORD (Nynehead Court, Wellington, Somerset).

Fulmar on Rathlin Island.—I have received information from Mr. Gage, the owner of Rathlin Island, that on Sept. 2nd an adult specimen of the Fulmar Petrel was caught alive on the east side of that island, and was brought to him. This bird is sufficiently rare here to be worth recording.—ROBERT PATTERSON (1, Windsor Park Terrace, Belfast).

Tengmalm's Owl in Suffolk.—While staying lately with my brother-in-law, the Rector of Thorington, Suffolk, I heard that a young keeper in his parish had got the smallest Owl he had ever seen, which he had trapped in the parish, and of which he thought a great deal. On going to see it, I found it to be a very good specimen of Tengmalm's Owl, and very fairly set up by a local taxidermist at Lowestoft. It was trapped on a pole on Jan. 15th, 1889, by an intelligent young gamekeeper named William Haylock in Hally Hills Wood, in the parish of Thorington, near Halesworth, in Suffolk. The property belongs to Major Bence Lambert, and he not caring to have it preserved, gave it to the young keeper, who values it much. Thorington being within a few miles of the east coast, I should think there was no doubt of its being a genuine immigrant.—ARTHUR P. MORRES (Britford Vicarage, Salisbury).

Notes from South Wales.—The following notes may be of some interest as showing the birds which probably breed in one of the least

requented parts of what may be termed the "Highlands of South Wales." On June 4th last, a party of four, we left Brecon, on a trip to the Breconshire Van Mountain, which lies some seventeen miles in a westerly direction from this town. The route follows the well-wooded valley of the Usk, almost to its source, and the day being brilliantly fine, the summer song-birds were heard to advantage, and we identified among others the notes of the Blackcap, Garden Warbler, Wood Wren, and Tree Pipit, the last named being common. At an altitude of eleven hundred feet, the ascent of the mountain began, and from that point, where the woodland birds were replaced by those of the moor, we took note of every species seen up to a height of nearly two thousand feet, where we reached a small lake on the mountain side. At this elevation the only bird seen was the Meadow Pipit, though the Dipper, Sky Lark, and Carrion Crow occurred nearly as high, and a little lower the note of the Raven was heard, and soon after a pair of these birds were seen. I was directed by a shepherd to a rocky glen where a pair of Ravens nested yearly; although not more than thirty feet from the ground, the nest was, as the man described it, "in a very awkward place to climb to." The young had, of course, already left the nest, which was snugly placed on a ledge of rocks, and was built of ivy-sticks. I also saw on the mountain-side a small hawk, which I believe was a Merlin, the Red Grouse, Snipe, Ring Ouzel, Wheatear, Curlew, and, on a rocky stream, the Grey Wagtail, and several Common Sandpipers, which apparently had nests near at hand. The Sandpiper, although common in April on the lower portions of the Usk, seems for the most part to move up to the moorland streams to nest. The Yellow Bunting, Wren, Linnet, Stonechat, and Pied Wagtail complete the list of birds observed in this upland district.—E. A. SWAINSON (Brecon).

Colourless Eggs of the Twite.—My attention was called last June to a clutch of six eggs of the Twite, *Linota montium*, of a pure white colour and perfectly fresh. On blowing them, I found the shells firm, and they all contained what I suppose should be the proper proportion of yelk and white. That afternoon we found several nests of this species containing seven eggs, while clutches of six were common.—C. E. STOTT (Lostock, Bolton-le-Moors).

Garganey and other Birds in Warwickshire.—I have recently received strong presumptive evidence of the Garganey breeding in Warwickshire this summer in the shape of—I am sorry to say—a freshly-skiinned drake, which had been shot on one of the canal reservoirs in the south of the county. It was observed on the 21st June, while flying round at a low elevation over a thick bed of rushes, close to the edge of which it presently alighted, and was immediately shot. It came into my hands a few days later. Early the next morning another bird, supposed to be the

duck, was observed close to the same spot, but fortunately was not molested. Considering the late date in the season at which the drake was killed, I am in hopes that a young brood was already hatched out, in which case they would of course do well under the charge of the duck alone. Compared with a very fine adult male procured at Surlingham, Norfolk, on the 2nd of April, 1852, the Warwickshire specimen is a less conspicuous bird. It is, indeed, considerably advanced in its summer "eclipse" moult. The long graceful scapular feathers, with their sharply contrasted distinctive black and white markings, have been entirely lost, and most of the flank feathers, delicately vermiculated with black and white, are replaced with others of a dark brown colour, with paler edges. The white of the under parts below the lower breast is obscured by a wash of brownish buff, and the breast is less distinctly marked, a considerable number of new long-edged feathers having made their appearance in this portion of the plumage. No change of colour has taken place in the head and neck, but the feathers in those parts were rather loose. Two pairs, at least, of Great Crested Grebes were breeding on the water at that time, two nests, containing one and three eggs respectively, having been discovered. One of these eggs is now in my possession. I consider these a little late, for on another pool I have known young Grebes one-third grown by that date; but, on the other hand, I have also known the young only just hatched by the middle of July. Four or five Black Terns frequented the reservoir for a few days about the 20th June; one which was shot is a young bird of the previous year. Some Common Terns were also observed about that time, also a large Gull. Coots were breeding in considerable numbers. Now, to avoid any misunderstanding, and perchance rebuke also, I may as well say at once that I had nothing whatever to do, either directly or indirectly, with the death of the birds here recorded. But, while greatly regretting and deprecating their destruction, I do not think that any good end would be served by withholding a record of their occurrence from other ornithologists. Since it appears from the last edition of 'Yarrell,' and Mr. Howard Saunders's 'Manual,' now in course of publication, that Norfolk and Suffolk are the only counties in which the Garganey has been known to breed of late years (although it is believed to have done so formerly in Northumberland, and it visits Lincolnshire in April), the strong probability of this little duck having nested in South Warwickshire this summer is especially noteworthy. — O. V. APLIN (Bloxham, Banbury).

Little Bittern in Sussex.— On the 31st October, 1888, a Little Bittern, *Botaurus minutus*, was taken, at about 7.30 a.m., on the Esplanade at Eastbourne, and lived some hours after capture. It is now in the possession of Mr. C. H. Simmons, of this town. KNOX, in his 'Ornithological Rambles in Sussex,' records the capture of an adult male at Pulborough.— ROBERT MORRIS (67, Seaside Road, Eastbourne).

Loxia rubrifasciata (Brehm) in Norfolk.—In October, 1871, I saw a male Crossbill which had been killed in Norfolk, with marks on its wings as in Mr. Williams's bird (p. 266); and not long ago I saw another, marked in the same way, at Newcastle, which had been shot at Beaufront-on-the-Tyne, near Hexham.—J. H. GURNEY, JUN. (Keswick Hall, Norwich).

Crossbill breeding in Immature Plumage.—Your correspondent, Mr. Howse, has evidently "jumped to an inaccurate conclusion," as to the views I hold regarding the moult of the Common Crossbill. I never suggested that the red dress, of what Professor Newton, Mr. Howard Saunders, and myself consider the mature male, must needs be obtained by passing through a yellow dress. I have no doubt that such is the case in some instances; but I could show Mr. Howse a nestling changing to red direct. How Mr. Howse can declare that his views coincide with Prof. Newton's opinion, while he pronounces the mature dress to be yellow I cannot comprehend. Your readers are well able to judge for themselves whether I "tried to lure them from the statement at issue." I suggested that anyone might examine the bird, and no man could do more.—H. A. MACPHERSON (Carlisle).

Two Pied Wagtails laying in the same Nest.—I send you an account of what I take to be a rather remarkable instance of two birds laying in the same nest. Some time back a shepherd, whom I had employed in collecting eggs for me, brought me nine eggs of the Pied Wagtail, *Motacilla lugubris*, which he had taken from one nest. On examining the eggs closely, I found that four of them were of a distinctly different type to the other five, and it was evident that they must have been laid by two different birds. I told the shepherd my opinion, and he said that he had not watched the nest at all, so could not say whether there were two or more birds about, but that this was the second clutch "t' year," as about a month before the birds had hatched off eleven young in the same nest that he had taken the eggs in question from. I should be glad to know if any of your readers have come across a similar instance.—A. M. LAW (Thetford).

Lesser Tern in Glamorganshire.—Mr. Cording, of Cardiff, received from the sands near Porthcawl, in August last, seven specimens of this Tern, two of which I have in my collection.—DIGBY S. W. NICHOLL (Cowbridge).

Cirl Bunting breeding near Godalming.—On August 26th I was shown the nest of a pair of Cirl Buntings, *Emberiza cirrus*, which contained three eggs, and on which the bird was sitting. The unusual lateness of the date is my chief inducement in sending you this notice. Another nest of the same bird, probably of the same pair, was shown me in May last—I cannot recall the exact day. It had eggs, which were hatched in due

course, and was placed not many yards from the bush, a juniper, in which that seen on Aug. 26th was built. The former, however, was on—or all but on—the ground among some elm-suckers, whereas the latter is three feet above it. I may add the locality is that in which I found a nest of the same bird, and afterwards a second, in 1887, as reported to you in August of that year (Zool. 1887, p. 303).—HENRY BENSON (Rector of Farncombe).

Chough in Pembrokeshire.—On the 6th August last, Mr. Cording received, for preservation, a specimen of the Chough, sent to him from St. David's.—DIGBY S. W. NICHOLL (Cowbridge).

Spotted Crake near Glasgow.—A young male of *Porzana maruetta* was found dead at Possil, about two miles N.W. from Glasgow, on the 1st September. It was still warm, and was supposed to have been killed by flying against a wire fence near which it was lying. It was in full plumage, but, from the appearance of the sexual organs, evidently a bird of the year. So far as I am aware, this species has not been recorded for the west of Scotland north of the river Clyde.—J. MACKNAUGHT CAMPBELL (Kelvingrove Museum, Glasgow).

Tameness of Young Cuckoo.—During the first few days of August a young Cuckoo was a source of great amusement to a party of visitors at a house very near my own. The tennis-ground had been surrounded by nets kept up on stakes to prevent damage to the flowers, and the bird seemed to imagine that this arrangement had been made for his special convenience, as he was almost always to be seen perched on either the nets or poles. On one occasion he perched on the net while play was going on, and allowed the balls to pass over him several times. We could never tell what species of bird brought him up, as we never saw him fed by any bird, except on one occasion by a Wagtail, which used to bring its own family to feed on the lawn which the Cuckoo frequented. Two pyracanthus plants on the house were much infested by caterpillars, identified by Mr. Frank Norgate as the larva of *Orgyia antiqua*, and on these the Cuckoo chiefly fed. When perched on a stake, with wings and tail pointing down and head drawn in, he looked very much like a hawk; so much so that the Swallows would dash down at him again and again, almost brushing him with their wings, and uttering the sharp angry twitter with which they resent the appearance of a cat near their nest. My brother searched the remains of an old hot-bed for worms, and when these were thrown on the grass near the tennis-net the Cuckoo "went for them" at once, and soon after helped himself to some from a plate. From the 4th to the 25th of August he was fed daily with worms, for which he came as regularly as any Robin for crumbs. As he grew bigger and stronger, he could manage a worm of three or four inches in length; in disposing of a large one he never used his feet to hold it, but would get one end in his bill, and swallow

it whole with a series of movements which reminded one of a terrier killing a rat. If our party had numbered an amateur photographer, some novel and interesting life-studies might have been obtained, as the bird would allow himself to be approached within four or five yards, and when engaged in devouring his worms would come even nearer. He disappeared after the 25th of August, much to our regret, for he had become quite a pet of the household; and it is almost too much to hope that so tame a bird would safely reach the "sunny south." I have seen a good many species of birds brought close up to a house by regular feeding, but probably this is the first instance in which it has been tried, and has succeeded, with the Cuckoo.—
JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Varieties of Red Grouse and Landrail.—I have recently received two very unusual varieties of the Red Grouse and Landrail. The latter, shot at Abbeyleix, Queen's Co., early in July last, and now in the collection of Mr. Marshall, of Taunton, is perfectly snow-white, with the exception of two patches of the ordinary colour in the middle of the back and nape. The Grouse is of a bluish white, showing the ordinary markings through, and is an old male bird. Another, in similar plumage, was observed on the same mountain, in Co. Fermanagh, and is being protected by the owner, to see what its progeny are likely to be next season.—EDWARD WILLIAMS (2, Dame Street, Dublin).

White-winged Black Tern near Salisbury.—On the 30th April last I saw in our meadows at Britford, Salisbury, five specimens of the White-winged Black Tern, *H. leucoptera*. They came within twenty yards of me, and the white tail and shoulders of the wing were distinctly discernible. They were evidently on their migration, and followed the course of the river towards Christchurch, where Mr. Hart generally sees a few of them in the early spring. I saw him the following week, and he said he had been looking out for them for the previous day or two. He has some nice Christchurch specimens.—ARTHUR P. MORRES (Britford Vicarage, Salisbury).

Little Bustard in Norfolk.—I have been requested by Mr. Southwell, of Norwich, to inform you, for the benefit of readers of 'The Zoologist,' that I received, for preservation, in August last, a female specimen of the Little Bustard, *Otis tetrax*. It was shot by a boy in a turnip-field at Waxham, Norfolk, and was purchased by a gentleman on board a pleasure-boat, Mr. A. J. Flaxman, of London, for whom I have preserved it. On examination, it was found to have been feeding on clover-leaves and beetles.—W. LOWNE (Taxidermist, Fuller's Hill, Great Yarmouth).

Roller in Kirkcudbrightshire.—When out Partridge shooting on the Mabie estate, Kirkcudbrightshire, on Sept. 9th, one of our party killed a fine specimen of the Roller, *Coracias garrula*. It proved, on dissection, to

be a male, and is now in the hands of Mr. Picken, of Bridge Street, Manchester, to be preserved for the collection of Mr. George Comber, of Myddleton Hall, Cheshire. I have carefully gone through several bird-books, including about ten years of 'The Zoologist,' but cannot find any record of the Roller having been met with in Kirkcudbrightshire before.—JOHNSON WILKINSON (Huddersfield).

[For records of the occurrence of this species in Scotland, see Gray's 'Birds of the West of Scotland,' pp. 202, 203.—ED.]

Grey Shrike in Nottinghamshire in April.—During the second week in April a Grey Shrike was shot by a keeper within a few fields of this house, and brought to me. It was a female bird, and having only one bar across the wing, I presume is Pallas's Grey Shrike.—J. WHITAKER (Rainworth, Notts).

Change of Colour in Birds caused by Food.—In 'The Zoologist' for July Mr. A. H. Macpherson, in his remarks on the coloration of birds' eggs, refers (p. 251) to an instance of changed colour, supposed to have been caused by food, in the plumage of *Chrysotis festiva*, which statement, according to a foot-note, is said to want corroboration. A similar instance, which was brought before the Zoological Society of Glasgow, may have some bearing on the case. At a meeting of this Society in January, 1888, a pair of Red-faced African Love-birds, *Agapornis pullaria*, were shown by Mr. Andrew MacLennan, in which the feathers on the back, as well as a number on the head, neck, and shoulders, with two or three of the wing-feathers, were in the female bird of a bright canary-colour, the male being similarly coloured, but in a less degree. Mr. MacLennan ascribed the peculiar colouring to the effects produced by their having eaten cayenne-biscuit, which was provided for other birds in the same aviary. In the expectation that the birds might become entirely yellow, the same feeding was continued, but the birds died, it is supposed, from the injurious effects of cayenne.—W. HANNAN WATSON (Sec. Zool. Soc. Glasgow, 219, St. Vincent Street, Glasgow).

Hybrid between Bernicle and Bar-headed Goose.—In addition to the hybrids mentioned in 'The Zoologist' (p. 314), the cross between the above-named geese is, I think, as remarkable as, if not more so, than any already noticed. The parent birds are kept on the ponds of St. Stephen's Green,—that little park so beautifully laid out for the use of the Dublin people by Lord Ardilaun,—and where a fine collection of waterfowl is kept The Bar-headed Goose was supposed to be a male bird by Mr. Williams, who presented it to the Park Committee; but a short time after the little Bernicle gander deserted his companion, and, paying attention to the attractive Bar-headed Goose, the result was a brood of four splendid young birds, now as large as their parents, and far larger than the Bernicle. The

parent birds are still in charge of their four young, the little Bernicle taking the greatest care, and trying to drive away any other birds approaching his charge. The young birds resemble the Bar-headed Goose in shape and size, and are very pale in colour, but the markings on their heads are like those of the Bernicle, although pale and indistinct.—ROBERT WARREN (Moyview, Ballina).

Wood Pigeon roosting with Dovecote Pigeons.—Some time ago I obtained from a wood near here a young "Cushat," or Wood Pigeon, which I reared. The bird eventually became quite tame, feeding and roosting with the other Common Pigeons. One day during a severe gale the cote was blown down, and the Pigeon flew off down wind in the direction of Manchester; it was absent for several hours, but came back towards evening. On several other occasions it disappeared suddenly for the day, but always returned to roost. Is not this a rather uncommon trait in the habits of so wild a bird?—E. A. H. KERSHAW (Beech House, Middleton, Lancashire).

The American Woodcock and its mode of Feeding.—A correspondent of 'Forest and Stream' (Paul Pastnor), writing on the American Woodcock, thus describes its mode of feeding:—"When the moon rose I took a position near one of the moist places along the brook, where the borings were freshest and most plentiful, and awaited developments. For a long time the bright light of the moon fell full upon the spot I wished to observe, and I could see everything with the utmost plainness. At about eight o'clock a Woodcock dropped down silently beside the brook. Presently another bird walked out of the shadow and joined it. Both began to "bore" for worms—an operation I had never seen before, and a curious performance it was. The birds would rest their bills upon the mud and stand in this position for several seconds, as if listening. Then, with a sudden, swift movement, they would drive the bill its entire length in the soil, hold it so for a second, and then as swiftly withdraw it. Though I watched the birds carefully with the glass, I could not detect the presence of a worm in their bills when they were withdrawn. But a subsequent process gave me the clue to their method of feeding. After having bored over a considerable piece of ground—a square foot or more—they proceeded to execute what looked comically like a war dance upon the perforated territory. They also occasionally tapped the ground with the tips of their wings. My intense curiosity to know the possible utility of this process was at length gratified by seeing a worm crawl, half-length, from one of the borings, when it was immediately pounced upon and devoured by one of the Woodcocks. Presently another worm made its appearance, and so on until the two Woodcocks had devoured as many as a dozen of them. Then the "vein" seemed exhausted, and the birds took their leave. I have

subsequently studied the philosophy of this method of digging bait, and have come to the conclusion that certain birds are a great deal wiser than certain bipeds without feathers. If you will take a sharpened stick and drive it into the ground a number of times, in a spot which is prolific with worms, and then tap on the ground with the stick for a few minutes, you will find that the worms will come to the surface, and that they will come up through the holes which you have made. I account for it by the supposition that the tapping of the stick somehow affects the worms the same as the patter of rain, and it is a well-known fact that worms come to the surface of the ground when it rains. The antics of the Woodcocks after they had made their borings, then, were simply mimetic, and intended to delude the worms into the belief that it was raining in the upper world. The worms, being deceived, came up and were devoured. All this may seem ridiculous, but, if it is not true, will some naturalist please state how a Woodcock can grasp and devour a worm when its bill is confined in a solid, tight-fitting tunnel of soil, and also how it is enabled to know the exact spot where it may sink its bill and strike a worm? And further, of all those who have seen a Woodcock feeding, how many ever saw it withdraw a worm from the ground with its bill?

[The extremity of the bill of the Woodcock is very flexible and sensitive, and we have no doubt, from what we have observed, that the bird is able to grasp a worm with it below the surface, guided by its sense of touch only.—ED.]

A Breeding-place of the Black-headed Gull in King's Co.—On the 11th of May last, in company with two ornithological friends, I visited what I think may be considered the largest breeding-place of the Black-headed Gull, *Larus ridibundus*, in Ireland, and one which has not hitherto been mentioned in print. This gullery is on the property of Lord Digby, in King's County, and lies two miles from Tullamore, on one of those extensive bogs so common in Ireland. Killeemore Bog is some 1200 acres in extent, and is covered with heaths of different kinds, very wet in some places, with small floating patches surrounded by water, in which grow quantities of the common bog-bean, *Menyanthes trifoliata*. It is in such places that the gulls seem most to congregate, as many as seven or eight nests being placed on many of these little islets, some of them perhaps not four yards in diameter. Although the nests may be found scattered all over the bog, in several such places as described they are crowded close together; and when standing on the outskirts, while my friends were in the centre of the bog, I could compare the clamour of the gulls only to the distant noise of the sea when breaking gently on the shore. The nests for the most part were built of the stems of the bog-bean, mixed with heather, and contained three eggs, but on two occasions we counted four in

the same nest. We had a good opportunity of noticing the wonderful variations in the colouring of the eggs, from a pale straw-colour to every shade of a rich olive-brown, and one very beautiful variety had the appearance of being scorched and smoked, while the ground colour of this egg was a lovely pale green. In many instances the young birds were already hatched, and seemed quite able to run and swim as soon as they got their plumage dry after emerging from the egg. On being approached they at once put themselves in a defensive attitude. One particularly early bird was almost as large as the parents, having the quill-feathers already half grown; and this bird, when lifted up, made noise enough to summon the whole colony to his assistance. We made a careful estimate of the number of gulls on this bog,—a very difficult matter, as they were going and coming, bringing food for the young, from all sides,—and we were pretty well agreed that not less than eight thousand were in sight at once. The “White Crows,” by which name they are known to the country people, begin to appear on the breeding-ground during the first week in March, and on the 12th of August—when the bog is shot over for Grouse—not one is to be seen. I noticed a good many birds in the second year’s plumage, having the brown bands on the wings and tail, and, being curious to ascertain if they were breeding, I secured one, and was surprised to find the hatching spots on the breast quite bare of feathers. I afterwards dissected the bird, and found eggs the size of buckshot in the ovary, with every appearance of the bird having laid. From this it would appear that the Blackheaded Gull sometimes breeds in the second year, although it is generally supposed that they do not do so until they attain their full plumage, in the third year. I may add that this particular specimen had not even the full black head, the forehead being dappled with white. I am glad to say that in this privileged spot the birds are rigidly protected by order of Mr. Reginald Digby, of Geashill Castle, who takes a keen interest in Natural History, and will allow no one on the bog without his written permission: thus the gulls increase and multiply in perfect security, and, from what one of the watchers told me, they have become much more numerous during the last few years. There certainly were about three times as many birds breeding than on the occasion of a previous visit in the year 1880. Amongst other birds which breed on this bog are Grouse, Teal (in numbers), Wild Duck, Curlew (a pair), Redshank, and Meadow Pipit. Tullamore is just on the verge of the range of the Jay in Ireland, as Mr. Digby informed me three or four pairs breed annually in Clonad Wood, just in view of the bog, but apparently are not increasing.—EDWARD WILLIAMS (2, Dame Street, Dublin).

