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P R E F A C E .

ON taking a retrospective glance at the contents of 'The Zoologist' for 1885, the Editor sees every reason to be grateful to those correspondents who have favoured him with contributions during the year. Many of these are especially interesting as throwing light upon unrecorded or unexplained habits of little-known species; whilst others, if they contain no new information, are at least useful as confirming statements made by previous observers, advanced possibly upon less complete evidence.

It has to be borne in mind that there is always a new generation of naturalists springing up, to whom much that appears in the pages of 'The Zoologist' will be new, although, in some form or other, it may have been previously published. It is obvious therefore that it would be unwise to exclude such observations as those referred to, for such a course would practically defeat one of the chief objects of this Journal.

It does not follow because a certain incident deserved publication once, that it is not worthy of being again recorded. It is obvious that there must be many occurrences which it is not only allowable, but even highly desirable, to communicate time after time, although beyond the mere occasional differences of place and date there may be little or no novelty in the notice.

Of such a kind are communications regarding the appearance of really uncommon species, or of common species at unusual seasons or in new localities. The use of these lies in their multitude, for it is only by collecting such records extending over a long period that any law may be deduced from them—a law which perhaps may bear upon some more general questions.

The Editor would only urge, as he has done on previous occasions, that his contributors, before sending articles for publication, should consider whether they are such as will really promote the progress of Zoology.

In the Preface to last year's volume occasion was taken to point out the importance of endeavouring to become acquainted as far as possible with the literature of a subject before attempting to write upon it; and, as an aid in this direction, the great utility of the annually published 'Zoological Record' was more than hinted at.

The recently prepared statement by the Secretary of the Zoological Record Association (which will be found at p. 476) is one which should receive the careful consideration of those who have at heart the advancement of zoological science in this country.

In offering these remarks by way of Preface to the Volume for 1885, the Editor trusts that during the year to come he may continue to receive as heretofore from all parts of the country, a proof, in the shape of useful contributions to this Journal, that public interest in Zoology is in no way subsiding, and that a real advance in knowledge is being made in this as in other branches of science.

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THE DOG OF SACRED HISTORY.

BY E. CAMBRIDGE PHILLIPS, F.L.S.

IN the able and interesting article on "Dogs, Ancient and Modern," published in 'The Zoologist' of October last, the author, quoting Canon Tristram on the subject, infers that the dog being unclean to the Israelites was regarded and tolerated by them simply as a scavenger, and that domestic breeds were almost unknown.

I have thought it worth while, therefore, to offer the readers of 'The Zoologist' the following observations, in which I have been assisted, as regards the Hebrew, by one of our best Hebrew scholars, and venture to hope that the remarks I have to make may cause the dog of Sacred History to be looked at in a very different light to that in which it is usually regarded.

Exception may be taken to the statement (p. 399) that the earliest record of the dog in Sacred History is in connection with the sojourn of the children of Israel in Egypt. In Gen. x. 9, as also Gen. xxv. 27, the word "hunter" signifies "one who lays snares"; but the Septuagint version, in Greek from the Hebrew, renders the word *κυνηγοσ*, *i. e.* "dog-leading." The inference is fairly plain that dogs were led in slips and used for coursing various kinds of game, and probably also for driving it into snares or nets; or possibly to follow up and course animals wounded with the arrow, as in Gen. xxvii. 3, where Isaac says to Esau, "Take, I pray thee, thy weapons, thy quiver and thy bow,

and go out to the field and take (Hebrew 'hunt') me some venison," though it by no means follows that this was the usual way of killing game at that time, the commands of the patriarch, and the particular mention of the weapons to be employed, seeming to indicate extreme haste.

That there were shepherd dogs at a very early date is evidenced from Job xxx. 1,—probably the most ancient book extant, supposed by many to be even before the time of Abraham,—in which the "dogs of my flock" are specially mentioned. In Proverbs xxx. 31, and after the exodus of the children of Israel from Egypt, occurs also that curious text, "a greyhound; an he goat also; and a king, against whom there is no rising up." Unfortunately, the word "greyhound" is a mistranslation, the Hebrew being "one girt about the loins." Some refer it to the horse. Both German editions of the Bible, however, render the word "dog," and as such the fact is worth recording. How the word "greyhound" has crept into our version I am unable to explain; it being the only passage in the Bible wherein a special breed of dog is mentioned. I only allude to it, however, in order to show that the text has not escaped my observation.

The words in Isaiah lvi. 10, "They are all dumb dogs, they cannot bark," would seem to show that at that time dogs were used as a watch for houses, especially when taken in conjunction with the preceding words, "His watchmen are blind." This was certainly the case later on, in the time of our Saviour, the words, "Yet the dogs eat of the crumbs that fall from their master's table" (Matt. xv. 27), showing unquestionably that dogs were then allowed not only in the house, but at the best table, *i.e.*, the master's, the article (τοῖς κυνάρκιοις) implying the presence of dogs, or rather little dogs or puppies.

It is to be regretted that there is no Hebrew version of the Book of Tobit, or possibly the breed of dog there referred to may have been mentioned. As it is, the word in both texts (Tobit v. 16; xi. 4) is simply *κυνον*. Assuming the genuineness of the book, and up to the present time no valid reason has been shown to the contrary, the information contained in these texts is valuable, as showing that the dog was at that time known as the friend and companion of man.

It would seem, also, that although the dog was unclean to the Jews, yet it had a certain value in their eyes, and that it was

placed before other unclean animals, for the Talmud says "Dogs may be fed on the Sabbath day, but not swine"; and we learn from Josephus that Herod kept a regular hunting establishment as well as a huntsman, following up the sport in a country abounding with stags and other wild animals.

The words of the text, 2 Kings viii. 13, "Is thy servant a dog (or more correctly *the* dog), that he should do this great thing?" is commonly quoted, with the omission of the word "great," to show the very low estimation in which dogs were held by the Jews, whereas it may very possibly allude to the power of the dog in Hazael doing this "great" and terrible thing, or has reference only to the pariah.

Although the Hebrews were not, as a rule, much given to field sports, lions being taken in pitfalls, as at the present day by the Arabs (2 Sam. xxiii. 20), and birds in traps or snares (Amos iii. 5; Ecc. ix. 12), which may possibly account for the few occasions on which dogs are mentioned in the Scriptures, yet I think it may be inferred, from the various texts I have quoted, that several breeds of dogs were known to the Israelites, differing from the miserable pariah, the scavenger of the East; such, for example, as shepherd dogs, watch dogs, house dogs, companionable dogs, and dogs used for the chase; and certainly dogs of far higher grade than the dog of Sacred History is popularly supposed to have occupied.

WAYSIDE NOTES DURING A WEST COUNTRY DRIVE.

BY CECIL SMITH.

I SEND a few wayside notes, made during a driving tour last year, which extended further to the westward than that described by me in 'The Zoologist' for 1883, p. 448. Instead of Wilts and Dorset we were this time chiefly in Devon and Cornwall, getting as far as the Land's End and the Lizard, and back over Dartmoor. We started from Bishops Lydeard on the 16th of May, and drove to Minehead. We saw nothing about the Harbour there but a few immature Herring Gulls, no adults amongst them. Amongst the furze on the hillside towards the sea were a considerable number of Stonechats; most of them

probably had nests, though we were not successful in finding one. I do not think, however, that any of them were sitting, as they were seen in pairs.

Next day, the 17th, we drove through Porlock to Linton, but did not see anything to interest us, not even a Peewit, on the part of Exmoor we crossed. After our arrival at Linton we walked to the Valley of Rocks, where we saw a good many adult Herring Gulls about the cliffs, and one pair of adult Lesser Black-backs, though we could not discover that either species was nesting there. We also saw a pair of Red-backed Shrikes on our way back.

On the 18th we again walked to the Valley of Rocks, saw the Red-backed Shrikes again, about the same place; they probably had a nest in a very thick hedge between the wild ground and some potato gardens. There were a good many pairs of Kestrels about the cliffs. One pair we watched down to their nest in a crevice in a perfectly impracticable part of the rock, at least without ropes. We also saw a pair of Buzzards, alternately bullying and being bullied by some noisy Jackdaws. Later on in the evening we walked up the Waters Meet Valley. Dippers seemed to be scarce on the stream, for we only saw two or three, and no Kingfishers. There were however a good many Grey Wagtails about, and were probably nesting, for I found a Grey Wagtail's nest at Lydeard on the 20th of April, and they were sitting hard before we left, on May 15th. These eventually brought off their young in safety.

On the 19th we went through Barnstaple to Westward Ho.

While we were in Barnstaple I paid a visit to Rowe, the local birdstuffer, but he had nothing in his shop of interest except a Velvet Scoter, which had been shot in Bideford Bay about two years ago. At Westward Ho we walked about the golf ground, and found a Meadow Pipit's nest, not quite finished and with no eggs in it, placed in a tuft of rushes. By a salt-water pool, lately made by the sea breaking over the pebble ridge, we saw a flock of about fifty Purres (*Tringa alpina*), some in full breeding plumage, with beautiful black breasts, and others as yet showing very little signs of summer plumage. They were very tame, and allowed a near approach.

May 20th, to Clovelly, where we saw a few Herring Gulls and Lesser Black-backs about the harbour, both adult and immature

birds, and one Cormorant. Proceeding to Bude, in the afternoon, we saw a small flock of Peewits, about some wild ground about half-way on, but we did not find any eggs; though we extended in line over the ground to look for them we did not see anything. At Bude there was nothing worth noting, and the next day we drove on to Boscastle, passing another small flock of Peewits in the same sort of ground, which were also probably breeding. On arrival we took a walk on the cliffs on the Bude side of Boscastle, and saw a good many Herring Gulls breeding on the cliffs, the females mostly sitting, but one or two had young hatched and able to run about on the ledges of rock some way from the nest. There were also a good many Razorbills on the ledges of rock, some sitting and some flying up and down to the sea and back; we did not see any young ones, though at places we could look across some narrow inlets in the rocks and see the eggs quite plainly. We saw several Shags about the cliffs, evidently breeding, though we could not see their eggs like those of the Razorbill. At one place we saw a male Kestrel come out of a hole in the rock, and soon after the female went into the same hole, but whether they were sitting alternately or had young ones hatched we could not make out, as we could not see across into the hole, and it was impossible to get near it. We waited some considerable time, but did not see the female come out again, so she may have been in there for a spell of sitting. On our way back to the hotel we saw some boys who ought to have been at school, if the Education Act had been properly enforced, swimming a Puffin in the stream which runs down to the harbour, and a lot of sailors and ostlers looking on at them; they had a string tied round his leg, and as he tried to dive in the shallow pools they kept pulling him back. The Society for the Prevention of Cruelty to Animals apparently had no agents in those parts!

The next day, May the 21st, we walked along the cliff from Boscastle to Tintagel. There were immense numbers of Puffins breeding, especially on two steep rocky islands just off the coast. There was a place on each island where there was a certain amount of soil above the rocks, rather more than an acre on each island, and the Puffins had taken possession of these places, and pitted them all over with thousands of holes, each hole apparently containing its pair of Puffins; there was a

continual flow of Puffins to and from the sea. I have seen lots of Puffins breeding at other places, at Lundy Island, and about Tenby on the Welsh coast, and in the Channel Islands; but I never remember to have seen a colony so thickly populated. On the sea side of these islands, which was more steep and rocky than the land side, both Razorbills and Guillemots were nesting in considerable numbers, as they were also in every place where there was room for an egg, on the cliffs on the mainland. There were places where we could see the eggs quite clearly, though we could not get at them. A great many Herring Gulls were nesting both on the cliffs and on the islands. One of my daughters and I, after a hard climb, got a Herring Gull's egg, which turned out to be quite fresh, though in other nests there were some young birds hatched. A great many pairs of Kestrels were nesting along the cliffs, mostly in quite inaccessible holes. From their numbers I suppose they are not much shot at along the cliffs. This may in some way account for the scarcity of Wheatears, of which we saw very few indeed all along the coast, and that even in most likely places for them, and sometimes in places where at other times I had seen them plentifully. There were also a great many Jackdaws and a few Crows; I suppose these latter are occasionally shot at, for we picked up one dead one. But we did not see a single Chough, even at Tintagel, which is the only place on the Cornish coast where I have ever seen any of these birds, though on the three or four occasions on which I have visited King Arthur's grand old ruin I have always seen one or two there. We did not see any Lesser Black-backed Gulls breeding about the cliffs here, the only gulls we saw being Herring Gulls. At Tintagel, a little way up towards the village, we saw a Ring Ouzel, a young bird of the year, with the ring scarcely developed.

On the 24th we went to New Quay, not very far from Boscastle; we saw a great many Herring Gulls, quite a flock, following the plough like Rooks, and picking up worms and grubs. They came quite as close after the plough and seemed quite as bold as Rooks generally do when engaged in the same manner. We did not see any Black-backed Gulls among the Herring Gulls this time, though when here in July, 1877, I had seen the Herring Gulls similarly employed about the same place, but then there were a few Lesser Black-backs with them.

On the 24th we walked from the hotel, the Great Western, to the headland on the other side of the town (Towass Head), but we did not see very much; one Whimbrel on the sand-hills about there, and the first and only Wheatear any of us had seen during the whole drive. There were a good many Rock Pipits about, mostly with food in their mouths, going to feed their young. In the afternoon we went out in a boat under the cliffs towards Bedruthan Steps. We saw two Guillemots on the water and a good many Herring Gulls on the cliffs; we threw out some biscuit from the boat and soon had a crowd of Herring Gulls about us; a good many immature birds also made their appearance amongst the adults, but where they came from we could not say; there were certainly none on the rocks or at the breeding-places. We also saw one Oystercatcher on the rocks; his mate was probably sitting somewhere near.

On the 25th, Sunday, we walked in the afternoon to Bedruthan Steps, over the cliffs, which in places are very fine. At one of the steepest and most inaccessible places, a pair of Peregrines came at us in a great state of excitement, evidently having a nest somewhere close under us, but the cliff was too crumbling and dangerous to let us look over for the nest. The male bird came at us first, but the female soon joined him on hearing his cry. They kept dashing about close to us for some time till we went on our way; they were very noisy all the time. Kestrels were not so numerous as at Boscastle; we only saw one pair. There were a good many Cuckoos about; probably the Rock Pipits' nests proved useful to them, the last-named birds, as well as Linnets and Stonechats, being common. A great many Swifts were breeding in the cliffs. As we came back by a short cut, more inland, we saw a flock of immature Herring Gulls, feeding in a ploughed field, mostly second and third year birds, though some of them may have been a year older; but there were no adult breeding birds amongst them.

On the 26th we left New Quay for Redruth, stopping for luncheon at Truro, where we saw the worst, least cared for, and I think the dearest museum I ever was in, not even excepting the Guernsey Museum (Zool. 1872, p. 2925). The few birds in it will soon be lost, if a little more care be not taken of them. Amongst others I noted the Spotted Eagle killed at St. Mawgan near St. Columb, in November, 1861; and a Hawk Owl, labelled

“See Yarrell, vol. i., ed. 3rd.” A good many of the best birds seem to have been lost since I was there in 1877, or, being too dilapidated perhaps for public view, have been put back out of sight as much as possible. I missed the Alpine Swift, Little Bittern, Little Egret, Glossy Ibis, and others which I had seen before, and which the then curator told me had been killed in Cornwall.

The road from Truro to Redruth passes through the mining country, and hence, as may be supposed, we did not see much in the bird way. At Redruth we walked to a monument on a hill, covered with rough granite boulders and ferns, where we found a Meadow Pipit's nest, with eggs hard set. Between Redruth and Penzance, on the mud at Hayle, were a good many Whimbrel, a few flocks of small waders, mostly Purres, and a great many immature gulls, both Herring and Black-backed Gulls. At Penzance we walked along the beach to the place to which most of the Mounts Bay fishing-boats belong, and where there were heaps of mackerel being constantly landed. Here there was quite a crowd of Herring Gulls and Lesser Black-backs, both immature and adult, but no young birds of the year. In numbers they appeared about equal, the Black-backs perhaps being rather more numerous.

On May 28th we drove to the Logan Rock and walked thence to the Land's End. At the Rock we saw few or no birds about, but as we got nearer to the Land's End we found a few Herring Gulls breeding, and in some very perpendicular places there were Kittiwakes nesting. In some places they were very numerous, every ledge being crowded with them. A good many Razorbills also were breeding, and here and there we could see their eggs distinctly. There were no Lesser Black-backs breeding anywhere; in fact, we could not make out where those seen in Mounts Bay do breed. On the drive home from the Land's End we saw a good many Magpies, and concluded that gamekeepers are not so numerous there as at home. Perhaps a dead horse we saw in a field by the roadside was an attraction to them.

On the 29th we went on board the little steamer which at this time of year goes every day to the Scilly Islands to bring back fish, carrying enormous loads of mackerel. At this time everything is given up to the mackerel, and the steamer was very full

of "empties"; but notwithstanding this, and in spite of the "ancient and fishlike smell," we made ourselves pretty comfortable on the bridge. On our way to the islands we saw a good many Gulls,—Herring, Lesser Black-backs, and Kittiwakes; there were also a few Razorbills and Guillemots about, and a few Puffins; and as we got nearer the islands, one or two Cormorants and a good many Shags. There was also a Tern or two flying about by the sandy beaches. We landed on St. Mary's Island, where I may say, for the information of anyone wanting to go there, there are no less than three hotels. The one we went to is in the old fort, and is called "High House." We found it very comfortable.

On the 30th we were taken to Trescoe, which I found to be a mistake, as we ought to have gone to Annette Island, which is the great breeding-place. Both islands might perhaps be visited in a day, but the boatmen do not care to overwork themselves, and have, moreover, a great idea of the danger of their own seas and the strength of their own tides. The tides, however, did not seem to be very hot, nor was the rise and fall much (25 feet), compared to the hot tides in the Channel Islands with 40 feet rise and fall. On the sail over to Trescoe we saw a few Common Terns about, but they did not appear to be breeding at Trescoe or on any of the islands we passed. We went over Mr. Dorian Smith's grounds, which are very interesting, especially to the botanist, on account of the tropical plants which grow there out of doors; they require shelter, however, from the winds, and directly they get their heads above the shelter of the rocks or trees they are cut back by the wind. Amongst other things we saw Mr. Dorian Smith's Ostriches, bred there last year. On the pond near the grounds were Coots and Moorhens, and the gardener who showed us round said the Moorhens bred there, but not the Coots. After seeing Mr. Dorian Smith's grounds we had a long walk over the island, along the narrow channel between Trescoe and one of the other islands, by an old tower said to have been built by Oliver Cromwell, and back by the sea-side, but saw only a few Common Terns fishing in the narrow channel. On getting back to our own island, St. Mary's, we had a long walk by the shore to the north end, seeing only a few Ring Dotterel, and not finding any eggs. We found one Oyster-catcher's nest, however, on the sand—a mere scratch under

some sea-kale that grew there rather plentifully. There were three eggs, quite fresh; we took one. The harbour was full of Kittiwakes; in fact there were thousands of them, and a very good living they seemed to get, especially when the mackerel-boats came in and were unloading into the steamer; there were also some Lesser Black-backs and a few Herring Gulls. I omitted to state that on our way to Trescoe we saw one solitary Great Blacked-backed Gull, wandering about between the islands. The same bird probably appeared the next day (the 31st), as we were going back between the islands in the steamer. A good many Kittiwakes followed the steamer most of the way, but as it was Saturday there were no fish on board, so they had to be content with bits of biscuit which we threw them, and for which they came quite close to the steamer.

On the 1st of June we took a long walk in the afternoon on the beach from Penzance to Marazion, where we saw a small flock of Purrees. They were very tame; most, if not all, had the black breast of the breeding-season. There were about a dozen Whimbrels also on the beach, which were likewise very tame, and let us come within easy reach. Amongst other "common objects by the sea shore" we picked up the body of a Raven, apparently not long killed, but the Gulls and Rooks, both of which were plentiful, had cleaned the sternum nicely, so I took it for my collection. There were also a good many dead bodies of Razorbills, Guillemots and Puffins which had been treated in the same way, nothing but a few feathers, the breast-bone and the skull remaining.

On June 2nd we drove over to Helston, on purpose to have a walk by Looe Pool, where we expected to see a good many birds, but were disappointed.

On June 3rd, on our way to the Lizard, we saw only a few Herring Gulls in a ploughed field near Helston, and the Lizard itself (in spite of the beauty of the cliffs and of the well-known Kynance Cove close by) was by no means as interesting to an ornithologist as the Land's End, Herring Gulls, Shags, and Cormorants being the only species noted; none breeding. Close to the Lizard Point a large number of House Martins were nesting.

On June 6th we were at Falmouth, and went for a sail in the river and about the harbour, where were only a few Herring Gulls.

On June 6th we got to Bodmin, and on the 7th were driving over Bodmin Moor. Here we proceeded in line over the moor on both sides of the road, especially on the look out for Purres and their eggs or young, as Mr. Rodd says they breed on this moor. We had lunch at Trebortha Hall, where I renewed my acquaintance with the late Mr. Rodd's collection, now very nicely arranged by his nephew round the dining-room. The birds are all in beautiful order, nicely cased and arranged; and Mr. Rodd has his own and his late uncle's notes as to the locality in which each was obtained. He kindly took us for a walk about his grounds, where we saw a good many Water Ouzel about the beautiful stream that runs through the grounds. We could not stay very long there, however, as we had to get on to Launceston the same night. On the drive from Launceston to Tavistock, which is very pretty, but hilly, across the Tamar and by Lidford Falls, we saw no birds worth noting.

On June 10th, on the way from Launceston, over Dartmoor to Moreton Hamstead, one or two Water Ouzels and Summer Snipe appeared on the stream at Two Bridges, and a few Peewits on the moor. Mr. Pollard, the landlord at the hotel at Moreton Hamstead, had a fine case of three Common Buzzards, all shot in the neighbourhood. He had also another, shot by himself close to the town, which was dark on the back and very white on the breast and under parts, and which accordingly he had put down as a distinct species, but (as I told him) I could make nothing of it but a Common Buzzard. He also had a Hoopoe, killed somewhere near Moreton. From that place to Exeter, and from Exeter home we did not see anything worth notice. The circumstance which most surprised me in the whole drive was the almost total absence of Wheatears; we did not see half a dozen, though in many places we passed I had on other occasions seen them in considerable numbers. It was pleasant to find that there was still at least one pair of Peregrines breeding in the West.

NOTES ON SOME MOLLUSCA COLLECTED IN SURREY.

By T. D. A. COCKERELL.

THERE is, perhaps, no county in England so rich in Terrestrial Mollusca as Surrey, and no part of Surrey is richer than the Caterham Valley. This being the case, one naturally enquires, Has this district been properly worked out? What records have we? Is there not much yet to be done? On looking over the public records, it appears that this district is by no means so well known as it might be, and that much may yet be done before we can say that there is nothing left for future observers. It occurs to me, therefore, that a list of even two days' captures may be of some service, as indicating the molluscan fauna of the district. It is as follows, the species being given in the order of their occurrence:—

Sept. 7.—(1.) Mollusca between Caterham and Godstone, commencing at Caterham.—*Hyalina nitidula*, *Helix pomatia*, *Cyclostoma elegans* (besides the type form there also occurred the var. *fasciata*, and a very dark and almost unicolorous form, and also a greyish white variety tinged with brown at the apex: this latter is also found at Folkestone, Mr. J. H. Ponsonby having given me specimens from that locality; the Folkestone specimens are whiter and the markings are somewhat less distinct than in my Surrey one), *Helix hispida*, *H. caperata*, *H. cantiana*, *Hyalina glabra*, Jeff., *Helix rufescens* and var. *rubens*, *H. rotundata*, *H. hortensis* var. *incarnata*, band-formula 12345 (for explanation of band-formula see 'Journal of Conchology.');

H. virgata and bandless variety, *H. aspersa*, *H. ericetorum* (also a variety in which the black bands are wanting, but traces of colourless ones are visible); *H. hortensis* var. *lutea* 00000, and *lutea* 1₂345, *Clausilia rugosa*, *Hyalina cellaria*, *Arion hortensis* (two varieties, the first light grey with bands, sole of foot grey, and the second dark grey, also banded, with a yellow sole); *Limax agrestis*, *Bulimus obscurus*, *Cochlicopa lubrica*, *Carychium minimum* (living under rush leaves in a wood), *Arion hortensis*, var. yellowish below, grey above, bands very indistinct; *Helix hortensis* var. *incarnata* 00000 and *lutea* 12345, *H. aspersa*, var. having the usual light mottlings nearly white, and the dark markings of the type replaced by a light reddish

brown colour. This is seemingly intermediate between the type and var. *exalbida*. My brother has taken a similar variety at Minster, in Kent.

(2.) Godstone to Oxstead.—*Anodonta cygnæa*, *Limnæa auricularia*, *Limax lævis* (I named this *lævis* on comparison with the descriptions of that species given by Jeffreys and Rimmer, but I should very much like to see good coloured drawings of this and other slugs, to aid in identification, though I fear that such a thing is not to be had); *Limnæa peregra*, *Sphærium corneum*, *Hyalina glabra*, *Helix hispida*, *H. aspersa*, *Planorbis contortus*, *P. albus*, *Helix rotundata*, *H. rufescens*, *Cochlicopa lubrica*, *Hyalina crystallina*, *H. pura*, *Vitrina pellucida*, *Hyalina nitidula*, *Helix pulchella*, and var. *costata*, and *Vertigo pygmæa* (amongst moss on a wall).

(3.) Oxstead to Warlingham.—*H. aspersa*, *H. rufescens*, *H. arbustorum* (dead shell), *H. hortensis* var. *lutea* 00000, *Cochlicopa lubrica*, *Hyalina nitidula*, *Helix ericetorum*, *H. concinna* var. *alba*, *H. caperata*, *Hyalina radiatula*, *H. crystallina*, *Helix concinna* (type form), *H. pomatia*, *H. cantiana*, *Cyclostoma elegans*, *Helix hortensis*, *Hyalina glabra* (many conchologists imagine this shell to be rare, it is certainly not so in Surrey), *Clausilia rugosa*, *Limnæa peregra* (a small variety having an elongated spire); *Sphærium corneum*, and *Planorbis nautilus* (type form).

Sept. 9th.—Between Kenley and Caterham Junction.—*Cyclostoma elegans*, *H. aspersa*, *H. cantiana*, *H. pulchella* and var. *costata*, *H. nemoralis* var. *rubella* 123(45), *H. caperata* and var. *ornata*, *Limax agrestis* (type form), *Hyalina nitidula*, *Helix rotundata*, *Cyclostoma elegans* var. *fasciata*, *Cochlicopa lubrica*, *Hyalina glabra*, *Vitrina pellucida*, *H. concinna*, *H. hortensis* var. *lutea* 12345 (some specimens had the band distinct and well coloured, but in others the bands were very nearly transparent, with very little colour); *H. rufescens*, *H. virgata*, *Clausilia laminata*. *H. cantiana* var. *albida*, *Hyalina cellaria* and var. *albida* (some of the specimens were unusually large); *Arion hortensis*, var. dark grey, banded, sole of foot yellow; *Helix aspersa*, a somewhat conical variety, *Bulimus obscurus*, *Helix virgata*, var. having the bands indistinct, and only visible near mouth of shell; *H. ericetorum*, *Arion ater*, var. entirely very dark brown; *A. hortensis*, var. light grey, with bands; *H. nemoralis*, vars. *rubella* 12345, and *libellula* 12345; *H. hortensis* var. *incarnata*

12345 (bands light in colour and indistinct); *Limax agrestis*, var. entirely light brown; *Helix hortensis* var. *arenicola*.

In conclusion, I will give a short list of some of the more interesting Mollusca I have taken in Surrey, not mentioned above. *Bythinia tentaculata* monst. *decollatum*, Barnes; *Bythinia leachii*, near Guildford; *Planorbis lineatus*, Barnes; *P. carinatus* var. *disciformis*, near Guildford; *P. corneus* var. *albinos*, Kew Gardens; *Physa acuta*, still abundant in a water-lily tank at Kew; *Cornulus (Zonites) fulvus*, Haslemere; *Helix aculeata*, Warlingham; *H. aspersa* var. *exalbida*, Warlingham; *H. rotundata* var. *alba*, near Addington; *H. lapicida*, Warlingham, Shirley near Shiere, and Haslemere; *Clausilia rolphii*, near Dorking; *C. biplicata*, Hammersmith, on Surrey side of river; *Cochlicopa (Azeca) tridens*, and var. *crystallina*, between Reigate and Dorking.

The following may be expected to turn up in Surrey, but have not, so far as I am aware, been yet recorded:—*Planorbis glaber*; this I have found at Paddock Wood, in Kent. *Amalia gagatis*; Mr. Roebuck informs me that this occurs in Kent, and it has also been taken in Sussex. *Testacella maugei*; I believe this has occurred in Middlesex. *T. haliotideia* is found in Surrey, Mr. K. McKean having kindly given me a specimen from Mitcham. *Vertigo minutissima*; this my brother has taken in East Kent. *V. moulinsiana*; the nearest locality I can find for this is in Hertfordshire. *Helix rupestris*, too, has been taken in Sussex, and may yet be met with in Surrey.

NOTES AND OBSERVATIONS ON BRITISH
STALK-EYED CRUSTACEA.*

BY EDWARD LOVETT.

Gebia deltura, Leach.

THIS species differs somewhat from *G. stellata* in being considerably larger. Bell seems to have some doubt whether it be really a distinct species: if it be, it is certainly much more abundant; but if, on the other hand, the two forms be different

* Continued from Zool. 1883, p. 218.

growths, or local divergencies of the same species, the form known as *G. stellata* must be of rare occurrence, as I have not met with it in Jersey, whence I have obtained scores of *G. deltura*. Bell, however, says that the distinction between the species was discovered by Mr. J. D. C. Sowerby.

The colour of *Gebia deltura* is a dull yellowish brown, the anterior portion of the carapace is thickly bristled, and the hands are furnished with tufts of stiff hairs arranged in lines. The abdominal segments widen considerably at the fourth and fifth somites, and the middle plates of the tail are nearly square.

The eggs of this species are exuded in the early part of the year; they are of a rich amber tint and translucent, becoming opaque as they mature. Like all burrowing species, *G. deltura* carries comparatively few ova, the zoeæ being doubtless not so exposed to the dangers as are those of less protected species, though what the early life-history of this species is I cannot say, nor do I think its zoea-form has ever been taken from its natural habitat.

Gebia deltura, as above stated, is a burrower, and is therefore but seldom met with. Bell even goes so far as to state that the only specimens he ever saw were those in the British Museum. Jersey does not appear to have been worked in those days, and I should imagine that it is the home, so far as our seas are concerned, of many of our rare southern forms, and this amongst others. Being a burrower, and one, too, that forms "runs" many feet in length and of considerable depth beneath the surface of the sand, it is a somewhat difficult task to dig it out, as that must necessarily be done at low tide, when the sand-bank is dry. I should imagine, however, that it either emerges altogether from its burrow when the tide rises, or at any rate comes nearer to the entrance of it; for, when digging for any of these fossorial crustaceans, I have noticed that the proper time to select is when the tide is flowing, and has almost reached the spot selected. Again, they have been recorded as occurring in the stomachs of fishes of the *Raia* genus, and the Ray could not obtain them for food if they were two or three feet deep in the sand.

Gebia deltura is recorded from Plymouth and Jersey, the specimens I have seen being all from the latter place, and number over one hundred; so that, considering the difficulty of

obtaining it, I should consider that it was a local species, being confined to one or two favourable spots, but occurring there in considerable numbers.

Axius stirhynchus, Leach.

This allied genus is represented by one British species, which resembles in general form the foregoing. It, however, possesses many characteristic differences, and is much more allied to the true Lobster type.

The carapace is somewhat cylindrical, but compressed laterally, and the abdominal somites are stoutly arched and massive; the anterior pair of legs are heavy and Lobster-like, but slightly hairy; the second pair possess small pincers, and the remaining three pairs are simple. The tail-plates are rounded, the central one being, however, triangular and armed with two spines.

The ova of this species are few in number, large in proportion to the size of the animal, and amber in tint. I have seen females of *Axius stirhynchus* carrying ova in November, which is late, unless the species be double-brooded, which is possible. The zoea is very similar in appearance to that of the Northern Stone Crab, *Lithodes maia*, but of course smaller.

The colour of this species is somewhat variable; Bell describes it as a pale reddish brown, but it is more frequently of a dull dirty white, though I have seen it pink. One specimen in particular in my own collection is exceedingly beautiful, and when alive was of a more delicate tint than the finest pale pink coral.

A. stirhynchus burrows in sand, mud, and detritus, though usually, I believe, in the two latter materials. If placed alive in a jar of sea-water it endeavours to bury itself at once, and will vainly endeavour to hollow out the glass bottom of the jar with its apparently clumsy claws.

It has been recorded from Plymouth, Sidmouth, and Jersey; at the last-named place it may be most readily met with.

Calocaris macandrea, Bell.

This extremely rare species is described and named by Bell, but, as I have never yet obtained it myself, nor seen it, except in the British Museum, I give an outline of his description. There is also a notice of it from Moray Firth in the British

Association Report for 1866, but beyond that records seem scarce.

The carapace of this species is somewhat cylindrical, with an acute triangular rostrum, and a raised medial line down the whole length of the carapace; the anterior feet possess long, compressed, grooved, and granulated fingers; the second pair are similar, but much smaller, and the remainder are simple. The abdomen is shorter and less cylindrical than other burrowing forms, and the colour of the animal is a pale pink or rose.

One of the most wonderful characteristics of this species alluded to by Bell is that it possesses eyes of a rudimentary character, having neither colouring pigment nor corneæ; and he states that, as this crustacean occasionally inhabits depths of one hundred and eighty fathoms, where it burrows in the soft mud, distinct vision would be useless. This is an exceedingly interesting fact, and doubtless the great depth of its habitat, and the fact of its being also a burrower, accounts for its being usually termed "rare."

Astacus fluviatilis, Auct.

This sole representative of our fresh-water Stalk-eyed Crustacea is widely distributed, and should be by this time well known, not only on account of the early writings of Réaumur and Rathke, but especially by reason of that valuable work by Prof. Huxley entitled 'The Crayfish: an Introduction to the Study of Zoology.' The mere mention of this work will show how unnecessary it would be for me to enter into any description of this animal in a paper like this, so that I shall merely give an outline of its characteristic features, together with a few observations of my own upon its habits.

Astacus fluviatilis is very much like a small lobster, which, instead of being smooth and black, is somewhat rough and of a dirty greenish brown colour: this tint, however, varies considerably, owing, I am inclined to think, to the nature of the locality in which the particular specimens are obtained. I have seen some of a rich warm sepia-brown, others of a pale sage-green, and others again of a bluish tinge; but the usual prevailing colour is, as I have said, of a dirty-looking greenish brown, so much resembling the bottom of a stream that it is

almost impossible to see the animals, even when they emerge from cover.

The length of the River Crayfish is about three or four inches, though they sometimes exceed this. I have two specimens which are nearer six inches in length, with claws nearly an inch in width; but this size is very unusual, as I never saw many so large, although I have caught, or seen caught, many thousands of crayfishes.

The carapace is granulated, and the regions are well marked; the rostrum is pointed, with a spine on either side. The first pair of legs, or "claws," are massive and nearly equal in size, but often through injury they are very unequal, as is the case with marine crustaceans; the second and third pairs of legs are didactyle, and their owner makes very good use of them when foraging about at the bottom of his native brook.

The eggs of this species are very large in proportion to the animal, consequently there are fewer of them to one parent than is the case with most other crustaceans; in fact, the eggs of *Astacus fluviatilis*, an animal four inches in length, are individually about four times the size of the eggs of the Sea Crayfish, *Palinurus vulgaris*, which is an animal reaching a foot in length, but which has reached (as I have measured) the enormous size of over two feet from rostrum to tail. But the number of eggs carried by the latter is tremendously in excess of the number carried by the former, and the reason is, I think, not far to seek. The Sea Crayfish, in consequence of its habits and surroundings, is at a great disadvantage in propagating its species, for considering what its zoea is, and also that it is a favourite food, until it is old enough to fight its own battles, for a number of fishes and other natural enemies, the wonder is that any reach maturity at all. *Astacus fluviatilis* has more victims than enemies; the narrow water-courses in which it lives contain but few foes, perhaps the only one being fish, and, so far as I have noticed, fish were not abundant in crayfish-brooks; besides, the Crayfish burrows into the clay-banks of its brook, and, as we have already seen with regard to the marine Crustacea, burrowing species carry but few ova.

As Prof. Huxley remarks, *Astacus fluviatilis* is usually found in water-courses of a calcareous district, especially when such

streams cut through a clay deposit. The spot where I have seen and caught them is Cricklade, in Wiltshire, where there is a good deal of water in the shape of brooks and swiftly-running streams which cut their way through the Oxford-clay of the oolitic limestone formation. Most of these brooks have steep banks, and the bottoms instead of being weedy, are often stony, so that these creatures are thoroughly at home. Plenty of running water, shade, coolness, and cover, but I do not think there is always plenty of food, for they must propagate to an enormous extent, judging from the fact that I once caught seven hundred in one evening in a small length of brook, and I have often heard of big hauls being made night after night in the same spot, and they never seem to get "low," so to speak.

I will briefly describe a "crawl-fishing" expedition. Having procured a dozen or more "nets" (a piece of string netting of small mesh stretched across an iron hoop about a foot in diameter, suspended horizontally by string), and a large piece of raw bullock's liver, we started off just before sundown, to a favourite brook. Having selected a convenient stretch of brook for the evening's fishing, we baited each net by tying a small piece of liver as firmly as possible to the centre, and lowered the nets into the middle of the brook, running them out over a forked stick, for any splashing or disturbance is to be avoided, and marking the position of each string by a piece of white paper pegged into the bank.

The nets having all been lowered into the brook about twelve or twenty feet apart, we proceeded to number one, for it was now almost dark, and hauled it up, using the forked stick for this purpose. Two or three crustaceans were on the net, which showed us they were "running," and after working the nets for an hour or two we find we have bagged perhaps three hundred brace. It is a curious fact that although crayfishes may be well on the "feed" one evening, it will be impossible to get a single one on another, when circumstances are apparently similar. I have often noticed this apparent anomaly in connection with sugaring for moths. But when *A. fluviatilis* is "running" freely, then it is indeed sport. I have myself hauled up a net which was literally piled up with a mass of about twenty crayfishes struggling to get at the bait. A friend

of mine once caught fifty-three crayfish with a rod and line baited with worms.

A curious way to keep the crustaceans from dying, when put into the basket of the fishermen, is to put a handful of stinging-nettles in with them. I could not account for this fact at all, although, of course, most crustaceans will live for a long time in a moist atmosphere; in fact, if a crayfish be suddenly placed into deep water, after having been for a short time out of that element, it will probably die.

Wishing to test the theory of the nettles, I had some crayfishes sent to me at Croydon, and they reached me healthy and vigorous, packed in nettles. I placed two or three of the strongest in a tub of water (tap water, not river water); in an hour they were dead. The remainder I placed in an open hamper with some nettles; I was careful that the nettles were not wetted, but just as they were gathered. The crayfishes lived for several days, but ultimately died one by one, the nettles being renewed every few days; one specimen, however, lived for the comparatively long period of twenty-two days without a drop of water or any food, but simply supplied with the nettles.

Another *Astacus*, which I obtained subsequently, lived for nearly a year in water an inch and a half deep, with mud at the bottom and a broken flower-pot as a hiding-place, into which it retreated backwards, guarding the entrance with its massive claws. It was a very fine specimen, and did not exuviate its shell. It fed freely on worms, but unfortunately died from a sudden increase of temperature in the early part of the summer, which prevented my keeping its little pond cool enough. Prof. Bell relates an interesting anecdote of a "domesticated crayfish."

Although this crustacean is "not highly esteemed" in this country, I think it must be due to the fact that to be appreciated it must be boiled as soon as captured, and eaten as soon as boiled. On the Continent it is much more largely used, as travellers there are well aware. I believe it might be successfully farmed in this country, if ever a free demand sprang up for it: for with judicious feeding and preservation I do not think that twenty or thirty thousand would be an unreasonable number to expect from one brook in a season.

(To be continued.)

ORNITHOLOGICAL NOTES FROM DEVON AND CORNWALL.

BY JOHN GATCOMBE.

THE following notes made by me during the past year may be of interest to your readers. On January 1st I examined a curious hybrid between a domestic fowl and common Pheasant, killed in a wild state at Membland, on the eastern side of the River Yealm, the property of Mr. E. C. Baring. It was a remarkably fine bird, weighing within one ounce of six pounds. The plumage exhibited equally the characters of both species. The keeper, who shot the bird, said there were several similar specimens in the covers, but he thought none so large as the one here described. He considered it to be a cross between the Game-fowl and Pheasant, but from its markings I should say it was more likely to be a hybrid between the Pheasant and "Gold-spangled Poland," especially as it showed an unmistakable sign of a crest; but this, of course, is only surmise on my part. Strange to say, it had a very large and long spur on one leg only, the other leg being similar to that of an ordinary hen Pheasant.

In the Plymouth Market about this date I saw a Woodcock with five toes on one foot, the hinder toe having another quite perfect growing from it. I also observed another with several pure white feathers at the back of the neck.

Plymouth Sound, towards the end of January, was full of Razorbills, Gulls, and Scoters. On the 28th, after a severe gale, there were three immature Black Redstarts about the rocks at the Devil's Point, Stonehouse, amongst them an adult male with black throat, breast, and white patch on the wing.

On January 31st a Cornish Chough was brought to the Stonehouse birdstuffer, making unfortunately the fourth trapped in a gin within two months. The stomach of this bird contained the remains of beetles and some fine sand. A few days later I observed, through a powerful telescope, a curious malformation in the beak of a Jackdaw, the upper mandible being so short that it did not extend beyond the ends of the feather covering the nostrils, the lower one being apparently of the usual length. The bird seemed to be in good condition, and after a while flew

down from a tree on which it was perched to feed with others on the mud-flats and sea-shore.