Training Swallows as Letter Carriers.—‘The Globe’ of the 22nd August last contains the following remarks from a correspondent in Paris:—

“ When reports were circulated a few days ago that an ingenious Frenchman was training Swallows for the work of carrier-pigeons, most people put them down to be mere *canards* ; but for once the sceptical were in the wrong, and the Swallow as a winged messenger has become almost an accomplished fact, as will be seen from the details which I subjoin. They are furnished by the trainer himself, M. Jean Desbouvrie, who lives in a village near Roubaix, and who has just been visited by an ornithological friend. It is now more than thirty years since he began his task. He was then a lad of eleven. Being passionately fond of birds, he determined to try his hand on Swallows, and to show that, in spite of the universal belief to the contrary, they could be tamed and reared. At that time he served as errand boy to his father, and in the course of his rounds robbed all the nests he could come across. At length he succeeded in training a dozen or so to follow him about wherever he went. They would fly round his head and perch on his shoulders in the open street. To-day he has not only been able to tame them, but also to rear them, to make them keep to their cage, to fly in and out like pigeons, and, what is more extraordinary, to acclimatise them. “ If the Swallow leaves us at the end of summer,” he says, “ it is less from fear of cold than from lack of nourishment. As everybody knows, it lives on insects. Now, when the fine season is over the air ceases to be full of insects, and the Swallow migrates to escape starvation. Give him a shelter exposed to the south, and food which he can eat, and he will remain with us throughout the winter as in summer.” What the food is the trainer reserves to himself as a valuable secret. M. Desbouvrie has not yet begun to hatch the Swallows, which he assures us would be easy for him to do. He confines himself at present to obtaining the young ones from their nests. The upper storey of his house is set apart to them entirely. There are two rooms; one is transformed into a large cage, the other adjoining it opens on a balcony, and serves as a kind of ante-chamber. The cage contains twenty young birds; twelve of them are allowed to go in and out at leisure, the other eight are kept in captivity, and sold to fanciers. The carrier Swallows are easily recognised, having a small bit of coloured silk on their feet, and the age and quality of each bird are registered. For example, a red piece of silk indicates a Swallow perfectly trained, while a blue piece signifies one whose training is not yet complete. Four of the little prisoners, the oldest not more than twenty days, were let loose. It was raining in torrents at the moment, a circumstance by no means favourable to the trial. The birds rose in the air, flew round the house several times, and then darted off into the country, disappearing on the horizon. Twenty-five minutes after the youngest returned and perched on the balcony; the other three did not come back before an hour. They all then entered the cage-room, when M. Desbouvrie gave them some food, which they ate out of his hand. Capt. Degouy, who has been commissioned

by the Government to make an inquiry into the subject, and to see how far these trained Swallows may be useful to the army as messengers in time of war, has not yet been able to test their efficacy, owing to the fact that the birds at present in possession of M. Desbouvrie are too young, and require further training before they can be fairly experimented with. An instance of the rapidity of their flight is quoted by the trainer. An untamed Swallow, which had its nest in a farm near Roubaix, was caught and taken in a cage to Paris, where it was released. It returned to its nest in ninety minutes, having accomplished a distance of 258 kilometres, or over two miles a minute. M. Desbouvrie is certain that a far greater speed will be obtained from trained birds. Should the Government accept his idea, which he is convinced it will, he proposes to build a Swallow-house on the heights of Montmartre, and another on Mont-Valérien. The superiority of Swallows over Pigeons as carriers, both as regards the swiftness of their travelling and the difficulty of shooting them, is evident; but they have yet to be tried on a large scale before a verdict can be pronounced on them. Still the results already obtained are remarkable, and the prospect of the messenger of the zephyrs, as one old poet calls the sacred little bird, being pressed into military service, is another proof of the utilitarianism of the age." We quote these remarks as likely to be of interest to our readers, but have no faith in the writer's idea that the experimentalist will succeed in his object.

SCIENTIFIC SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

September 4, 1889. — Capt. H. J. ELWES, F.L.S., Vice-President, in the chair.

Prof. C. H. Fernald, of Amherst, Mass., U.S.A., and Mr. C. J. Fryer, of Emscote Road, Warwick, were elected Fellows; and Prof. C. V. Riley, of Washington, U.S.A., and Dr. A. S. Packard, of Providence, Rhode Island, U.S.A., were admitted into the Society.

Mr. George T. Baker exhibited two remarkably dark specimens of *Acronycta ligustri* taken near Llangollen.

Mr. P. B. Mason exhibited and remarked on a collection of Lepidoptera which he had recently made in Iceland. The following species, amongst others, were represented, viz.:—*Crymodes exulis*, *Triphæna pronuba*, *Noctua conflua*, *Plusia gamma*, *Larentia cæsiata*, *Melanippe sociata*, *Coremia munitata*, *Phycis fusca*, and *Crambus pascuellus*.

The Rev. Dr. Walker also exhibited a number of Lepidoptera, Diptera, and Hymenoptera, recently collected by himself in Iceland. The collection included the following, viz. :—*Crymodes exulis*, *Noctua conflua*, *Larentia cæsiata*, *Coremia munitata*, *Culex pipiens*, *Scatophaga stercoraria*, *Calliphora erythrocephala*, *Helophilus grænlandica*, *Bombus terrestris*, &c.

Mr. W. White exhibited, on behalf of Mr. G. C. Griffiths, a specimen of *Nephronia hippia*, Fab., var. *gæa*, Feld., which he believed to be hermaphrodite. He also exhibited, for comparison, a female of the same species. A discussion on hermaphroditism ensued, in which Mr. Distant, Capt. Elwes, Mr. M'Lachlan, and Mr. Baker took part.

Dr. Sharp exhibited specimens of *Cychramus luteus* and *fungicola*, Auct., and stated that they are the sexes of one species, *C. luteus* being the male, *C. fungicola* the female. In working through the Central American *Cychramini*, he had found that in some genera the males differed greatly from the females in size and sculpture; but this was not a constant character, for in some species, while certain males scarcely differed from the females in these respects, others were so different that they would scarcely be recognised as belonging to the same species.

Mr. Edward A. Butler exhibited specimens of *Platymetopius undatus*, Deg., from Ewhurst, Surrey. He remarked that the species was recorded as having been once previously taken near Plymouth by the late Mr. John Scott.

Mr. G. T. Baker read a paper entitled, "On the distribution of the Charlonia group of the genus *Anthocharis*." Mr. Baker stated that the species, six in number, of this small division of the genus *Anthocharis* formed a very natural and closely allied group, presenting many points of interest, both in their relationship to each other and in their geographical distribution, which extended from the Canaries on the west to the valley of the Indus on the east. The author's theories as to the causes of the present distribution of the group, which were based on geological data, were discussed by Capt. Elwes, Mr. M'Lachlan, Mr. Distant, and Mr. Stainton.

The Chairman read a paper entitled "On the genus *Argynnis*," which gave rise to a discussion in which Mr. Distant, Mr. Jenner Weir, and Prof. Riley took part.—H. Goss, *Hon. Secretary*.



Believe me to be
Yours very truly
Fred Bund

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MEMOIR OF THE LATE FREDERICK BOND, F.Z.S., F.E.S.

IN the list of English naturalists of mark who have passed away during the present generation, must, to our regret, be included the name of Frederick Bond, who, at the age of 78, died at Staines on the 10th of August last. Not that he made any remarkable biological discovery, or published any important work on Natural History: his claim to distinction as a naturalist arises solely from the impetus and encouragement which his verbal teaching and the display of his valuable collections undoubtedly gave to the study of Zoology in the persons of all those, and they were very many, who applied to him for information and advice.

Of his earlier life little is now remembered even by his contemporaries. The son of Capt. Bond, of the 77th Regt., he was born at Exmouth on the 22nd of February, 1811. He was educated at Brighton, and, by his father's wish, commenced to study for the medical profession, but, owing to the repugnance which he felt towards the necessary dissection of the human subject, a feeling which he was never able to overcome, he abandoned his design. Possessing sufficient means to render him independent of a profession, he gradually settled down to the enjoyment of a country life,—first at Winchmore Hill, near Edmonton, and subsequently at Kingsbury, where he went to live in 1828, and remained until 1855. In the latter year he temporarily took up his abode in London,—first in Cavendish Road, St. John's Wood, and subsequently in Adelaide

Road, Hampstead,—returning in 1862 to Kingsbury, where he remained until 1865, when he proceeded to Cambridge to further the education of his nephews, he himself having never married. Thirty years of his life, therefore, were spent at Kingsbury, although during this time, and especially in the shooting season, frequent excursions were made to different parts of England and Scotland. He was especially fond of Snipe and Wildfowl shooting, and the present writer, who, as his pupil in later years, was often his shooting companion, has heard him speak with delight of the great fens of Cambridgeshire, Lincoln, and Huntingdon, parts of which he was old enough to remember in their undrained condition, with all their wealth and variety of bird-life.

Bittern and Bustard were to be found, in his boyhood days, before the draining of the Fens, and butterflies of species now extinct were not uncommon, and used to delight the eyes of the young naturalist. The sunsets of the Great Fen, all the more striking from the wide sweep of horizon, were never forgotten, and the low flat scenery had always a charm for him in after life, from the memory of those days.

In an eloquent lecture on the Fens, given to a Mechanics' Institute at Cambridge, in 1867, Charles Kingsley spoke of a certain sadness as pardonable to one who has "watched the destruction of a great natural phenomenon which had turned a waste howling wilderness into a garden of the Lord. And yet," he adds, "the fancy may linger without blame over the shining meres, the golden reed-beds, the countless water-fowl, the strange and gaudy insects, the wild nature, the mystery, the majesty,—for mystery and majesty there were,—which haunted the deep fens for many hundred years. Little thinks the Scotsman, whirled down by the Great Northern Railway from Peterborough to Huntingdon, what a grand place even twenty years ago (1847) was that Holme and Whittlesea which is now but a black, unsightly, steaming flat, from which the meres and reed-beds of the Old World are gone, while the corn and roots of the New World have not as yet taken their place. But grand enough it was, that black ugly place, when backed by Caistor Hangland and Holme Wood and the patches of the primeval forest; while dark green alders, and pale green reeds, stretched for miles round the broad lagoon, where the Coot clanked and

the Bittern boomed, and the Sedgebird—not content with its own sweet song—mocked the notes of all the birds around: while high overhead hung, motionless, Hawk beyond Hawk, Buzzard beyond Buzzard, Kite beyond Kite, as far as eye could see. Far off upon the silver mere would rise a puff of smoke from a punt invisible from its flatness and white paint. Then down the wind came the boom of the great staunchion-gun; and after that another sound, louder as it neared; a cry as of all the bells of Cambridge and all the hounds of Cottesmore; and overhead rushed and whirled the skein of terrified Wildfowl, screaming, piping, clacking, croaking, filling the air with the hoarse rattle of their wings, while clear above all sounded the wild whistle of the Curlew, and the trumpet-note of the great Wild Swan. They are all gone now! No longer do the Ruffs trample the sedge into a hard floor in their fighting-rings, while the sober Reeves stand round, admiring the tournament of their lovers, gay with ruffs and tippets, no two of them alike. Gone are Ruffs and Reeves, Spoonbills, Bitterns, Avocets; the very Snipe one hears disdains to breed. Gone, too, not only from the Fens, but from the entire country, is that most exquisite of butterflies, *Lycena dispar*, the Great Copper, and many a curious insect more.” *

It may well be imagined that a man with his taste for out-of-door life, with leisure to indulge it, and with such happy hunting and collecting grounds as those above described, must have enjoyed exceptional opportunities for the study of Natural History. His whole life was devoted to outdoor observation, and to the formation of what came to be one of the best collections of British Lepidoptera, Birds, and Birds' Eggs. In the formation of these collections the knowledge which he acquired often astonished the younger men who were following in his footsteps.

It is much to be regretted that he kept no journals, for there can be no doubt that, had it not been for a natural disinclination to sit indoors and write, he might, if he had been so minded, have produced a volume (aye, many volumes) which would have rivalled in interest the delightful productions of Charles St. John, the author whom, perhaps, of all others he most resembled in his tastes, and whom he most admired. All that he accomplished in the way of publication was confined to the brief notes which

* 'Prose Idylls,' pp. 95, 96.

he communicated from time to time to 'The Zoologist' and 'The Entomologist,' of which latter journal he was one of the Editors from 1877 until the time of his death. As regards 'The Zoologist,' he was one of those who—with the brothers Doubleday, Thomas Bell, William Borrer, Bree, Couch, W. R. Fisher, J. H. Gurney, Hewitson, Waring Kidd, A. E. Knox, Rodd, Salmon, Frederick Smith, William Thompson, and Yarrell (of whom alas! only two are still living)—helped the late Edward Newman to found it: he wrote in the first volume (1843), and in the last, his latest communication (on the appearance of the Sand Grouse near Staines) having appeared in the number for June of the present year.

Taking them in chronological order, the notes he contributed to this Journal were the following:—

1843.—Birds shot at Southend, p. 39; Water-birds (57 species) occurring at Kingsbury Reservoir, 102; Occurrence of rare British Insects (including a Locust near Hampstead), 125; Occurrence of rare British Birds (including the Purple Martin, Buff-breasted Sandpiper, and Wilson's Petrel), 148; Cure of grease in Insects, 175.

1844.—Edible Frog in Cambridgeshire, p. 393; *Colias edusa* and *hyale* in Northamptonshire and Cambridgeshire, 397; *Anthus petrosus* at Kingsbury Reservoir, 447; Note on the Kestrel, 491; Summer Birds at Kingsbury, 650; Missel Thrushes, 656; Hen changing her colour, 667; Edible Frog, 677; Rare Waders at Kingsbury Reservoir, Greenshank and Curlew Sandpiper, 767.

1845.—*Polyommatus arion* in Northamptonshire, p. 803; Food of the Pheasant, 873.

1846.—Flowers attractive to Moths, p. 1341; Occurrence of *Sphinx convolvuli* near Kingsbury, 1510; Occurrence of the Locust near Kingsbury, 1518,—at Duxford and Fulbourne, 1521.

1847.—*Vanessa antiopa* near Kingsbury, p. 1791; Lepidoptera near Yaxley, 1881; Locust near York, 1881.

1848.—Young of the Little Bittern near Enfield, p. 1969; Capture of *Buprestis mauritanica* in Plaistow Marshes, 1999; Locust in Cambridgeshire, 2000.

1849.—*Colias edusa* and *C. hyale*, p. 2612.

1850.—Great Grey Shrike near London, p. 2698; *Scolopax Brehmi* (?) near London, 2703; Little Auk at Newmarket, 2706; Waxwing in Cambridgeshire and Norfolk, 2767; The Exotic Grosbeak, 2770; Black-throated Diver at Chesterfield, 2775; Kite at Kingsbury,

2797; Black Redstart near London, 2798; Fork-tailed Petrel near London, 2803.

1851.—Captures of Lepidoptera at Hornsey, Wicken and Burwell Fens, 3012; Iceland Falcon in Ross-shire, 3275.

1852.—Occurrence of the Gannet in Cambridgeshire, 3712; Occurrence of the Egyptian Goose in Cambridgeshire, 3712; Occurrence of *Vaenssa antiopa* near London, 3715.

1858.—The Red and Willow Grouse, their distinctness affirmed, p. 6264.

1859.—Capture of the new Snake, *Coronella austriaca*, at Ringwood, New Forest, p. 6787.

1860.—Serin Finch in England, near Brighton and London, first recorded p. 7105; Occurrence of *Deilephila lineata* at Brighton, 7107; *Sesia spheciformis* in Sussex, 7249.

1862.—The Little Gull at Brighton, and at Freshwater, p. 7939; Notes on Sabine's Snipe (considered a variety), and Jack Snipe (a black variety), 8000.

1863.—Pallas's Sand Grouse in Cambridgeshire, p. 8722.

1864.—Redwings singing in England, p. 9021.

1865.—Early arrival of Summer Birds at Freshwater, p. 9562.

1867.—Water Pipit at Brighton (second record of its appearance in England), p. 792; Wood Lark in flocks at Brighton, 792.

1868.—Early breeding of the Common Snipe in Sussex (shot by Mr. Harting from a nest with four eggs, on April 4th), p. 1256.

1870.—Ornithological notes from South Devon, p. 1983; Rare or new British Birds taken near Brighton, 1984; including Richard's Pipit, Tawny Pipit, Shore Lark, Scarlet Grosbeak (*Pyrrhula erythrina*), first occurrence; Supposed Citril Finch, proved to be a Wild Canary, 2022; Supposed Snow Finch, *Fringilla nivalis*, proved to be the White-winged Lark (*Alauda sibirica*), its first occurrence, 2022; Supposed *Emberiza rustica*, proved to be a young male Lapland Bunting, 2022; Lapland Bunting near London, 2061; Little Gulls in Leadenhall Market, 2066; Little Gull in the City, 2108; Tawny Pipit, Ortolan Bunting, and Lapland Bunting near Brighton, 2383; Second occurrence of the Scarlet Grosbeak (*Pyrrhula erythrina*) near London, 2383.

1871.—Late-staying Hirundines, p. 2440; Quail nesting between Hampstead and Kentish Town, 2683; Singular nesting of the Nuthatch in a haystack at East Grinstead, Sussex, 2850. [This nest was figured in 'The Field' of October 28th, 1871, and is preserved in the British Museum.]

1872.—The Whitby Wader a young male Ruff, 2905.

1873.—Goshawk at Hampstead, p. 3368; Late Cuckoo, 3368.

1877.—Tawny Pipit at Brighton, 299.

1879.—Bullfinches eating Privet-berries, p. 220; An albino Weasel in Cambridgeshire, 455.

1884.—Manx Shearwater inland in Shropshire, p. 431.

1887.—Hedgehog eating Swedes, 345; Swifts nesting in Martins' nests, 348; Distribution of the Bank Vole, 425.

1889.—Pallas's Sand Grouse in Middlesex, 227.

Before the first appearance of 'The Zoologist,' however, in 1843, he was a reader of, and an occasional contributor to, Loudon's 'Magazine of Natural History.' So long ago as 1830, we find the following note from his pen (vol. iii., p. 449), and this, so far as can now be ascertained, was the first note published by him:—

“A female Sparrowhawk with a blue back.—Sir,—In the 'Magazine of Natural History' (vol. i., p. 220) your correspondent T. F. says he has never seen a female Sparrowhawk with a blue back like the adult male. I have seen two the last year (1829); one shot in October, the other in November, by myself, in the act of pursuing a wounded Fieldfare, and it is now in my possession, stuffed.—F. B.; Kingsbury, February, 1830.”

Until 'The Entomologist' was re-commenced, in 1864, the principal medium for the publication of information concerning insects (chiefly British) was 'The Zoologist, to which periodical, as the above list shows, Frederick Bond occasionally sent notes concerning rare or little-known British Lepidoptera, for, it should be stated, that he knew as much of Entomology as of Ornithology, and possessed one of the finest collections of butterflies and moths in this country, the greater number of which were taken by himself. In the opinion of those best competent to judge, it is regarded as probably the most extensive and representative now in existence, combining the past with the present, for, until a short time only before his death, he missed no opportunity of adding to it and improving it. His name has been appropriately associated with *Tapinostola Bondii*, Knaggs, best known as a British insect, and *Sthenias Bondii*, Pascoe (Trans. Ent. Soc., ser. 2, vol. v., p. 48), a fine longicorn beetle, subsequently separated generically under *Xynenon* (*op. cit.*, ser. 3, vol. iii., p. 159).

The following letter, lately received from one who knew him intimately, the Rev. O. Pickard-Cambridge, of Bloxworth Rectory,

Wareham, will find an echo in the heart of many a young collector who had the privilege of knowing him and of profiting by his generosity :—

“ I do not know when I have felt anything so much as the death of our dear old friend Frederick Bond. He and I began our acquaintance in the early part of 1849, so that we had been friends for over forty years ! We collected insects together for many years in the New Forest, Isle of Wight, Portland, and here at Bloxworth, and I cannot recall a single word, or act as a collector, to mar the wholly pleasant recollection of our work together. His unselfishness and generosity were a bye-word among all who knew him, and his cheeriness and unfailing good humour made many a blank day (entomologically speaking) one of our pleasantest days. His pertinacity in working for an insect he believed ought to be found in one locality or another was most remarkable, and was generally rewarded by finding it.

“ A common feeling amongst all of us who had the privilege of his friendship was how we could best help to enrich Bond's collection and I need scarcely say that few ever found themselves anything but gainers in the end.

“ Bond's manipulation of Lepidoptera was also remarkable, and the rapidity with which he set them could scarcely be exceeded. What also was more important was that an insect never looked the worse for his manipulation. New methods of setting have come into practice of late years, but I do not observe any improvement in the results compared with what came off Bond's “ setting-boards.” No doubt he followed to a great extent the old practice amongst British collectors of setting insects low down on the pin, thus bringing them low down on the bottom of the cabinet drawer, but it always ‘ went against the grain ’ for him to do so ; and, indeed, to keep the wings just clear of the bottom of the drawer, so as to avoid injuring the ciliæ of the wings was the point he always kept in view.

“ I will not say that there are no other entomologists left like Frederick Bond, but if there are they are unknown to me ; and I say this without a word or thought of disparagement to the many valued friends still left to me in the ranks of entomologists.”

Another friend who knew him well, the Rev. Murray A. Mathew, of Buckland Dinham, Frome, writes :—

“ In your memoir of our old friend Bond I hope you will record instances of his kindness in helping and encouraging schoolboy naturalists. I have always felt that I, among many others, owe him

a great debt of gratitude in this respect. In 'the fifties,' when I was at Kensington Grammar School, I used to spend many half-holidays, happy and delightful hours, at Bond's house in Cavendish Road, St. John's Wood, when he not only showed his splendid collections, but was ready to give all manner of information, and to listen kindly to schoolboy prattle about pets at home. Once or twice it was my good fortune to be with him when someone arrived from a collecting tour, and to watch the unpacking and display of all the treasures, certain at the end to receive some gift of egg or insect to carry rejoicingly away. And how kind he was in replying to the letters sent him, in answering numerous questions, in naming boxes of moths unknown to the capturer (too often so rubbed as to be almost beyond identification), and in sending back with the named insects perfect specimens of his own setting, with others which he thought would come as a welcome gift. And then how proud he would make us by giving us some commission to do, such as asking us to secure and send him a family of Dippers in the nestling plumage, or any similar task to be easily and delightfully accomplished by the trout streams of Devonshire. Of late years it has not been my privilege to have had much intercourse or correspondence with him; but I shall ever have a loving and grateful recollection of him as having been (after William Brodrick) my best teacher in Natural History.*

"My personal recollections of our deceased friend," writes Mr. Harting, "are of the pleasantest kind. For about fifteen years we lived in the same parish (Kingsbury), and within half a mile of each other. During a great part of this time we met almost daily, except while I was away at College, or he was absent on some shooting or collecting expedition. He taught me to shoot, and to skin birds, and some of the happiest hours of my early life were passed in his museum or in his company shooting. I believe it was the sight of his collections, when a boy of ten, that caused me first to take an interest in Natural History. Looking with wonder and admiration at his cases of stuffed birds, and cabinets of birds' eggs, and butterflies and moths, I thought 'Can it be possible that all these beautiful things are to be found *alive* in this country?'; and when told 'Yes, and many of them *in this parish*,' I was wild with excitement to find them for myself. He often accompanied me in my

* For a Memoir of the late William Brodrick see 'The Zoologist' for April, 1889, p. 139.

search, and under his tuition I quickly learned to distinguish all our commoner birds by their notes, flight, or peculiar actions, and many of the more conspicuous insects. I had commenced making a collection of birds' eggs at school, a collection which was afterwards often added to by my kind friend and mentor. And how cherished were those specimens of 'British taken' rarities! Then, having learnt to skin under his direction (beginning with a Starling), I commenced to collect birds, and in this he often helped me, either by giving me duplicates, or by shooting birds for me, and sending them to me 'in the flesh.' Many a time a servant would arrive with a small parcel and a message 'Mr. Bond's kind regards, and he thought perhaps you might like this.' The parcel being tenderly unfolded, displayed perhaps a Hawfinch, or a Green Sandpiper, shot at our brook.