On February 2nd two Hawfinches were brought from Car-green, near Saltash, by the side of the River Tamar. Their stomachs were filled with fragments of the kernels and shells of some stone-fruit. After some severe gales many Great Black-backed Gulls made their appearance in the harbour and Sound. Kingfishers were numerous, and I saw a fine adult bird of this species which was knocked down by a boy with a stone. On February 28th there were more Black Redstarts on the coast, and I observed *Larus ridibundus* with a complete black head.

On March 1st Waterhens were in full breeding-dress. By the 10th the Chiffchaff was to be seen at Brent, and on the 11th I remarked a Wheatear at the Devil's Point. This I consider a rather early appearance. The wind at the time was S.W., and the weather mild. On the 21st an adult male Peregrine was killed at Wembury, close to the breeding-place of the Herring Gulls, where a pair used annually to nest. The stomach contained no food, but several long, thin, white intestinal worms. On the 22nd an immature Red-throated Diver was obtained, a species now becoming very scarce on our coast. On the same day the Chiffchaff was seen and heard singing in a small garden, or rather court, quite in the centre of the town. By the 28th the Blackcap was also in full song, and the Corn Crake also was heard.

On April 4th I purchased, in Plymouth Market, a common Ringdove, which at that late date did not show the least sign of the usual white patch, nor green metallic tint on the side of its neck; the whole plumage, too, being suffused with a strong tinge of brown leads me to suppose it must have been one of a very late brood of the previous year.

About this time our birdstuffer received a Common Buzzard, a Merlin, and a Lesser Spotted Woodpecker for preservation, all of which were killed in the neighbourhood.

Mr. Stephen Clogg, of Looe, informed me that on May 5th he observed Swifts for the first time, and I saw some myself the following day at Plymouth. Five Dotterels (*Eudromias morinellus*) were sent for preservation from Dorset, in which county they were obtained. There were eight in the "trip" or flock, five of which were killed in two shots. On examination I found

their stomachs crammed with the remains of small beetles. Our birdstuffer also received two adult Turtle Doves, two pied Blackbirds, and one pretty variety of a young Rook. At Brent I remarked some young Dippers apparently as large as the old ones. When watching this bird through a powerful telescope I have often been struck with the singular habit it has of continually winking its eyes, the white under lids rendering the action very conspicuous, and causing the incessant twinkling, as it were, to appear quite in keeping with the white froth and bubbling water rushing past the rock on which it stands.

On June 20th I visited the breeding-station of the Herring Gulls at Wembury, on the western side of the River Yealm, and found that about the usual number had nested there; but few young ones were to be seen, as they had grown large enough to hide themselves on our approach. There is another colony of breeding birds close to Rhame Head, on the Cornish coast, not far from Plymouth.

Swifts were very plentiful during the month of July; Swallows, on the contrary, were scarce. I examined a Swift which had fallen dead in the street after having struck against a telegraph-wire. On the 10th a Great Spotted Woodpecker was brought to our birdstuffer for preservation.

On August 5th I examined a greyish buff variety of the Spotted Flycatcher, which showed no trace of the usual dark markings on the head and breast. On August 29th a Storm Petrel was captured which had lost the inner toe and web of one foot. The same day, on visiting Penzance, I saw, at the shop of Mr. Vingoe, a Manx Shearwater in the flesh, which had just been brought from Scilly.

On Sept. 19th a Common Buzzard was obtained near Plymouth, and a Sparrowhawk was captured in the middle of the town, having dashed at a Goldfinch in a cage. On the 25th a pretty variety of the Hedgesparrow was obtained. The head and back of the neck were pure white; the thorax and under parts of the usual colour; the back, wings, and tail much diversified with white; bill and legs yellowish white. On the 29th a Greenshank was forwarded from Wadebridge, Cornwall. The stomach contained the remains of a small shrimp.

NOTES AND QUERIES.

MAMMALIA.

Note on a Weasel and Wren.—On the afternoon of the 23rd November last I watched a Weasel running about on a garden lawn at Northrepps, and examining in succession the roots of the standard roses and other shrubs planted at intervals on the grass. This operation evidently excited the attention of a Wren, which perched on every bush visited by the Weasel, flying to each immediately the Weasel reached it, but not pursuing the animal on the open grass. This continued for some minutes till the Weasel and Wren both disappeared in an adjacent plantation.—J. H. GURNEY (Northrepps Hall, Norwich).

The Greater Horse-shoe Bat not a Yorkshire Species.—With reference to the editorial note at p. 483 of 'The Zoologist' for December, I may say that the bat which Mr. James Carter took at Carperby, in Wensleydale¹, was not this species, but the Great Bat, or Noctule, a species which is by no means uncommon in Yorkshire. Mr. Carter most kindly sent me the specimen for inspection soon after he obtained it. The Berkshire record would therefore appear to be about as far north as the species ranges in Britain.—WILLIAM DENISON ROEBUCK (Sunny Bank, Leeds).

BIRDS.

Hybrid Wagtails.—In the course of several visits to Mr. Swaysland, during a recent stay at Brighton, I saw, among his large collection of stuffed birds, three very remarkable ones, of which he kindly permitted a full examination to be made. There is no doubt that they are hybrids between the Grey Wagtail (*Motacilla melanope*, Pall.) and the Pied Wagtail (*M. lugubris*, Tem.), bred in the aviary of Mr. T. J. Monk, at Lewes. The first cross was between a cock Grey Wagtail and a hen Pied Wagtail; the second cross between the male hybrid so bred and a hen Pied Wagtail. Only one of the first cross seems to have been preserved. Though certainly more like a Pied than a Grey Wagtail, its plumage furnishes irrefutable evidence of the hybridism. It is a rather larger bird than a Pied Wagtail, and its tail is longer. The throat and chin are white, while on the upper part of the breast there is a narrow semicircular gorget of black spots, below which comes a wash of bright yellow, and a tinge of the same colour extends to the belly. The progeny of the second cross are just like young Pied Wagtails in autumn, but with a little more yellow tint suffused about the plumage. If it is possible to carry inter-breeding to such an extent in the Wagtails, a genus of birds not previously known to have

interbred, why should there not be frequent hybridism in a state of Nature among many birds which have never been suspected of it? Who could possibly distinguish a hybrid between the Pied Wagtail and the White Wagtail, the Chiffchaff and the Willow Wren, or the Lesser Redpoll and the Mealy Redpoll, when the birds themselves are almost indistinguishable? Although the first cross in Mr. Monk's hybrid Wagtails bespoke its origin in its plumage, the second cross showed very little signs of it—practically none at all. In the same way, hybrid Ducks, which not only did not show their origin, but which did not show hybridism at all in their plumage, have been bred in confinement. These have been male or female, neither sex preponderating, and such birds, for aught one can say, may often occur in a state of freedom.—J. H. GURNEY, jun. (Northrepps, Norwich).

Cuckoo Flying at Night.—On the morning of July 12th a Cuckoo was found dead in our garden; during the previous night he had flown violently against the stay ropes of a tent which is pitched, during the summer months, in front of our house. He was not damaged in any way externally, except that most of the feathers of the gullet were rubbed off; but, on dissection, the brain and all the internal organs of the body were found to be gorged with blood. This was the apparent cause of death, as no local injury could be detected. The bird was a young male of the fleeting year, and was probably on its annual immigration, which, from this occurrence, appears to take place during the night.—A. MATTHEWS (Gumley, Market Harborough).

Nesting of the Dipper.—Referring to Mr. Edward's interesting account of a Dipper or Water Ouzel's nest on a boulder (Zool., 1884, p. 468), I may state that a few years since a pair of these birds built their nest in a similar situation here, on a large mossy boulder in the middle of a rapid stream in the River Burn. The nest was about a foot and a half from the surface of the water; and, to the best of my recollection, the young were reared in safety, though a freshet would have swamped the structure. In 1883 I found a nest built in the fork of a small tree which overhung the river, a situation I have never previously heard of. The nest was placed about seven feet up the trunk, which was covered with moss, but, owing to the angle at which the tree leant across the water, the nest was only about four feet from the surface. It was not in any way worked round the branches but simply rested in the fork, and was of unusually large size. Water Ouzels build, year after year, within a few yards of some chosen spot for which they seem to have a great liking. I have seen a nest built on the face of a perpendicular bare scaur, where the green nest was, when first erected, a very conspicuous object, owing to the want of surrounding vegetation; but as the materials withered and

became soiled by the washing and dropping down upon it of small portions of the cliff, it might easily have been passed unnoticed. Another singular site for a Dipper's nest was between two beams of a sluice, over which pedestrians constantly passed. In this instance, again, the nest showed very prominently, yet frequently escaped observation owing to its very conspicuousness; and the young would, in all probability, have flown in safety had not some four-footed thief discovered the nest and sucked the eggs.—THOMAS CARTER (Burton House, Masham).

Lesser Black-backed Gull and Rock Dove on the Yorkshire Coast.
—My friend Mr. Carter's excellent paper in 'The Zoologist' for November last leads me to offer a few remarks. As regards the breeding of *Larus fuscus*, he alludes to having seen a few eggs in the possession of some climbers returning from their day's work. Again (p. 447), he mentions having seen a pair of these birds at the end of June on the Filey range of cliffs. Neither of these circumstances furnishes sufficient evidence that this Gull has bred on the Yorkshire coast, and the fact remains to be proved. The first item of this circumstantial evidence, above referred to, is eminently unsatisfactory, as has been already pointed out by the Rev. Mr. Tuck (Zool., Dec., p. 485); while the fact of the presence of this species on our coast in summer is alluded to by me in the 'Handbook of Yorkshire Vertebrata' (p. viii); and if this were to be considered evidence of breeding, then, by the same method of argument, we must consider the Common Scoter and the Red-throated Diver to be also breeding species. I should not, however, be at all surprised to hear that the Lesser Black-backed Gull did occasionally breed on the Yorkshire coast, but, as yet, there is no satisfactory evidence that such is the case. As to the Rock Dove's eggs obtained by Mr. Carter being undoubtedly those of that species I do not feel at all sure. It is rather singular that in so good a list of species as he has given for the district no mention is made of the Stock Dove, a bird which is now very numerous in the range of cliffs visited by Mr. Carter. These facts make it not at all improbable that the Stock Dove's presence was overlooked; and, if such were the case, then, unless the parent bird was identified on leaving its eggs, it would be difficult indeed to say to which of the two species his eggs belong.—WM. EAGLE CLARKE (Leeds).

Hybrid Black Grouse and Pheasant.—Major Gregory Knight, of Leicester, has recently presented to the Leicester Town Museum a beautiful cross between a Black Grouse and a Pheasant, which he shot on 18th November, on the property of Mr. John Jones of "The Groves," near Craven Arms, Shropshire. As it arrived in the flesh I was enabled to make a thorough examination of it. It weighed $3\frac{1}{4}$ lbs., and measured in length (from tip of beak to end of middle or longest tail-feathers) 25

inches; culmen, a little over 1·1 inch; wing, from carpus to tip, 10·25 inches; tail, 8·75 inches; tarsus, 2·50 inches; middle toe, 2·25 inches (excluding nail). Sex (by dissection), young male. The crop contained—amongst other ordinary food—acorns. The legs and toes resemble those of a Pheasant in colour, shape and size, and are feathered in nearly the same manner, the feathers ending just below the tibio-tarsal joint, and not continuing on the front of the tarso-metatarsus to the toes, as in the Grouse. Broadly speaking, this handsome bird may be described as being most like a Black Grouse in the head, neck, and breast, and like a Pheasant or Game-fowl in the wings, tail and legs. The weight and dimensions are beyond those of an ordinary Black Grouse, and especially is this observable in the breadth of the wings and the length of the neck (this was remarked on by Major Knight when the bird was first shot). The figure on page 311 of Yarrell's 'British Birds' (1st edition), that of a hybrid killed in 1839, by Lord Howick, near Felton, in Northumberland, might, curiously enough, be an exact representation of the present specimen; and the colour of another specimen mentioned on page 310 describes it almost accurately. I am disposed to think that the male parent was a Pheasant, possibly a ring-necked one, from the fact of four or five small white feathers appearing on the neck of the hybrid.—MONTAGU BROWN (Curator, Town Museum, Leicester).

Wryneck nesting in a Sand Martin's Burrow.—About the end of June last Mr. L. W. Bartlett visited a colony of Sand Martins which have their burrows in the side of a small sand-pit on Tadmarton Heath. As he was about to put his hand into one of the holes a brown bird flew out very quickly and entered some bushes near at hand. At the end of the burrow he found seven pure white eggs in a very slight nest of dry grass (probably an old Martin's), and considerably incubated. He showed me some of the eggs a few days afterwards, and I told him I thought they were Wryneck's, but, as the position of the nest was curious, I asked him to let me submit one of them to a competent authority. I therefore herewith enclose it for your inspection. Mr. Bartlett was unable to get another sight of the bird although he watched for a considerable time.—OLIVER V. APLIN (Great Bourton, Oxon).

[In size and shape the egg sent certainly resembles that of a Wryneck.—ED.]

The Birds of the Burlings.—With reference to Major Feilden's note on the Burlings (p. 470), I may state that I have before me an extract from the 'Boletim' of the Geographical Society of Lisbon (4th series, No. 9, pp. 409-452), giving an account of a botanical excursion to these islands in May, 1883, by M. J. Daveau, to which is appended a zoological notice of the group by M. Albert A. Girard, assistant in the Zoological

Museum of Lisbon. M. Girard, from information obtained through M. Daveau, from Senhor Alfredo B. da Silva, the principal lightkeeper on the Berlenga Island, and who has been resident there several years, gives the following list of birds which are known with certainty to frequent the Berlengas and Farilhoes groups. The Portuguese names are given with each:—

1. *Ruticilla tithys*, Scop. "Rabiruivo." Berlenga; very common.
2. *Upupa epops*, L. "Poupa." Berlenga; rare.
3. *Corvus corax*, L. "Corvo." Berlenga; a few.
4. *Passer domesticus*, L. "Pardal." Berlenga; very common.
5. *Columba palumbus*,* L. "Pombo bravo." Berlenga; rare.
6. *Turtur auritus*, Gray. "Rola." Berlenga; not common.
7. *Scolopax rusticola*, L. "Gallinhola." Berlenga; rare.
8. *Uria troile*, L. "Airo." Berlenga, Farilhao grande, &c.; common.
9. *Mormon arcticus*, L. "Gallo do mar." Berlenga; in small numbers.
10. *Phalacrocorax carbo*, L. "Corvo marinho, Galleta." Berlenga, Farilhao grande, &c.; very common.
11. *Larus argentatus*, Brunn. "Gaivota." Berlenga, Farilhao grande, &c.; very common.
12. *Puffinus kuhlii*, Boie. "Pardella." Berlenga and Farilhao grande; not very common.

Nos. 1, 5, 8, 10, 11 and 12 are stated to breed, and doubtless also No. 4 does so. Besides these twelve species thirteen others are named, which do not seem to have been exactly identified by M. Girard; but he states that if they are known at the Berlengas by the same name as in the neighbourhood of Lisbon, they are as follows:—*Muscicapa grisola*, rare; *Phyllopeste* sp., common; *Motacilla alba*, common; *Ædicnemus crepitans* and *Charadrius pluvialis*, rare; two other species of *Charadrius* which are abundant; *Vanellus cristatus*, rare; *Numenius arquata*, increasing in number; two species of Gull, viz.: *Larus marinus* and *L. fuscus*, the latter also found in small numbers at Farilhao grande; also two other rare species known under the local names of "Furabrichos" and "Turrãos." M. Girard states that bats have not been observed by Senhor da Silva.—J. J. DALGLEISH (Edinburgh).

Singular Death of two Magpies.—I can vouch for the accuracy of the following statement relative to the death of two Magpies, apparently from broken hearts. In early spring two Magpies built in a poplar tree in a small orchard situated in the Parish of Gunwalloe, Cornwall. The two birds, however, made such a noise that the proprietor of the orchard, who dwelt close by, destroyed the nest and its contents, namely six eggs. The

* Probably *C. livia* is the species here intended.

birds, nothing daunted, built a second time, and laid five eggs. The annoyance of their noisy throats, however, caused the proprietor to cut the tree down. The birds then retired to a neighbouring orchard and built a third time; but, the nest being again destroyed, they returned to their original nesting-place, and for the fourth time built in a thorn tree; there, for a time, they seemed to defy the spoliator, until some boys managed, with great difficulty, to get at the nest in the thorn and destroy it and its six eggs. This was on May 15th. On the 16th the proprietor was walking in the garden, and under the very tree where the Magpies last built he found both birds quite dead, side by side. They wore a perfectly natural appearance, not a feather displaced or ruffled, and there was no other assignable cause than that above stated to account for death. It is only fair to the proprietor to add that it was no feeling of cruelty that induced him to destroy the nests, but simply to stop the unceasing noise which the birds made.—EDMUND RUNDLE (Porthleven, Helston).

Chiffchaff in Ireland in Winter.—On the 21st of November last I shot a Chiffchaff while it was flitting about the branches of a fir tree. I was at the time watching a party of Golden-crested Wrens busily engaged in search for insects, when a Chiffchaff appeared on the same tree, and I shot it to make sure of the species. On the 20th of January, 1883, an unusually fine and mild day, I heard a Chiffchaff in full song, in a grove of trees near the village of Glandore. These two instances of its occurrence in winter go far to confirm Yarrell's supposition "if, indeed, it ever entirely leaves the island."—C. DONOVAN, JUN. (Westview, Glandore, Leap, Co. Cork).

Spoonbill on the Devonshire Avon.—A bird of this species was seen on the morning of November 4th standing motionless by the water's edge, below the Weir at Aveton Gifford, and some time elapsed ere Mr. Ellis (the lessee of the Salmon fishery) returned with his gun and shot it. The plumage indicates a bird of the year, and its trachea lacks the figure-of-eight convolutions peculiar to the adult. Its sex is female, and, from the perfectly empty condition of its stomach, it had evidently not fed for some time.—E. ELLIOT (Kingsbridge, Devon).

Domestication of the Partridge.—Towards the end of October I saw a remarkable instance of the tameness to which Partridges may be brought with care and patience. The birds, two in number, were hatched by a Bantam, and successfully reared by Mr. James Emerson's gardener at Easley Hall, Cleveland. For several weeks they have lived in a walled garden, following the gardener about while he attends to his duties, and have become so tame as to allow strangers to approach within a yard of them. They feed regularly out of the gardener's hand, and even took food from a lady who was a comparative stranger to them. Until recently they

showed no desire to leave the garden ; but shortly before I saw them they were frightened by a cat, and since that time they have flown out to roost, returning at daylight to receive their breakfast.—T. H. NELSON (Redcar).

Variety of the Wild Duck.—When shooting near Adderbury, Oxon, on October 4th, we bagged a curious light-coloured variety of the Wild Duck (*Anas boschas*, female). The ordinary brown is everywhere replaced by various shades of buff, and the light-coloured markings are much paler than usual. The white of the wing-lining is strongly tinged with yellow, and the same tint is noticeable on many of the light-coloured feathers. Primaries stone-coloured, with the inside webs, except the tip, nearly white ; legs and beak perhaps a little lighter and brighter than usual. The bird rose from the swere with a normally coloured one, which afforded us the means of at once noting the stranger's peculiarities by comparison.—OLIVER V. APLIN (Great Bourton, Oxon).

Late nesting of the Yellowhammer.—On September 10th, while Partridge shooting, and looking for a wounded bird, I found a Yellowhammer's nest, in a gorse-bush, containing three eggs and two young birds.—T. N. POSTLETHWAITE (Hallthwaites, Millom, Cumberland).

Spotted Redshank in Co. Sligo.—On the 8th October last, when passing along the Scurmoreshore in my gunning punt, I observed a Spotted Redshank, *Totanus fuscus*, in the company of two Greenshanks. I passed within about twenty yards, but not having my small gun with me I was unable to secure it. When paddling past the same place, on the 14th, I met with the bird again, in company with two Greenshanks, probably the same pair. I followed them for nearly a mile along the shore, and although I several times got within range I was unable to fire, the punt being too unsteady in the rough water. However, at last I got, as I thought, a fair shot, and fired, but missed the bird, which after all got off uninjured.—ROBERT WARREN (Moyview, Ballina).

Wildfowl Decoys.—May I ask your readers, through you, if any interested in the subject will supply me with the names and positions of past and present wildfowl decoys in our Islands. Though I have a large amount of plans and sketches, and many hundred letters, about Decoys, still there may be much information I have not yet received. I think that Decoys deserve a standard work, and this want I hope to supply.—RALPH P. GALLWEY (Cowling Hall, Bedale).

Breeding Habits of the Hooded Crow.—Hooded Crows breed in this neighbourhood in considerable numbers. Several pairs this season frequented some low-lying meadows called the Coolfin bogs. They are by no means gregarious in the breeding season, and hardly so at other times about here ; although I once saw eight of them feeding together in

a field, a considerable distance, usually at least the breadth of a field, separated their nests. All the nests I saw, except two, were built in very low whitethorn bushes, on an average about seven or eight feet from the ground.—W. W. FLEMING (Clonegam Rectory, Portlaw, Co. Waterford).

Crossbills in Co. Cork.—On the 13th and 30th of November last two small parties of Crossbills—consisting of two and seven birds respectively—visited some Scotch Firs close to this house. I shot four of them, two in red and two in green plumage. They were very tame, particularly on the last occasion, when they took no notice of the report of the gun, but remained on the tree; and it was not till I had thrown two or three stones into the tree that they at length flew away. I heard them again among the firs on the 1st of December, and on the 2nd I saw two of them flying over my head, going in the direction of a fir wood. I heard Crossbills last year in a grove of silver firs close to Myross Wood. I was not sure at the time what birds they could have been, but now, since I have heard the notes of the Crossbill, I have no hesitation in saying that they were of that species.—C. DONOVAN, JUN. (Westview, Glandare, Leap, Co. Cork).

Black Redstart in Oxfordshire.—On the morning of November 7th I watched for some time a Black Redstart which was enjoying the sunshine on some walls and heaps of stones near here. The bird seems rarely to have found its way into this county. Judging by the very dark colour of head and neck, I think this specimen was an old male. I have not been able to discover it a second time.—W. W. FOWLER (Kingham, Chipping Norton, Oxon).

Short-toed Lark in Kent.—Passing, by chance, a bird-catcher's shop, I stepped in to ask the owner if he had ever caught any rare birds. He told me that in June, 1883, he had caught, near Orpington, in Kent, a peculiar lark which no bird-stuffer or bird-catcher of his acquaintance had been able to name. The bird died, but he had it preserved, and showed it to me, when I found it to be the Short-toed Lark, *Alauda brachydactyla*, Leisler. The bird-catcher kept it for some time; and it soon became accustomed to confinement; but, unfortunately, died soon after completing its moult. "Its song," he remarked, "resembled that of a Sky Lark, but was more varied."—THEO. FISHER (Erfurt Lodge, Greenwich).

Hairy Variety of the Moorhen.—A specimen of the hairy variety of the Moorhen, *Gallinula chloropus*, was procured on the 13th of October last at Claughton, Lancashire. Owing to the hair-like nature of its wing-feathers it was unable to fly, and was caught by a little boy and brought to me. The ends of the longer wing-feathers have been worn away, presumably by its efforts to fly. In the 'Transactions of the Norfolk and

Norwich Naturalists' Society,' vol. iii., part 5, there is an interesting article on this singular variety by Mr. J. H. Gurney, jun., from which it appears that the specimen now under notice is the first which has been met with in any of the northern counties of England. In general appearance and colouring it resembles the specimen figured by Mr. Gurney in the above-mentioned publication.—W. FITZHERBERT-BROCKHOLES (Claughton-on-Brock, Garstang).

Tree Sparrow in South Devon.—Three specimens of this bird were seen, and two of them shot, early in the month of November near here. They were identical in plumage, but proved to be male and female. So far as I can ascertain, this is the only instance of their having been obtained in this portion of the county.—E. ELLIOT (Kingsbridge, Devon).

[The Tree Sparrow, according to previous writers on Devonian Ornithology, has occurred at Plymouth, St. Budeaux, and Bicton in South-East Devon, and it is also met with occasionally in Cornwall and the Scilly Islands. There is, perhaps, nothing very remarkable in its appearance at Kingsbridge, except the fact that it had not previously been noticed there.—ED.]

The Migration of Birds on the West Coast of England.—Having been elected a member of the British Association Migration Committee I have had assigned to my special charge the West of England and Wales. In order to make my report as complete as possible, I appeal to ornithologists and others to assist by sending me their observations (however scanty they may be) on the migratory movements of all species, or on the occurrence of rare or uncommon birds within the region during the spring or autumn of the present year. The notes, where possible, should be accompanied by observations on the direction of the wind and the state of the weather during the observations of migratory movements, or immediately preceding the occurrence of uncommon species. Notes received will be incorporated with those from the lighthouses and lightships. All assistance will be fully acknowledged.—WM. EAGLE CLARKE (18, Claremont Road, Headingley, Leeds).

Breeding-places of the Gannet.—I believe I am accurate in saying that the Gannet does not breed at any British station where man is permanently resident. Every British station is an island, and they are all uninhabited. In 'The Zoologist' for December (p. 477) I am reported to have said the very reverse of this, an error which I desire to correct.—RICHARD M. BARRINGTON (Fassaroe, Bray, Co. Wicklow).

[We do not think our correspondent is quite correct in his assertion. Lundy Island is inhabited; so formerly was the Bass Rock; both are well-known breeding haunts of the Gannet.—ED.]

Lesser White-fronted Goose in Leadenhall Market.—On November 14th I saw a Lesser White-fronted Goose (*Anser erythropus*) in Leadenhall Market. The bird, I was told, had been received from Holland. Is it not unusual for this species to occur so far west? There were two specimens of *Anser albifrons* in the market the same day; it was therefore not easy to mistake the two species.—THEO. FISHER (Erfurt Lodge, Greenwich).

The Garden Warbler in the Færoe Islands.—*En route* for Iceland by the Danish royal mail steamer 'Thyra,' in September last, along with my friend Mr. James Backhouse, jun., we made the usual call at Trangisvaag, Thorshavn, and Klaksing. At the two first-named places we spent some hours on shore with our guns, and, singularly enough, at both these places we observed single specimens of the Garden Warbler (*Sylvia hortensis*), which, I believe, has not been hitherto noted as occurring in these islands. On September 4th, at Tvera (Trangisvaag), on the island of Suderoe, the first bird was seen, at a distance only of a few feet, busily searching for food on some low herbage. It was so close to the houses that we did not care to shoot it. On being disturbed it flew away and was lost. The one seen at Thorshavn on the following day was feeding on red currants in a small sheltered garden on the outskirts of the town. This I watched for some minutes with my binoculars, and am quite positive as to the identification of the species.—WM. EAGLE CLARKE.

FISHES.

Electric Ray at Porthleven.—The recent capture of a Torpedo, or Electric Ray, at Porthleven, near Helston, afforded me an opportunity of trying one or two very interesting experiments. This fish was captured on the 15th of October last on the exact spot where two Torpedoes were captured in 1883. It was a large specimen, weight about half a hundred-weight, length $3\frac{1}{2}$ feet, caudal fin 10 inches across. The capture was effected by means of a "drag-in" seine, and the fish kept alive until I reached the spot by tying a long cord to the tail and allowing it to remain in deep water. Experiments were first made to test the strength of the galvanic stroke. I placed my foot for an instant on the creature's back; immediately a severe shock was transmitted. Others then experimented; each individual received violent shocks. It was most interesting to note that the shocks were only given at the animal's will. Sometimes there was a delay of half a minute and no shock, but when it came it was very powerful. The smaller boys present seemed very susceptible of the stroke. Next an electric bell I brought with me was connected thus—a piece of zinc was attached to each of the wires leading to the bell; one plate was placed on the torpedo, the other underneath; the result was anxiously watched. To our great gratification the bell sounded distinctly. This did not continue long, for the torpedo was nearly exhausted. No

further experiments could be made, for the Torpedo ceased to evolve any electricity after this. On examining the mouth, the tails of two fishes were seen. On extricating them they proved to be a large bass two feet long and a conger two feet and a half in length. This last circumstance affords proof of the destructive powers of this most remarkable of the electric fishes.—ED. RUNDLE (Porthleven).

Food of the Common Cod.—On 24th November last I took out of the stomach of a Common Cod caught in Mounts Bay, the half-shells of several bivalves, all of the species "Pecten"; three or four little rounded pebbles of unstratified slate, one of them covered with a coralline formation; the half-digested remains of some small fish, too far gone for identification; and a mass of small crabs, out of which I was able to select the remains of forty sufficiently perfect for identification. I found *Xantho florida* and *X. rivulosa* (which I believe to be the same Crab) in the greatest numbers. More than one half were of this species. There were two specimens of the Wrinkled Swimming Crab (*Portunus corrugatus*), two of the slender Spider Crab (*Stenorhynchus tenuirostris*), a fragment of a small Common Crab (*Cancer pagurus*), two specimens of the minute Dwarf Crab (*Porcellana longicornis*), two of the Dwarf Swimming Crab (*Portunus pusillus*), and eight distinct carapaces (some with claws, some with legs, and some without either) of that exceedingly rare Crab the Slender-legged Spider Crab (*Inachus leptochirus*). I had never seen this species before; but, on comparing the eight specimens with Bell's description and figure, the identification was absolutely certain. Two of the males were sufficiently perfect to show plainly and unmistakably the "round polished tubercle on the thorax which somewhat resembles the half of a pearl" (Bell). It is to be noted that in the whole contents of the stomach of the Cod—those which I threw away as well as those which I was able to identify—I found no trace of the remains of any shrimps or of any of the little lobster-like Crustaceans (*Galathea*, *Munida*, *Scyllarus*, &c.), which, we know, are abundant in Mounts Bay. I need hardly say that none of the specimens were in a state fit for preservation.—THOS. CORNISH (Penzance).

ANNELIDS.

Collections at Jersey.—We hear that Messrs. Sinel & Co., marine zoologists of David Place, Jersey, are now sending out to museums and collectors some remarkably fine and rare Annelids obtained from their coasts. They also have one of the finest series of Crustaceans ever offered to naturalists, and their microscopic preparations of the early life-stages of these and other marine forms attract, we understand, much attention, being comparatively new objects to microscopists. Messrs. Sinel are fortunate in having selected so favourable a locality, the fauna of which they are so assiduously investigating.

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

November 20, 1884.—Prof. P. MARTIN DUNCAN, F.R.S., Vice-President, in the chair.

Mr. A. Roope Hunt, of Torquay, was elected a Fellow of the Society.

Mr. F. M. Campbell exhibited a Dragonfly caught in September on the left bank of the Dordogne from a flight of Dragonflies which were taking a south-easterly direction; numbers were observed passing continuously for an hour and a half. He also drew attention to the steady progressive movement of the Humming Bird Hawk Moth when placed on its back.

In a paper entitled "Notes on the habits of some Australian Hymenopterous Aculeata," by Mr. H. L. Roth, the author states that the wasps of the genus *Pelopæus* (*P. ætus*) build their nests on the walls, ceiling, legs of chairs, under the table, in cupboards, vases, between pictures and the walls, on curtains, and in all sorts of crevices in the house, or on the roof. No place is safe from their intrusion. When a cell is completed the wasp goes in search of spiders, and, seizing these, packs their half-dead bodies in the cell, lays an egg and closes the cell top. Afterwards rows of cells are added to the primary one, and dealt with in the same fashion, generally finishing with a streaked coating of mud, to conceal the real contents beneath. Of the Australian ants, *Formica rufinigro* is numerous, bold and destructive; it destroys the web of certain caterpillars, and thereupon wriggles them out to fall a prey to a host of attendant warrior ants.

December 4, 1884.—WILLIAM CARRUTHERS, F.R.S., Vice-President, in the chair.

The following gentlemen were elected Fellows of the Society:—The Hon. F. S. Dobson, LL.D., of Victoria, Australia; William A. Haswell, M.A., of Sydney, N. S. Wales; George W. Olfeld, of London; Dr. George W. Parker, of Honolulu; Michael C. Potter, M.A., of Cambridge; Vet. Surg. Thos. J. Symonds, of the Madras Presidency; W. A. Talbot, of Yellowpore, Bombay; and J. M. Thompson, of Melbourne, Australia.

A paper was read by Dr. Francis Day on the "Relationship of the Indian and African Freshwater Fish-Fauna." In this communication the author refers to certain papers of his read before the Society on previous occasions; but he more particularly deals with the differences shown between his own statements therein and those subsequently enunciated by Dr. Günther in his "Introduction to the Study of Fishes." Dr. Day is inclined to believe that in the consideration of Indian fish-distribution there seems a possibility that certain marine forms; for example,

the Acanthopterygian *Lates*, the Siluroid family *Ariinæ* and others, have been included amongst the freshwater fauna by Dr Günther; whereas freshwater genera such as *Ambassis*, several genera of the Gobies, *Sicydium*, *Gobius*, *Eleotaris*, &c., have been omitted by Dr. Günther from the freshwater fauna of India. Thus Dr. Day attempts to show that there may be less affinity between the African and Indian regions, so far as freshwater fishes are concerned, than there is between his restricted Indian region and that of the Malay Archipelago. He adds that, of eighty-seven genera found in India, Ceylon, and Burmah, fourteen extend to Africa and but forty-four to the Malay Archipelago; whereas out of 369 species only four extend to Africa and twenty-nine to the Malay Archipelago.

“On *Heterolepidotus grandis*, a fossil fish from the Lias,” was the title of a paper by James W. Davis. The author describes the specialities of this form, and remarks that the genus was instituted by Sir Philip Egerton for certain fish closely related to *Lepidotus*, but differing in their dentition and scaly armature. The *H. grandis* has interest, among other things, in the attachment of the dorsal and anal fins with the series of well-developed interspinous bones, in the peculiar arrangement of the articular apparatus of the pectoral fins, and in the heterocercal form of the tail.—
J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

November 18, 1884.—Prof. W. H. FLOWER, 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 October, 1884, and called attention to a specimen of a Black-necked Coly, *Colius nigricollis*, purchased October 20th, being the first example of this species received alive by the Society.

A communication was read by Mr. J. G. F. Riedel, containing comments on certain passages in Mr. H. O. Forbes's paper on Timor-Laut birds, read before the Society on the 17th June, 1884.

A communication was read from Mr. H. Pryer, giving an account of a recent visit to the Edible-Bird's-nest Caves of British North Borneo. In illustration of this paper, Mr. Pryer sent specimens of the Swift, *Collocalia fuciphaga*, of its nest and eggs, of the Alga on which the bird is supposed to feed, and of the Bat which inhabits the same caves.

Mr. Selater read an account of some skins of Mammals from Somaliland, which belonged apparently to five species. Amongst these was an apparently new form of Wild Ass, which was proposed to be called *Equus asinus somalicus*.

Mr. F. E. Beddard read a paper on the anatomy of the Umbrette,

Scopus umbretta. The author observed that as regards its exact systematic position, which had been hitherto a matter of doubt, he was inclined to place this peculiar form as the type of a separate family, between the Herons (*Ardeidæ*) and the Storks (*Ciconiidæ*).

A second paper by Mr. Beddard contained the results of some recent investigations into the structure of *Echidna*, and related to the presence of a persistent umbilical vein in that animal.

Captain Shelley read a paper on some new or little-known species of East-African birds. Three of these were described under the names *Muscicapa Johnstoni*, *Pratincola axillaris*, and *Nectarinia kilimensis*. The collection, which contained altogether ninety-four specimens, referable to thirty-eight species, was the first fruits of Mr. H. H. Johnston's Expedition to Kilimandjaro.

A communication was read from Mr. J. H. Gurney on the geographical distribution of *Huhua nipalensis*, with remarks on this and other allied species of Owls.

December 2, 1884.—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 November, 1884, and called attention to a pair of Tasmanian Wolves, *Thylacinus cynocephalus*, obtained by purchase, being the first examples of this animal received since the pair presented in 1863.

Colonel Biddulph exhibited a stuffed specimen of the Wild Sheep of Cyprus, *Ovis ophion*, sent for presentation to the British Museum by Sir Robert Biddulph, the High Commissioner of Cyprus.

Colonel Biddulph also exhibited three heads of the Wild Sheep of Beluchistan, named *Ovis Blandfordi* by Mr. Hume, and drew attention to their similarity to *O. cycloceros* from the Salt Range, which led him to express doubts as to the distinctness of *O. Blandfordi* as a species.

The Secretary called the attention of the Meeting to the death, on the 5th July last, of the Greater Vasa Parrot, *Coracopsis vasa*, presented to the Society by the late C. Telfair, Esq., in July, 1830, which had passed fifty-four years in the Society's Gardens, and made some observations on a peculiar habit of this species.

A communication was read from the Rev. A. M. Norman and the Rev. T. R. R. Stebbing, containing an account of the first portion of the Crustacea Isopoda dredged during the Expedition of the 'Porcupine,' 'Lightning,' and 'Valorous.' The memoir contained descriptions of the representatives of the three families *Tanaidæ*, *Apeudidæ*, and *Anthuridæ*, obtained during the several expeditions. A great number of new forms, chiefly from deep water, including several new genera (*Sphyraphus*, *Alstotanais*

and *Tanaella*, among the *Tanaidæ*, and *Anthelura*, *Hyssura*, *Cyathura* and *Calathura*, among the *Anthuridæ*), were described.

Mr. G. E. Dobson exhibited a diagram designed to illustrate the evolution of the Mammalia, after Huxley.

Prof. F. Jeffrey Bell read the fifth of his series of Studies in Holothuroidea. The present paper gave some further information on the characters of the Cotton-Spinner, *Holothuria nigra*.

Mr. J. Bland Sutton read a paper on the parasphenoid, the vomer, and the palato-pterygoid arcade of the vertebrated skeleton. Mr. Sutton came to the conclusion that the parasphenoid of Fishes was the homologue of the vomer of Mammals.

Mr. G. A. Boulenger read some notes on the Edible Frogs introduced into England, which he referred to two forms—*Rana esculenta typica* of France and Belgium, and *R. esculenta lessonæ* of Italy.

A communication was read from the Count T. Salvadori containing remarks on certain species of Birds from Timor Laut.

A communication was read from Mr. E. P. Ramsay, containing the description of a supposed new species of Flycatcher from New Guinea, proposed to be called *Rhipidura fallax*.

Mr. F. Day read the third of his papers on races and hybrids among the *Salmonidæ*. The author gave an account of how the Salmon, which had been raised in freshwater at Howietown, had been artificially obtained; and pointed out that all the hybrids between the Salmon and the Trouts had proved sterile, while the hybrids between the Trouts and the Chars had proved fertile.—P. L. SOLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

August 6, 1884.—J. W. DUNNING, Esq., M.A., F.L.S., &c., President, in the chair.

Mr. F. P. Pascoe exhibited some curious white puffy balls he had found on a vine growing in a greenhouse when staying at St. Helier's, Jersey, doubtless the work of *Coccidæ*, and probably belonging to *Lecanium (Pulvinaria) vitis*. Prof. C. V. Riley confirmed the determination.

Mr. J. H. Durrant exhibited specimens of the three British species of *Blaps* (*B. mortisaga*, L., *B. mucronata*, Latr., *B. similis*, Latr.), all lately captured in the neighbourhood of Hitchin.

Mr. W. L. Distant exhibited an ordinary specimen of *Cilix spinula*, Schiff., and remarked that though its peculiar position when at rest had been described, it had not been noticed that it thus perfectly resembled a species of the homopterous genus *Flata*. Its anterior wings, vertically raised, with the upper surface exposed, are only visible, the antennæ being hidden and the head depressed, so that it appears truncate in front. Familiar

with the Homoptera, Mr. Distant concluded that he had discovered a species of *Flata* new at least to Britain, until he came to set out the specimen. He further remarked that the recently loosely-used term "mimicry" could not be applied here, as the moth could hardly be considered to mimic a *Flata* which did not occur in our fauna.

Mr. A. G. Butler remarked on the great similarity sometimes existing between lepidopterous and homopterous insects; he had lately described a Lithosiid allied to *Nudaria* from New Holland, which he certainly thought at first was an Homopteron; the resemblance was so striking that he had named the genus *Homopsyche*; the hairs along the costa were very striking, and he quite believed this was a case of mimicry. Quite lately he had found a second specimen in the Museum collection which had been put away in the supplementary cabinet as not a lepidopterous insect.

Mr. E. A. Fitch called attention to the great resemblance that *Cilix spinula* bore to the excrement of a bird, when at rest on the upper side of a leaf, as was its common practice.

Mr. G. C. Champion said when collecting in Central America he was frequently deceived as to the orders to which certain insects belonged, and was often surprised at their great resemblance to other natural objects.

Mr. F. P. Pascoe, in connection with the above, exhibited a large and pretty Chalcid (which Mr. Fitch determined as one of the *Cleonymidæ*), which he had lately captured at St. Helier's, quite thinking it was an Hemipteron; when running it had its wings overlapping in true bug fashion.

Mr. T. R. Billups exhibited specimens of the two following *Tenthredinidæ*, new to Britain, which had been determined by Mr. Cameron:—*Blennocampa alternipes*, Kl., captured at Loughton last May, and *Camponiscus apicalis*, Brischke, captured at Weybridge last May. The latter species was only described last year, and is probably exceedingly rare. Also specimens of a hymenopterous insect taken from the burrows of *Halictus morio* at Chertsey on July 21st last.

Mr. Fitch said this latter insect was a *Chelogyne* (probably *C. lapponicus*, Thoms.), one of the *Dryinidæ*; he could not account for its presence in the bee burrows, but he called attention to the remarkable anterior raptorial claws, and exhibited Curtis's figure (Brit. Ent. fol. 206).