"Kingsbury Reservoir was our happy hunting-ground, and in those days (twenty or five-and-twenty years ago) it was a paradise for an ornithologist. There was no railway-viaduct at one end of it then, as now; the extension of the Midland line to Bedford had not been commenced. When we visited London we had to drive our own horses, or go by one of the two coaches which were then on the road, one of them going to and from St. Alban's, the other to Stanmore and Elstree. It was no uncommon thing, as we crossed the two bridges over the reservoir, and the Hyde water, to see Wild Ducks there, and Gulls and Terns flying about at the period of their migration in spring and autumn. About the end of April and beginning of May, and again in August to about the middle of September, the number and variety of wading birds which visited this fine sheet of water were most remarkable. Plovers and Sandpipers, Snipe and Jack Snipe, were all there in their proper season, and there were always a few Herons about, which came either from Osterley Park, Black Park, Uxbridge, or Wanstead Park in Essex. The water was very little disturbed then by human visitors, and we have many a time walked round it, about two miles, and followed the Brent towards Hendon, or in the other direction towards Brentford, without meeting anyone but farm-labourers, or perhaps one or two anglers. Here in the early morning might be heard the note of the Ringed Plover as it ran along the shingle at the head of the Reservoir, or the musical cry of the high-flying Redshank which we marked down, to be stalked and shot. On the muddy

margins in the bed of the brook, especially at a bend devoid of trees, the Green Sandpiper, *Totanus ochropus*, might be found every spring and autumn; and more rarely the Wood Sandpiper, *Totanus glareola*, and Temminck's Stint, *Tringa Temminckii*. On September 4th, 1869, I shot a nice specimen of the last-named little bird there, and also a Greenshank, *Totanus glottis*; and on that date, at 6 a.m., I counted seven different species of shore birds there, seeing besides those just mentioned, the Common Sandpiper, Green Sandpiper, Dunlin, Ringed Plover, and Heron.

“In ‘The Zoologist’ for 1843, p. 102, will be found a List, by Mr. Bond, of Waterfowl met with at Kingsbury Reservoir. He enumerates fifty-seven species, and adds that he has not included one which was not thoroughly well identified, and, indeed, of most of them he had himself shot and preserved specimens, which I have seen many a time and oft. But our rambles were not confined to Kingsbury Reservoir and the Brent. We visited the Hampstead and Highgate Woods, in those days a rare place for insects, and for some of the more or less uncommon small birds, such as the Wood Wren, Pied Flycatcher, Hawfinch, and Spotted Woodpeckers. We visited Golders Green, and the lower part of Hampstead Heath, getting many a Snipe and Jack Snipe there in the early morning. Along the brook at Colin Deep Lane our dogs were sure to find and hunt a Moorhen, and Stanmore Common and Bushy Heath supplied our collections with splendid Wheatears and Stonechats in full plumage, and the rarer Dartford Warbler. We shot over four parishes, including a bare open tract lying between Kingsbury, Kenton, and Edgware, known as Hungry Downs, where Golden Plover and Peewits came in winter, and the Dotterel, *Eudromias morinellus*, appeared in spring and autumn. One of the last-named stands, stuffed, before me as I write, a memento of bygone days, when, with our guns and dogs, we were out from morning till night. We each had a couple of spaniels, and I had in addition an excellent red Irish setter, which I reared from a pup, and broke to retrieve, and which would fetch a duck out of the water in cold weather as well as any ordinary retriever. This dog once brought me a wounded Jack Snipe which I had shot, and carried it so completely within his closed mouth that I thought he had come back without it; but on reaching the spot

where I stood he opened his mouth, when the Snipe dropped out, and fluttered away to a considerable distance,—so tenderly had it been carried. This dog we found most useful for collecting purposes, as he would find a small bird in thick covert, and bring it without further injury. With our united “pack” we rambled about the country, shooting and collecting, and sometimes making excursions to a distance. He came to stay at our house in West Sussex, and greatly enjoyed the walks over the chalk downs, and through the beech woods, where we found a great variety of land and fresh-water Mollusca. We collected between sixty and seventy different wild flowers in bloom there one summer, and I remember that he was particularly struck with the Orchids, of which ten or a dozen species were identified, including the Fly, Bee, and Butterfly Orchids, Lady’s Tresses (*Neottia spiralis*), and the Bird’s-nest Orchis (*Listera nidus-avis*). In the woods and hollow lanes in that part of the country, the great variety of Ferns and Fungi to be met with, many of which he could name off-hand, made our country walks most delightful. Amongst the rarer birds’ eggs we obtained there were those of the Grasshopper Warbler, Woodlark, Great Spotted Woodpecker, Water Rail, and Teal. Never shall I forget the pleasure he expressed on my showing him a Teal’s nest *in situ*,* nor his delight on receiving a beautiful clutch of Snipe’s eggs which I had searched for and secured for him, at his request, together with the old bird, which I shot from the nest, at a date (April 4th) which he considered to be unusually early.†

“It was at his house that I first saw ‘The Zoologist,’ and from the time that I commenced to take it in regularly, in 1860, it was read with keen interest every month, and discussed in detail by us. His criticisms of the observations which it contained were always kindly expressed, and the way in which he explained what were evidently errors of observation, or want of knowledge on the part of correspondents, taught me volumes. Little did I think in those days, when studying the pages of ‘The Zoologist,’ that I should one day come to be the Editor of the Journal which I then so much admired.”

* Described in ‘The Birds of Middlesex,’ p. 231.

† He communicated a note on the subject to ‘The Zoologist,’ 1868, p. 1256.

About this time the late John Gould was issuing in parts his splendid folio work on the 'Birds of Great Britain,' and few persons gave him more information for his text than our mutual friend Bond. His knowledge of species, and intimate acquaintance with birds in a state of nature, enabled him to give many valuable hints, and, although he would rarely take the trouble to write down information, he would tell you more in an hour than you could learn from books in a week. Many of the birds figured in Gould's work were drawn from specimens obtained by Bond, and some of them—as the Black Redstart, Scarlet Grosbeak, White Wagtail, Crested Lark, Serin, and others—were, through his instrumentality, introduced for the first time in the List of British Birds. Indeed the aid he gave to his friends who had more taste for writing and publishing than himself was considerable; and the information which he communicated to the author of the 'Birds of Middlesex,' and to Mr. A. G. More for his observations on the fauna of the Isle of Wight (published in Venables' 'Guide to the Isle of Wight,' 1860), and for his excellent paper "On the Distribution of Birds in Great Britain during the Nesting-season" (printed in 'The Ibis' for 1865), must be apparent to those who are familiar with these publications.

It now only remains to notice some of the more remarkable specimens in his collection of British birds and their eggs, in the formation of which he spent a lifetime; and it is perhaps the more desirable to have some record of them here, as he himself made no catalogue of his treasures, and the history of many of the specimens is now only to be ascertained from an examination of the labels attached to them. Many, alas! are without labels, and all that can be said of them is that they are "certainly British, and in many cases were obtained by himself."

The birds are preserved partly in glass cases, of which there are about 150 stacked round the walls of his study; partly in skins preserved in cabinets. As the cases have been recently numbered and catalogued by the present writer, it will perhaps be most convenient to refer to them here by their numbers, as, in consequence of the way in which they are stacked, it would be impossible to take them in any scientific order without first entirely re-arranging them.

In the Case numbered 1, containing the British Shrikes, a

noticeable bird is the young Woodchat, shot by H. Rogers, at Freshwater, Isle of Wight, in September, 1856 (*cf.* Yarrell's 'Brit. Birds,' 4th ed. i. p. 216).

In Case 4 there is an Alpine Accentor, not mentioned in the latest edition of Yarrell, which was purchased at the sale of the Margate Museum, and is labelled "Killed at Hove, near Shoreham, Sussex, 1845." In Case 6 is the young male Black Redstart obtained by Bond at Kilburn, Middlesex, Oct. 25th, 1829, and the first recorded British example of this species ('Zool. Journ.' vol. v. p. 103). In Case 8 are a pair of Pied Flycatchers from Cumberland, 1848, received from Heysham, the well-known ornithologist; and two young birds of the same species, evidently reared in this country,—one taken near Brighton, in September, 1866; the other at Hampstead, in August, 1868. The label has "Sept. 1868" for the last-named specimen; but in an interleaved copy of 'The Birds of Middlesex,' in the writer's possession, there is a MS. note of the occurrence, written at the time, from information supplied by the birdcatcher (Davy, of Camden Town), who took it with three others, from which it appears that it was in August they were obtained. This renders it the more likely that, being all immature birds, they were reared at no great distance from where they were found, namely, on the outskirts of the Hampstead Woods.

In Case 9, besides three examples of the Grasshopper Warbler, and an albino Sedge Warbler (from Lewes, Sussex, Sept., 1860), the most remarkable bird of the group is Savi's Warbler, *Acrocephalus luscinioides* (Savi), a single specimen, labelled "Fen near Baitsbight, Cambridge, May, 1845." From information supplied by Mr. Bond to Prof. Newton (*cf.* Yarrell's 'Brit. Birds,' 4th ed. vol. i. p. 391) it would appear that the specimen just mentioned, as well as some others from the same district afterwards, were obtained through the intervention of one Harvey, the lock-keeper, at Baitsbight, on the River Cam.

"At that time a large extent of fen in the neighbourhood was overgrown with one of the social sedges (*Cladium mariscus*), which towards autumn was regularly cut, and, being made into bundles, was carried by water to Cambridge, to serve as kindling for fires. The sedge-cutters used commonly to find many old nests of singular construction in the course of their work,—nests which could not be assigned to any of the known kinds of fen-birds; and this fact was learned by Harvey,

who dealt in various objects of Natural History. The people of the district were also aware of a reddish brown bird, having a peculiar song, often heard at night, not altogether unlike that of the Grasshopper Warbler or 'Reeler,' but still quite distinct; and this bird they called indifferently the 'Brown,' 'Red,' or 'Night Reeler.' Instigated by his customers, Harvey at length procured from the fen-men specimens of this bird, and a few years later its fresh nests and eggs. The earliest of the former so obtained seem to have passed into Mr. Baker's hands; and the first of the latter, taken in May, 1845, were purchased by Mr. Bond, who distributed the eggs to several of his friends,—among others to Yarrell, to Newman, by whom they were described ('Zoologist,' 1846, p. 1212), and to Hewitson, who, in the same year, figured a specimen in his 'Eggs of British Birds,' Pl. XXV." "Thus," adds Professor Newton (*tom. cit.*, p. 392, note), "Mr. Bond is entitled to the merit of having been the first to bring the discovery of the eggs and very peculiar nest of this species to the knowledge of naturalists."

He presented one of the nests to the British Museum, and a representation of it forms the final vignette to the article on Savi's Warbler in the latest edition of Yarrell's standard work.

Another fen-bird in this collection, the Bearded Tit (of which old and young specimens from Whittlesea Mere, June and August, 1849, are in Case 10), deserves mention, as having been obtained by Bond himself in the old days before drainage had destroyed or considerably circumscribed its ancient haunts; and a pair of Crested Tits from Carr Bridge, Perthshire (obtained by the late Mr. Charles Thurnall in 1852) are conspicuous in Case 14.

The first recognized occurrence of the White Wagtail, *Motacilla alba*, in this country was in May, 1841, when Mr. Bond found two pairs of this bird on the banks of Kingsbury Reservoir, Middlesex, and shot two males and a female (see *Ann. Mag. Nat. Hist.* vol. vii. p. 350; also Yarrell, 'Brit. Birds,' 4th ed. vol. i. p. 548). Two of these are preserved in Case 13; the third he gave to Yarrell. The Grey-headed Wagtail, *Motacilla flava* (the first British specimen of which was obtained by Henry Doubleday at Walton-on-the-Naze in October, 1834), is represented in Case 11 by a specimen taken near Brighton in 1866.

Case 131 contains a female Pine Grosbeak, *Pyrrhula enucleator*, shot at Harrow-on-the-Hill, and figured by Yarrell, who was the original possessor of the specimen ('Brit. Birds,' 4th ed. vol. ii. p. 177); and in another case, in a cabinet drawer, is the Scarlet

Grosbeak, *Pyrrhula erythrina* (also a hen-bird), caught at Hampstead, and figured by Gould in his 'Birds of Great Britain.' Several Waxwings, *Ampelis garrula* (Case 17), from various localities, including the neighbourhood of London, were obtained during the great visitations of 1851 and 1866-67, when numbers of these birds were shot in different parts of the country (see 'Zoologist,' 1867).

In Case 122 is the first recorded English specimen of the Crested Lark, *Alauda cristata*, procured at Littlehampton, Sussex, and figured by Yarrell (vol. ii. p. 177). The Siberian Thrush, *Turdus sibiricus*, Pallas, shot between Guildford and Godalming in the winter of 1860-61, sent to Mr. Bond as a variety of the Redwing, and identified by the late Edward Blyth, who noticed it incidentally in 'The Field' of 24th September, 1870.

In the autumn of 1845 several small flocks or family parties of the Two-barred Crossbill, *Loxia bifasciata*, appeared in Cumberland, and ten or a dozen were shot in the neighbourhood of Brampton ('Zoologist,' 1846, p. 1551, and 1847, p. 1638). Of these some were secured and preserved by Mr. T. C. Heysham, of Carlisle, and besides those traced by Mr. Macpherson ('Birds of Cumberland,' p. 52) to the collections of Messrs. Doubleday, Dix, Stevenson, and John Hancock, two, both female birds, were sent by Heysham to Bond, in whose collection they now are (Case 130), with a pair of the Parrot Crossbill, *Loxia pityopsittacus*, from Christchurch, Hants, March, 1862, and an adult male of the last-named species shot near Lymington, Hants, in March, 1843, out of a flock of eleven birds.

Golden Orioles, shot in Middlesex and Bedfordshire (Case 132), and Hoopoes from Sussex and Leicestershire (Case 118), are conspicuous amongst the brighter plumaged birds.

Case 114 contains an American Purple Martin, *Hirundo purpurea*, which belonged to Yarrell, and was said to have been shot with another one at Kingsbury Reservoir in September, 1842, but no one now believes the story; and there can be no doubt, from the result of inquiries made, that Yarrell's credulity was imposed upon. In the same case is a specimen of the Alpine Swift, *Cypselus melba*, which is stated erroneously, in 'The Birds of Middlesex' (p. 129), to have been shot at Reading in August, 1841. It was received by Mr. Bond from Mr. Wheeler,

of Reading, in October, 1841, but was shot in the previous month of August at Chobham, in Surrey. It is quite possible that this may have been the bird seen shortly before at Kingsbury Reservoir, but this is merely inferred from the infrequency with which this species has been observed in England.

A female Little Bittern (Case 44) is noteworthy, as having been shot on the Lea, near Enfield, on the 10th September, 1847 (Zool. 1848, p. 1969), and a specimen of the American Red-breasted Snipe, *Macrorhamphus griseus*, deserves mention, as having been shot, probably at low tide, on the banks of the Thames, near Battersea, some forty years ago. This is the specimen referred to in 'The Birds of Middlesex' (p. 195), the second Middlesex specimen therein mentioned as "killed at Stone Bridge, on the River Brent," having been deposited by the author in the collection of British Birds in the Natural History Museum, together with other rare wading birds shot by him at Kingsbury Reservoir, amongst others the Little Ringed Plover and Temminck's Stint. A Little Ringed Plover, in Case 54, is in precisely similar plumage to that just referred to, and was also obtained at Kingsbury Reservoir by Mr. Bond. The date cannot now be ascertained, but it is almost certain to have been in August or September, the season at which the young of most grallatorial birds are met with on their southward migration.

The Red-necked Phalarope, *P. hyperboreus*, is much rarer in the South of England than the Grey Phalarope, which in some years is comparatively common, and birds in summer or breeding plumage are very seldom met with in the spring. Case 37 contains a specimen of *P. hyperboreus* in summer plumage, which (strange to tell) was shot in the summer of 1850, while running between the rails near the Stratford Station on the Great Eastern Railway, and was presented by Mr. E. Shepherd.

The series of wading birds in this collection is very fine, containing good specimens of all the British *Charadriidæ* and *Scelopacidæ*, most of which were shot by their late owner at Kingsbury Reservoir, Southend, and the Isle of Wight.

The pair of Sand Grouse in Case 67, although not labelled, were received from Cambridgeshire in July, 1863 (*cf.* 'Zoologist,' 1863, p. 8722), the female from Cottenham, and the male from Swaffham Prior. Another male, which was shot at the same

date and only winged, lived for some time in the aviary of Mr. F. Barlow, of Cambridge, an old friend of Mr. Bond.

If a full account of this remarkable collection were to be written, the numerous cases of "varieties" would require a chapter to themselves. We know of only two other collections of such abnormalities in this country which are at all comparable to that of Mr. Bond, namely, those owned by Mr. Whitaker, of Rainworth, Notts, and Mr. John Marshall, of Belmont, Taunton. We are unable to say which of these three collections of white and pied varieties contains the largest number of specimens, but it will suffice for our present purpose to notice a few only of the more remarkable forms which have been so carefully preserved by our deceased friend. Two Jays, one white the other pied, are in Case 20. Pied and white varieties of the Rook and Jackdaw (Case 34); a white Magpie (Case 35). Amongst the smaller birds may be mentioned Case 108, containing albino specimens of the House Sparrow, Redpoll, Linnet, Tree Pipit, Bullfinch, Yellowhammer, and Greenfinch, all from the collection of the late Mr. Hugh Hanley, of the 1st Life Guards. From the same collection came Case 116, containing three Starlings, one pure white, one silver-grey, one dark cream with a few spots, a pure white Bunting (*Emberiza miliaria*), a white Sand Martin, and a white Hedgesparrow. Another white variety of the Common Bunting, from Foulmire, Cambridgeshire, with a white example of the Black-headed Bunting from Berkshire, and presented by the late Mr. Gould, will be found in Case 121.

Case 109, with varieties of the Linnet, Yellowhammer, and Chaffinch (all taken near Woolwich), a white Linnet (near London), a cream-coloured Sparrow from Cambridge, and two abnormally-marked Goldfinches and a Linnet from Brighton. Case 110 includes six varieties, one pure white, of the Starling, from Leicester, Freshwater, Lewes, Darlington, and Warwick Castle. In Case 111, besides four abnormally-coloured Sky Larks, are several varieties of species usually accounted rare by collectors, and seldom found to present much variation in plumage, such as the Tawny Pipit, Shore Lark, and Lapland Bunting. *Apropos* of this last-named, a case of Buntings (134) contains a male Lapland Bunting, the third of its kind recorded to have been obtained in England, which was taken by a London birdcatcher in Copenhagen Fields in September, 1828, as noticed

by Gould ('Zool. Journ.' vol. v. pp. 103, 104), and Yarrell ('Brit. Birds,' 4th ed. vol. ii. p. 16); also a hen-bird of this species, shot by Mr. Bond near the Red House, Battersea Fields, during the winter of 1830. In the same case, amongst some Snow Buntings from Hertfordshire, Middlesex, and Sussex, is a cream-coloured variety of this species, received from Heysham, to whom it was presented by Macgillivray.

In Case 122, which contains a white Sky Lark from Sussex, and a Wood Lark from Welshpool, are two other birds which deserve special mention, namely, the first recorded English specimen of the Crested Lark, *Alauda cristata*, figured by Yarrell, and referred to in the 4th edition of his 'British Birds,' vol. i. p. 633; and a Shore Lark, *Otocorys alpestris*, which was caught near Brighton on the 15th November, 1861, and kept alive in an aviary for a year and eight months (*cf.* 'The Ibis,' 1862, p. 88). Five very singular varieties of the Sky Lark are preserved in Case 112, cinnamon-coloured, silver-grey, white, variegated white, and black and white pied. The last-named, which has the head, neck, back, and whole of the under parts black, with wings and tail white, variegated with black, was obtained at Hampstead by the late Mr. Herbert Greenwood.

White and cream-coloured Swallows and Martins are displayed in Case 113, the most remarkable specimen in this case being a Swallow with a white head from Reading. A fawn-coloured Mistle Thrush (Case 22), and a Fieldfare with the head and shoulders white, shot near Hendon (Case 115) deserve notice, as do also (in the last-mentioned case) a young Cuckoo with white wings, from Sussex, presented by the late A. E. Knox, the author of 'Ornithological Rambles in Sussex,' and a Nightjar of a dark cream-colour, obtained by the late Mr. C. Thurnall while partridge-shooting at Duxford, Cambridgeshire, on Sept. 1st, 1859. Another Nightjar, nearly white, is preserved in Case 120.

One cabinet is entirely set apart for a collection of "varieties" of small birds, which are mounted in groups in the drawers, instead of in cases. Conspicuous amongst these are a hybrid Goldfinch and Greenfinch, taken near London in 1868; a white Brambling from Davy, the birdcatcher, of Camden Town, probably captured near Hampstead, on his favourite ground for Linnets; a red variety of the Chaffinch, caught by boys "bat-fowling" at Hammersmith; a Scarlet Bullfinch, *Pyrrhula*

erythrina (a female bird), taken at Hampstead, Oct. 5th, 1870, and figured by Gould in his 'Birds of Great Britain'; a Bullfinch of a smoky white, obtained at Hampton Court in 1875; a very curious variety of the Hawfinch, nearly white, with black wings and tail, caught at Denmark Hill, and presented by Mr. E. Bidwell; an abnormally-coloured Yellowhammer, taken in Hackney Marshes in 1872; a pied Linnet, caught also near London; and a singular variety of the Chaffinch, with the head, neck, and part of the wings and breast white, obtained at Staines in 1880. So much for this unique cabinet. Then we have a white Partridge, shot at Brandon in September, 1856 (Case 36); a white Knot, *Tringa canutus* (Case 47); four very curious varieties of the Common Snipe, and one so-called Sabine's Snipe (Case 47), regarded by the owner as a melanism of the common species (Zool. 1862); an albino Black-headed Gull, *Larus ridibundus* (Case 58); two Puffins, one white, the other pied (Case 71); and (amongst the collection of skins) a pure white female Eider Duck (*cf.* Yarrell, 'Brit. Birds,' 4th. ed. vol. iv. p. 462).