Miss E. A. Ormerod exhibited a piece of leather perforated by *Æstridæ*, the punctures being more than one to the square inch. She also called attention to what is known of the life-history of our bot-flies, and especially of the warble-fly (*Hypoderma bovis*, DeG.), and laid considerable stress on the practical necessity of attempting to lessen the amount of injury occurring both to the cattle themselves and to the great loss from warbled hides. Apparently what is required is to know the exact time when the egg is laid in or on the cattle, and how early in life is the maggot come-at-able under the bullock's hide, then probably methods of precaution

or remedy might be recommended that would be tolerably effective. Miss Ormerod thought that the injury occasioned by the *Æstrus* larva could be prevented with slight trouble and expense, and hoped that the necessary observations to ensure successful treatment would be made.

Mr. W. L. Distant agreed as to the great injury occasioned to the hides by these pests, and recommended Miss Ormerod to address a letter to the 'Leather Trades Journal' upon the subject; he believed many people engaged in the leather trade would be willing to lend their assistance towards the object of lessening the number of warbled hides.

Mr. E. A. Fitch said that the amount of damage occasioned by the *Æstrus* larvæ was very uncertain; he had always found short-horn beasts (and especially yearling and two-year olds) most affected, and three and four year old Welsh or Scotch beasts—commonly known as 'runts'—quite free from attack; he believed that the warble opened in May or June, but there appeared to be some special difficulty in breeding the perfect *Æstrus*, as he had tried it from many scores of larvæ, but had never yet succeeded.

Prof. C. V. Riley expressed the interest he felt in the remarks of Miss Ormerod. In reference to the time of year when the cavity opened, it would differ somewhat in different countries and with individual larvæ. In the State of Illinois, where he had much experience with the species, the larva left the cattle in May and June; oviposition extended over a period of several weeks, and there would be a corresponding difference in the period of opening of the cavity. For this reason it was best to defer destruction of the "warble" till late in the autumn, when the rubbing of kerosene along the backs, or the use of a little mercurial ointment would destroy the larvæ. The insect was rarely injurious to grown cattle, but when abundant affected the health of yearlings. The interests of the cattle raiser and of the leather dealer had little in common, and it was for this reason that it was so difficult to get concert of action on the part of stock-raisers in freeing their animals from the insect.

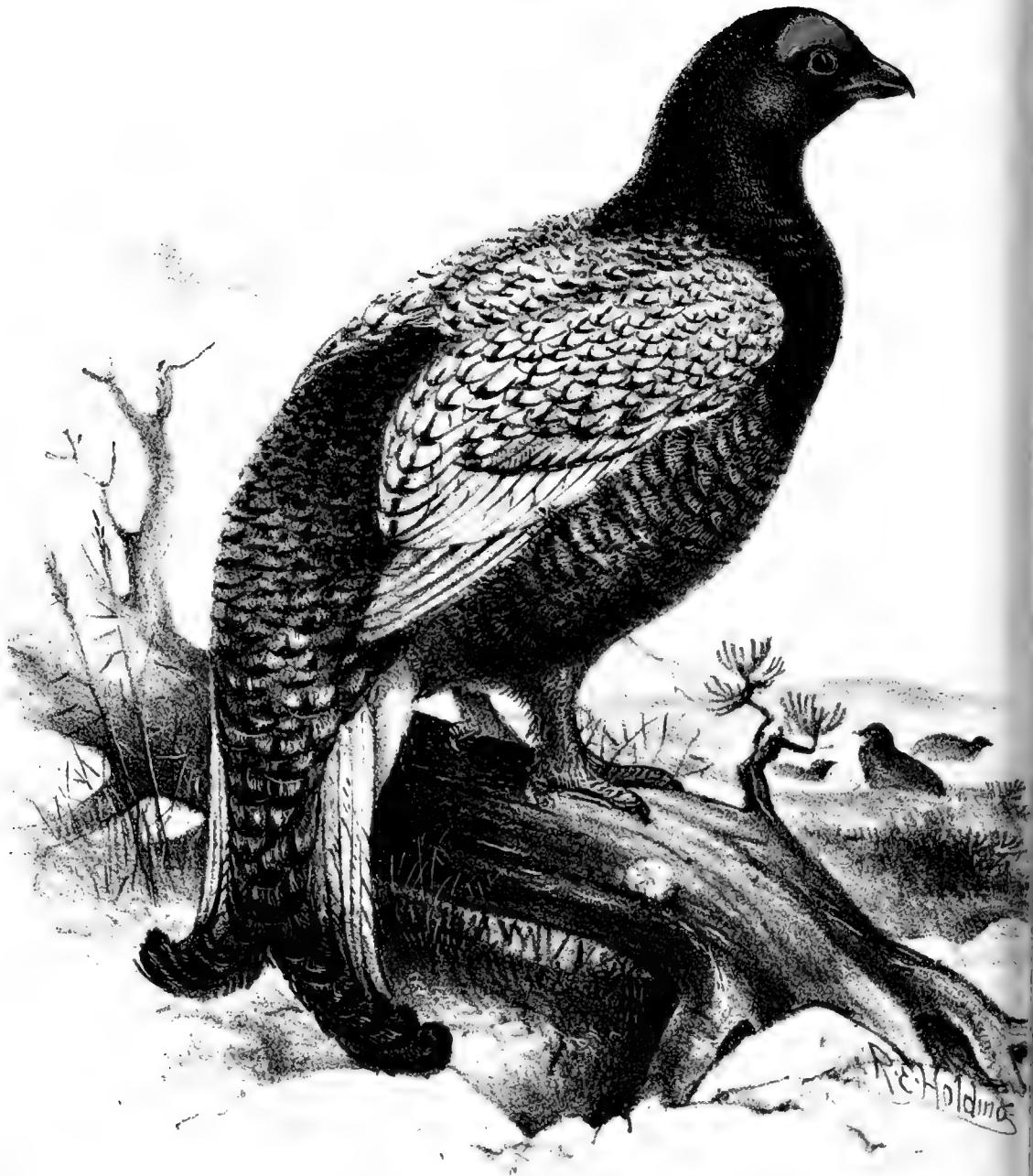
Miss Ormerod thanked Prof. Riley for his information, and said she could give some confirmation of his remarks, as in some Northumbrian districts the application of a mixture of oil with a small amount of turpentine or of strong pickling brine had effected a perfect cure.

M. Wailly exhibited a large box of bred Lepidoptera, especially of silk-producing Bombyces.

The Secretary read a "Note on the habitat of *Platyhile pallida*, Fabr.," by Mr. Roland Trimen, F.R.S., &c.

Mr. Butler communicated a paper by Surgeon-Major R. W. Forsayeth, "On the life-history of sixty species of Lepidoptera observed in Mhow, Central India." Mr. Butler referred to the more remarkable species, and Mr. Forsayeth's three books of drawings were exhibited.—E. A. FITCH, *Hon. Sec.*





R.E. Holding del et lith.

West, Newman & Co. imp.

Variety of the Black Grouse,
Tetrao tetrix, Linn.



THE ZOOLOGIST.

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[No. 98.

ON A SINGULAR VARIETY OF THE BLACK GROUSE, *TETRAO TETRIX*, LINN.

BY THE EDITOR.

AN interesting but difficult subject for investigation is the cause of variation in the plumage of birds, and the laws (if any such can be formulated) which by their operation result in the production of albinism, melanism, and other abnormalities. I do not here refer to permanent varieties, such as occur chiefly in the case of domesticated species, and whose existence has been to some extent accounted for and explained by Darwin,* but to individual variation which may or may not prove to be the first stage in the formation of some permanent variety or race; for while in some cases peculiarities of colour as well as structure are transmitted by inheritance, we frequently meet with varieties which apparently are never perpetuated. An instance of the latter kind is furnished in a specimen of the Black Grouse (*Tetrao tetrix*, Linn.) now before me, and of which a figure carefully drawn by Mr. R. Holding is here given (frontispiece). This bird, received in a consignment of Black-game from Norway in December last, was very kindly forwarded in the flesh for my inspection by Mr. Castang, of Leadenhall Market, who stated that in his lifelong experience as a game-dealer he had never met with a similar example.

The feathers of the head, neck, and breast are of the usual glossy black, but those of the upper portion of the back, scapulars,

* 'Variation of Animals and Plants under Domestication.' Vol. ii., chap. xxii. Causes of Variability.

and upper wing-coverts are white, with dark shafts, dark centres, and dark margins. The central portion of the back presents a much blacker appearance, in consequence of each feather being dark, with a white margin; while the upper tail-coverts are marked like the scapulars, but darker in tone. The primaries and secondaries are grey, inclining to white at the extremities; the tail-feathers white, broadly terminated with black, the white portion just above the black tips being somewhat speckled on both webs; the under tail-coverts, as usual, pure white.

Mr. Howard Saunders has remarked (Yarrell's 'British Birds,' 4th ed., vol. iii., p. 67) that "Examples of both sexes are sometimes found with an unusual amount of white about their plumage, and this is especially the case with females from northern and north-eastern localities. Males from Siberia show more white than western specimens, but beautiful examples with white-mottled breasts and wing-coverts may also, *though rarely*, be obtained in Scotland." I am inclined to think that the "white-mottled breast" denotes immaturity, as it does in the case of the Cormorant, and therefore cannot be regarded as abnormal.

We have yet, however, a good deal to learn on the subject of variation, and the causes which tend to produce it. Darwin has expressed the opinion that "Variability of every kind is directly or indirectly caused by changed conditions of life" (*op. cit.*, vol. ii., p. 255), and considered it "doubtful whether a change in the nature of the food is a potent cause of variability" (p. 257); for as he truly observes, "Scarcely any domesticated animal has varied more than the pigeon, or the fowl, yet their food, especially that of highly-bred pigeons, is generally the same."

It will be seen that these remarks apply chiefly to animals under domestication, for, in a state of nature, individuals of the same species are exposed to nearly uniform conditions, being rigorously kept to their proper places by a host of competitors, and have moreover long been habituated to their conditions of life. At the same time it cannot be said that they are subject to quite uniform conditions, and they are liable to a certain amount of variation. In the case of game-birds, doubtless those which, like the Pheasant, are brought more directly under the influence of man are more liable to variation. The Black Grouse which, except by hybridisation, varies very little, is only to be found in wild haunts far removed from human habitation.

A VISIT TO THE BIRDS' NEST CAVES AT GOMANTON,
NORTH BORNEO.

BY H. PRYER.*

THE edible bird's-nest has long been famed as one of the most remarkable articles of the Chinese *cuisine*, and little being known concerning the place of production, I determined, during my recent trip to North Borneo, to visit the caves where the nests are obtained, to gather information on the subject, and to ascertain, if possible, the material from which the bird makes its much-prized and valuable nest.

On March 19th, at half-past ten o'clock a.m., in company with a gentleman in the employ of the British North Borneo Company, I left the flourishing little town of Elopura, at the head of Sandakan Bay, in a steam-launch for the Sapugaya River, which flows into the bay about eight miles below the town. Our party was composed of two Englishmen (W. and self), one Chinese cook, two Malay boys, three Malay boatmen, eight Sulu to act as carriers, a Buludupi guide named Buti, and my Japanese collector. The mouth of the Sapugaya was reached at noon. The banks here for some miles are lined with mangrove trees, of which there are several kinds, but all agreeing in their love for mud and salt water, and growing on trestles formed by their own roots, the tree-trunks being raised from four to ten feet above the ground. The river winds about in a most puzzling manner, and sometimes, after we had been steering due south, our course was suddenly altered due north. After the mangrove is passed, the Nipa swamps commence; this plant is like a huge fern, sending up immense fronds, sometimes 30 ft. in length; it bears a large fruit, something like a round pineapple, weighing 15lb. to 20 lb. The leaf is used for walls and roofs of houses by the natives, who prefer it to anything else for this purpose, and the young unexpanded frond makes an excellent cigarette-wrapper.

Above the Nipa, where the river-banks rise above the reach of the tide, the forest extends down to the water's-edge; it is composed of splendid forest trees of the most durable timber;

* Reprinted from 'The Japan Gazette.'

many of them run up, perfectly smooth to the first branch, fully 200 ft. Ferns, orchids, and numbers of peculiar parasitical plants grow on their branches ; in fact, owing to the impossibility of any number of plants growing in the shade of the forest, these plants have migrated to the tops of the trees for light and air. On the way up we saw some splendid Kingfishers, and an occasional Sandpiper or Curlew would fly off at our approach. Making the launch fast to the landing-stage at a sugar and coffee plantation, we took to our rowing-boat, the river beyond this point being too narrow and full of rocks and tree-trunks for the launch to proceed further. At 4 p.m. we reached our resting-place for the night ; this was a shed ; the roof of Nipa-leaves (called attap), and an occasional attap at the side ; the floor, which is always raised about six feet from the ground, was formed of thin sticks laid loosely on a frame of poles. Notwithstanding our rough accommodation, we managed to make ourselves comfortable, and, spreading our india-rubber sheets and blankets, were soon enjoying a capital dinner prepared by our Chinese cook, who had brought along with him a goodly supply of food, and his pots and pans. After a soothing pipe, and still more soothing pull at our whisky-flask, we turned in. I was awakened once in the night by what I thought was rain, but on looking out found it was only the dew which, being condensed in the tops of the high trees, comes pattering down as soon as the air begins to warm towards daylight.

After the usual difficulty with the baggage-carriers, the largest and strongest men insisting upon carrying the smallest possible amount, we started at 7 a.m. for a five hours' walk through the forest. Shortly after the start we noticed a splendid specimen of a *Calladium* ; each leaf was 5 ft. long by $3\frac{1}{2}$ ft. broad, the trunk was 18 in. in circumference, and the plant stood 12 ft. high. About half-way W. had a shot at an Ourang Utan, but missed, and I did ditto to a deer. We noticed the fresh track of elephants, and the ground was in many places cut up by pigs and deer. The Argus Pheasants made the forest ring again with their loud "ku-hu-u," the Long-armed Ape (the Siamanga) was singing his morning song in the tree-tops, and the huge Hornbill, with its peculiar cries, flew overhead on loudly-sounding pinions. I was rather surprised to hear the familiar croak of a Crow, but found them just as wide-awake here as anywhere else, and could

not get a specimen. Leeches were very troublesome, crawling into boots and down one's back, generally selecting awkward places to bite; and the legs of the whole party were speedily streaming with blood. At first I found every bite very painful, but after a time this ceased, and on turning down my stockings frequently found a horrid leech fully gorged, whose unwelcome presence I had not suspected. The track is fairly level, and crosses several small streams, which had, however, now dried up into a succession of small pools, full of pretty fish, of three species; remarkably tame, they would come up and nibble one's fingers directly the hand was placed in the water. Along the path I picked up a number of different land-shells; one very pretty kind is about two inches long, of a bright pea-green colour.

At noon we reached our destination, coming quite suddenly into the thick forest, to the foot of a sheer limestone cliff running up to 900 ft. In this cliff the caves are situate. The path leads directly to the mouth of the great cavern, called Simud Itam, *i. e.* the Black Cave. The porch is rather over 100 ft. wide by 250 ft. high, and the roof slopes up for 110 ft. more; the height of this magnificent natural cathedral being 360 ft. The interior is well lighted, as there is a large circular hole in the roof about 200 yards from the entrance on the right, and a smaller one on the left, forming two aisles. The walls and roof are rugged, grand, and beautifully coloured, shading from black to brown, grey, dark yellow, red, and green; the blue sky and sunlight shining beyond through the openings make a picture far beyond my power to describe in its grand and awful beauty. Here, indeed, is a fitting temple formed by Nature to worship her in; compared with which the grandest cathedral in the world, the work of human hands, sinks into insignificance.

“The forest growth and Gothic walls between,
The wild rocks shaped as they had turrets been,
In mockery of man's art.”

High circling above our heads were hundreds of Bats and Swifts, and, notwithstanding the enormous heights, the nests were seen in clusters attached to the sides and roof. Here and there, from seemingly the most inaccessible places, were the rattan stages, ladders, and ropes of the nest-gatherers. Indeed, until we solved the mystery on ascending the cliff from the

outside, by finding many smaller caves connected with the roof of Simud Itam, it seemed impossible for the Malays to have reached these places unless they too, like the Swifts, could fly, We gazed and gazed at the wonderful scene around and above us, but as we had to ascend far up the cliff we started on our perpendicular climb; in this we were assisted in many places by ladders fixed to the rock, and at others by projections formed by the rugged nature of the limestone, which was weather-worn into many fantastic shapes.

After an ascent of nearly 400 ft. in the glowing sun, the mouth of the white cave, Simud Putih, is reached; it is immediately over the right-hand circular opening in the roof of Simud Itam; this cave is the main entrance for the Swifts, and they were flying in and out in numbers. This entrance is about 40 ft. high by 60 ft. wide, and here live most of the nest-gatherers, together with the company's guard of soldiers. The scene was most picturesque, and the brightly-coloured and varied costumes of the men, all of whom were armed with either rifle, spear, or kris, reminded me very forcibly of the scene of the robbers' cave from a Christmas pantomime at home, ten thousand miles away. The head man placed at our disposal a raised platform of sticks, similar to that already described, built inside the mouth of the cave. Here we took a rest, as the climb had made everyone stream with perspiration. On the way up my Japanese had captured a very fine grey and white snake 6 ft. long, much to the horror of the Malays, who, as usual, said it was poisonous; but to convince them it was not I allowed it to bite me, without any bad effect.

As soon as I was cool enough I sallied out to try and find the material the nests are made from, this being the main object of my journey. In this I was very speedily successful, and my only wonder now is that it should ever have been supposed to be such a great mystery. The nests are made from a sort of fungoid growth that encrusts the limestone in all damp situations; it grows about an inch thick, outside dark brown, but inside white; the birds make the black nests from the outside layer, and the best quality of white nests are of course from the inside; it is taken by the bird in the mouth, and drawn out in a filament backwards and forwards, like a caterpillar weaving its cocoon. The natives are under the impression that the bird that builds

the black nest is different from that building the white nest; they pointed out two sizes of birds, asserting that the small one built the "Sarong Putih" (*i. e.*, white nest), and the larger the "Sarong Itam" (*i. e.*, black nest). This, however, is a mistake, the difference in size being that usually found in the two sexes of all birds. I collected here a number of land-shells I had not seen down below in the forest, and noticed many ferns, begonias, orchids, and other plants new to me.

The Malays told me to be sure to return at five o'clock, as I should then see the most wonderful sight in all Borneo, the going out of the Bats and the return to roost of the Swifts. I accordingly took my seat on a block of coral limestone at the mouth of the cave at a few minutes before five; soon a rushing sound was heard, and, peering over the circular abyss leading into Simud Itam, I saw columns of Bats wheeling round and round the sides in regular order; at a quarter past five they began to circle up, rising into the air in a corkscrew flight, which led them round a high tree growing on the side of the chasm opposite; having reached a certain height, a detachment would break off and fly away rapidly. I counted nineteen flocks go off like this, each flock consisting of many thousands, and then they commenced to pour away in a continuous stream, and continued to do so until it was too dark for me to see them any longer. At a quarter to six the Swifts began to come into Simud Putih, at first in tens, then hundreds, and at last they, too, streamed in continuously; and when I went to sleep at midnight they were still flying in in undiminished numbers. As long as there was any daylight left, I found it impossible to catch any with my butterfly net, but as soon as it was quite dark it was only necessary to wave the net in the air to secure as many specimens as I wanted, although they must possess wonderful powers of sight in the dark to fly about in the deepest recesses of their caves and return to their nests, in places where no light ever penetrates.

Shortly before sundown a pair of Kites made their appearance, and taking their station over the bat chasm would every now and then clumsily swoop down into the thick of the Bats, generally securing a victim every time. I shot both these marauders, which proved to be *Haliaster indus*, a very beautiful but common bird; head and breast pure white, back and wings

bright chocolate. There were also several specimens of a Hawk about, and woe betide the unfortunate Bat that, becoming separated from its flock, was put in chase. The way these Hawks took the Bats one after the other was astonishing, and strongly reminded me of a man eating oysters. I shot several of these Hawks, but only succeeded in getting one, the rest falling over the side of the cliff. It proved to be the scarce *Machærhamphus alcinus*, remarkable for the size of its gape and shortness of its beak, very much resembling the Swallow, being accustomed to take its prey in the same manner while on the wing. Among the Bats were three albinos, called by the Malays, "the rajah, his son and wife."

Arising before daylight we witnessed a reversal of the proceedings of the previous night, the Swifts going out, and the Bats coming home. These latter literally "rained" into their chasm for two hours after sunrise; looking up in the bright sky, numbers of small specks appear; these flash down perpendicularly with great rapidity, and disappear in the darkness. Several *M. alcinus* put in an appearance, hawking after the Swifts which they had rarely tried to catch the night before, the Swift then being as a rule easily able to avoid them. Their plan now was to swoop down from the mouth of the cave, striking into and following the stream of the birds, being successful once in every three swoops. I secured many specimens of the Bats, and found them to be all of one species; the caudal membrane extends only half down the tail, which is free for an inch and a half, giving the animal, when the wings are folded up, very much the appearance of a mouse. The wings are very long and narrow, and it is a very swift flyer.

After breakfast we started for the summit of the cliff; the path, which is about two feet wide, overhangs the Bat Cavern. I must confess I took a very tight hold of the rock when looking down, the bottom being lost in the darkness, at this point 600 ft. below. We ascended between 200 and 300 ft. more, and then found ourselves on the summit; here a most lovely extended view in every direction except the north; miles and miles of forest, broken here and there by mountain-tops. Unfortunately Kina Balu, the highest mountain in Malaysia, was hidden by clouds. To the north we could trace the sea, and were much surprised to find how short a distance we had actually covered, although we

travelled continuously thirteen and a half hours by launch, boat, and walking. Elopura was visible with a glass, and not more than twenty miles off in a direct line. Sandakan Bay extended to within twelve miles of where we stood, and the beautiful islands of Pulo Buy and Balhalla, covered with all the most lovely tropical vegetation, fit abode for fairies, stood out in the shining sea. On the highest point the Malays have built a house, into which we were invited, and we examined a quantity of very fine white nests, gathered from a small opening close by; which is, however, 110 fathoms deep, and connects with Simud Putih, our resting-place of the night before. We then commenced the descent by another track, and found it much easier work than going up. About 200 feet below the summit we reached a large opening looking exactly like a railway-tunnel; lighting our candles, and attaching them to the lower part of the staves each of us carried, we entered the gloomy portal and soon lost daylight, the path becoming steeper and more and more slippery the further we descended. About 500 ft. from the entrance it got unpleasantly warm, and the atmosphere stifling, the guano deposited giving out a most disagreeable smell. We were here shown a small beam of light from the funnel at the top of the rock, exactly 696 ft. above us.

Owing to the guano, our footing became very precarious, and we had to balance ourselves on poles laid on the surface. How deep this guano is is not known; a long spear, used by the natives for nest-gathering, does not touch the bottom when thrust in up to the hilt. Just when matters were getting unbearable, the cave turned to the left and commenced to ascend; we were very glad to find that Simud Putih had been reached, and we shortly emerged again into the daylight, very much dazzled. All the roof of the dark parts of the cave was occupied by the birds, who keep up an intermittent twittering, sounding, from the immense quantity of birds assembled, like the surf breaking on a rocky shore. We saw the nest-gatherers getting in their crop; they had extended their flexible rattan ladders over some horrible-looking gulfs and fixed them against the sides: two men take their station on these; one carries a light four-prong spear, about 15 ft. long; just below the prongs a lighted candle is fixed; holding on to the ladder with one hand, the spear is managed with the other, and the nest transfixed; a

slight push detaches it from the rock; the spear is then withdrawn until the head is within reach of the second man, who takes the nest off the prongs and puts it in a pouch carried at the waist.

We again took up our quarters for the night at the mouth of Simud Putih, and after dinner, in course of conversation with the head men, elicited a few facts about the caves. The annual value varies from 25,000 to 30,000 dols.; they had been worked for seven generations without any diminution in the quantity; three crops were gathered during the year; accidents to the men employed very rarely occurred, notwithstanding the dangerous nature of their occupation; unless a considerable quantity of black nest is gathered, the supply of white nest falls off. There is an almost inexhaustible supply of guano in the caves, and the number of bats and birds in them is so enormous that, if they are undisturbed, a regular quantity may be taken out yearly.

On March 22nd we left our cave at 7 a.m., and after a farewell visit to Simud Itam commenced our return journey. During our walk we saw Deer, Monkey, and one splendid Fireback Pheasant. We reached the Sapugaya River shortly before twelve noon, and were disappointed at finding the tide out and our boat high and dry; we waited patiently until half-past four, but as there was still no sign of a return of the water we determined to try and carry the boat down until water sufficient to float her was met with; this we eventually succeeded in doing, our Chinese cook greatly distinguishing himself on this occasion, although a remarkably thin and weedy-looking individual. As luck would have it, he had one end of a pole slung across the boat, and the strongest Sulu, a fine strapping young fellow, the other. They placed the pole in position; up went the Chinaman, down went the Sulu; the Sulu got up looking very fierce, rubbed his shoulder, set his teeth, and tried again, with the same result; we soon found that our opium-smoking Celestial was more than a match for any of our men at lifting. Just at dusk we reached our steam-launch. Several of that very peculiar animal, the *Galcopithecus*, were floating from tree to tree, and a very large Bat was flying about. We soon got up steam, and at 10.30 p.m. reached the pier at Elopura.

ORNITHOLOGICAL NOTES FROM NORFOLK & SUFFOLK.

BY T. E. GUNN, F.L.S.

THE following notes, made during the past year, are offered in continuation of those published in 'The Zoologist' for January, 1884:—

PEREGRINE.—A female in the second year's plumage was shot by a gamekeeper near Harleston on January 12th, 1884. The bird weighed two pounds six ounces. On dissection I found it very fat, the crop and stomach being filled with the remains of a Wood Pigeon, the weight of food in its crop being three ounces and a half.

MERLIN.—An immature male was shot at Catton, near Norwich, on October 11th, 1883. Females in this plumage, as also in the adult state, are more frequently met with than males.

SPARROWHAWK.—On June 28th, 1884, I took a nest of young Sparrowhawks containing six young birds, which is rather an unusual number for one nest (four or five being the ordinary complement). I also secured the parent birds. I had visited the nest on June 15th, and found the eggs cracked round the larger end; the young were doubtless hatched the following day. Thus the nestlings when taken would be just twelve days old, at least the larger birds would. These were more forward in plumage than the smaller ones, and proved on dissection to be of the female sex, the smaller birds being males; the proportion of the sexes being four of the former to two of the latter. I have invariably noticed in nests of the Raptores (both hawks and owls) not only that the females are in greater preponderance, but they are apparently hatched first. These nestling females showed their new feathers partly issuing from the soft quills of wing and tail, the feathers in the males being less developed in one and scarcely started in the other. The parent birds, I was somewhat surprised to find, were breeding in their immature plumage, being but twelve months old when they paired; this, I imagine, is unusual. A few dark slate-coloured feathers here and there had just made their appearance in the back and upper parts of the plumage of each, also two new short centre feathers in the tail of the male; the rest of the feathers exhibited the usual margins indicative of immaturity. The cere, legs, and

toes were pale yellow, but deeper in shade than during the first year; eyes deep lemon-yellow; the eyes of the young birds were leaden-grey; legs and toes buffy-white. In the stomach of the female parent I found the bills and other bones of two Greenfinches, which I was enabled to identify by some feathers which I rinsed and dried. The nest, compactly built of sticks, was situated in one of the upper branches and close to the trunk of a Scotch fir. The gamekeeper seemed rather anxious that this pair of birds should be killed, as the previous day they had been watched passing backwards and forwards to his coops, from which he found they had taken just twenty young pheasants, the male bird being particularly active in this performance. Remains of some of the young birds were found in the crops of the nestling hawks, as well as in a few cast-off pellets beneath their nest.

FOOD OF OWLS. — On dissecting an adult female Short-eared Owl, killed at Caister, near Norwich, on January 1st, 1884, I found in the stomach the remains of a half-grown brown rat and an adult field-mouse, including the skulls and leg-bones of each. On the 8th of the same month the stomach of another Tawny Owl contained the remains of a sparrow.

VARIETY OF BARN OWL. — On November 13th, 1883, a beautiful dark variety of the Barn Owl, a female, was shot near Norwich and brought to me. The whole of the under surface of its plumage was of a rich buff instead of the ordinary white; the face white; the back and upper parts of the plumage were also many shades darker than in the usual type. I recorded a similar variety in 'The Zoologist' for 1880, p. 49. Birds of this variety of *Strix flammea* are evidently migrants. The two just mentioned and three others I have had in my possession all occurred earlier or later in the autumn.

ALBINO MISSEL THRUSH. — An albino immature bird of this species was killed on May 26th, 1884, at Leiston, near Saxmundham, and forwarded to me. The plumage was entirely white, the usual round spots of the breast-feathers being indicated by the faintest tints, reminding one of the water-marks in note-paper. It had pink eyes, and the bill and legs were yellowish white. When skinned I found a thread-worm (*Filaria*) of five inches in length protruding from a wound in its breast, and on dissection obtained a few smaller ones, as well as a tape-worm

from the intestines. On dissecting a young Thrush that had been killed in a market-garden near Norwich, on July 21st, I found its stomach filled with ripe white currants, of which I counted as many as thirty; it also contained a small garden-snail, which it had swallowed without breaking the shell.

FIRECREST AND GOLDCREST.—An adult male of the former species was brought me from Attlebridge, near Norwich, where it had been captured on November 29th, 1879. Having been just killed, it was in a perfectly fresh state and in splendid plumage. Having sold it to a customer immediately I had mounted it, I omitted placing it on record; and Mr. J. H. Gurney having since seen it, suggested that I should do so (although late), and add it to these notes, which I now have the pleasure of doing with the following particulars from my notes made at the time:—Total length, 4 in.; tip to tip of fully-extended wings, $6\frac{5}{8}$ in.; wing from carpus, $2\frac{1}{8}$ in.; tail, $1\frac{1}{2}$ in.; bill, 5-16ths in.; tarsus, $\frac{3}{4}$ in.; tibia, 13-16ths in. The stomach was empty. It proved to be somewhat larger than a Goldcrest with which I compared it, placing them side by side. I have the following note on an unusually large example of the Goldcrest, an adult male, shot at Lynn on January 1st, 1884, and posted to me:—Total length, $4\frac{1}{4}$ in.; wing from carpus, $2\frac{1}{8}$ in.; fully-extended wings, $6\frac{1}{2}$ in.; bill, 5-16ths in.; tarsus, $\frac{5}{8}$ in.; it weighed 2 drms. (apothecaries' weight).

BRAMBLING. — When reading Mr. O. V. Alpin's note (Zool. 1884, p. 341) on the occurrence of the Brambling in Oxfordshire on March 16th, a date which he considers unusually late for this species to stay, I referred to a specimen, an adult male, in my collection, which I find according to its label and entry in my note-book was shot by myself on April 10th, 1872, at Beeston Regis. There were five or six of these birds on the top branches of a fir, and when I secured this one to make sure of the species I did not follow the others, which then flew to another fir a short distance off.

SHORE LARK. — On February 11th, 1884, I received a female bird of this species that had been shot in the neighbourhood of Twyford.

KINGFISHER. — On August 9th last I dissected a Kingfisher, and found in the stomach a few fish-bones and remains of a "water boatman" (*Notonecta*), and other aquatic insects. On

November 30th, 1883, I found in an adult female Kingfisher a stone-loach which measured three inches in length; the head of the fish lodging in its stomach was decomposed; the rest of the fish being in its gullet was comparatively fresh, and therefore easily recognised.

SPOTTED WOODPECKER. — *Picus major*, seems to be on the increase in the eastern counties; an unusual number was killed between November, 1883, and the end of March, 1884, in different parts of Norfolk and Suffolk, and I observed several pairs nesting in the fir-plantations within a few miles' radius of Norwich. Being rather a shy bird, it requires a great deal of patient watching to detect its presence. The increase of this species, as also that of the Long-eared Owl, is doubtless due mainly to the strict preservation of game, and the comparatively quiet state of the woods and plantations during the nesting season.* To this cause is also doubtless due the additions noted in the numbers of the Lesser Spotted Woodpecker; these birds have been steadily increasing for the past three or four years. An adult male *Picus minor* was shot whilst flying over a field adjoining Unthinks Road, just on the outskirts of Norwich, on the afternoon of September 19th last. On dissection I found in the stomach a larva of the wood leopard moth (*Z. æsculi*) and the remains of another; this insect seems to be a favourite food with both *Picus major* and *minor* (see Zool. 1884, pp. 6, 7).

SPOTTED REDSHANK. — Four Spotted Redshanks, *Totanus fuscus*, were killed out of a "bunch" of seven by one shot from a swivel gun by Mr. Ward, of Lynn, in that neighbourhood, on October 28th, 1883. I found two of them to be adult, and two in immature plumage. The sexes and weights were as follows:— Immature male, $6\frac{1}{2}$ oz.; adult male, 7 oz.; adult male, 7 oz.; immature female, 8 oz.

RUFF. — A Reeve came to hand on January 5th, 1884, just killed on the coast at Aldborough, Suffolk. The ovary contained from twenty to thirty eggs about the size of an ordinary pin's head, and in the stomach were the remains of some insects and fibrous substance. In the gullet I found a caddis-worm and its case entire. The bird was fat and in good feather. On Septem-

* The increase referred to is more likely to be due to migration, as no unusual efforts at game-preserving have been made of late years.—ED.

ber 17th, 1884, a Ruff was killed at Stalham. The stomach contained seven or eight pebbles, and remains of insects.

LITTLE CRAKE.—A bird of this species which I exhibited at a meeting of the Norwich Science Gossip Club on January 5th, 1881, was shot on the marshes near Hickling Broad on October 25th, 1880; it is the bird referred to by Mr. Stevenson (Zool. 1882, p. 374), and was forwarded to me for preservation when quite fresh by Mr. Randall Johnson, who afterwards presented it to Mr. B. C. Silcock, of Stalham. It is a rare British species, though probably occurring more frequently than is generally supposed, owing to its minute size, stealthy habits, and power of secreting itself amongst the tall grass and sedges of our extensive marshes and broads. On dissection I ascertained it to be a female. The gizzard was small and somewhat muscular; it contained the remains of minute insects, including the elytra of some small beetles and an entire minute fly, a few small seeds, particles of grit, and small stones. Total length from tip of bill to end of tail, 8 in.; bill, $\frac{3}{4}$ in.; wing from carpal joint to tip, $3\frac{7}{8}$ in.; from tip to tip of fully-extended wings, $11\frac{3}{4}$ in.; tail, $2\frac{3}{8}$ in.; tibia, $1\frac{3}{4}$ in.; tarsus, $1\frac{3}{8}$ in.; middle toe and claw, $1\frac{1}{8}$ in.; weight, $1\frac{3}{4}$ oz.

WAXWING. — The Rev. S. N. Micklethwait, of Hickling, informed me of the occurrence of this uncertain visitor to his garden in January, 1884. He was sitting in his dining-room on the 20th of that month, and looking out of the window saw four birds feeding on the berries of a yew-tree within a few yards of him, which he immediately recognised as Waxwings, being well acquainted with the species and having specimens in his collection.

BITTERN. — A fine male Bittern was shot on January 9th, 1884, near Stalham, and sent to me for preservation. It was exceedingly fat, and weighed three pounds six ounces. In its throat I found the remains of a water-beetle, *Dytiscus marginalis*, with the elytra quite perfect; the stomach contained the bones of a small pike and roach, the remains of another *Dytiscus*, and some bits of reed.

HERON. — On February 7th I received an adult male from Weston. In its stomach I found a dace weighing six ounces and a half, and measuring eight inches and a half in length; the fish was a female, with the roe forward in development. Attached to

its gills I found several tape-worms averaging about five inches; the fish was broken across the shoulders by the strong beak of its captor previous to being swallowed, and was doubled-up in the bird's stomach; from the fish's intestines I took an entozoon six inches in length, and a quarter of an inch in breadth; this was alive and uninjured, and thus bears out the fact of these parasites being introduced from one host to another.

COOT.—On November 6th, 1883, a Coot was caught in one of the signal-cords of a railway-carriage at Thorpe Station, on the Great Eastern Railway. The bird had by some means entangled its legs, and was held a prisoner until released by a porter, who brought it to me. It lived four days without food, refusing all kinds of tempting morsels placed before it. The stomach contained a quantity of silt, and a small bivalve or two.

EGYPTIAN GOOSE. — An adult male, brought me on January 24th, 1884, was shot on the marshes at Cringleford, near Norwich. It exhibited no symptoms of having been kept in confinement, but whether a genuine migrant or a wanderer from some lake in the county it is impossible to say. The Egyptian Goose has been repeatedly shot both on Breydon and in the Yarmouth Roads, and is often seen during the winter migration along the eastern coast.

GOOSANDER. — This species was unusually abundant during the winter of 1883-84 in the eastern district. I received an adult female from Oulton Broad on December 14th; in this I found two perch, one measuring seven inches and the other five inches and a half in length. When pike-fishing on Kimberley Lake on February 4th, 1884, I counted fourteen of these birds, which I examined with my glass, one being an adult male; these and a number of wild duck were consorting with the semi-domesticated fowl on the water. The old keeper told me the Goosanders had been there several weeks; they seemed well able to take care of themselves, something like two hundred yards being the nearest approach allowed. On the 19th of the same month a pair of adult Goosanders were killed at one shot on a small lake in Honningham Park; the female was sent to me the following day quite fresh; the male, however, was not found until four days later in a reed-bed, by which time decomposition had set in; however, by careful treatment I managed to preserve it. Lady Bayning, the owner, informed me that the two birds

had been observed on the lake for some days prior to their being killed by her gamekeeper. In the throat and stomach of the female I found two roach of five and six inches, and the remains of a third roach. The male had also been feeding on small roach, and the bodies of both were in good condition and covered with fat. I omitted to mention in my previous notes that on February 20th, 1883, I received an adult male Goosander, killed on Gunton Lake, where it was found in company with six or seven grey birds of the same species.

POLISH SWAN. — An immature female Polish Swan was killed at Wramplingham on March 22nd. Weight, 15 lbs.; length, 4 ft. 8 in.; tip to tip of fully-extended wings, 7 ft.

WILD GEESE. — On November 29th, 1883, a large flock of Geese passed over the city of Norwich about 2 p.m., in the direction from N.W. to S.E. I kept them in sight for about two minutes, and as they passed over probably some two hundred yards high I could distinguish them as Canada Geese, at least the right hand wing, as the flock flew in V-shape contained thirty individuals of this species. These were in all probability escaped birds bred on the ornamental waters in various parts of this country, and being unpinioned they collect together and either migrate or wander away. The entire flock consisted of eighty-three or eighty-four birds, as variously counted by different observers. Smaller flocks of Canada Geese consisting of ten or twelve or more not unfrequently at this time of the year in various localities in Norfolk. Three winters ago a flock of eighteen were seen passing over Heigham Causeway, two or three of which were shot. Seven swans, reported to be Whoopers, but probably unpinioned Mute Swans, were seen on the River Wensum at Hellesdon on November 26th, 1883, but none of them were killed.

BLACK TERN. — It was my intention to have corrected the error occurring in the local name of the Black Tern as given in my former notes (Zool. 1884, p. 8), in which a "w" is inserted instead of an "r," rendering the word "Daw" instead of "Dar," evidently a printer's error. This shows how very necessary it is to write plainly. I am obliged to Mr. Southwell, who anticipated my correction (Zool. 1884, p. 144), and who states that "Terns were all formerly known as Dars." I may add that the Breydon gunners with whom I am acquainted still apply the name Dar to three Terns, *viz.*, the Common, Black, and Lesser Terns.

BIOLOGICAL STATIONS FOR THE OBSERVATION OF MIGRATORY BIRDS.

THE nature of the services rendered by the Committee appointed by the British Association to collect observations on the Migration of Birds is now fully recognised and appreciated, thanks to the excellent Reports which the Committee have annually published since the subject was fairly taken in hand some five years since; but our readers may not be so well aware of the steps which have been taken in the same direction by naturalists on the Continent. We therefore append a translation of a German circular on this subject which has lately reached us, and which is interesting not only because it shows what our German friends are doing in the matter, but also because it contains suggestions which deserve the consideration of observers in this country. It is issued by Dr. Rudolf Blasius, of Brunswick, and runs as follows:—

AN APPEAL TO THE ORNITHOLOGISTS OF GERMANY.

At a Meeting of the General Ornithological Society of Germany, held at Brunswick nine years ago, on the proposition of Dr. A. Reichenow (warmly seconded by the late Dr. A. Brehm), it was resolved that a Committee should be formed for organising stations for the observation of birds in Germany. Seven Annual Reports have since appeared, bearing witness to the unceasing activity of the Committee and its correspondents. A great number of observations have been collected together; but there still remain many gaps in our knowledge of German bird-life which should be filled up. The example set by Germany has been followed by many other countries; in England, America, Austrian-Hungary, and Denmark, ornithological committees have been formed, which publish similar Annual Reports from information supplied from a series of stations for ornithological observations. At the first International Ornithological Congress, held at Vienna in April, 1884 [see *Zool.* 1884, pp. 139, 188, 346], a resolution was passed for the formation of a permanent International Ornithological Committee, which should superintend arrangements for similar stations in every inhabited country of the

world. Under the patronage of his Royal and Imperial Highness, the Crown Prince Rudolph of Austria, the President of this Committee, Dr. R. Blasius of Brunswick, and the Secretary Dr. G. von Hayek, of Vienna, are endeavouring, in conjunction with a number of well-known ornithologists of all nations, to obtain a universal acceptance of the scheme. A noble rivalry will be kindled, and Germany must not be left behind. We have yet much to learn; and if everyone who knows anything of bird-life in his own district will send his notes on the subject, much may be accomplished. Observations apparently trivial may be of use, and find place in the Annual Report.