It is a curious fact that although the young of most, if not of all, hawks are clothed with white down when first hatched, they very rarely grow up white, and indeed an albino specimen of any diurnal bird of prey is so seldom met with, notwithstanding the numbers of hawks shot and trapped by gamekeepers, that "when found" it deserves to be "made a note of." There is a white, or rather cream-coloured, Sparrowhawk in this collection (Case 18), which was purchased at the sale of the late Dr. Crisp's Museum, on May 12th, 1884, but no particulars have been noted as to when and where it was procured. At the moment of writing we can only call to mind two other cases of albinism amongst the *Falconidæ*. Mr. Howlett, the birdstuffer at Newmarket, in 1865, had a white Kestrel, *F. tinnunculus*, which was shot that year on Newmarket Heath; and he afterwards preserved a white Sparrowhawk, shot at Garely in 1876, which, if we mistake not, is now in the collection of Mr. John Marshall, of Belmont, Taunton.

Next to the "varieties" may be mentioned the "hybrids," which, although not numerous, are some of them extremely curious. Amongst these may be noticed a cross between the Mallard and Pintail, and Teal and Wigeon (Case 38), and a hybrid duck, purchased at Mr. Doubleday's sale at Epping,

August 23rd, 1871, and figured in the 1st edition of Yarrell's 'British Birds' as the American Scaup, *Fuligula mariloides*. In 1872 the following remarks on this identical specimen appeared in the 'Handbook of British Birds,' p. 64:—

"The specimen figured by Yarrell belonged to Doubleday, and at the sale of that gentleman's collection, in August, 1871, it was purchased by Mr. Bond, in whose possession it now remains. From an examination of this specimen I have little doubt that it is a hybrid between the Pochard and Scaup, although it is but fair to add that this view is not shared by Mr. Bond, who considers it a hybrid between *F. ferina* and *F. ferruginea*. The broad bill, however, and dark colour of the head and dorsal plumage are points which seem to me to indicate a relationship to the Scaup."

One of the most singular birds in the collection is that in Case 84, a supposed hybrid between a Baldpate Pigeon and a Silver Bantam. It was stuffed by Sayer, of Norwich, in April, 1864, and was presented by Mr. J. H. Gurney, who saw it before it was skinned. Its history will be found in an article by the late well-known artist, Mr. T. W. Wood, who has also furnished a very good engraving of the bird in 'The Country' for July 24th, 1873. Mr. Wood says:—"After carefully examining the specimen, which is stuffed, I told Mr. Bond that I guessed it to be a hybrid bald-headed Pigeon and Bantam. Mr. Bond then said I had guessed rightly, and added that Mr. J. H. Gurney, Sen., the well-known ornithologist, had seen the bird when in the flesh dead." As Mr. Wood characterizes it as "probably the only example known of such an extraordinary hybrid," we may assume that he believed in the possibility of such a cross, though admitting that others dissented from him. We confess our inability to share his opinion, for the fact that chickens when hatched are clothed with down and able to run, while Pigeons at birth are naked and helpless, and require to be fed by the parent, seems at once to create an insuperable difficulty in the production of such a hybrid. For this reason, and having regard to the structure and shape of the legs, feet, and tail, which are essentially of the Columbine type, we are disposed to consider the bird an abnormal Pigeon of the colour of a Bantam. It is asserted, in the account given by Mr. Wood, that the bird in question was reared by a game-dealer at Norwich named Engall, in an aviary which contained both

Pigeons and Bantams. What, it may be asked, was Mr. Bond's opinion on the subject? It was somewhat oracular. He said that "he did not know what to make of it, and had never seen anything like it; the pigeon-like shape and the fowl-like plumage would lead any one, without reflection, to believe in its asserted hybridity."

Here we must take leave of the Birds, and devote the remainder of this memoir to a few remarks on the beautiful collection of Eggs of British Birds, in the formation of which Mr. Bond spent the best years of his life. To this collection, unfortunately, access cannot now be readily gained, since it was disposed of some years ago to Baron Louis d'Hamonville, and has been removed to France. It is undoubtedly one of the finest collections ever formed in this country; not only because it was commenced so long ago that it contains the eggs of many birds which no longer breed in the British Islands, or are now almost impossible to procure here, but also because it contains such well-selected, typical examples of every species, with occasional varieties, and every one of them carefully identified. Many and many a time have we revelled in an examination of the contents of that egg-cabinet, and admired the treasures it enclosed, the gem, of course, being the egg of the Great Auk, which was previously in the collection of Yarrell, and the history of which, so far as is known, is given in Mr. Grieve's Monograph of that bird (page 105). British Eagles, Ospreys, Kites, and Buzzards, each with a history; Honey Buzzards from the New Forest; Harriers and Short-eared Owls from the Fens, whence came also eggs of the Black-tailed Godwit, Reeve, and Redshank, Spotted Crake, and (if our memory serves us) of the Black Tern also; to say nothing of ducks of different sorts, and such marsh-loving birds as the Bearded Tit, Savi's, and Great Reed Warblers, Dotterels from the North-country "fells," and Kentish Plovers from the Sussex beach, English Crossbills and Golden Orioles, Choughs and Ravens, and many others dear in the eyes of a collector. With what pleasure would he open drawer after drawer and recount to a delighted listener the history of the specimens most prized, and the incidents of the day on which they were found. He could remember the time when a hatful of Water Rail's and Spotted Crake's eggs might be purchased of a "fenman" for a

shilling, and when "Large Coppers" (*Lycæna dispar*) might be bought at the rate of "two shillings a dozen, if you took them as they came, or half-a-crown a dozen if you picked them." Those good old days have passed away, and with them the worthy naturalist (one of the last) who could remember them. His memory will still live in the hearts of his many friends and pupils, of whom the present writer is proud to have been one, while the benefit of his teaching, too little recorded, will be admitted by every naturalist who had the pleasure of his acquaintance.

As we stood bare-headed at his grave, on the 14th August last, in the quiet little churchyard of St. Mary, at Staines, where the last years of his life had been spent, we thought of many a bygone day spent with him in the woods and fields, in the autumn stubble and the wintry marsh, and recalled many an act of friendship. The sky was overcast, the heavens frowned, and as if unable, like ourselves, to repress a parting tear, dropped gentle rain as we moved away; while a few passing Swallows, with lowered flight, twittered o'er the open grave, a fitting dirge for one who had been the friend of birds through life, and who had made so many others feel the pleasure which he himself derived from a study of their haunts and habits.

The accompanying photograph was taken in 1882.

NOTES ON THE ORNITHOLOGY OF NORTHAMPTONSHIRE AND NEIGHBOURHOOD.

BY THE RT. HON. LORD LILFORD, F.L.S., F.Z.S.

I CONTINUE my notes from Oct. 25th (Zool. 1888, p. 466).

Oct. 31st. One Swallow reported at Lilford.—R. C.

Nov. 3rd. A Jack Snipe snared at decoy weighed full 3 oz. A very fine young male Golden-eye shot by my son near Aldwinckle.

Nov. 7th. Two Coots (first appearance this autumn) on the river near Lilford.—R. C.

Nov. 14th. "A tiercel Peregrine came at the decoy-pigeon at the hawk-hut and struck it so hard as to prevent its using its wings; the hawk came again and again, but would not 'bind to,' and after some ten minutes of repeated stooping, flew slowly

away. I caught a young male Sparrowhawk three days ago, and set him at liberty."—R. C. [R. Cosgrave, falconer.]

Nov. 17th. "The Shag (*cf.* my notes, Sept. 1st, 1884) has a crest the usual size. I only noticed it this last week or so."—R. C. This is the first notice that I received of any appearance of a crest on this bird, which had lived on our ponds since the date last quoted. I may add that this old favourite was drowned under the ice on Dec. 14th, 1888, and Mr. J. Cullingford, of Durham, to whom I sent it for preservation, in writing to me on the 17th of that month, states:—"The Shag is a male, and very fat, not less than a quarter of an inch of fat on the skin; not fully through the moult, many of the quills being full of blood."

Nov. 19th. "I caught a female Sparrowhawk at the hut this morning; she is a bird of the year, and must be a very plucky one, as she knocked the Pigeons about like a Peregrine; I sent her on to the Rev. Gage E. Freeman. Skelton brought in a Water Rail alive, snared at the decoy. I forgot to say that a pair of Shovellers visit the Aviary Pond; I first saw them on the 12th inst.; they are getting tame."—R. C.

Nov. 20th. Female Pintail taken, with a few Teal, on the decoy.

Nov. 22nd. "A Bittern shot at Faxton."—Wm. Bazeley (Sheep Street, Northampton), in a letter to me.

Dec. 3rd. "A common brown Buzzard flew over my lodge about a fortnight ago, and was seen in Wadenhoe Wood after that."—D. M.

Jan. 2nd, 1889. "I saw Lord Lyveden's gamekeeper, and he told me that he had seen the Buzzard several times about Farming Woods, and lately went to Deene Park, where he saw it dead at the keeper's house; it was killed by one of the under-keepers in the Corby Woods, and was unfortunately too far gone for stuffing."—D. M.

Jan. 4th. My son reported about 100 Golden Plovers going over southwards.

Jan. 5th. The same correspondent tells me of fourteen Wild Geese passing southwards.

Jan. 12th. "One male Gadwall on the decoy."—R. S.

Jan. 16th. "The Black Vulture, *Vultur monachus*, female (taken from a nest in Central Spain in June, 1865) and Griffon Vulture, *Gyps fulvus* (from a nest near Irun in May, 1867) are

already nest-making in the same corner (of their aviary at Lilford) as in previous years."—R. C.

Jan. 19th. "A fine male specimen of Pallas's Sand Grouse, weighing $11\frac{1}{2}$ oz., was shot in the parish of Weedon on 15th inst. It flew out of some turnips close to a rick of barley, where it had evidently been feeding, its crop being full of the same."—Wm. Bazeley (from 'Northampton Daily Chronicle').

Jan. 23rd. Seven Wild Geese seen going northwards over Aldwinckle.

Jan. 28th. My fisherman, writing from Lilford under this date, states:—"The weather at present is very mild, and Thrushes and Hedgesparrows are singing every day; they began to sing about the middle of November last, and continued until the frost came. The Rooks were at their nests for several days.

Jan. 31st. Through the good offices of Lord Burghley, I this day received a pair of wings of Pallas's Sand Grouse from John Munton, one of Lord Exeter's gamekeepers at Southorpe, near Stamford, who subsequently gave me the following information by letter dated Feb. 4th:—"Twelve of these birds were first seen, in one flock, in one field on the Southorpe Mill Farm, on the last day of May, 1888, and again on June 1st; on this latter day two of the birds were shot by a boy in the employ of the occupier of the farm; the others were not seen again."

Feb. 6th. "I am pleased to see the Golden Eagles (at Lilford) begin nesting again. I gave them a lot of sticks, moss, &c., which they at once began to take to the place where the nest was last year; they are getting savage."—R. C. These Eagles are a pair that I received in 1877 from a nest in Inverness-shire; they built a nest for the first time in 1888, and laid three eggs, of which they broke one and devoured another; the third was addled.

Feb. 13th. "This afternoon, when I went to the park aviary to lock the fence-gate for the night, I was surprised to see two wild Swans rise from the pond. When I first caught sight of them they were close by the pinioned ones (Whoopers and Mute Swans). As they flew away they kept calling to the others. There is also a female Pochard which dropped in yesterday; she goes to the river when I go near, but returns to the pond again."—R. C.

Feb. 19th. "Three Swans flying southwards this morning. Gadwall brought alive to me from the decoy, caught on the 18th."—R. C.

Feb. 21st. "A few fowl begin to take to the decoy-pond again, now that the floods are going down; fifteen Ducks, seven Teal, and four Wigeon in to-day. Twenty Golden Plovers seen on 15th."—R. S.

Feb. 23rd. Three Swans seen going northwards. Wm. Seal (a London birdcatcher) says positively that he saw two Wheatears at Wadenhoe on 21st.—R. C.

Feb. 28th. "The Bearded Vulture, *Gypaëtus barbatus* (one of two received from separate nests in Andalusia in 1878), is making a nest (at Lilford); the only material used is wool, but she does not line the bottom of the hole that she has scratched in the sand—she only collects the wool around it."—R. C. This bird did not lay, and till last year has never during the ten years she has been in my possession shown any desire to nest. The other bird, which I believe to be a male, was so bullied by his fellow-captive, that we were forced to separate them about six years ago, but at present (September, 1889) they are living together in perfect amity.

March 1st. Our total of wildfowl for the past season is singularly poor, as the produce of the decoy, gun, and telegraph-wires—*viz.* 1 Landrail, 4 Spotted Crakes, 5 Water Rails, 1 Golden Plover, 7 Woodcocks, 35 Snipes, 17 Jack Snipes, 177 Mallard, 24 Teal, 1 Gadwall, 1 Pintail, 6 Wigeon, and 1 Goldeneye.

March 9th. "The Black Vulture (*cf. supra*) laid on 5th, quite in the open; I put the egg in the nest: she and the Griffon sit upon it by turns."—R. C.

March 20th. "There are 20 Ducks, 10 Teal, and 6 Wigeon on the decoy; there were two Pochards in on 15th. Twelve Seagulls (? species) passed over on 16th."—R. S.

March 22nd. "The Golden Eagle (*cf. supra*) laid this morning, and sits very closely; both Eagles are very savage."—R. C.

April 9th. "The Eagles are sitting closely by turns on *two* eggs. A very fine young Falcon came a few days ago and looked at my Pigeon at the 'hut,' but would not stoop at it. On the 2nd there were several Herring Gulls going down over the river, and yesterday I saw two Gulls which looked like the Brown-headed, *Larus ridibundus*."—R. C.

April 22nd. "During the past week I have seen several large flocks of Mistletoe Thrushes going northwards. On the 19th there was a solitary Fieldfare about the lawn at Lilford; he

seemed to be quite lost, and only flew from tree to tree. A Grey Crow was seen on 19th.”—R. C.

April 23rd. “A nest of Little Owl found in a hollow bough of old ash-tree in the park; the finder lifted the old bird, who would not leave the nest, and could make out one egg.”—S. J. I am glad to say that these Little Owls (a pair of many set at liberty here in July, 1888) succeeded in hatching out and rearing four young birds, which left their nursery about June 10th. I have good reason to believe that one, if not two, other broods of this species, *Athene noctua*, were successfully reared in the neighbourhood of Lilford during this summer.

April 25th. “I regret very much to find that this morning the Eagles have left their nest, and have left nothing but a few broken pieces of egg-shell. I have no doubt that they have eaten the eggs.”—R. C.

April 26th. Miss M. K. Stopford informed me in a letter bearing this date, that on the previous day she and her father saw a very large bird, which they are convinced was an Eagle, flying steadily northwards over Tichmarsh at a very great height.

April 29th. “I saw a Fieldfare on 27th, and found the first Pheasant’s nest, containing ten eggs on 10th; first Partridge’s eggs on 27th.”—D. M.

May 3rd. “I have seen two broods of Wild Ducks in the meadows, and know of two nests of eggs still unhatched. I saw two of the Common (?) Sea-gull on April 27th, and three of the grey Gulls (probably *L. argentatus*, immature) on 30th; three Sea Swallows on May 1st and a Coot on 2nd.”—R. S.

May 6th. Under this date Mr. W. Tomalin, of Northampton, wrote to me as follows:—“I went to Spratton this morning to inspect the Snipe’s nest reported to me as having been found there on 3rd inst. The finder took me to the spot, and I saw the bird sitting on the nest; when we were about seven yards from it she flew away and pitched about forty yards off. The nest contained four eggs; I did not touch it or them: it was partially concealed by some rushes, and appeared to be lined with dry bents. There are cattle and sheep in the field; the nest is on rising ground about twenty yards from a snipe-bog which in the driest weather would be over one’s knees in mud.” I have recorded the above particulars because they are the only details

that I have ever received concerning a nest of Snipe in Northamptonshire.

May 10th. "A male Wigeon dropped into the decoy on 4th; it stops on the pool, and is getting very tame."—R. S. Major C. J. Strong, under this date from Thorpe Hall, near Peterborough, wrote:—"Knowing that you like to note the occurrence of any uncommon bird in this county, I write to say that a male Pied Flycatcher passed May-day here. I saw him several times on that day, but, alas! on the next, his place—generally a wire-fence—knew him not, and I suppose he had moved on."

May 13th. Mr. G. Hunt informed me that thirty-five Whimbrels passed up our valley on 9th inst.

May 17th. "I saw a large Curlew on 10th."—R. S.

May 28th. Our butler, who has a very fair acquaintance with British birds, assured me that he saw and closely identified a male Cirl Bunting near Achurch. He first saw this bird yesterday morning, and on my expressing some doubt, went this afternoon to the spot where he had seen it, and had so near a view that he is quite convinced as to species and sex. I am only acquainted with two previous occurrences of the Cirl Bunting in Northamptonshire.

June 4th. First hatch of Partridges reported—very early for our neighbourhood. A Great Titmouse is sitting on ten eggs in a disused iron pump in the kitchen garden, her only means of access to the nest being literally "up the spout." On the removal of the iron pump-cover she seldom retires further than into this spout, whence she hisses and snaps at visitors. I am glad to say that this bird, in spite of constant disturbance, succeeded in taking off seven young ones into the garden.

June 8th. Three male Shovellers dropped into the decoy, and were caught and brought to me; they were in beautiful plumage, only just beginning to moult. I had three pinioned widows of this species on my wildfowl-pond, and placed these roving gentlemen at their disposal; another solitary male was taken on the decoy on the 10th inst., and turned down with the others. The Shoveller is by no means common in Northamptonshire at any time of year, and I am rather puzzled to account for the occurrence of these four adult males here at this season. I can only suppose that they had retired to moult to some spot from which they were driven by the heavy floods which prevailed in

this neighbourhood during the early part of June. I may mention that these four drakes became fairly tame, and are now (Oct. 12th) beginning to show their true colours, after nearly three months of comparative dinginess.

June 14th. The Garden Warbler is unusually abundant here.

June 19th. I sent my falconer to try and find a Hobby's nest in the wood from which we have procured young birds for the last three years; but although he saw a pair of old birds he could not find their eggs, the nest from which he took two young birds last August (*cf.* Zool. 1888, p. 463) being to-day occupied by five very young Kestrels.

July 8th. My friend Lieut.-Colonel Irby, whilst searching for Lepidoptera in the wood above alluded to, flushed a Woodcock. I have several records of the nesting of this species in our county, but it may be fairly regarded as a very rare bird during the summer therein. Heard the hooting of the Tawny Owls for the first time since our arrival from Bournemouth on May 21st.

July 11th. Although perhaps not strictly appertaining to *county* ornithology, I may mention that one of my Algerian Horned Larks, *Otocorys bilopha*, which escaped from its cage a few days ago, was recaptured this morning in a village more than two miles from this house, and brought back to me alive and uninjured. This recapture was most satisfactory to me, not only on account of the intrinsic value of the bird, but from the fact that had it fallen into the hands of an "intelligent taxidermist," it would probably have been sold for an enormous sum, and figured in some collection as the first specimen of a species new to the *British* list.

July 12th. First report of Snipes, seen on 7th, and a Green Sandpiper on 11th inst.

July 14th. Noticed my Ruffs in the aviary eagerly pursuing and devouring the midges, which have been an intolerable and unusual nuisance during the last few days. I mention this because I could not see that the other waders,—Knots, Redshanks, Godwits, Turnstones, &c.,—took any particular notice of these little pests. A solitary Curlew passed over, southwards bound.

July 16th. Four Snipes on banks of the decoy pool.

July 21st. My son reported the first Teal of the season.

July 22nd. I received three young Hobbies of about ten days old from an old nest of Carrion Crow in our bordering county of

Rutland. I mention this only because these are the earliest nestlings of their species that I have ever seen.

July 23rd. Several Gird Buntings seen lately about the same spot as the bird of this species previously mentioned.

July 24th. A female Peregrine seen close to the house.

July 30th. Mr. W. Nichols was good enough to make me a present of a Dotterel, *Eudromias morinellus*, stuffed and mounted. This bird was killed on the Grange Farm, Raunds, on Oct. 26th, 1886, and is the only Northamptonshire specimen of its species that I have ever seen, although a flock of these birds appeared in our meadows in April, 1887, as already recorded in this Journal (*cf.* Zool. 1887, p. 253). A Spotted Crake was flushed by the otter-hounds this afternoon above Aldwinckle.

Aug. 4th. Pied Wagtails, in family parties of fives and sixes, gathering about the gravel-drive in front of the house to the number of thirty to forty.

Aug. 7th. A Curlew was brought to me alive, but dreadfully emaciated, by one Tiney, of Woodford, who informed me that it was picked up, unable to fly, near that village, about a fortnight ago. Although many of this species pass southwards up our valley in late summer and early autumn, and some, no doubt, upon their return migration in April and May, this is the first Northamptonshire Curlew that I have handled.

Aug. 11th. On this day, and on many subsequent occasions, my young Rutland Hobbies (*cf. supra*), now flying "at hack" in the park, were joined by an old bird of their species.

Aug. 12th. My falconer, after several fruitless expeditions in search of Hobbies to the wood whence we have previously obtained them, to-day discovered the nest, at a considerable distance from the quarter formerly frequented by these hawks, but two young Hobbies had taken wing, and were careering from tree to tree, closely attended by the old birds. The nest only contained one rotten and discoloured egg.

Aug. 13th. Six large grey Gulls going over southwards.

Aug. 19th. A very perfect specimen of Spotted Crake was picked up on the L.N.W. Railway near Thorpe Station, and brought to me, having obviously killed itself by flying against the telegraph-wires.

Aug. 26th. Mr. G. Hunt reported that whilst Wood Pigeon shooting on his manor to-day, he witnessed the passage of fifty-

five Wild Geese, seven Curlews and some three hundred Peewits, all bound in a south-westerly direction.

Aug. 28th. The station-master at Thorpe, L.N.W.R., brought me a wing of Spotted Crake, clean cut off from the body by telegraph-wires, and picked up this morning on the railway line.

Aug. 31st. We flushed the first Water Rail of the season on the left bank of the river, between Lilford and Stoke Doyle.

Sept. 5th. Saw the first Grey Wagtail of season.

Sept. 7th. Saw the first Merlin of season.

Sept. 8th. The first Wigeon of season dropped on to the decoy-pool, and was joined by four more on the 16th inst.

Sept. 21st. Very large numbers of House Martins congregating in sheltered spots.

Sept. 22nd. A Spotted Crake, shot on Thorpe, brought in to me; another seen at the decoy.

Sept. 23rd. First report of Redwings this season.

Sept. 30th. A Spotted Crake, snared at the decoy, brought to me quite uninjured, and immediately set at liberty. First Grey Crow of season seen; first Jack Snipe of season seen, and shot.

Oct. 4th. First Woodcock of season reported.

Oct. 7th. A male Peregrine passed the hawk-hut, but being evidently full-fed, took no notice of the decoy-pigeon.

Oct. 10th. First report of Brambling this season.

Oct. 13th. First Pochard of the season (a fine old male) dropped in upon the wildfowl-pond close to the house. First Fieldfare of season reported.

Oct. 16th. First flight of migrating Wood Pigeons reported.

I conclude by mentioning the dates of the appearance of summer migrants in Northamptonshire in 1889, which may be useful for comparison with dates observed in other parts of the country:—Feb. 21st, Wheatear. March 25th, Chiffchaff; 31st, Wryneck. April 6th, Woodcock; 10th, Willow Wren; 17, Swallow; 18th, Redstart; 19th, Nightingale, Blackcap; 20th, Jack Snipe, Tree Pipit; 22nd, Sedge Warbler, Lesser Whitethroat; 23rd, Green Sandpiper, Cuckoo; 24th, Whitethroat, Common Sandpiper; 25th, Landrail, Ray's Wagtail; 30th, Redshank. May 1st, Reed Warbler, Pied Flycatcher, Turtle Dove, "Seaswallow"; 3rd, Whinchat; 5th, Swift; 7th Spotted Flycatcher; 8th, Red-backed Shrike; 9th, Whimbrel; 10th, Curlew; 11th, Nightjar; 20th, Hobby.

THE GREAT BLACK WOODPECKER IN ENGLAND.*

BY E. CAMBRIDGE PHILLIPS, F.I.S.

THE disinclination on the part of Professor Newton and Messrs. Seebohm and Saunders to give *Picus martius* a place in the List of British Birds is now well known to ornithologists, and doubtless their decision was arrived at after a careful and painstaking enquiry. It is not with the slightest intention of setting my humble opinion against theirs that I offer these few remarks. The publication, in the 'Birds of Herefordshire,' of a distinct statement of the occurrence of *Picus martius* in that county has reopened the question, and as the statement has called forth many letters on the subject, it has seemed to me worth while to notice the reported occurrences of this bird in this paper, alluding principally to those mentioned in the 'Birds of Herefordshire,' in the hope that its omission from the List of British Birds may be reconsidered.

First, I must mention Mr. Harting's list in his well-known and useful 'Handbook of British Birds.' There he enumerates thirty-three instances of its reported occurrence, out of which eight are considered to be doubtful. Professor Newton, however, who seems to have taken great pains in the matter, states, in the 4th edition of Yarrell's Birds, that Mr. J. H. Gurney has critically revised this list, and has completely disposed of the claims set up in *nearly* every instance. I may, however, point out that the two shot at Nottingham, and referred to by Macgillivray, whose name carries considerable weight, seem to have been certified by the person who procured them.

I next come to those instances recorded in the 'Birds of Herefordshire,' and which have attracted far greater attention than anything else in the book, as evidenced by the controversy which has arisen on the subject. The statements of the Rev. Clement Ley are undoubtedly of the greatest value, because he has heard the cry of the bird when on the Continent, and even an adverse critic says that his statements are deserving of the greatest consideration. The Rev. Clement Ley states with

* Read at the Annual Meeting of the Woolhope Naturalists' Field Club, at Hereford, October 3rd, 1889.

great distinctness that he saw *Picus martius* in Ruckhall Woods, Eaton Bishop, about the year 1874, in company with Mr. du Buisson and his daughter, that he also saw it and heard it at Mount Edgecombe in Devonshire in 1876, and that he heard its cry twice unmistakably in Pengethley Gorse, Ross, once unmistakably in the parish of Fownhope (certainly a most likely place), and once dubiously, distant, and uncertain, in the parish of Little Doward; and what is of the utmost value in cases like this, he adds, he possessed the faculty, and still retains it, of never forgetting the note of any bird which he has once heard, and he points out that without the knowledge of this note (and I quite agree with him) he would have been unable to recognise the bird. He graphically adds:—"Can any sane man have mistaken *Picus martius* flying at less than twenty yards distance towards the north-east of the observer, the sun being in the west, for any other bird?" That is a question which appears to me to require a great deal of answering. Unfortunately the state of Mr. Ley's health is, I regret to learn, very feeble, or a paper from him instead of myself would have been highly appreciated.

Mr. D. R. Chapman, another member of the same Naturalist's Club, and an observer of considerable experience, states that he saw a Black Woodpecker at Belmont, about a mile from where Mr. Ley saw it, in the spring of 1879. To make sure he crawled along the meadow for some sixty or seventy yards, and was rewarded by a clear view of the bird.

Captain Mayne Reid also states that in 1880 he saw two specimens in the woods near Frogmore, Ross, and has noted the occurrence in 'The Naturalist in Siluria' (p. 46). As he has given great attention to Natural History, his statement is deserving of consideration. See 'The Zoologist' for May last (p. 46).

Lastly, I come to the bird seen by myself and one of my sons as it was flying from an oak at Dinas, near Brecon, on Whit Monday, 1885, and reported by me in 'The Zoologist' (1885, p. 305). I certainly should not have noticed it but for its cry, which was most startling, loud, and resonant, and quite unlike anything I ever heard before or since, although I have been a field naturalist for thirty-five years. This cry was very like the cry of the Curlew when unexpectedly disturbed (omitting the

“*Courlee*”), but was louder and more weird-like, and I think I may add, almost human in its shrillness. I admit that this cry is most difficult to describe, and, although the Rev. Clement Ley says that it would not have occurred to him to compare it to the startled cry of the Curlew, still he agrees with me in the main. That it was a Woodpecker, and a Black one, I have no doubt, and if it was not *Picus martius*, what bird was it? I omitted to state that it flew with a bold sweeping flight, and with its tail slightly forked. I heard its cry twice afterwards, but saw it no more.

It must not be forgotten that the bird at Ruckhall Wood was seen in the month of June, that in Devonshire in the month of April, that at Belmont in the spring, that by myself at Dinas, Brecon, on the 25th of May, whilst no date is assigned to Capt. Mayne Reid's specimens; and, although the Rev. Clement Ley says that the evidence against the supposition that *Picus martius* is migratory seems to him overwhelming, yet the circumstances of the above occurring in the spring and early summer are certainly worth noting. Probably it is more silent in winter, but possibly it may be a stray summer visitant. I think, moreover, that it is almost impossible that the observers in the cases I have quoted could have been mistaken in every instance. It may be remarked with a great deal of truth that most of this has been said, and better said, before. I admit that there are links of evidence yet wanting, and probably most people will agree that the production of a freshly-killed British specimen in the flesh will alone settle this much-disputed question.

NOTES AND QUERIES.

MAMMALIA.

Pigs used as Sheep-dogs in Italy.—A curious custom, which I first observed while travelling on the Apennines, and staying at Gavinana, near Pistoia, is worth recording for the benefit of your readers. The mountain peasants, though apparently poor, have under their care, either as their own property, or as that of rich landowners, large tracts of chestnut-woods. Some of them also own flocks of sheep. The expense of keeping a good sheep-dog for these would, in most cases, be too much for them. Hence,

as a substitute, they employ small mountain pigs, which practically cost them nothing. They are as good as sheep-dogs in keeping the flocks together, and when a suitable feeding-place has been found, the pigs, as they wander about under the chestnut trees, pick up chestnuts and other food. The reason why they are employed thus seems to be that they may be trained to become good substitutes for dogs, and by finding their own food in the woods cost their owners nothing.—F. V. DARBYSHIRE (Balliol College, Oxford).

Black Rat in Cornwall.—A specimen of the "Old English" or Black Rat, *Mus rattus*, was taken at Tredorwin in Towednack, about five miles north-east of Penzance, and is—in this neighbourhood, at least—decidedly of rare occurrence. Some years ago I was advised of a small colony of this rat which had established itself at a farm called Trenuggo, about four miles west of Penzance; but I failed to secure a specimen, and they seem to have deserted the place.—THOMAS CORNISH (Penzance).

Bat resting on the Water.—One evening in July last I witnessed an unusual action on the part of a bat (*Vespertilio daubentonii*). I was fishing for Tench in a large pond overhung by willows, which forms a favourite hunting-ground for bats of this species, when one of them, after hovering repeatedly over a particular spot, suddenly dropped flat on the surface of the water with its wings fully extended. Having remained motionless for several seconds, it rose with apparent ease and continued its flight. The action appeared to me to be voluntary, and not the result of accident. I have had many opportunities for observing these bats, both here and in North Wales, but never previously saw one take to the water. The power of avoiding obstacles possessed by bats is, I think, much exaggerated, and I have known Daubenton's Bat strike against my fishing-line several times in the course of a single evening.—G. H. CATON HAIGH (Grainsby Hall, Great Grimsby).

BIRDS.

Occurrence of the Crane in Essex.—While shooting with a party, on Sept. 26th, in the adjoining parish of Little Oakley, I had the pleasure of seeing a fine specimen of the Common Crane. We were sitting at lunch under a hedge, when, happening to look up, I noticed—as I at first thought—a large Heron flying towards us. It was then about a mile off. Presently I looked up again, and by that time it had come much nearer, and to my astonishment I observed that the bird held its head and neck stretched out in front of it, as Herons never do, and from its immense size there was no mistaking what it was. It still came gradually towards us, and appeared to be looking for a place whereon to alight, for it flapped its great wings several times over its back until they almost appeared to touch, and then glided on with outstretched pinions. This it repeated several

times, and then pitched in the next field, and well in view from where we sat. It looked a grand bird as it stood upon the grass with the bright sun shining upon it. Unfortunately it was a long way out in the field, and out of shot from the hedge. However, I thought I would try and stalk it, so crept down by the edge of the field we were in, until I reached a gap near the bottom, which I crawled through into the next field, where I was well out of sight of it. I then went on until I arrived nearly opposite to where I supposed it to be standing, then looked through cautiously and had a fine view of it. It was about 150 yards off, and appeared to be an old bird in perfect plumage. Of course it was no use firing at it at such a distance, but I thought if I went on a few yards further, and crawled through a gap, and ran in upon it, I might get within shot before it rose, or that it might fly towards me. But while I was thinking of this it took wing, and flew right away from me towards some salt marshes, where it pitched again. I followed to the bank, and, upon looking over, saw it about a mile off standing on some bare mud. Soon after it was fired at by some one from a boat which was in a creek near at hand; and it then flew off to the westward, and I lost sight of it.—GERVASE F. MATHEW, R.N. (Lee House, Dovercourt).

Osprey in Richmond Park.—On the 22nd September last, at about 5.25 p.m., while walking in Richmond Park, Surrey, an Osprey flew slowly over our heads at a distance of less than twenty yards, the black eye-stripe and white throat being most apparent. The bird flew out of the plantation at the head of the Pen Ponds, and with heavy peewit-like flight flapped slowly away in a north-westerly direction. A Rook and a Jackdaw in full pursuit had the game all to themselves for half-a-mile or so, but when lost to sight behind one of the more distant plantations the Osprey was being mobbed by a mixed horde of *Corvidæ* several hundred strong. Our object in going to Richmond Park was to see whether some birds which we had seen on the Pen Ponds on August 25th,—*viz.*, a Kingfisher, some thirty Wild Ducks, and two birds which, without glasses, we could not positively identify, but which looked uncommonly like Teal,—were still there; and it is a pleasure to be able to record that the Kingfisher had obtained a companion, and that seven at least of the Wild Ducks still remained; of the Teal—if Teal they were—we saw nothing. A third person was with us when we saw the Osprey.—HERBERT K. REEVES (Fernbank, East Sheen); EDWARD G. WADDILOVE (21, Old Square, Lincoln's Inn).

Spotted Redshank and Hoopoe in Kent.—I have to record the appearance of the Spotted Redshank, *Totanus fuscus*, which was shot by my son, on the 9th September last, by the river Stour. It is a fresh addition to my list of East Kent birds. I had some notes of the Spotted Redshank having been taken some years ago, but it was outside my

district; and I do not know that it has been recorded in Kent for the last ten years at any rate. I have sent the specimen for preservation to Mr. Gordon, of the Dover Museum. It was in good plumage, and I believe a young bird. The Redshank, *Totanus calidris*, is tolerably abundant, and breeds in our marshes. I suspect the Spotted Redshank may have been mistaken for the former bird, as I find it is often recorded from neighbouring counties. A specimen of the Hoopoe was shot lately near Dover by Mr. Crundel while out partridge-shooting.—GEORGE DOWKER (Stourmouth House, Wingham, Kent).

Two Birds laying in the same Nest.—Although I have never found two Wagtails laying in the same nest, as mentioned by Mr. Law (p. 391), I have come across many similar instances with other birds. I once found eight eggs of the Song Thrush in a single nest, three eggs of the Wood Pigeon in a nest, and a fourth broken on the ground below, evidently the produce in each case of two hen birds. Last year nine eggs of the Redstart were found in the same nest, but, not having seen them myself, I can say nothing further about them. I have found two Pheasants laying in the same nest, a Pheasant laying in a Partridge's nest, a Jackdaw and Starling laying together in the Starling's nest, and this year a Swift sitting on one of its own eggs and one of a House Sparrow. This year, too, I have found many nests of the Black-headed Gull with four, five, and six eggs—in each case evidently the produce of two birds; also two nests of the Common Tern with four eggs in each, but as in both cases the eggs closely resembled each other, it is impossible to say in either case whether the set was the produce of a single bird or not.—ROBERT H. REID (6, Osborn Villas, Cathcart, Glasgow).

Lapland Bunting near Brighton.—I received on Sept. 23rd a good specimen of the Lapland Bunting, *Calcarius lapponicus*, caught near Brighton by a local birdcatcher; on dissection it proved to be a female. Since writing the above I have received a second specimen of the Lapland Bunting (a male), which was taken by a birdcatcher near this town on Oct. 10th. I also obtained from a poulterer's two pied varieties of the Red-legged Partridge.—C. BRAZENOR (Brighton).

Early appearance of the Pintail.—A male Pintail, *Dafila acuta*, changing into winter dress, was shot at Aldeburgh, Suffolk, on Sept. 30th, and sent to me a day or two afterwards, in the flesh. This is a very early appearance of a bird which is seldom met with in Suffolk, even in severe weather. In 'The Zoologist' for January last (p. 10), Mr. Aplin mentions one which was shot at Cley, on the Norfolk coast, on Sept. 19th.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

A new Work on European Birds.—We understand that Mr. James Backhouse, jun., of West Bank, York, has in the press a 'Handbook of European Birds, for the use of Field Naturalists and Collectors,' which will be published in a few months by Messrs. Gurney and Jackson. It is to be a crown octavo of about 300 pages, and will contain descriptions of the various plumages of each species, with brief notes upon the distribution and habitat. The moderate cost to subscribers (7s. 6d.) should place it within the reach of every ornithologist.

Thrush nesting on the Ground.—Early in April last a lady informed me of a Thrush's nest, containing four eggs, placed on the ground. This I at first hardly believed, but on visiting the wood myself for the purpose of seeing it, and upon getting near the spot, up flew the Thrush from its nest, actually placed upon the bare ground. I consider this a curious place for a Thrush's nest, for the wood contained several trees, upon which other thrushes were building.—E. C. MOOR (Great Bealings, Woodbridge).

[This is by no means an exceptional case. See 'The Zoologist,' 1878, p. 350, and 1887, p. 12.—ED.]

Rose tint on Neck of Albatross.—In a Report on the Birds of Kerguelen Island, by Dr. Kidder, published at Washington in 1875, the writer says (p. 20):—"All the nesting Albatrosses that I saw, without exception, showed a slight pinkish discoloration of the neck, as if a blood-stain had been washed out; usually on the left side, and extending downward from the region of the ear." Dr. Bennett, in his 'Gatherings of a Naturalist in Australia,' alludes to "a streak of delicate rose-tint" on each side of the neck, which fades after death. Perhaps this appearance is due to the rose-coloured powder on the adult *Diomedea exulans* during December, which Mr. Sanford describes in the last number of 'The Zoologist' (p. 388). Both the authors quoted refer, however, only to the neck as being coloured, not to the whole of the white parts of the bird; and Dr. Bennett adds that he only noticed this rose-colour in those birds with black pencillings on the back,—*i. e.*, in individuals which Herr Reischek considers (*antea*, p. 339) to be birds of the fourth year,—which is curious. It is noteworthy that Dr. Bennett's specimens were procured on June 8th, while Dr. Kidder visited the colony at Kerguelen Island on January 2nd. It would appear therefore that the colour is not peculiar to the breeding season.—ARTHUR H. MACPHERSON (51, Gloucester Place, Hyde Park, W.).

REPTILES.

Snake swimming.—On the afternoon of the 6th inst. I saw a Ringed Snake swim across a pool of water twelve yards wide. The snake swam with its head just showing above the water, its body forming a series of

curves just on the surface. I believe it is an uncommon thing for a snake to swim at any time of the year; I was certainly surprised to see one apparently enjoying itself in the water in October. The snake could easily have got to the other side of the valley by travelling a short way to either end of the pool, and when first seen it was apparently playing about in the water, so that I am inclined to think it was swimming for pleasure rather than of necessity.—E. W. H. BLAGG (Cheadle, Staffordshire).

[We do not regard it as anything remarkable for snakes to be found in or near water. Many instances of the common Ringed Snake and Viper swimming have come under our notice.—ED.]

FISHES.

Large Whiting Pollack off the Land's End.—The largest recorded Whiting Pollack (Lythe), *Merlangus pollachius*, was taken by Lord St. Leven off the Rundle Stone, near the Land's End, in September last, and was sent for preservation to Mr. Rowe, of Lea Moor, near this place. It turned the scale at 24½ lbs., and from the tip of the upper jaw to the fork of the caudal fin it measured just three feet.—THOMAS CORNISH (Penzance).

ARTHROPODA.

Observations on a Japanese Spider.—The following is an extract from a letter dated "Utsunomyea, Japan, July 7th, 1889," written by Mr. Gervase Holmes, J.P., M.A.:—"I saw a curious thing in Natural History yesterday that was quite new to me, and would be, I fancy, to a good many. The circumstance may be quite common, but I never heard of it. I was waiting in my balcony for the coming up of a thunder-storm, and just as it began to rain I saw a large spider, whose web was fixed at the corner of the house, unfasten the lower edges and begin furling it, rolling it up into a ball. This he did very quickly, then unfastened it from the top suspending line, and walked off with it to his den under the roof. This morning I see the same web is again set. When you come across a naturalist, I wish you would ask if this is a common occurrence, or whether it is peculiar to Japanese spiders. There is no doubt about the web being the same; I noticed yesterday that it was old and torn, and full of the remains of mosquitos, so I am sure I am not mistaken on that point."

[We have submitted this letter to the Rev. O. P. Cambridge, a well-known authority upon spiders, who writes in reply:—"On the above account I would remark that it is well known that spiders of the family *Epeirida* roll up their webs and devour them; this is no doubt what the spider in question did, and then formed a new one. The formation of a new web is accomplished very often with marvellous rapidity, and insects, &c., coming into it at once would in a few hours, or less, give it the appearance

of the old web. This explanation seems to meet the facts of the case in a way consistent with the known habits of spiders, while the idea that the spider rolled up its web and kept it in safety for a time and then unrolled and reset the identical lines is simply inconceivable.—O. P. CAMBRIDGE (Bloxworth, Rectory, Dorset.)]

SCIENTIFIC SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

October 2, 1889.—The Right Hon. Lord WALSINGHAM, M.A., F.R.S., President, in the chair.

Mr. Arnold Umfreville-Henn, of Heaton Chapel Rectory, near Stockport, was elected a Fellow.

Mr. F. P. Pascoe exhibited a number of species of insects of all orders, collected by himself during the past summer at Brindisi, and in Greece and the Ionian Islands.

Mr. J. W. Douglas sent for exhibition specimens of *Lygus visicicola*, Puton, a species new to Britain, taken at Hereford, in September last, exclusively from mistletoe, by Dr. T. A. Chapman.

Mr. R. M'Lachlan exhibited nearly one hundred specimens of Trichoptera recently collected in Iceland by Mr. P. B. Mason. Only six species were represented, and of these five had been previously recorded from the island. He remarked on the great amount of variation existing in some of the species.

Mr. E. B. Poulton exhibited a mounted specimen of the yellow powder from the cocoon of *Clisiocampa neustria* under a power magnifying 188 diameters. The powder was thus seen to consist of crystals so minute that the form could only just be made out. He said the powder was present in a crystalline form in the malpighian tubules, and was discharged from the anus of the larva. A discussion ensued as to the functions of the malpighian tubes, &c., in which Mr. Stainton, Lord Walsingham, Mr. M. Jacoby, Mr. P. B. Mason, Mr. M'Lachlan, and Dr. Sharp took part.

Mr. Poulton also exhibited some photographs of living larvæ of *Hemerophilla abruptaria*, showing different depths of colour which had been induced by experiment; specimens of the larvæ preserved in spirit were also shown, together with water-colour representations of two varieties. He said that, as in other experiments of the kind, the larvæ had been rendered very pale by being surrounded by green leaves and stems only, whereas they became extremely dark when numbers of dark twigs were intermingled with the leaves of the food-plant. All were bred from eggs laid by the same female.

Mr. F. Merrifield said that Dr. Chapman had recently obtained similar results from experiments on the larvæ of *Ennomos alniaria*.

The Rev. Dr. Walker exhibited, and read notes on, a number of Coleoptera, Neuroptera, Hymenoptera, and Diptera, which formed the second instalment of the collection he had recently made in Iceland.

Mr. R. South exhibited a specimen of *Luperina testacea*, bred from a pupa found at the root of a species of *Silene* at Eastbourne; also a specimen of *Luperina Nickerlii*, Freyer, caught in Lancashire last August. He also exhibited, and read notes on, a long series of *Boarmia repandata*, bred from larvæ collected in North Devon. Mr. Poulton, Mr. Merrifield, and Lord Walsingham took part in the discussion which ensued.

Mr. J. J. Walker, R.N., exhibited a number of Coleoptera collected during the past summer in Cobham Park, Kent. Thirty-three species were represented, amongst which were the following, viz., *Eros minutus*, *Philonthus fuscus*, *Homalota hepatica*, *Abræus granulum*, *Anisotoma grandis*, *Agaricophagus cephalotes*, *Thalycra sericea*, *Cryptophagus ruficornis*, *Platy-tarsus setulosus*, &c. He also exhibited a living larva of *Helops cæruleus*.

Mr. Jacoby exhibited a curious Phytophagous beetle found by Mr. J. H. Leech in the Corea. He stated that he was unable to determine the genus, as was also Mr. J. S. Baly, to whom he had submitted the specimen.

Mr. R. Adkin exhibited specimens of *Retinia resinella*, received by him from Forres. Lord Walsingham remarked that he had never seen the species in Scotland, but that it was not uncommon in Germany, and he had found it at Hamburgh.

Mr. W. Dannatt exhibited a male specimen of *Papilio Antimachus*, Drury, from Lukolela, a missionary station about 500 miles from the mouth of the Congo. He stated that the species, although very rare, had a wide range, as three other specimens of it had been received from the Stanley Falls, which were more than 800 miles further up the Congo.

Lord Walsingham exhibited preserved specimens of the larva and imago of *Cidaria reticulata*, from the Lake District, sent to him by Mr. Hodgkinson.

Mr. W. White stated that as some doubt had been expressed at the last meeting as to whether the specimen of *Nephronia hippia*, Fab., var. *gæa*, Feld., which he then exhibited, was hermaphrodite, he had, with Mr. Griffith's permission, handed the specimen to Mr. G. T. Baker for dissection.