We would call attention to the following instructions as a basis for making observations, together with those already issued by Herr E. von Homeyer and ourselves for Germany, and Herr von Tschusi for Austrian-Hungary:—

I. *Boundaries of the locality under observation.*—Give, if possible, a short description of its topographical position, with the exact latitude and longitude.

II. *Occurrences.*—(1) What birds are you acquainted with, and what are their local names? (2) Which species remain the whole year in the same place? (3) Which species change their abode according to the time of year? (4) What species do you observe only in passing over in spring, or autumn, or at both seasons? (5) What species breed in your district during summer, and leave at the approach of winter? (6) What species do you observe only in winter? (7) What species do you regard as of rare occurrence only, and what do you consider to be the cause of their appearance? (8) What species appear occasionally singly or in numbers? (9) What species appear simultaneously in the valleys and on the mountains; and at what height on the mountain are they seen? (10) Have you observed any striking increase or decrease in any particular species, or that the increase of one species is accompanied by the decrease or disappearance of another? Has this occurred in consequence of a change of conditions in the habitat of each species, or from what other cause? (11) Are common birds (for instance, sparrows, swallows, magpies, &c.), scarce in your district; if so, what reason can you assign for such scarcity? (12) Have you observed any summer birds during winter, or winter birds during summer; if so, of

what species? (13) Have you observed in certain species any peculiar change of colour; mules or hybrids? (14) Have you noticed any bird, that you could identify by certain peculiarities, which has returned year after year to the same spot?

III. *Migration*.—With regard to the migration of birds, the following points should be noted:—(1) Day and hour of the first arrival; (2) of the arrival of the main flock; (3) of arrival of stragglers; (4) of commencement of departure; (5) of departure of main flock; (6) of departure of stragglers. (7) Mention any species that you have observed to depart in spring, and the probable cause of such departure. Did the movement extend to every individual of the species, or only to a limited number? When and in what sort of weather did they reappear? (8) Note the direction of the birds' flight in general, and that of each species in detail. (9) Weather and wind on day of taking observation. In the case of any extraordinary flight, note the state of the weather on the days preceding and following it. (10) Which species have you observed to fly with the wind, and which against it? (11) What localities are selected as resting-places by certain species? Do these differ according to the time of year; and what do you consider to be the reason of their choice? (12) Have you noticed whether male and female, or young and old birds of a particular species fly together or separately? (13) What species appear singly, in pairs, in family parties, or in flocks? (14) What species have migrated to your neighbourhood or disappeared; when did this take place; and what do you take to be the reason? (15) Is the direction of their flight affected by the course of any river, the windings of a valley, or position of hills? When a hill stands in the line of flight, do the birds fly over it or go round it? (16) Which species avoid any such obstacle, and which fly over it?

IV. *Breeding*. — (1) How often in the year does each species breed? (2) At what date was each "clutch" found, and how many eggs in each? (3) What interval occurred between the depositing of each egg? (4) How long was the period of incubation? Did the male take part in it, and if so, when did he relieve the female? (5) Do the eggs laid by young birds differ in colour and shape from those of old ones? (6) Which species use the same nest for a second brood, in the same or following year, and which build a new nest? (7) What localities are

preferred by certain species for nesting in; at what height are the nests found; and of what materials are they composed? (8) What species have built abnormal nests, or in unusual places? What cause can be assigned for this? (9) Have you any large breeding-colonies of Herons, Gulls, Sea-swallows, Rooks, Sand Martins, &c., and if so, in what localities? How many pairs are there on an average in these colonies, and do they increase or decrease in numbers?

V. All kinds of biological observations, as well as notes on moulting, food, utility or otherwise, song, &c.; even single instances are useful.

After the Ninth Annual Meeting of the General German Ornithological Society at Berlin, this Committee hopes to publish charts of the geographical distribution of the birds of Germany, and possibly of existing routes of migration. The following species will be taken first, and any reliable information as to their place of breeding, on the basis of the above instructions, will be acceptable:—

Lesser Kestrel	-	-	-	-	<i>Cerchneis cenchris</i> , Naum.
Black Kite	-	-	-	-	<i>Milvus ater</i> , Gmel.
Short-toed Eagle	-	-	-	-	<i>Circaetus gallicus</i> , Gmel.
Eagle Owl	-	-	-	-	<i>Bubo maximus</i> , Sibb.
Roller	-	-	-	-	<i>Coracias garrula</i> , Linn.
Grey-headed Green Woodpecker	-	-	-	-	<i>Gecinus canus</i> , Gmel.
Black Woodpecker	-	-	-	-	<i>Dryocopus martius</i> , Linn.
White-backed Woodpecker	-	-	-	-	<i>Picus leuconotus</i> , Bechst
Starling	-	-	-	-	<i>Sturnus vulgaris</i> , Linn.
Carrion Crow	-	-	-	-	<i>Corvus corone</i> , Linn.
Hooded Crow	-	-	-	-	„ <i>cornix</i> , Linn.
Rook	-	-	-	-	„ <i>frugilegus</i> , Linn.
Lesser Grey Shrike	-	-	-	-	<i>Lanius minor</i> , Linn.
White-necked Flycatcher	-	-	-	-	<i>Muscicapa albicollis</i> , Temm.
Red-breasted Flycatcher	-	-	-	-	„ <i>parva</i> , Linn.
Goldcrest	-	-	-	-	<i>Regulus cristatus</i> , Koch.
Firecrest	-	-	-	-	„ <i>ignicapillus</i> , Brehm.
Bonelli's Warbler	-	-	-	-	<i>Phyllopeuste bonellii</i> , Vieil.
Great Reed Warbler	-	-	-	-	<i>Acrocephalus turdoides</i> , Meyer.
Grasshopper Warbler	-	-	-	-	<i>Locustella naevia</i> , Bödd.
River Warbler	-	-	-	-	„ <i>fluviatilis</i> , Meyer.
Barred Warbler	-	-	-	-	<i>Sylvia nisoria</i> , Bechst.
Fieldfare	-	-	-	-	<i>Turdus pilaris</i> , Linn.

Rock Thrush	-	-	-	-	<i>Monticola saxatilis</i> , Linn.
Nightingale	-	-	-	-	<i>Philomela lusciniæ</i> , Linn.
Stonechat	-	-	-	-	<i>Pratincola rubicola</i> , Linn.
Whinchat	-	-	-	-	„ <i>rubetra</i> ,
Common Bunting	-	-	-	-	<i>Miliaria europæa</i> , Swains.
Ortolan	-	-	-	-	<i>Emberiza hortulana</i> , Linn.
Rock Sparrow	-	-	-	-	<i>Pyrgita petronia</i> , Linn.
Serin	-	-	-	-	<i>Serinus hortulanus</i> , Koch.
Capercaillie	-	-	-	-	<i>Tetrao urogallus</i> , Linn.
Black Grouse	-	-	-	-	„ <i>tetrix</i> , Linn.
Hazel Hen	-	-	-	-	„ <i>bonasia</i> , Linn.
Little Bustard	-	-	-	-	<i>Otis tetrix</i> , Linn.
Little Bittern	-	-	-	-	<i>Ardetta minuta</i> , Linn.
Great Snipe	-	-	-	-	<i>Gallinago major</i> , Bonap.
Shoveller	-	-	-	-	<i>Spatula clypeata</i> , Linn.
White-eyed Pochard	-	-	-	-	<i>Fuligula nyroca</i> , Guld.
Cormorant	-	-	-	-	<i>Carbo cormoranus</i> , Meyer.
Black-headed Gull	-	-	-	-	<i>Larus ridibundus</i> , Meyer.

In order to determine the route of migration, special attention in spring and autumn may be directed to the following well-known species:—

Kite	-	-	-	-	<i>Milvus regalis</i> , auct.
Swift	-	-	-	-	<i>Cypselus apus</i> , Linn.
Swallow	-	-	-	-	<i>Hirundo rustica</i> , Linn.
Cuckoo	-	-	-	-	<i>Cuculus canorus</i> , Linn.
Thrush	-	-	-	-	<i>Turdus musicus</i> , Linn.
Redwing	-	-	-	-	„ <i>iliacus</i> , Linn.
Skylark	-	-	-	-	<i>Alauda arvensis</i> , Linn.
Lapwing	-	-	-	-	<i>Vanellus cristatus</i> , Linn.
Crane	-	-	-	-	<i>Grus cinereus</i> , Bechst.
Stork	-	-	-	-	<i>Ciconia alba</i> , Bechst.
Greylag Goose	-	-	-	-	<i>Anser cinereus</i> , Meyer.
Bean Goose	-	-	-	-	„ <i>segetum</i> , Meyer.

Brunswick, November, 1884.

The Chairman of the Committee of Stations for the observation of Birds in Germany is Dr. Rudolf Blasius of Brunswick.

NOTES AND QUERIES.

The late Dr. Gwyn Jeffreys, F.R.S. — It is with great regret that we have to announce the sudden death from apoplexy, on January 24th, of Dr. John Gwyn Jeffreys, F.R.S., the well-known conchologist, who had only a few days previously attained his 76th year. On the evening of January 20th he read a paper before the Zoological Society, when he appeared in his usual health and spirits, and on the evening before his death was present at the Royal Institution to hear a lecture by his son in law, Professor Moseley. His unexpected demise will evoke a very wide-spread feeling of regret not only amongst a large number of private friends, but in a wide circle of scientists both at home and abroad to whom he has long been well known through his publications. Dr. Jeffreys was born at Swansea in 1809, and for some years, prior to his being called to the Bar at Lincoln's Inn, practised as a solicitor in that town. His tastes, however, were rather scientific than legal. At nineteen he wrote "A synopsis of the Pulmonobranchous Mollusca of Great Britain," and in the following year was elected a Fellow of the Linnean Society. He became a Fellow of the Royal Society in 1840. In 1869, 1870, 1871, and 1875, he either conducted or took part in exploring voyages in the North Atlantic and on the north-eastern coast of the United States. In 1880 he joined the French Sounding and Dredging Expedition in the Bay of Biscay. Dr. Jeffreys wrote over a hundred papers on scientific subjects; but he is probably best known by his principal work, "British Conchology," in five volumes. An assiduous attendant of the meetings of the British Association since 1836, he was the local treasurer at Swansea in 1848, president of the Biological section in 1877, and one of the vice-presidents of the last meeting at Swansea.

BIRDS.

Bird-life in Wanstead Park, Essex.—Wanstead Park, which has been thrown open to the public within the last few years through the action of the Corporation of London, is remarkable, considering its proximity to the metropolis, for the variety of birds that frequent its woods and waters; for the great city with its suburbs extends in an unbroken stretch of houses to within a quarter of a mile of the park-gates. The Herons, however, continue to arrive in early spring in undiminished numbers of from forty to fifty, and nest in the tall trees on an island surrounded by the broad ornamental waters. These trees also contain the largest rookery in the neighbourhood, and afford nesting-places for numbers of Jackdaws, Wood Pigeons, and a few Carrion Crows and Turtle Doves. Among the undergrowth Moorhens abound, notwithstanding that a Fox has for a length of

time taken up his quarters in this secluded part ; but as there are plenty of rabbits he may perhaps leave the birds alone. Dabchicks come in the spring and breed, but appear to leave us in late summer. Coots bring up two broods every year, and are so tame that they hardly keep beyond the range of the floats of the boys who come to fish in the unpreserved ponds. Jays are very frequent, but they retire to breed in the denser parts of the forest. Kingfishers are seen occasionally, and the Nuthatch is not uncommon ; while Tree Creepers, Golden-crested Wrens, and the various Tits and Finches abound. The summer migrants are well represented, and I have seen years ago a passing Ring Ouzel ; but perhaps the wild winter visitors are the most interesting. Some years ago a Red-necked Grebe came to the Basin, a large piece of open water in the park, where I watched it with a telescope for several days. I have also seen, on the same water, a female Great-crested Grebe, a Red-throated Diver, and a flock of Scaups. Last year a Pochard and four Tufted Ducks remained for more than a month on the lower ponds, where there is good cover of rushes ; they kept company with the Coots, and, though at first shy, they became curiously tame by the example of their companions. This year the Basin has been visited by about a score of Wild Ducks and a flock of fifteen Goosanders in immature plumage, which remained for five days. It was an interesting sight to watch the graceful fishing operations of these birds with a good telescope. After swimming in a compact company for a considerable time, they would all suddenly commence diving, probably having come over a shoal of fish, for many would be seen emerging with a fish in their bills, and, if one was too large to be immediately swallowed, a scramble would take place, and it would change beaks several times before being finally disposed of. To be quite sure of the species of the bird I made a coloured drawing from our telescopic observations, and compared it with the specimen in immature plumage at the South Kensington Museum, when the correspondence was exact ; it also agreed perfectly with the description in Yarrell. They left us on the 8th of this month (December). On the 15th we watched a small flock of Teal on one of the smaller ponds, and within the last few days have noticed Snipe, the Common Sandpiper, a Water Rail, and the Grey Wagtail ; the latter bird is frequently seen here in the winter. One of the ponds is fringed with large alders, and during the last week these trees have been frequented by a flock of Siskins, among which we have noticed a few Lesser Redpolls ; a pair of the latter were busy with the birch catkins in a copse close to the high road. During the winter months Peewits and Golden Plovers come in large numbers to the extensive and highly manured fields in this neighbourhood ; on the 16th March last year a flock of about a hundred Golden Plovers frequented the park and its vicinity, and we noticed that a fair proportion of the birds had already acquired the deep black on the front

of the neck and breast; they were in company with a host of Peewits and Fieldfares, making a fine group as seen through the telescope.—ARTHUR LISTER (Leytonstone).

Icterine Warbler in Norfolk.—It is as well to place on record, in 'The Zoologist,' particulars of the capture of a British specimen of the Icterine Warbler, *Hypolais icterina*, which was exhibited by Mr Dresser at a meeting of the Zoological Society on the 14th November last, as already noted (Zool. 1884, p. 493). The specimen referred to, as I am informed by Mr. Dresser, was shot by Mr. F. D. Power on the 11th September last near Blakeney, where he found it in a thick clump of thistles along the Cley sea-wall. It was alone at the time, although a number of Wheatears, Redstarts, and one Bluethroat were observed the same day arriving from the north, the wind being E.N.E. The sex was undetermined; the plumage indicated a bird of the year.—J. E. HARTING.

The Barred Warbler in Norfolk.—At a meeting of the Zoological Society, held on the 4th November, 1884, the Rev. H. H. Slater exhibited a specimen of the Barred Warbler, *Sylvia nisoria*, which had been obtained in August, 1884, on the Yorkshire coast, and particulars of the capture were subsequently communicated to 'The Zoologist' (1884, p. 489). At the same meeting another example of this bird was exhibited by Mr. Dresser, the history of which has not yet been noted in this Journal. It was shot by Mr. F. D. Power on the 4th September last from scrub at the base of Blakeney Sandhills, Norfolk, where Garden Warblers on migration were at that time numerous. It was the only bird of the kind observed, and proved on dissection to be a female. In plumage it closely resembled the specimen described by Mr. Slater (*l. c.*), being in fact, like the latter, a bird of the year.—J. E. HARTING.

Ornithological Notes from Somerset.—I forward a few notes of occurrences in this county during the last six months, the first I regret to state being the destruction of two pairs of the Great Spotted Woodpecker, *Picus major*, by far the least common Woodpecker in Somersetshire. They were shown to me on the 9th of July as having been shot near Taunton, both pairs being then set up and cased; in both instances the female, as far as I could see, showed signs of having been sitting, the breast of each bird being partially denuded. On the 6th of August, while driving home from Taunton, an acquaintance called to me over the hedge of his garden to come in and identify a clutch of eggs he had had brought to him that day, and which he supposed to be Quail's eggs. I accordingly went in, and found the eggs to be undoubtedly those of a Quail. My acquaintance had just blown some of them, which he said were quite fresh. From the lateness of the season these must have been a second laying, the first very likely having been destroyed by a mowing-machine earlier in the summer. In former,

years I have had the remains of Quails' eggs brought to me mostly smashed to pieces by the mowing-machine in the haymaking time, but never so late as August. Although unfortunately so destructive to birds and eggs, the general use of the mowing-machine has shown that Quails breed with us in Somersetshire more frequently than is supposed. My acquaintance also showed me at the same time three or four clutches of Red-backed Shrikes' eggs taken in the neighbourhood, two I have no doubt taken in this parish (Bishops Lydeard), as I had previously noticed two pairs of Red-backed Shrikes, both of which I have no doubt had nests. I expected to hear of more Quails being shot about here in September than usual, but the only one I have seen or heard of was killed at Monkton on September 3rd. On the 29th of August a Greenshank was sent to me in the flesh and quite fresh from Huntspill, near Bridgewater. From the brown markings of the feathers of the back and upper parts, and the peculiar markings of the tail, I suppose this to have been a young bird of the year. On the 27th of September I received a letter from Mr. Edwards, of Wrington, in the eastern part of this county, informing me that he had just killed an old hen Red Grouse at that place. So far as I know this is the only instance of the occurrence of the Red Grouse in Somersetshire, the only other within a moderate distance of which I am aware being the one recorded in Montagu's 'Ornithological Dictionary' as having been shot near Wedhampton, in Wiltshire, in the winter of 1794. I also received from Huntspill, early in September, a Grey Phalarope, a young bird of the year, but rather an early occurrence. From the same place also, at the same time, a Richardson's Skua in rather peculiar plumage. It is of the pale form and nearly adult, but, as usual at that time of year, in moult. The brownish band on the breast is fully developed; the chin, the lower part of the breast, and the belly are white; the flanks, however, are much clouded with grey, and the under tail-coverts more or less barred. The back and upper parts are mostly of the usual pale grey of the adult, but mixed with this pale grey are many darker grey feathers rather broadly tipped with white; these, from their unworn appearance, are new feathers fresh grown after the autumn moult, the old paler feathers being a good deal worn at the tips and sides; the tail-feathers are new feathers after the moult, and not half-grown. There are none of the yellow markings of the adult bird on the sides of the neck; the dark cap, however, is fully developed. My last note is on a Little Auk, which I saw at the birdstuffer's in Taunton on December 10th. It had been sent from Ilminster, and I suppose had been killed there, as it was in the flesh and quite fresh. The weather had been stormy, with a strong gale from the west to north-west, which would account for its being found so far inland. — CECIL SMITH (Bishops Lydeard, Taunton).

Tree Sparrow nesting near Cromer.—I was not a little surprised at having a Tree Sparrow's nest last summer in our dry parish of Northrepps, far removed from marsh or stream, in the tiles of a cottage within one hundred yards of the front door. In thirteen years I have seen about a dozen of these birds, and, although I had in June last seen a couple for the first time at this season, I should not have thought of looking for their nest in a tiled roof. The nestlings were just ready to fly when discovered, and a fortnight afterwards I captured a young one in the garden, evidently one of the second brood. In Asia the Tree Sparrow is stated to nest habitually among houses, but my previous experience of its nests have been in trees and sheds by the water-side.—J. H. GURNEY, jun. (Northrepps, Norwich).

Notable Birds' Nests.—On April 19th I found a Kingfisher's nest, containing seven eggs, in the uprooted portion of a fallen poplar. In this neighbourhood of late years many poplars have been blown down, affording secure and favourite nesting-places for the Kingfisher; the hole in which the nest was placed was ten feet from the ground. On April 21st young Rooks were hatched. On May 5th a Nuthatch's nest with four eggs was found, about three feet from the ground, in an apple tree. On May 21st I was fortunate enough to take nearly four dozen Tree Sparrow's eggs in Cambridgeshire. The nests without exception were built in pollard willow trees. The variety in these eggs was very great; I obtained several quite light specimens, and there was one light egg with a clutch of dark ones in many instances. On May 30th a Wryneck's nest containing eight rather small eggs was found in the top of a perfectly dead pollard elm. On August 24th I found, amongst some potatoes with very little top on, being late in August, a Yellowhammer's nest containing three eggs; I call it a nest, but really it consisted of little but a few grasses, &c., bent round, for positively the three eggs were placed upon the hot, dry, dusty soil, and it was the most curious place I have ever seen for a Yellowhammer's nest. During the summer, at Martlesham, Suffolk, a Butcher Bird (before it could be destroyed) had taken over twenty young partridges, transfixing them up on the hedges in the vicinity. An unusual number of Bramblings have appeared this year on the beech trees.—E. CHARLES MOOR (The Rosery, Great Bealings, Woodbridge, Suffolk).

Lesser Black-backed Gull on the Yorkshire Coast.—In reply to the remarks of the Rev. Mr. Tuck and Mr. W. E. Clarke (p. 26), my statement that some climbers had eggs of this bird among their other spoils was simply given on their authority, as I myself am of opinion that the eggs of this species cannot be distinguished from those of the Herring Gull. I may mention, however, that the climbers in question could not have selected the clutch of three eggs (which they emphatically declared to me

were those of the Lesser Black-backed Gull, as I questioned them closely respecting them) from any pecuniary point of view, for they did not ask any higher price for them. In our subsequent climbing excursions on the Filey cliffs we were always accompanied by one of these men, and he seemed to be well acquainted with the different species of sea-birds occurring on the coast, and when I asked him respecting the Lesser Black-backed Gull he said he only occasionally met with them breeding there, and could not be certain of finding their eggs every season, but was positive upon the point that this species does nest on the cliffs. I hope the question may be satisfactorily cleared up this year, and have little doubt but that our man's statement will prove to be correct. In reply to Mr. Clarke's remarks respecting the Rock Dove's eggs we took, I am certain the two clutches we were fortunate in obtaining were of this species, for in both cases we had a clear view of the bird, from above, as it left the nest. From one of the nests we had sent off the bird at least half a dozen times before we finally took the eggs, as we almost daily walked above the site. I appear to have omitted all mention of the Stock Dove in my paper somewhat unaccountably, for, on reference to my note-book, I find we constantly noticed its presence. We not only observed it on the cliffs, but we found a nest containing eggs in an old tree in one of the ravines running inland.—THOMAS CARTER (Burton House, Masham).