Mr. J. Jenner Weir exhibited fore wings of the males of *Argynnis Paphia*, *A. Adippe*, and *A. Atlantis*, denuded of the scales, in order to show that there was no dilatation or thickening of the median nervules and submedian nervure in that sex of these species; but that the apparent dilatation was produced by a dense mass of scales crowded together on each side of the nervules. He also read a short paper on the subject entitled, "Notes on the nervules of the fore wings in the males of *Argynnis Paphia* and other species of the genus."—H. Goss, *Hon. Secretary*.



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ON THE EASTERN AND WESTERN FORMS OF THE NUTCRACKER.*

BY LEONHARD STEJNEGER.

HAVING recently been asked by Baron von Tschusi-Schmidhoffen to express an opinion in regard to the races of *Nucifraga caryocatactes*, I shall not attempt a full analysis of the whole question, but only review the material in my hands, as it may throw some light on the subject.

Brehm was the first to clearly define the two races of Nutcrackers, which most ornithologists who have studied the question are now willing to admit. He was, however, unable to assign to them definite and distinct habitats; and partly because the shape of the bill, which is the principal characteristic of the two races, is in itself subject to great individual variation as well as to considerable changes on account of wear and tear, partly on account of the unreasonable prejudice of ornithologists concerning the forms described by Brehm, the races or subspecies in question were either misunderstood, or entirely ignored for more than half a century. When, in 1872, I examined and measured a number of Nutcrackers in the museums of Bergen and Christiania for the monograph of Von Tschusi-Schmidhoffen,† I laboured under the same impression, *viz.*, that because both thick-billed and slender-billed specimens occurred in Norway there could not well be any racial difference. But after the elaborate monograph of

* Proc. U.S. Nat. Museum, 1889, pp. 425—432.

† 'Der Tannenheher (*Nucifraga caryocatactes*).' Dresder, 1873, p. 4.

Dr. Rudolph Blasius,* in which he most convincingly demonstrates that the resident bird of Europe is the thick-billed form, while the slender-billed individuals belong to the numerous flocks which, with short and irregular intervals, invade the western countries from the foreign region of Siberia, there is no excuse for confounding them any more.

Before proceeding any further, it will now be necessary to ascertain the correct names of the two forms. While expressing my great appreciation of Dr. R. Blasius's painstaking work, I cannot but most severely condemn that he should think it necessary to reject the old names for the trifling reason that they are unsuitable, and substitute new terms in direct violation of the law of priority recognized both by the code of the American Ornithologists' Union and by the Stricklandian code. The new names are imposed in order to avoid misunderstandings and confusions, but they have only made confusion more confounded. It is safe to say that if Dr. Blasius and Von Tschusi had stuck to the old terms, they would by this time have become familiar to all ornithologists. As it is, the new names should be suppressed as soon as possible, before more mischief is done.

The following is a condensed, but correct and nearly complete, synonymy of the two forms. It is plain that the resident form of Sweden, upon which Linnæus bestowed the name *Corvus caryocatactes*, must stand as the typical form. The Thick-billed Nutcracker, therefore, is entitled to the name—

Nucifraga caryocatactes, Linn.

- Corvus caryocatactes*, Linn., Syst. Nat., 10 ed. i. p. 106. (1758.)
Caryocatactes maculatus, Koch, Syst. Baier. Zool., i. p. 93. (1816.)
Nucifraga guttata, Vieillot, Nouv. Dict. d'Hist. Nat., v. p. 354. (1816.)
Caryocatactes nucifraga, Nilsson, Orn. Suec., i. p. 90. (1817.)
Nucifraga brachyrhynchus, Brehm, Lehrb. Eur. Vög., p. 104. (1823.)
N. platyrhynchus, Brehm, Isis, 1833; p. 970. (1833.)
N. alpestris, Brehm, Vogelf., p. 66. (1855.)
N. caryocatactes major, Brehm, Journ. f. Orn., 1860, p. 236. (1860.)
N. caryocatactes pachyrhynchus, R. Blasius, Ornis, ii. p. 543; extr. p. 107; pl. ii. figs. 3, 4.; pl. iii. (1886.)

Should it be found necessary to use a trinomial in order to avoid mistakes, it should be no other than *Nucifraga caryocatactes*

* 'Der Wanderzug der Tannenheher, &c.,' Ornis, ii., 1886, pp. 437—550, + pl. i. to iii. (separate copies pagged 1—114.)

brachyrhynchus. On the other hand, the Slender-billed Nutcracker should stand as—

Nucifraga caryocatactes macrorhynchus, Brehm.

Nucifraga macrorhynchus, Brehm. Lehrb. Eur. Vög., p. 103. (1823.)

N. hamata, Brehm, Isis, 1833, p. 970. (1833.)

N. caryocatactes, Selys-Longch., Bull. Ac. Brux., xi. (p. 298), (*part*; *nee* Linn.). (1845.)

? *N. arquata*, Brehm., Vogelf., p. 66. (1855.)

N. caryocatactes macrorhynchus, Brehm, Verz. Samml., p. 4. (1866.)

N. caryocatactes leptorhynchus, R. Blasius, Ornith., ii. p. 543; extr. p. 107; pl. i.; pl. ii. figs. 1, 2. (1886.)

It appears that Von Tschusi-Schmidhoffen, quite independently and about the same time, came to the same conclusions as Dr. R. Blasius,* and both these ornithologists agree in dividing the Nutcracker into two races—one western, thick-billed, and another eastern, slender-billed. According to them *N. caryocatactes brachyrhynchus* “breeds in the northern temperate zone of the western portion of the Palæarctic Region, *viz.*, in the forests of Lapland, Scandinavia, the Baltic provinces of Russia, East Prussia, the Harz, the Riesengebirge (Böhmerwald), the Schwarzwald (Black Forest), the Carpathians (the mountains of Bosnia, Herzegovina, and Dalmatia), the whole extent of the Alps, and the Pyrenees.” *N. c. macrorhynchus*, on the other hand, is stated to “breed in the northern temperate zone of the eastern portion of the Palæarctic Region, *viz.*, in the forests of Asia, from Kamtschatka and Japan west to the Ural Mountains, and the governments of Perm and Vologda in European Russia.”

Mr. Henry Seebohm, in a paper “On the Arctic Form of the Nutcracker,” † has lately taken issue with Dr. R. Blasius in regard to the alleged distribution of the two forms, though agreeing with him in the general result, *viz.*, the distinctness of the forms, and the migrant into northern Europe being the slender-billed Siberian race. He contends that “that there is not an eastern and a western form, * * * but an arctic and a temperate form. * * * The Siberian form appears sometimes to winter

* See “Verbreit. und Zug. d. Tannenhebers,” ‘Verhandl. k. k. zool.-bot. Ges. Wien.,’ 1888, p. 488; separate copies, p. 82.

† ‘Ibis,’ 1888, pp. 236—241.

in north China, as well as in southern and western Europe, but the Japanese form appears to be a resident, and to be, to all intents and purposes, identical with the resident form of Europe. The white spots, both on the upper and under parts, and on the ends of the tail-feathers, are rather more developed in the Japanese birds than in the resident European ones, but not so much so as in examples from Siberia."

My material is not sufficient to solve the puzzle entirely, but I think it is large enough to show that Mr. Seebohm's theory is not well founded. But before examining my material I must, from a general standpoint, protest against the terms "arctic form" and "temperate form," used by Mr. Seebohm. In the first place, the Nutcracker is not an "arctic" bird. In Europe it occurs, more or less, stationary from Spain (roughly, 42° N. latitude*) to northern Norway (about 64° N. latitude). In north-western Russia the typical form hardly extends so far north, while farther east the slender-billed race is not known to occur north of 62° north latitude, and the southern limit of its breeding range in the Ural seems to be about 62° north latitude.† In Asia the latter has been found by Mr. Seebohm himself in the valley of the Yenisej, as far north as 67°, though farther east it hardly exceeds the 64th degree of latitude. The southern limit of its breeding range in western Asia seems to be the Tian-Shan,‡ consequently about 40° N. latitude, while in the extreme East slender-billed birds have been found in summer, at least as far south as 38° N. latitude. It will be seen that the distribution of the Siberian form, on the whole, is not more arctic than its western representative, if we regard the latitudes alone. But the adjectives—"arctic" for the former and "temperate" for the latter—are not better founded if, by such a nomenclature, we would indicate the relative distribution of the two forms where

* Blasius, as quoted above, states that it breeds in the Pyrenees; but according to Dr. Companyo, in Dresser's 'Birds of Europe' (iv. p. 458), it is only a rare bird in the Eastern Pyrenees, while Arévalo y Baca ('Aves de Espana,' Madrid, 1887, p. 260) expressly says that it occurs only accidentally in Spain. In Italy, according to Gigioli ('Avif. Ital.,' 1886, p. 13) and Salvadori ('Ucc. Ital.,' 1887, p. 189), the Nutcracker is stationary only in the Alps.

† Nazarow, 'Rech. Zool. Steppes Kirguiz,' 1886, p. 31.

‡ Zeverzow, 'Journ. f. Orn.,' 1875, p. 172.

their ranges meet, for there is no evidence that in any part of the whole Palæartic Region breeding localities of the slender-billed race are situated north of those of the thick-billed form on approximately the same degree of longitude, unless Mr. Seebohm be correct in referring the Japanese specimens to the typical form. In fact, this identification by Mr. Seebohm seems to be the only foundation for his theory of an arctic and a temperate race, as opposed to Blasius's of a western and eastern. Upon a proper reference of the Japanese specimens, therefore, hinges the whole question.

I have before me four examples from Japan, which I can compare with four from Korea, one from Kamtschatka, and a number of both forms from Europe. According both to Blasius and Seebohm, the slender-billed individuals from Western Europe are only immigrants from Siberia; they will consequently serve as well as specimens from the latter country.

Both Blasius and Seebohm lay considerable stress on the dimensions of the bills as indicating the subspecific difference. To a certain extent this is so, but only if the specimens can be examined at the same time, for it is plain when inspecting a series of these birds that the peculiar *shape* of the bills in the two birds is of more importance than the length and the height. In the typical form the upper mandible is more swollen, the upper tomium more inflected, and the basal portion of the culmen straighter and more parallel with the commissure, while in the slender-billed form the upper tomium is hardly inflected at all, and the culmen tapers at once towards the tip from the frontal feathering. At the latter point the bills of both forms are nearly of the same height, and consequently Dr. Blasius's method of measuring the bills in the middle is more expressive than that of Mr. Seebohm, who measures them at the angle of the gonys. It is plain that this difference is easier to appreciate in the specimens than to express in words or condense into a satisfactory diagnosis, the more so since the bills in these birds are subject to considerable individual variation in all directions. I will also call attention to the fact that the bills of the resident birds of Europe seem to vary to some extent locally, as both Blasius and Von Tschusi-Schmidhoffen have noted a difference in the stoutness of the bill in specimens from Sweden and from the Alps.

The other character to which Blasius has called special

attention is the width of the terminal white band of the tail-feathers. In the typical form the average width is stated to be 18·3 mm., while in the slender-billed subspecies it is given as averaging 27·4 mm. on the outer pair. The difference in the width of the white band is also admitted by Mr. Seebohm, and I find it corroborated by the material before me. I will remark, however, that this character is also subject to some individual variation, but, so far as I can make out, there is no local variation *within the two races*. On the other hand, as in many other birds, the white ends to the tail-feathers are probably, on the whole, smaller in the young birds than in the old ones.

With these remarks in view, I shall now proceed to examine the material before me.

The first one is U. S. National Museum, No. 110,015, from Petropaulski, Kamtschatka, collected December 27th, 1885. It is the easternmost example I have seen, and is a very pronounced slender-billed bird, agreeing closely with Blasius's fig. 2, pl. i. Its coloration exhibits the maximum amount of white, as might be expected.

Next come four birds collected by Mr. P. L. Jouy, at Fusan, southern extremity of Korea (latitude 35°), the southernmost locality, I think, in which specimens of this species have ever been taken (U. S. National Museum, Nos. 114,097—114,100). They are all alike, and very characteristically slender-billed, belonging undoubtedly to *N. macrorhynchus*, both on account of the shape and size of the bill and the width of the white tail-band. From Norway I have four slender-billed birds, evidently Siberian immigrants, collected near Bergen during the great invasion in 1887* (U. S. National Museum, Nos. 113,218—113,222),

* I have seen only a few notices of the 1887 migration. According to J. Collin, in his 'Bidrag til Kundskaben om Danmarks Fuglefauna,' the Nutcracker has never before occurred in such numbers in Denmark. In Norway the immigration was remarkable, both on account of the number of birds and the extent of country covered, specimens having been taken even north of Tromsø. Near Bergen about one hundred individuals were killed during September, and Mr. V. Storm states that the bird appeared in the vicinity of Trondhjem in vast numbers about the first of that month. Numerous specimens were received from Roeraas, Guldal, Ørkedal, Rissen, and more northern localities.—(K. Norske Vid. Selsk. Skr. 1886—'87, Trondhj., 1888, p. 52: Naturen, xii., 1888, p. 224.)

which are in every particular identical with the Korean examples. It would be utterly impossible to tell these birds apart were the labels removed, and the uniformity of these eight specimens of so variable a species, and from so distant localities, is truly astonishing.

Finally, I have four specimens from Japan, collected by Mr. Jouy, but as two of them are young birds, which have not yet fully assumed the adult plumage, they may safely be left out of the comparison. The remaining two are U. S. National Museum, No. 88701, ♀, Fuji, July 2, 1882, a fully adult bird, just moulted into a fresh plumage,—possibly the mother of the two young birds referred to, which were shot in the same locality on the same day,—and the other, No. 91392, ♂, Tate-Yama, December 17, 1882. The latter is unquestionably a typically slender-billed bird, very much like the one described from Kamtschatka, with a slightly longer bill, the length of which exactly equals the average of the eight specimens from Korea and Norway referred to above, while the amount of white on the tail almost reaches the maximum. The bill is just a trifle higher than that of the other slender-billed specimens (though not reaching the maximum height of specimens measured by Blasius, *e. g.*, his Nos. 30, 31), but its shape is normal, and differs in that respect from the *resident* Scandinavian birds as much as any one in the series. The Fuji-Yama bird, found breeding near the extreme southern range of the species, differs only in having the bill shorter than any other specimen in the series. The shape, however, is that of *N. macrorhynchus*, and the white on the tail is almost up to the average, as established by Blasius, or 3 mm. wider than the maximum of any specimen referred by him to the typical thick-billed form. That the shortness of the bill is no argument against referring this Japanese specimen to the Siberian form is very plain, from the fact that it is nearly identical with a Yenisej specimen collected by Mr. Seebohm himself (No. 176 of his collection, *fide* Blasius, 'Ornis,' 1886, p. 472, extra, p. 36, No. 8).*

My material, therefore, contradicts Mr. Seebohm's suggestion

* In the table alluded to, the length of the bill is given as 30 mm. This I take to be a misprint or a slip of the pen for 40 mm., as the length from nostril to tip of bill is said to be 34.2 mm., exactly as in the Japanese specimen before me, the exposed culmen of which is 40 mm.

that the resident bird of Japan is, "to all intents and purposes, identical with the resident form of Europe." On the contrary, it is evident to me that it is, to all intents and purposes, identical with the Siberian, or the slender-billed form, *N. c. macrorhynchus*.

The very meagre *details* in regard to his specimens, which Mr. Seebohm furnishes in his article, do not support his own conclusion that "the white spots * * * on the ends of the tail-feathers are * * * not so much [developed] as in examples from Siberia;" for he himself gives the white on tail as varying between 0.9 and 1.1 inch in the Japanese birds, against a variation of from 0.8 to 1.25 inch in Siberian and Chinese specimens and presumed European migrants, consequently nearly coinciding with the limits established for the latter.

I am, therefore, forced to conclude that Dr. R. Blasius and V. von Tschusi-Schmidhoffen are right in distinguishing between an eastern and a western race, and that Mr. Seebohm is wrong in assuming the existence of an arctic and a temperate form of the Nutcracker.

Before closing I would say, however, that I will not deny the possibility of a large series of Japanese birds, showing a somewhat shorter bill, on the average, than continental Asiatic specimens; but I will venture to say that the difference in size and shape will not be so great as it is between resident birds from Scandinavia and Southern Europe, and I do not think that the differences will ever prove tangible or constant *enough* to allow a further subdivision of this species. Blasius and Von Tschusi have made it pretty plain that the differences in size and shape of bill in the two subspecies recognized are due to the difference in the food, the nut of the Siberian form of *Pinus cembra* having a thinner shell than the typical form growing in the mountains of Central Europe. The difference between resident Scandinavian and South European specimens is easily explained from a similar reason, as *Pinus cembra* does not occur wild in Scandinavia, where the Nutcrackers are compelled to live on seeds or nuts harder and more difficult to open. *Pinus cembra* is said to occur in the highest mountains of Hondo, Japan, but apparently in limited number. It is therefore doubtful whether the Nutcracker to any great extent feeds on this fruit. I am also unable to say whether the Japanese *P. cembra* belongs to a thin-shelled variety or to a thick-shelled, as I cannot find it stated

whether the form occurring in Japan is *P. cembra sibirica* or not. It may be useful to remark that Prof. Schübeler ('Die Pflanzenwelt Norwegens,' Christiania, 1875, p. 154) characterizes the seeds of the two forms (or species?) as follows:—*P. sibirica* having the seed sooty brown in colour, and rather attenuated in shape at one end, one hundred seeds weighing 24·75 grms. while those of *P. cembra typica* are light brown, oval or nearly globular, one hundred seeds weighing 39·10 grms. There are consequently three questions for the resident field ornithologists of Japan to solve: (1) Are the bills of the Nutcrackers residing in Japan normally and on the average shorter than the bills of the birds residing on the Asiatic main-land? (2) What kind of seed or nut forms the principal food of the Nutcracker in Japan? (3) Are the seeds of *Pinus cembra* in Japan encased in a harder shell than those from Siberia?

[Here follows a Table of Measurements of the specimens in the U. S. National Museum above referred to.

So long ago as 1845 the late Mr. W. R. Fisher discussed in this Journal the supposed existence of two species or varieties of Nutcracker. See Zool. 1845. p. 1073.—ED.]

NOTES AND QUERIES.

MAMMALIA.

White Weasel in the New Forest.—On the 16th of October last I saw a perfectly white Weasel, which had been caught a few days previously by a man who was carting fagots from the Forest. He had observed it in the fagot-stack, and would have caught it alive, but was afraid of its bite. It proved to be a male, and a perfect albino, with pink eyes. Length, from head to tip of tail, 10 inches, of which the tail measured $2\frac{1}{4}$ inches; weight exactly 3 ounces. Its shorter tail, and lacking the black tip,—if not its comparatively small size,—at once distinguished it from the Stoat, but, though wanting in bulk, it was not deficient in the characteristic odour of its kind. The tail appeared, in proportion to its size, to be more bushy than that of the Stoat, and the roots of the hair had a slight trace of the brown hue of the summer pelage, though not conspicuous, the rest of the fur being perfectly white. Is it a fact that albinos are more or less deaf? —G. B. CORBIN (Ringwood, Hants). [We should say not.—ED.]

Notes on Bats.—Mr. Kelsall has referred (Zool. p. 308) to a specimen of Daubenton's Bat (which he kindly named for me) taken in Surrey. I may further state that at the time this specimen was captured (July, 1888) seven others were taken, and many more escaped. They were disturbed by poking a stick up a hollow apple tree at Cranleigh, and were caught in an insect-net. Mr. Kelsall also detected in my small collection two Whiskered Bats, *Vespertilio mystacinus*, obtained at Ratham, and I have since (Oct. 18th last) obtained another specimen. The Noctule, perhaps for want of accurate observation, appears to have been less common of late years than formerly, when, as stated by the Editor (p. 244), I used to notice it in great numbers in August, and came to the conclusion that they were migrating, but this by my note-book appears to refer to the first week in August, 1863, and August 3rd, 1866. This year I saw none in August, nor in the preceding months, though during September, and as late as the 18th of October, they were observed, but not in great numbers. The Pipistrelle is of course our common bat, and the Long-eared Bat is fairly numerous. I may add that, although searched for, no specimens of Daubenton's Bat were found in the apple tree at Cranleigh during the past summers.—WILLIAM JEFFERY (Ratham, Chichester).

Black Rat in Cornwall.—In your last number (p. 434) I recorded the occurrence of the "Old English" or "Black" Rat, captured at a place about five miles north-east of Penzance. Immediately after that capture a perfectly trustworthy observer saw near Camborne, at a place ten miles south-east from where my specimen was obtained, a Black Rat which was certainly not the ordinary Hanoverian Rat; and to-day I have seen and handled another specimen which is unmistakably the Black Rat, captured in Paul Parish, about three miles south-west of Penzance. These facts apparently point to an incursion of this animal, which is gregarious certainly, and probably a vagrant in herds, but not a migrant.—THOMAS CORNISH (Penzance).

BIRDS.

The Marsh Warbler in Somersetshire.—About the middle of July, 1888, during a visit to my home in Somersetshire, a young farmer friend brought me a nest, containing five eggs which puzzled me for some little time. At the first glance I took them to be unusually lightly coloured eggs of the Reed Warbler, but the nest more resembled that of the Lesser Whitethroat, except that there was no wool in it. It then occurred to me that they might belong to the Marsh Warbler, *Acrocephalus palustris*, already recorded to have been found nesting in Somersetshire, some twenty five or thirty miles away (Zool. 1875, p. 4713), and turning up my copy of Seebohm's 'British Birds' on my return here, I found that they undoubtedly belonged to that species. The nest and eggs are there very accurately

described, although the coloured plate of the latter is very poor. My friend informed me that he had found two nests, the one in question with fresh eggs on June 5th, and another a little later with eggs just hatching. I went with him to see this latter nest, hoping that it might still contain young, and that I might get a glimpse of the parent birds, but found it quite empty. It was much more substantially built than the first nest, and more neatly finished, so I do not think it could have been a second nest of the same pair. Unfortunately I could not get the exact date of its discovery. It was very clean, and not at all damaged, and I am therefore rather doubtful whether the young brood had remained in the nest until fully fledged, or whether they had been destroyed by Shrikes, which are very plentiful in that district. Both nests were built amongst the rank herbage of tall grasses, nettles, and meadow-sweet, with here and there a bramble, which almost choked up a ditch alongside the hedgerow of an arable field. The ditch was about two feet deep, and the nests were placed at about ground-level. The first nest was loosely woven of round grass-stalks with one or two flat grass-blades, lined with a few fine roots and a very few black horse-hairs. Diameter of cup, about 2.2 inches \times 1.5 inches in depth. Eggs, greenish white ground-colour, with pale purple-grey and olive-brown markings; darker spots in middle of many of the markings and scattered about over the surface of the egg generally; average measurements, .73 \times .53 inches. The second nest was compactly woven of round grass-stalks, lined with a large quantity of fine roots and a few black horse-hairs. Diameter of cup about 2.25 inches \times 1.6 inches in depth. Last summer I asked my friend to look out for any similar nests, but not on any account to disturb them. I was in Somersetshire in July last, and he informed me that he had found two nests in precisely the same spots as the previous year. The first one contained one egg, but unfortunately the birds forsook it, and this nest was afterwards destroyed. The lining of the second one was hardly completed, and he fenced this about with hurdles to protect it from the sheep, but the birds never finished it, and forsook it without laying. This was in the month of May, but about the beginning of June, when cutting a piece of clover, the mowing-machine on its first round cut away the supporting-stalks of a third nest, leaving them and the nest suspended by the adjacent herbage on the edge of the ditch. It contained five fresh eggs quite uninjured. This nest was beautifully woven in between stalks of nettle and hemlock, a good deal of cobweb, or web of some kind of caterpillar, being used in binding it to the stalks. This is the nearest resemblance to a Reed Warbler's nest that I have seen, and is much deeper on the outside than either of the two previously found nests. The eggs are similar in their markings to those of 1888, but the ground colour is a much clearer white, with a faint tinge of blue in it; average measurements, .74 \times .53 inches. I have received a set of Marsh Warbler's eggs from

Germany, which are intermediate in ground-colour, and barely distinguishable from either of the two sets obtained in Somersetshire. I took the unfinished empty nest which had been fenced round. It was built low down in the hedgerow, nearly on a level with the ditch, in one of the outer branches of a thickly-grown bush of dog-wood (not dog-rose), and was loosely woven with webs of insects amongst the twigs, and composed of similar material to the others. These four nests and two sets of eggs are in my possession. My friend was never able to obtain a good view of the bird. It always slipped off the nest on his approach, and disappeared almost unperceived amongst the thick herbage of the hedgerow.—ROBERT H. READ (Cathcart, Glasgow).

The Pectoral Sandpiper in Orkney.—On the 28th August I received a freshly-skinned example of the Pectoral Sandpiper, *Tringa maculata*, Vieillot, together with the body, for dissection, from Mr. F. Menteith Ogilvie, and as this species is of rare occurrence in the British Islands the following particulars of its capture, kindly furnished by Mr. Ogilvie, will be of interest:—"This bird was secured when Snipe-shooting round the edge of a loch in Westray, Orkney, Aug. 26th, 1887, strong W.N.W. breeze week before. It rose in company with two or three full Snipe, without calling, and I imagined it was a Jack Snipe which had arrived earlier than usual. I shot at two of the full Snipe, missing the second one, and I then became aware that the bird flushed with the Snipe was calling a note which I did not recognise; it seemed to be a short double note, or perhaps a single one repeated twice in quick succession. I watched the bird, and after a long flight it pitched straight down, as Snipe will generally do, into the rushes at the east end of the loch. I walked round, but finding the ground extremely boggy, took off my boots and stockings, and struggled along as well as I could, often sinking over my knees in the soft mud, towards the spot where I had marked it down. The 'going' grew worse at every step, and just as I was about to turn back, fairly beaten, the bird rose behind me, and but for its curious call would have escaped. As it was, I could only turn round with the greatest difficulty, owing to both my legs being firmly embedded in the mud, but a rather lucky shot brought it down, and without much further trouble it was brought to bag. The bird was thin and in poor condition; unfortunately I was unable to weigh it, as the only obtainable scales had no weight under $\frac{1}{4}$ lb. I took the following measurements:—length from tip of bill to end of tail, $9-9\frac{1}{8}$ in., and from carpal joint to end of longest primary, $5\frac{1}{4}$ in.; irides very dark brown; legs and toes yellowish green, rather more yellow than green. I send you a sketch, showing colour a few hours after death, and the body of bird for dissection." In plumage the bird appeared to be adult, having the arrow-pointed markings on the breast-feathers, the principal distinction between the adult and immature of this species (see 'Yarrell,' 4th ed., vol. iii. p. 372).

The tail consists of twelve feathers, the two centre ones extending about a quarter of an inch beyond the others. The legs, as stated by Mr. Ogilvie, were decidedly yellowish green, which differs from Mr. Saunders's description, who states these parts to be yellowish brown. The bird, on dissection, proved to be a female, the ovary containing a large number of minute eggs. The stomach contained remains of small Coleoptera and grit.—T. E. GUNN (St. Giles Street, Norwich).

Short-eared Owls breeding in Essex.—Whilst shooting on the bentlings near Walton-on-the-Naze, on the Bank Holiday in August, 1884, I saw three of these birds, two of which were shot; at that time I fully believed they had bred somewhere near. On the 31st July last I saw an old bird hawking, in the afternoon, over the bentlings and continually calling. I at once made enquiries, and found that the Owls had nested in the rough grass on an island, and that some of the young Owls had been caught before they were able to fly.—F. KERRY (Harwich).

Birds attracted to Burning Ricks as to a Lighthouse.—Hearing that many birds were seen flying round some ricks set on fire by lightning at Stebbing, in Essex, on September 2nd, I asked the Vicar (Rev. A. R. Bingham Wright) for details as to the species, in case you should care to publish them, and he kindly replied as follows:—"My informant in charge of our fire-engine said there were a lot of Larks (this probably would include Sparrows, Yellowhammers, Greenfinches, &c.), some Plover (Lapwing, no doubt), and some Gulls. The place is about twenty miles from the estuary of the Blackwater. Another witness of the fire described the two kinds of large birds (he was ignorant of their respective names) as wheeling above the ricks at different heights, each flock keeping to itself. I may mention that in stormy weather Gulls are frequently about the fields here."—J. E. KELSALL.

Sheldrake near Oxford.—On the 8th October I saw a bird, which I believe was a Common Sheldrake, swimming on the River Isis adjoining Portmeadow (a large piece of ground close to Oxford). The bird allowed me to approach within a distance of about thirty yards, then rose, and after flying round several times made off up the river out of sight. As it flew, it had somewhat the appearance of a large Magpie. I give the description from a note taken on the spot, as I have at present very little acquaintance with the ducks in a state of nature:—It was apparently a young bird. Beak, pink; head and neck, brown; back, darker brown; wings, black; upper and under wing-coverts, white—under parts, white; legs, pale (pink, I think). About the size of an ordinary domestic duck. As it sat on the water it had a curious mottled appearance. It had doubtless been driven inland by the storm which raged the day before. I might add that there was also a Gull—I could not get near enough to determine the species—

flying about and dipping in the water a short distance from the Sheldrake.—
F. W. LAMBERT (17, Woodstock Road, Oxford).

Spotted Redshanks near Harwich.—We have had quite a flight of these birds in this neighbourhood; several frequented a piece of bentlings at the mouth of the River Orwell, and a female specimen was shot on the 4th September. I had previously shot one in the same place on the 15th August, 1885. Their call is quite different from that of the Common Redshank, and may be distinguished some distance off, when, if fairly imitated, the bird will fly towards you.—F. KERRY (Harwich).

Woodcock carrying its Young.—In 'The Zoologist' for 1879 there is an article by the Editor on the mode in which Woodcocks carry their young. It appears that they have been observed to transport them in at least three different ways:—(1) pressed to the body by their legs, (2) pressed between their legs, and (3) grasped in their feet, authority for each of these methods being quoted, and the third mode illustrated by an excellent sketch by J. Wolf. As I understand that some doubt has been expressed whether a Woodcock is able to grasp anything in the feet as described and depicted, it may be of interest to say that I can confirm the statement from personal observation. In the last week of May, or beginning of June last, I was beating an alder clump for moths in the early part of the day, when my attention was arrested by the low cheeping note of a young bird, and on looking up I was astonished to see that it came from a nestling woodcock, dangling from the lowered legs of its parent, and evidently grasped by the old bird's feet as the latter flew slowly away into a neighbouring plantation. It was not ten yards from me when I first saw it, and the scene I witnessed at once recalled the illustration above referred to, which I had seen years ago in 'The Zoologist.'—H. CHICHESTER HART (Carra-
blagh, Croaghross, Co. Donegal).

Crossbills in the Co. Waterford.—Crossbills were seen about my plantations here on the following dates:—July 12th, a flock seen on the wing; twenty, counted, formed but part of it. July 20th, twenty feeding on Scotch firs, on the top of the Black Hill. July 21st, three seen. August 17th, a flock flying high over the stable-yard; followed to the plantations, and found feeding there. Aug. 28th, sixteen seen on the wing on the Black Hill. October 7th, three (one of them a red bird) seen by myself on a silver fir. Oct. 23rd, a flock of nineteen near the Giants' Rock. Oct. 26th, I saw two in the top of an ash tree, one singing; recognised by the song, which was louder than that heard on Feb. 11th, and saw the peculiar beaks, and heard the cry of both birds as they flew away. From these and similar observations of my friend Mr. Allan Ellison, in the north of this county, near Cloumel, on June 10th, as well as in Co. Wicklow during the past few months, it appears to be certain that the

birds which invaded Ireland last year have bred in considerable numbers.—R. J. USSHER (Cappagh, Co. Waterford).

Redstart in Co. Waterford.—A bird of this species, *Ruticilla phæniceus*, was picked up dead at Sweetbriar, near Tramore, on October 12th, and has been kindly presented to me, for the Science and Art Museum, Dublin, by the owner, Mr. Thomas Spencer. The feathers of the chin and throat are black, with light-coloured edges; the breast, under parts, and tail are distinct. The white spot on the forehead is not developed through the bases of the feathers; these are whitish. This is the first instance in which I have met with the Redstart in Co. Waterford, though the Black Redstart has often occurred from October to March.—R. J. USSHER (Cappagh, Co. Waterford).

Tringa canutus in Barbados.—In a paper contributed to 'The Ibis' (October, 1889), giving a list of the Birds of Barbados, I recorded the Knot as evidently a very rare straggler to that island. I must now modify this statement, as I have lately received from Mr. J. P. Massiah the skin of a Knot, killed in Barbados this season, with the following remarks:—"I send you a bird by parcel post, shot by Johnny Ashby, at Chancery Lane, on September 30th. He skinned it himself, and, although useless to you as a specimen, it will enable you to identify the bird; we usually get a few of them with the Lesser Yellow-legs and Pectoral Sandpipers, but they are never numerous." We are therefore justified, I think, in considering the Knot as an annual visitor to Barbados, in small numbers.—H. W. FEILDEN.

Spoonbills in Co. Kerry.—On the 30th of September last I received a specimen of the Spoonbill forwarded from Waterville, Co. Kerry. It was exceedingly fat, weighing four pounds and a half. On November 5th another was received, which had been shot at Tarbert, in the same county. Both specimens were in very faded plumage, the ends of the feathers being much abraded.—EDWARD WILLIAMS (2, Dame Street, Dublin).

Velvet Scoter in Leicestershire.—On November 12th a female Velvet Scoter, *Ædemia fusca*, was shot on the Reservoir at Saddington, in this county, by Mr. R. Burgess, of Saddington Hall.—A. MATTHEWS (Gumley, Market Harborough).

[This must be a rare bird in the county. It is not included in Mr. M. Browne's recently published 'Vertebrate Fauna of Leicestershire and Rutland.'—ED.]

Osprey on the Thames.—Your correspondents, Messrs H. K. Reeves and E. G. Waddilove, will be sorry to hear of the fate of the Osprey which they had the pleasure of observing in Richmond Park, as reported in the last number of 'The Zoologist' (p. 435). An Osprey (probably the same bird) was shot on the Thames, at Barnes, during the first week of November,

and was sent to a birdstuffer in London. It was found to measure 5 feet 2 inches from tip to tip of extended wings.—J. L. COLLISON MORLEY.

Dr. Shufeldt's Classification of the Macrochires.—I see I have made a *lapsus calami* in my paper on the *Macrochires*, which appeared in the 'Linn. Soc. Journ.' (vol. xx., No. 122), and it occurs on p. 384. Near the bottom of the page it should read, "I am convinced that, so far as the United States forms of this group of birds are concerned, there are certainly two very well-defined families of the Caprimulgi. From what we know of their external characters, and from what I have shown of their widely different internal structures, these might readily be characterized as the families *Antrostomidæ* and *Chordeilidæ*—the former to contain the genera *Antrostomus*, *Phalænoptilus*, and *Nyctidromus*; the latter the genus *Chordeiles*." It will be clear to you that I meant "families," and not "subfamilies" as it now stands. Should the point be mentioned to the Society, I should like to have it corrected. A note in 'The Zoologist' would go far towards correcting it. *Subfamilies* should read *families*, and of course *Antrostominæ* should be *Antrostomidæ*, and *Chordeilinæ* should be *Chordeilidæ*; the rest you will see by comparison.—R. W. SHUFELDT.

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

Nov. 7, 1889.—Mr. W. CARRUTHERS, F.R.S., President, in the chair.

Messrs. Miller Christy, John Fraser, W. T. Rabbits, and Col. Swinhoe were admitted Fellows; and Mr. Thomas Scott, of Leith, and Mr. A. J. Campbell, of Melbourne, Australia, were balloted for and elected.

Mr. H. Veitch and Rev. Prof. Henslow exhibited a beautiful series of East Indian hybrid Rhododendrons, on which Prof. Henslow made some valuable remarks on the effects of cross-fertilization in regard to colour and form, upon which some critical observations were made by Mr. Veitch, Prof. Bower, and Capt. Elwes.

Mr. E. M. Holmes exhibited and made remarks upon some new British Marine Algæ, describing their origin and affinities.

Dr. St. George Mivart exhibited a drawing by a Surgeon, who had been consulted as to amputation, of a tail-like process in the human subject, being a prolongation of the coccyx to the extent of $4\frac{1}{2}$ centimetres.

Dr. Mivart also exhibited a photograph showing a remarkable resemblance between two arm-stumps; one the result of an amputation, the other a congenital defect in the child of a nurse who had attended the patient whose arm was amputated. Both cases were commented on and

explained by Dr. W. O. Priestley, and further remarks were offered by Dr. Murie and Mr. W. Thistleton Dyer.

Mr. W. B. Hemsley then read a paper by General Collett, C.B., and himself, "On a collection of plants made in the Shan States, Upper Burma." An interesting discussion followed, in which Messrs. J. G. Baker, C. B. Clarke, and Capt. Elwes took part.

ZOOLOGICAL SOCIETY OF LONDON.

Nov. 5, 1889.—Prof. FLOWER, 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 June, July, August, and September, and called attention to certain interesting accessions which had been received during that period. Amongst these were specially noted a Short Python, *Python curtus*, from Malacca, presented July 2nd by Mrs. Bertha M. L. Bonsor; and a Prêtre's Amazon, *Chrysotis prætrii*, purchased July 23rd; both new to the collection.

Mr. J. H. Gurney, Jun., exhibited and made remarks on a hybrid Wagtail, bred in confinement, between the Grey Wagtail, *Motacilla melanope*, and the Pied Wagtail, *M. lugubris*.

Mr. W. B. Tegetmeier exhibited and made remarks on some variations in the plumage of the Partridge, *Perdix cinerea*.

Prof. Bell exhibited and made remarks on two specimens of *Virgularia mirabilis*, recently dredged by the Hon. A. E. Gathorne Hardy, M.P., in Loch Craignish. He also exhibited two young living specimens of *Palinurus vulgaris*, received from Mr. Spencer, of Guernsey, in which the stridulating organs were still capable of making sounds.

A communication was read from the Rev. Thomas R. R. Stebbing, containing an account of the Amphipodous Crustaceans of the genus *Urothoë*, and of a new allied genus proposed to be called *Urothoides*.

A communication was read from Col. C. Swinhoe, containing descriptions of a large number of new Indian Lepidoptera, chiefly Heterocera.

Mr. P. L. Sclater gave an account of the birds collected by Mr. Ramage in St. Lucia, West Indies, which were referred to thirty species.

Mr. G. A. Boulenger read a note on the Short Python, *Python curtus*, a specimen of which was stated to be living in the Society's Reptile House.

A communication was read from Dr. E. C. Stirling, of the University of Adelaide, on some points in the anatomy of the female organs of generation of the Kangaroo, especially in relation to the acts of impregnation and parturition.

Mr. F. E. Beddard read some notes on the anatomy of an Oligochæteous worm of the genus *Dero*, relating principally to its reproductive system.

A communication was read from Mr. Scott B. Wilson, in which were given the descriptions of four new species of Hawaiian birds, proposed to be called *Chrysometridops caruleirostris*, *Loxops flammea*, *Himatione montana*, and *H. stejnegeri*.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

November 6, 1889.—Prof. J. O. WESTWOOD, M.A., F.L.S., Hon. Life-President, in the chair.

Mr. Richard S. Standen, of Framlingham Earl Hall, Norwich, was elected a Fellow; and the Rev. C. F. Thornehill, M.A., was admitted into the Society.

Mr. J. W. Douglas sent for exhibition specimens of *Anthocoris visci*, Dougl., a new species, taken from mistletoe, at Hereford, in the end of September last by Dr. T. A. Chapman; also specimens of *Psylla visci*, Curtis, taken by Dr. Chapman from mistletoe, at the same time and place.

Mr. R. M'Lachlan exhibited coloured drawings of a specimen of *Zygæna filipendulæ*, in which the left posterior leg is replaced by a fully-developed wing, similar to an ordinary hind wing, and with the neuration almost precisely the same, but less densely clothed with scales. The specimen was described by Mr. N. M. Richardson in the Ent. Mo. Mag. for June, 1889, and the drawing was executed by Mrs. Richardson. Mr. M'Lachlan also exhibited a female specimen of the common earwig *Forficula auricularia*, with a parasitic *Gordius* emerging from between the metathorax and abdomen. He said that it had been placed in his hands by Mr. A. B. Farn, by whom it was taken, and that other instances of similar parasitism by *Gordius* on earwigs had been recorded.

Mr. W. F. Kirby exhibited a gynandromorphous specimen of *Lycæna icarus*, having the characters of a male in the right wings and the characters of a female in the left wings, caught by Mr. T. Brown at Keyingham, Yorkshire, on the 22nd of June last; also a specimen of a variety of *Crabro interruptus*, De Geer, found by Mr. F. Woodbridge in a hole in a log at Uxbridge.

Mr. W. L. Distant exhibited a male and female specimen of a species belonging to a new genus of *Discocephalinæ*, from Guatemala, in which the sexes were totally dissimilar, the female having abbreviated membranes, and being altogether larger than the male.

Dr. D. Sharp stated that he had observed that in the *Ipsinæ* division of *Nitidulidæ* there was present a stridulating organ in a position in which he had not noticed it in any other Coleoptera—*viz.* on the summit of the back of the head. He had found it to exist not only in the species of *Ips* and *Cryptarcha*, but also in other genera of the subfamily; on the other hand, he could not find any trace of its existence, except in members of the *Ipsinæ*.

He exhibited specimens of *Ips* and *Cryptarcha*, mounted to show the organ. Dr. Sharp also exhibited a box of *Rhynchota*, chiefly *Pentatomidæ*, in which the specimens were prepared so as to display the peculiarities of the terminal segment in the male sex.

Mr. R. Adkin exhibited, on behalf of Mr. H. Murray, of Carnforth, a fine series of *Polia xanthomista*, var. *nigrocincta*, from the Isle of Man, and *Cidaria reticulata* and *Emmelesia tæniata* from the Lake District.

Mr. W. White exhibited a living larva of *Zeuzera æsculi*, and called attention to the chitinous scutum or thoracic segments with several rows of minute serrations, which evidently assist progression. He stated that the larva exudes from its mouth, when irritated, a colourless fluid, which he had tested with litmus-paper and found to be strongly alkaline. Prof. Westwood made some remarks on the subject.

Captain H. J. Elwes exhibited a number of insects of various orders, part of the collection formed by the late Otto Möller, of Darjeeling.

Mons. A. Wailly exhibited the cocoon of an unknown species of *Antheræa* from Assam; also a number of cocoons and imagos of *Anophe venata* from Acugua, near the Gold Coast, West Africa; specimens of *Lasiocampa otus*, a South European species, which was said to have been utilized by the Romans in the manufacture of silk; also a quantity of nests containing the eggs of *Epeira madagascariensis*, a silk-producing spider from Madagascar, locally known by the name of "Halabe." He also read extracts from letters received from the Rev. P. Camboué, of Tananarivo, Madagascar, on the subject of this silk-producing spider.

Mr. H. Goss read a communication received by him from Prof. S. H. Scudder, of Cambridge, Mass., U.S.A., on the subject of his recent discoveries of some thousands of fossil insects, chiefly Coleoptera, in Florissant, Western Colorado, and Wyoming. Prof. Westwood remarked on the extreme rarity of fossil Lepidoptera, and called attention to a recent paper by Mr. A. G. Butler, in the Proc. Zool. Soc., 1889, in which the author described a new genus of fossil moths belonging to the Geometrid family *Euschemidæ*, from a specimen obtained by Mr. A'Court Smith at Gurnet Bay, Isle of Wight.

Mr. F. P. Pascoe read a paper entitled "Additional Notes on the genus *Hilipus*," and exhibited a number of new species belonging to that genus.

The Rev. Dr. Walker read a paper entitled "Notes on the Entomology of Iceland." Mr. Roland Trimen asked if any butterflies had been found in the islands. Dr. Walker said that neither he nor Mr. P. B. Mason had seen any during their recent visit to Iceland, nor were any species given in Dr. Staudinger's list. In reply to a question by Mr. G. C. Champion, Mr. Mason said that during his recent visit to Iceland he had collected nearly a hundred species of insects, including about twenty Coleoptera. He added that several of the species he had taken had not been recorded either by Dr. Staudinger or Dr. Walker. Capt. Elwes enquired if Mr. J. J. Walker, with his great

experience as a collector in all parts of the world, was aware of any land except Iceland, outside the Arctic Circle, from which no butterflies had been recorded. Mr. J. J. Walker replied that the only place in the world which he had visited, in which butterflies were entirely absent was Pitcairn Island.—H. Goss, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

An Illustrated Manual of British Birds. By HOWARD SAUNDERS, F.L.S., F.Z.S. 8vo, pp. xl, 754. With illustrations of nearly every species. London: Gurney & Jackson, Paternoster Row. 1888—89.

IN 'The Zoologist' for August, 1888, we noticed the commencement of this useful work, of which four parts had then appeared. The punctuality with which it has been issued in monthly shilling parts reflects credit alike on author and publishers, and now, with the appearance of the twentieth part, it has been brought to a satisfactory conclusion.

In a single volume of nearly 800 pages we have a condensed account of 367 birds which, in the opinion of Mr. Saunders, are entitled to rank as British, accompanied by an illustration of almost every one of them, including several species whose portraits have been expressly engraved for this 'Manual,' and are supplementary, therefore, to those previously figured in the volumes of Yarrell's standard work.

The scientific arrangement followed is mainly in accordance with that of 'The Ibis' List of British Birds, in which again the sequence is almost identical with that in Mr. Dresser's 'Birds of Europe.' The introduction, extending to forty pages, is occupied chiefly with systematic diagnoses of the genera, the utility of which is obviously greater in facilitating the comparison of allied genera than the old plan of giving a diagnosis of each genus in the place assigned to it in the body of the work.

It will, perhaps, surprise some readers to find the Nightingale located with the Thrushes in the subfamily *Turdinæ*, instead of with the Warblers in the subfamily *Sylviniæ*, with which it has been familiarly associated; but the reason for this is to be found in the appearance of the young on leaving the nest, young Nightingales, like young Thrushes, having the upper and under

parts of the plumage spotted, instead of differing very little in colour from their parents, as do the members of the subfamily *Sylviinæ*.

We are amongst those who regard with disfavour what appears to be an unnecessary multiplication of genera, and the more we examine closely the points relied upon for the separation of such allied forms as *Saxicola* and *Pratincola*, *Erythacus* and *Cyanecula*, *Phylloscopus* and *Hypolais*, *Acrocephalus* and *Locustella*, *Panurus* and *Acredula*, *Fringilla* and *Acanthis*, *Calcarius* and *Plectrophanes*, &c., &c., the less inclined we are to admit the necessity, or even the utility, of such separation.

The location of the *Cypselidæ* in the Order *Picariæ*, and far removed from the *Hirundinidæ*, we hold to be unwarranted by the light of the latest researches upon this much-vexed question. Of late years certain ornithologists have never lost an opportunity of telling us that the Swifts have nothing to do with the Swallows, that they are abnormal Humming-birds, and that consequently they should not only not be placed in the same family with the Swallows, but not even in the same Order.* The author of any ornithological treatise contravening this view has been held to be in error and behind the age (see, for example, 'The Ibis,' Oct. 1889, p. 571). But it seems to us that the critic is here at fault, for in the latest attempt to elucidate this ornithological problem, Dr. Shufeldt (whose opinion as a well-known student of avian anatomy carries the greatest weight) has shown conclusively that although there are undoubtedly points of resemblance between Swifts and Humming-birds, in all the most important osteological characters, the former are much more nearly related to the Swallows.† So that the old view, after all, was correct, although the classification, since objected to, was based upon external characters, and upon similarity of flight and mode of life. When we add that Dr. Shufeldt's view is endorsed by Prof. W. K. Parker,‡ than

* Cf. Sclater, Proc. Zool. Soc. 1865, p. 593.

† "Studies of the Macrochires, morphological and otherwise, with the view of indicating their relationships and defining their several positions in the system" (with 8 plates), by R. W. Shufeldt, M.D., C.M.Z.S., 'Journal Linnean Society,' vol. xx. No. 122 (1889).

‡ See his paper "On the systematic position of the Swifts," 'Zoologist,' 1889, pp. 91—95.

whom no one in this country is better qualified to express an opinion on the subject, we need do no more than recommend to our readers a careful perusal of Dr. Shufeldt's paper.

In his treatment of the Owls, we observe that Mr. Saunders has not invariably adopted the views of Prof. Newton, as set forth in the first volume of the 4th edition of Yarrell's 'British Birds'; but, although we are glad to see our old friend the Barn Owl re-appearing under the time-honoured name of *Strix flammea*, we still think that the Owls, as a family, have been separated into too many genera. The Tawny Owl, Tengmalm's Owl, and the Little Owl might well be placed in one and the same genus, the points of difference as detailed in the diagnoses of the genera *Syrnium*, *Nyctala*, and *Athene* being so slight as hardly, in our opinion, to warrant generic separation. They all have the head large, round, and without ear-tufts, bill decurved from the base, cere small, ears large, wings full and rounded, legs and toes feathered. Wherein, then, lies the alleged generic distinction? In *Syrnium* the tail, in proportion to the closed wings, is long; in *Nyctala* short. In *Athene* the toes above are clothed with soft bristles instead of feathers, as in *Nyctala*. But, to parody Burns, "An owl's an owl for a' that."

Similarly fine distinctions are drawn between allied genera in other orders of birds, as, for example, between *Ægialitis* and *Eudromias*, and between *Anas*, *Dafila*, and *Mareca*. True, these distinctions are not of our author's making, but only of his adoption: the question is whether he would not have acted wisely in discarding some of them as unnecessary, and thus have simplified his classification.

Considering that the limits of the work did not admit of more than two pages of letterpress being devoted to each species, it would be difficult to give a better condensation of facts in fewer lines than has been contrived by Mr. Saunders; but inasmuch as the object of his 'Manual' is to give an account of birds *in*, not *out of*, the British Islands, it may be said that the paragraphs relating to the geographical distribution of species abroad might have been usefully replaced by further and fuller information than is here given as to haunts, habits, food, nesting, &c., as observed by British ornithologists. This remark applies especially to such species as Savi's Warbler, the Bearded Titmouse, Kite, Honey Buzzard, Bustard, Bittern, Dotterel,

Black-tailed Godwit, Ruff and Reeve, Crane, Spoonbill, and other birds, which, as breeding species, are most of them no longer to be observed in England. We should much have preferred to see under the head of Hen Harrier the interesting remarks by Mr. Elmhirst ('The Field,' Nov. 27th, 1886) on the status of this bird sixty years ago in Lincolnshire, where it used to breed regularly and in some numbers, than the less acceptable statistics which are given concerning its distribution in the palæarctic region.

The question of nomenclature is one upon which it is apparently hopeless to expect unanimity, and we are at a loss to understand why certain names adopted with good reason in the 4th edition of 'Yarrell' should be again altered. For example, we have it on Prof. Newton's authority that the Great Reed Warbler is *Acrocephalus arundinaceus* (Linnæus), and the Sedge Warbler *Acrocephalus schoenobænus* (Linnæus). Mr. Saunders now calls the former *Acrocephalus turdoides* (Meyer), and the latter *A. phragmitis* (Bechstein), though without assigning any reason for the change. Should not the Linnean names have priority?

As to those species which have crept into the British list with very slender claim to recognition as British, Mr. Saunders has, perhaps, done well to discard them,—at all events, such species as the Blue Rock Thrush (*Monticola cyanus*), the American *Regulus calendula*, *Vireo olivaceus*, *Zonotrichia albicollis*, as well as the American Woodpeckers; but we are somewhat disappointed to note the rejection of the Great Black Woodpecker (*Picus martius*), which, as an Old World species, frequently reported to have been observed in England, stands upon a very different footing. In this case at least it might have been well to republish the figure, if not the description, of a bird which, like a "will-o'-the-wisp," many persons in this country believe they have seen, but have never apparently been able to capture and produce.

The new engravings which appear in this 'Manual,' in addition to those from 'Yarrell,' are noteworthy, the following making their appearance for the first time: the Isabelline, Black-throated and Desert Wheatears, the Barred Warbler, Wall Creeper, Needle-tailed Swift, Lesser Kestrel, Killdeer and Sociable Plovers, and Mediterranean Black-headed Gull; while

fresh figures have been substituted for the unsatisfactory originals of the Marsh Harrier, Goshawk, Merlin, and Great Auk. *Apropos* of the last-named, Mr. Saunders might have included amongst British-taken specimens (as he did in the 4th ed. of 'Yarrell,' vol. iv. p. 65) the Great Auk noticed by Wallis in his 'Natural History and Antiquities of Northumberland,' 1769, wherein he observes (vol. i. p. 340) "the Penguin, a curious and uncommon bird, was taken alive a few years ago in the island of Farn, and presented to the late John William Bacon, Esq., of Etherstone, with whom it grew so tame and familiar that it would follow him with its body erect to be fed." It is difficult to conceive that the bird here referred to could by any possibility have been a Razorbill or Guillemot, species so common on and around the Farn Islands that they must have been perfectly familiar to the captors of the bird in question, as well as to many of those who subsequently saw it. Moreover, Wallis, as if to make its identification clearer, quotes from the 'Fauna Suecica' (p. 43), the Linnean diagnosis, "*Alca rostri sulco octo; macula alba ante oculum,*" a brief though sufficiently pertinent description of *Alca impennis*. The omission of this record from the "Manual" conveys the impression that Mr. Saunders is not quite satisfied of its value, whereas it would seem to be quite as much entitled to credence as the earlier reports of "M. Martin, Gent.," or Sir George McKenzie.

We have only to add that the natural history loving portion of the British public ought to be grateful to Mr. Saunders for having placed within reach at a moderate cost, and in one volume, such a well-illustrated and accurately-written account of our native birds.

A Vertebrate Fauna of the Outer Hebrides. By J. A. HARVIE BROWN and T. E. BUCKLEY. 8vo, pp. xciii, 279. With illustrations. Edinburgh: Douglas. 1889.

EXPECTATIONS in regard to this book, aroused by the appearance of the companion volume on Sutherland and Caithness (*cf.* Zool. 1888, p. 38), have been more than realised. The result of eighteen years' exploration and observation, supplemented by hints from shooting tenants, factors, gamekeepers,

and others, has culminated in the production of a work which, for accuracy and fulness of information, aided by excellent illustrations and maps, places it in front of all the books (and they are many and various) which have been written on the Western Isles. It would, indeed, have been well if our authors had given a bibliography of these works, for it would be curious to trace the growth of information concerning a portion of the British Islands which to very many Englishmen is less known than New York.

The introductory chapters deal with the geographical position and physical features of the Outer Hebrides, each island being described in turn; and, following some remarks on the faunal position and importance of the group, we have chapters on the Mammals, Birds, Reptiles, Amphibians, and Fishes (by Mr. W. Anderson Smith), succeeded by remarks on the general geological features by Professor Heddle.

Although we do not doubt that our authors are well acquainted with all the accessible literature relating to this group of islands, we think they might very well have quoted some of the remarks of their predecessors concerning certain animals about which they themselves give no information. To take the Roe-deer, for example, of which we learn nothing but the Gaelic names (p. 34), we are told in an explanatory note (p. 12), that species which "have not any notes attached to them are entered merely for purposes of comparison and future additions, and have nothing directly to do with the present state of the fauna of the Outer Hebridean Area." From this we are to infer that the Roe-deer is not now to be found in the Islands. Yet Dr. Johnson, in his 'Journey to the Western Islands of Scotland,' 1775, observed (p. 121), "the Isle of Skye has stags and roe-bucks, but no hares." If there are no longer Roe-deer in Skye, it would have been well to note this. Similarly, under the head of Weasel (p. 18), we find nothing but the Gaelic name for this animal, while Dr. Johnson has the interesting note (p. 189) that, although "there are in Skye neither rats nor mice, the weasel is so frequent that he is heard in houses rattling behind chests or beds, as in England," to which he adds "that they probably owe to his predominance that they have no other vermin; for since the great rat took possession of this part of the world scarce a ship can touch at any port but some of his race are left behind.

They have within these few years (1775) begun to infest the Isle of Col, where, being left by some trading vessel, they have increased for want of weasels to oppose them." Messrs. Brown and Buckley make no allusion to this under the head of Brown Rat. Dr. Johnson is not known to have possessed much acquaintance with natural history, but he collected his information on the spot where his observations were written, and the statements of such an author are worthy of consideration. If he were in error, it would have been well to have pointed out his mistake.

Martin, in his 'Description of the Western Islands of Scotland,' remarked (in 1703) that the Mertrick (or Marten) was pretty numerous in Harris, but our authors, in their account of this animal, do not take us farther back than 1777, quoting an observation of Pennant in his Preface to Lightfoot's 'Flora Scotica.'

In the case of animals which have been introduced to the Inner Islands, as the Roe-deer has been in Islay, Mull, and Jura (*vide* Alston, 'Fauna of Scotland,' 1880, p. 25), or are indigenous there, like the Long-tailed Field Mouse (*Mus sylvaticus*), it would have been useful, for the purpose of indicating the limits of their distribution westward, to have noted this.

The plan of introducing the names of species which are not only unknown in the Hebrides, but do not occur in any part of Scotland, is, in our opinion, very inconvenient, and cannot be said to serve any useful purpose. It may be urged that it shows what forms are absent from the fauna, or are not known to occur, and may be looked for on the chance of their discovery. But this cannot be held to apply to such species as the Rock Thrush (*Monticola saxatilis*), Nightingale, Dartford Warbler, Savi's Warbler, Bearded Tit, Gold-vented Thrush (*Pycnonotus capensis*), Scarlet Grosbeak (*Carpodacus erythrinus*), Needle-tailed Swift (*Acanthyllis caudacuta*), Russet-necked Nightjar (*Caprimulgus ruficollis*), Bee-eater, and many others which might be named, and which are not in the least likely to occur. The introduction of these names only tends to confuse the reader, and to unduly swell the list of species which have really been obtained or observed.

Subject to this objection, we have nothing but praise for a work which must have cost its authors an infinity of labour, and

which for a very long time to come must be the standard work of reference on the subjects of which it treats.

The full-page illustrations are admirable, "The interior of North Uist," "Mingalay Village," and the "Eyrie of the White-tailed Eagle, Shiant Islands," being especially noticeable, as tending to convey with photographic exactness the scenes in which the authors' notes and observations have been made.

With many English yacht owners nowadays a favourite summer cruise is to the Western Islands, and for them and their friends on board the present volume will be found invaluable, for, apart from the general information which it contains on the geographical position and natural history of the islands, the maps and charts, with the latest soundings, will be of use even to the practised mariner.

The Fauna of British India, including Ceylon and Burma. Edited by W. T. BLANFORD. Fishes by FRANCIS DAY. 2 vols. 8vo, with illustrations. London: Taylor & Francis. 1889.

About a year ago ('Zoologist,' 1888, p. 395) we noticed the appearance of the first volume of this important series of manuals on the Fauna of British India, namely, Part I. of the Mammalia, by Dr. Blanford. We have now to call attention to the fact that two more volumes have been published entitled as above. It will be generally admitted that no one could have been found better qualified to write these two volumes than the late Surgeon Francis Day, whose death we had so recently to deplore (Zool. 1889, p. 306). A long residence in India, where he was for some years Inspector-General of Fisheries, afforded him ample opportunities for becoming generally acquainted with the fish-fauna of that country, and for the collection of the materials which enabled him, in 1878, to complete his great work on that subject. Fortunately for science he was spared long enough to finish the present undertaking so far as to admit of the volumes going to press, though much of the labour of revising the proof-sheets, we understand, devolved, through his illness, upon the Editor.

The present work is chiefly an abridgement of his larger 'Fishes of India,' with such alterations and additions as were rendered necessary by information since collected, and much of

which appeared in his 'Supplement' of 1888. The synonymy, having been already fully worked out in his previous treatise, has not been reprinted, but under the head of each species a reference is given to the original specific description, and to the page of the former work where fuller details may be found.

With few exceptions the woodcuts which serve as illustrations are reduced copies of the quarto plates.

We learn from the Editor's Preface that the limits of the area of which the fresh-water fauna is here described are those defined in the Introduction to the volume on Mammals, and are those of British India and its dependencies, such as Burma, the Andaman and Nicobar Islands, Manipur, Nepal, Cashmere, Baluchistan, &c., together with Ceylon. The marine fishes are all known to inhabit the seas around British India.

As there are no representatives of the *Salmonidæ* in India, it was, perhaps, hardly to be expected that the Index would contain any reference to "Trout," but inasmuch as there is a spotted fresh-water fish (*Barilius bola*), one of the *Cyprininae*, which takes the fly well, and is popularly known to Anglo-Indians as "Trout," it might have been well to give this name in the Index, and so enable any uninformed reader to discover the real name and affinities of this fish. This leads us to remark that the work would have been made more acceptable to English sportsmen and naturalists in India if some information had been given about the size and weight of what are commonly known as "game-fishes," that is, fishes sought for by the angler, as, for example, the "Mahseer" (*Barbus tor*), belonging also to the subfamily *Cyprininae*, with an indication of such species as are to be recommended for food or avoided, and a reference to such rivers as are celebrated for the sport which they afford to lovers of the fly-rod.

The absence of such information as this makes the work quite unreadable. It is merely a reliable "book of reference" for those who want no more than a comprehensive and systematic catalogue of Indian fishes, containing the scientific and native names, with brief but sufficient diagnoses of the species, and supplemented where possible with illustrations. These undoubtedly will enhance its value in the eyes of non-scientific readers. Like all works emanating from the press of Messrs. Taylor and Francis, it is admirably printed.

Pig-sticking or Hog-hunting: a complete account for Sportsmen and others. By Capt. R. S. BADEN-POWELL, 13th Hussars. Illustrated by the Author. 8vo., pp. 212. London: Harrison & Sons. 1889.

WE have had no better book on this subject since the appearance of Capt. Newall's 'Hog-hunting in the East,' and no more graphic illustrations since the publication, in 1851, of Capt. J. F. Fotheringham's 'Sporting Sketches and Scenes in India' (in oblong folio), which, devoted exclusively to Hog-hunting, soon went out of print, and has never been re-published.

Those who have had opportunities of taking active part in this thoroughly Anglo-Indian sport insist that it puts every other kind of hunting completely in the shade, not excepting Fox-hunting, and aver that not only do you get as fast a run over as difficult ground as is to be found anywhere, but there is the greater excitement of pursuing at full speed an animal which, if brought to bay or wounded, will turn upon its pursuer and show gallant fight. After reading some of Capt. Baden-Powell's stories of good days after pig, we cannot wonder at the enthusiasm which has prompted him to write this very entertaining book.

He explains the choice of title by remarking that in Bengal the sport is designated "Pigsticking," and in Bombay "Hog-hunting," adding that the modern form of it (that is, riding down a boar on horseback and killing it with a spear), is not of great antiquity, but "became recognised only at the beginning of this century as the substitute for bear-sticking, which had until then been the most popular sport in Bengal." He tells us the "points" of a good boar, the signs of age, size, weight, &c., describes the animal's haunts and habits, its craftiness, speed, and ferocity, and descants upon the long spear and the short spear, discussing their respective merits.

The chapter on "rearing pig" will have no interest for British agriculturists; it relates not to feeding and fattening, but to getting the beast out of covert. For Hog-hunting, like other sports, has its technical terms. You may "flush" a Woodcock, "put up" a Wild Duck, "spring" a Pheasant, or "rouse" a Stag, but you "rear" a Wild Boar, and (as our

author points out) have to mind how you do it!* Full directions are given on this subject in the chapter referred to (Chap. IX.), but the pages which concern us most are those which deal with the natural history of the Wild Boar. These are full of interest, and we only regret that want of space will not permit of our making extracts.

There is a capital account of a pitched battle between a Boar and a Tiger (p. 72), as observed by a friend of the author, from a hiding-hole near a pool where the wild beasts came to water. The result showed the extraordinary muscular power of an old Boar, and the extensive nature of the injuries he is capable of inflicting with his terrible "tushes." He is indeed a foe well worthy of the hunter's steel, and to vanquish him is to ensure a triumph not realized in overcoming any other animal.

But it is not on this account only that Capt. Baden-Powell sounds the praises of boar-hunting. There are other and weightier reasons why it should be encouraged and practised wherever the "quarry" can be found by English sportsmen.

"Apart from the fact that any hardy exercise conduces much to the training and formation of a soldier, 'pig-sticking' tends to give a man what is called a 'stalker's eye,' but which *par excellence* is the soldier's eye. It teaches him to keep looking about him, both near and far, so that by practice he gets to notice objects in the far distance almost before an ordinary man can distinguish them even when pointed out to him. In difficulties of ground he will learn to keep a look-out to the front, and not only see his way over present obstacles, but also the best line to take when these have been successfully disposed of. The habit of looking for and noticing the smallest signs of pig teach a man to note and carry in his mind those little marks by which he can often obtain important information, and will always get the country more or less mapped into his brain by a succession of insignificant signs and landmarks, the value of which can be duly appreciated when he has once had to perform a reconnaissance by night, or to work through an unknown country in time of hostilities."

Coming from a soldier and a sportsman, this argument furnishes a good *raison d'être* for a very entertaining and instructive volume.

* "Jinking" is another term peculiar to this sport, and signifies turning sharply to the right or left when on the point of being speared while going at full speed. Tracking is termed "pugging," and the animal's tusks are known to the craft as "tushes."

Sylvan Folk: Sketches of Bird and Animal Life in Britain. By JOHN WATSON. Small 8vo., pp. 286. London: Fisher Unwin. 1889.

THE title of this little book is not well chosen, the word "folk," being inapplicable to birds and beasts, and "sylvan folk" being suggestive rather of fairies than of wild animals. The chapters (sixteen in number) deal with various matters of outdoor observation, some of them having already appeared in print and being now re-published in a collected form. Here and there we find an interesting note called forth by the author's experience, as when he tells us, in the chapter on small British mammals, that he has seen Shrews, "on the sides of Hellvellyn, 1500 feet above the sea-level" (p. 47).

We do not quite follow Mr. Watson when he says (p. 33) that the Pheasant is not an indigenous British bird, *nor is it a distinct species.*" At least three species are well known here in a wild state,—*Phasianus colchicus*, *torquatus*, and *versicolor*,—and of late years a few others have been introduced and turned out by way of experiment. In referring to the earliest mention of the Pheasant in England, he is in error regarding the date; 1177 being the date of the MS. in which the bill of fare is mentioned, and not of the bill itself, which was framed A. D. 1059.

In 'The Field' of March 31st, 1888, appeared an article (not by Mr. Watson) on the subject of small birds being assisted in their migrations by larger ones, and of this (without any acknowledgment) Mr. Watson gives a *réchauffé* in the first portion of his chapter on "Bird-problems," the second portion of the same chapter, on the flight of birds, having been evidently inspired by a perusal of the Duke of Argyll's 'Reign of Law.' This style of writing is not to be commended, for it allows the unwary reader to suppose that a chapter so constructed is new and original, whereas it is only a counterfeit. Worse than this, it sometimes saddles the author quoted with mistakes which he has not committed. We may point to an instance of this on p. 74, where Mr. Watson, commenting on what is now a well-known fact, *viz.*, that the Woodcock carries its young from the nest to the feeding-ground, observes that the young are not conveyed either by or in the bill, and that "it is just as erroneous to substitute the claws, *as some have done*, for the bill." If Mr. Watson had attentively

read the article on this subject, from which he evidently quotes, and which appeared in 'The Zoologist' for 1879 (pp. 433—440), he would have found the evidence on which this statement was grounded. Curiously enough, on his next page, he is so inconsistent as to quote (very inaccurately) a passage from Stuart's 'Lays of the Deer Forest' (correctly quoted in 'The Zoologist' for 1879), wherein the writer states that he saw the young Woodcock carried "in the claws" of its parent, an observation which is confirmed by Mr. Chichester Hart in our present number (p. 454).

To the statement (p. 175) that "Peregrines are very destructive to Grouse," we cannot object: they can catch and kill them easily, though many sportsmen affirm that a driven Grouse is the fastest bird that flies. But when Mr. Watson adds that "it is just as true that they pick off the slowest and weakest birds," we entirely disagree with him, having repeatedly had ocular proof that this is not the case. Having taken some part in "Grouse-hawking" for three seasons, and having seen as many as six or eight Grouse killed in one afternoon by Peregrine Falcons, we may confidently claim to express an opinion on this subject, an opinion, by the way, which has been already called forth (*antea*, p. 117) by an iteration of the popular fallacy which Mr. Watson still tries to maintain. Once put a plausible, though erroneous, statement into print, without any evidence to support it, and it will be copied over and over again, in spite of contradiction. We have another instance of this in Mr. Watson's book, on p. 78, where he tells us that the dark brown variety of Fallow-deer was introduced into England from Scandinavia, a fallacy that has been long since exposed (see 'Essays on Sport and Natural History,' p. 12).

We might give other instances of want of accuracy, but have no desire to pursue such criticism further. The book, though not without its redeeming features, is on the whole a disappointing one. It savours too much of "book-making," and too little of the well-considered, well-expressed truths that might be collected by a more careful writer.

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