Reported Occurrence of the Short-toed Lark.—Referring to Mr. Fisher's note on the Short-toed Lark (p. 31), I must confess that to my mind the evidence adduced as to the authenticity of the specimen amounts at most only to a probability of its being British. Mr. Fisher is not perhaps aware that Short-toed Larks are imported by London dealers among Goldfinches from France and Spain. At all events, I could myself add the Serin Finch and Cirl Bunting to the Norfolk lists on similar evidence; or might register the Little Owl, Brambling, and Siskin as having bred in Devon, Essex, and North Wales on the strength of hand-reared specimens, which I was assured had been taken in those counties.—H. A. MACPHERSON (Carlisle).

Puffin in Nottinghamshire.—A daughter of the Rev. C. Wells, of Mansfield Woodhouse, picked up one of these birds alive on the road near that village in November, and kindly brought it over here for me. This is the first time this species has occurred in this county, so it will form a great addition to the county birds in my collection. It was a young bird of the year.—J. WHITAKER (Rainworth Lodge, Mansfield).

Uncommon Birds in Devon.—Early in January an adult male Golden-eye Duck was shot near Slapton, at Mr. Holdsworth's lea, also a female Gadwall on the Slapton Lea, the first of which we have any record in this neighbourhood. On Jan. 12th, on Slapton Lea, a fine male Egyptian

Goose was shot, the second we have ever known to occur in this district; the other was killed about twenty-five years since. I may also mention that a spotted Crake was sent to me from the Plymouth Market on Dec. 15th, quite fresh and in excellent condition; also a Landrail shot near here on Dec. 26th, which I believe is very late for both species, and the former of rare occurrence here, say one in five years.—R. P. NICHOLLS (Kingsbridge, Devon).

Night Heron in Scotland.—The Night Heron, *Nycticorax griseus* (L.), although having a very wide distribution, may be considered rather a rare visitant to Scotland, for during the present century only some seven specimens have been recorded to have been obtained there. The individual in question (an immature female) was caught in the beginning of November last at Loch Creran, Argyleshire, by Mr. W. Anderson Smith, of Ledaig. It was in an exhausted condition when taken, the result probably of the severe storms then prevalent, and lived only a few days, and on Nov. 14th was presented in the flesh to the Kelvingrove Museum, where it is now preserved. The species has now been proved to be identical with that found in America, from which it was (till quite recently) said to differ.—J. M. CAMPBELL (Kelvingrove Museum).

Interbreeding of the Thrush and Blackbird.—As this subject has been already referred to in the pages of 'The Zoologist' (1884, p. 146), I should like to draw attention to an apparent case of this kind, which, as Mr. J. H. Gurney, jun., has kindly pointed out to me, is recorded in Thompson's 'Natural History of Ireland' (vol. iii., Appendix, p. 456). He says:—"Another instance [of hybridity among birds] was made known to me in April, 1850, by Mr. Robert M. Austin, an eye-witness of the fact. At Waterloo Cottage, within a mile of Ayr, where this young gentleman resided, a female common Thrush (*T. musicus*) and a male Blackbird (*T. merula*) paired in the summer of 1849, built a nest in a small shrub, and produced three young in June, which were parti-coloured, having some black spots, the size of a sixpence, on their breasts. The notes of these young birds were frequently heard, and differed from those of Blackbird and Thrush by being more detached. Both parents are stated to have fed and tended the young. My attention was first called to this interesting circumstance by the Rev. W. M'Ilwaine, of Belfast, who happened to pay a visit to the place at the time." The foregoing would have been noticed in my article upon the subject in the 'Transactions of the Norfolk and Norwich Naturalists' Society' (vol. iii., part v., 1883-4, p. 588) had it come to light in time. I am inclined to think that it is one of those instances in which a female Blackbird may possibly have been mistaken for a Song Thrush.—ROBERT MILLER CHRISTY (Chignal St. James, near Chelmsford).

FISHES.

Salmon in the Hampshire Avon.—It is well known that this river is somewhat celebrated for the breeding of the Salmon in its waters, and doubtless many more fish would come up the stream if there were not certain obstacles to prevent them. I am informed that during last season no less than sixteen hundred salmon of various weights were taken in the so-called "run" at the mouth of the river, and four or five hundred more a few miles further up, besides the numbers that were taken with hook and line at Ringwood, and places still farther north. The Avon, like many other rivers, has suffered much from continued drought, and for a considerable time the lowness of the water was a topic of conversation, but with the first heavy rain there was a "flush" of the stream, and the Salmon—no doubt kept back by the shallowness—made a rush "up stream" in countless numbers, and the consequence is that at the present time (December 8th) the river is literally swarming with them, especially about the mills and hatches, where anything like an obstacle prevents their ascent, and the fish, in their eagerness to ascend, have in several instances thrown themselves out upon the land, or come to an untimely end by striking themselves against the obstructions named. In one instance a large fish was found dead, having forced itself so tightly into an aperture near one of the "ladders" that it was with difficulty extricated. Much to my regret, a continued indisposition prevented me from seeing the sight; but an old fisherman friend of mine who has known the river all his life says he never saw the like before. Previous to this it had been remarked how few fish had ascended the river for spawning, and possibly their retarded ascent had made them even more eager than usual to reach the gravel beds where Nature's law is fulfilled. Most of the fish, if not all of them, at present in the river are of the reddish hue peculiar to them at this season, and I believe it is a tint usually assumed by individuals whose stay in fresh water is at any time prolonged; and yet my old friend informs me that sometimes a fish, after the spawning season, will get as clear in appearance as a "fresh run" specimen, or, to use his expression, "as bright as a shilling," the truth of which I cannot gainsay. In many cases it is somewhat strange that men whose occupation is continually upon the river should have such a superficial knowledge of the fishes therein, but the above statement was made by a man who certainly knows the difference between a "clean" and an "unclean" fish. We are well aware that a lengthened stay in fresh water alters the condition and appearance of Salmon, but what fish are those which are caught in the first few weeks of the season, in February? Are they individuals who had previously spawned early and returned to the sea before the main body made their ascent? We can scarcely believe that the fishes, now so

eager to ascend, are some of the same that will reward the angler in the cold days of February next, for in that case the spawning, the return to the sea, the improved condition, and subsequent ascent up the river, take but a comparatively short time. If, as is generally supposed, the fish eat nothing whilst in fresh water—nothing being found in the stomachs of those which are caught—their voracity on their return to the sea must be very great, and consequently their condition may be rapidly improved. It is well known that the longer a salmon stays in fresh water the weaker it gets, and possibly the salt water recruits its strength in a much more rapid ratio than the weakness assails it, yet the mere act of spawning must be a considerable item in the weakening process in the constitution of some of the poor emaciated individuals as they go back to the sea; and one would think its reparation would take more than a few weeks to accomplish. That the now spawning fishes, many of them, go back to the sea and return again into the fresh water plump and bright in the early spring, is an opinion shared by not a few who have an interest in the matter. It is a remarkable fact that, although the Avon and Stour empty themselves by one mouth into the sea, yet the Salmon, till within the last few years, almost shunned the Dorset stream for that of Hants, and, although at the present time the great majority of fish ascend the Avon, yet the numbers found in the Stour are annually increasing; but whether this arises from more anglers and a stricter investigation of the latter river I cannot say.—G. B. CORBIN (Ringwood, Hants).

Food of the Cod.—Referring to my previous remarks on this subject (p. 34) I may add that I have to-day (Jan. 19th) taken from the stomach of a Common Cod a very large specimen of *Scyllarus arctus*, and a small Velvet Swimming Crab (*Portunus puber*). The Cod in question was caught in the Bay here. The measurement of the specimen of *Scyllarus arctus* were:—Over all, five in. six-sixteenths; across the carapace, one in. six-sixteenths; length of exterior antennæ (included in “over all”), fourteen-sixteenths in.; breadth of each of them, eleven-sixteenths in. — THOS. CORNISH (Penzance).

Flight of the Flying Fish.—In ‘The Zoologist’ for 1880 (pp. 471–481) appeared an article on this subject by C. O. Whitman, and in the succeeding volume for 1881 notes by Capt. Hadfield (p. 68), Mr. D’Urban (p. 146), and Mr. Pascoe (p. 147), all contributing information from personal observation. In a recent letter to ‘Nature’ (1st January, 1885) Prof. Möbius writes as follows:—“Flying Fish are incapable of flying, for the simple reason that the muscles of their pectoral fins are not large enough to bear the weight of their body aloft in the air. The pectoral muscles of birds depressing their wings weigh, on an average, one-sixth of the total weight of the body, the pectoral muscles of bats one-thirteenth, the muscles of the

pectoral fins of Flying Fish only one-thirty-second. The impulse to which Flying Fish owe their long shooting passage through the air is delivered, while they are still in the water, by the powerful masses of muscle on both sides of their body, which are of much greater breadth than in the case of the Herring or any other fish of their own size."

MOLLUSCA.

Rossia macrosoma in Argyleshire.—A fine specimen of this rare little Cephalopod was taken in the dredge during the summer of 1884 in Loch Creran by Mr. W. Anderson Smith, and sent by him to Kelvingrove Museum, Glasgow. This is the first time it has been taken in the West Highlands, so far as I am aware.—J. M. CAMPBELL (Kelvingrove Museum).

Erratum.—Through an unfortunate confusion of identity I described my sketch of a monstrosity, in the December number of 'The Zoologist,' as *Buccinum undatum*; of course it should be *Fusus antiaus*, which is at once palpable from the figure itself. — EDWARD LOVETT (Addiscombe, Croydon).

Errata.—In my paper on Surrey Mollusca the following errata occur:—Page 13, lines 4 and 15 from top, for "Oxstead" read "Oxsted." Page 14, line 9 from top, for "*Cornulus*" read "*Conulus*." Line 18, "*Planorbis glaber* at Paddock Wood"; it is possible that these may be merely a var. of *P. albus*. Line 19, for "*gagatis*" read "*gagates*"; I have recently taken this in Middlesex.—T. D. A. COCKERELL.

 SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

December 18, 1884.—Sir John LUBBOCK, Bart., F.R.S., President, in the chair.

The following gentlemen were elected Fellows of the Society:—Lieut.-Col. W. Rowe Lewis, Dr. Chas. B. Plowright, Messrs. Thos. B. Blow, H. G. Greenish, A. G. Howard, Lionel de Nicéville, and Fred. Shrivell.

Mr. Edw. Alfred Heath exhibited a stuffed adult specimen of the Wild Cat, which had been found dead in a trap (November, 1884) in Ben-Armin Deer Forest, Sutherlandshire, in which district they still are frequently met with.

Prof. St. G. Mivart read a paper on the convolutions of the brain in the Carnivora and Pinnipedia, describing for the first time in detail the brains of *Nandinia*, *Galidia*, *Cryptoprocta*, *Bassaricyon* (from a cast of the skull), *Mellivora*, *Galictis*, and *Grisonia*. Confirming the views of previous observers, the author gave additional reasons for a three-fold division of the Carnivora into *Cynoidea*, *Æluroides*, and *Arctoidea*, though he remarked that amongst the *Æluroids* the section of *Viverrina* formed a very distinct group, judged by the cerebral characters. He specially called attention to the universal tendency amongst the *Arctoidea* to the definition of a distinct and conspicuous lozenge-shaped patch of brain-substance defined by the crucial and precrucial sulci. This condition, which he found in no single non-arctoid carnivore, he also found in the brain of *Otaria Gillespii*, and afterwards in *Phoca vitulina*, where it is very small and much hidden. This fact he adduced as an important argument in favour of the view that the Pinnipedia were evolved from some Arctoid, probably Ursine form of Land Carnivora.

In illustration of some ornithological notes, Mr. T. E. Gunn showed an interesting series in varied plumage of the Blue-throated Warbler (*Ruticilla suecica*, Linn.) The examples in question were procured by Mr. G. E. Power at Cley, on the Norfolk coast, in the second week of September last. Mr. Gunn also exhibited an immature female specimen of the Little Bittern (*Botaurus minutus*), shot by Mr. E. N. Benningfield at Broxbourne Bridge, Herts, on October 15th; as likewise a hybrid between a cock Goldfinch and hen Bullfinch, possessing the marked characteristics of both parents.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

January 20, 1885.—Prof. W. H. FLOWER, 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, 1884, and called attention to a Muntjac from Ningpo, China, deposited by Mr. H. E. Dresser on December 20th, which appeared to belong to a species distinct from any yet described, and which was proposed to be called the Hairy-fronted Muntjac, *Cervulus crinifrons*, sp. n.; and to a young male Nubian Ibex, *Capra nubiana*, presented December 30th by Mrs. Laing, of Thornhill, Sunderland, which was stated to be new to the Society's Collection.

Mr. Sclater called attention to the breeding of a pair of the Chinese Blue Magpie in the Society's Gardens in 1884, and exhibited specimens of their eggs.

Prof. Bell exhibited some models illustrating a paper by Rathke on the development of the great blood-vessels in the Vertebrata.

Mr. Tegetmeier exhibited a specimen of the Wild Cat, *Felis catus*, from Donegal, and an example of a singular variation in plumage of the Black Grouse, *Tetrao tetrix*.

A paper was read by Dr. P. Pelseuer on the coxal glands of *Mygale*. Dr. Pelseuer's observations had been made on a large specimen of *Mygale* of the subgenus *Theraphosa* received from the Society's Gardens. The form and position of this organ in the Arachnides had not been previously described or figured.

Mr. E. J. Sidebotham read a description of the muscular system of the Water-Opossum (*Chironectes*), as observed in a specimen of this Marsupial which he had recently dissected.

A paper was read by Mr. G. A. Boulenger containing the description of a new species of Frog from Asia Minor, belonging to the section *Rana temporaria*. This was proposed to be called *Rana macrocnemis*.

A communication was read from Dr. O. Boettger containing the descriptions of five new species of Shells of the genus *Bulimus*. The specimens upon which these descriptions were based had been collected by Vice-Admiral T. Spratt in various parts of the Levant.

A communication was read from Mr. J. H. Thomson containing the description of a new species of mollusk of the genus *Hyalina* obtained at the island of Vaté, New Hebrides, by Mr. E. L. Layard, which he proposed to call *Hyalina (Conulus) layardi*.

Dr. Gwyn Jeffreys read the ninth of his series of papers on the Mollusca of the 'Lightning' and 'Porcupine' Expeditions. This part included the representatives of the families from Ianthinidæ to Cerithiopsidæ, with seventy-five species, of which twenty-three were new to science. One new genus (*Stilus*) was also described.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

December 3, 1884.—J. W. DUNNING, Esq., M.A., F.L.S., &c., President, in the chair.

Baron C. R. Osten-Sacken (Haus Mai, Heidelberg) was balloted for and elected an Honorary Member of the Society; and James J. Walker, Esq., R.N., a Subscriber, was elected an Ordinary Member.

Mr. H. T. Stainton exhibited specimens of *Goniodoma Millierella*, bred from *Statice virgata* in the South of France, recently received from M. Constant, and British specimens of *G. auroguttella*, Fisch.-Rössl., bred from *Atriplex laciniata*, for comparison. Although Mr. Stainton quite believed they were distinct species, he had as yet failed to find an appreciable character to separate them. Specimens of *G. limoniella*, bred from *Statice Limonium*, were also exhibited.

Mr. H. Goss exhibited specimens of *Bankia argentula*, Hübn., from a

new locality on the borders of Cambridgeshire and Suffolk; also a drawing of the larva of this species, received from Mr. Brown, of Cambridge. The drawing represented the larva as feeding on some species of grass apparently belonging to the genus *Festuca*, though, according to Mr. Buckler, the larva feeds on some species of *Poa*.

Mr. R. McLachlan said it would be interesting to British entomologists to know that *Tapinostola Bondii*, Knaggs, had occurred on the island of Rügen in the Baltic (Stett. Ent. Zeit. xlv. 432); it was only known previously from Central Greece and Britain.

Mr. W. F. Kirby alluded to *Noctua subrosea*, Steph., as another British moth with very limited distribution (Britain, Livonia, Finland).

Mr. J. Jenner Weir, on behalf of Mr. E. Lovett who was present as a visitor, exhibited a collection of Micro-Lepidoptera from the neighbourhood of Grahamstown, Cape Colony, and made some remarks on their great resemblance to British species. They were collected by Mr. H. F. Billingham.

Mr. T. R. Billups exhibited specimens of Aculeate Hymenoptera captured at Chobham during the past season; also Ichneumonidæ, &c., collected in various localities during 1884.

Mr. H. J. S. Pryer contributed a paper "On two remarkable cases of mimicry from Elopura, British North Borneo, with remarks on Mr. George Lewis' paper read before the Society on 4th October, 1882." The cases of mimicry referred to was that of a large coleopteron (*Nothopeus fasciati-pennis*, n. s., C. O. Waterhouse) mimicing an equally large hymenopteron (*Mygnimia aviculus*, Sauss.), and of a large lepidopteron (*Scoliomima*, n. g., Butler, *insignis*, n. s., Butler) mimicing a large hymenopteron (*Triscolia patricialis*, Burm.).

Mr. A. G. Butler made some remarks upon the very interesting cases of mimicry alluded to, and contributed a description of the moth, for which he formed a new genus of *Ægeriida*, coming next to the African genus *Toosa* (= *Ninia*). He also referred to the remarkable mimetic resemblance between the two species of *Myrmecopsis*, Newman, with their distinctly petiolated abdomen, and species of *Polybia* or *Agenia*. Mr. Butler said it was both interesting and curious to find that in India the female *Argynnis Niphe*, Linn., mimics *Danais Chrysippus*, Stoll; while in Australia the sexes of the representative of *A. Niphe* (*A. inconstans*, Butl.) are similar, the Australian *Danais* being so small that it is not worth mimicing. The well-known case of *Papilio Merope*, Cram., was also interesting: furthermore, that the *Catocalinæ* were directly opposed to Mr. Lewis' views, since the upper surface of the hind wings, which are least exposed to the action of the sun's rays, are the most brilliantly coloured portion of these insects.

Mr. C. O. Waterhouse remarked upon and exhibited specimens of the following two cases of mimicry: a species of *Myocoris* (Hemiptera) and a

species of *Joppa* (Hymenoptera) from the Amazons; a dipteran allied to *Dasypogon*, the hymenopterous *Abispa australis*, and the coleopterous *Hesthesis ferrugineus*, M'L., from Australia. Mr. Butler said the lepidopterous genus *Dycladia* would complete the trio in the first-mentioned case. Mr. Waterhouse did not think it possible that the Longicorn could be parasitic on the wasp, as was suggested by Mr. Pryer. Mr. Fitch thought if there was any community of habitat it would be that the wasp nested in the burrows of the Longicorn.

Several members took part in a discussion upon the various points raised by Mr. Pryer's criticism of Mr. Lewis' paper.—E. A. FITCH, *Hon. Sec.*

NOTICES OF NEW BOOKS.

British Oribatidæ. By ALBERT D. MICHAEL, F.L.S., F.R.M.S.
8vo. pp. 336, with 39 plates. London: printed for the
Ray Society. 1884.

IT is fortunate for biologists that there exists such an excellent medium for the publication of scientific works on Zoology and Botany as the Ray Society; for it is certain that were it not for the aid which this Society extends, many important works requiring to be expensively illustrated would never see the light. The class to which works of this nature appeal is confessedly a small one, hence the difficulty which arises in finding a publisher willing to undertake the cost of their production. The Ray Society, in such cases, comes to the rescue, and, by the aid of the funds annually raised by the subscription of its members (an insignificantly small subscription when compared with the value of the volumes annually issued), secures the publication of treatises which otherwise would never appear, and which in many instances must have cost the authors years of unrequited labour.

To this important series another volume, on the British *Oribatidæ*, has just been contributed by Mr. A. D. Michael.

The ordinary English name for the *Oribatidæ* is "beetlemites," but it is an unfortunate one, because it gives many people the idea that they are parasitic upon beetles, and that the so-called species *Acarus coleopterorum* of Linnæus is a type of

the *Oribatidæ*, whereas this creature belongs to an entirely different family, *viz.*, the *Gamasidæ*.

The name of "beetle-mite" has no doubt been given from the general resemblance in appearance of many, indeed most, of the species to beetles. This resemblance is, however, probably little more than superficial, as in most essential points the *Gamasidæ* are more closely allied to the true Insects than the *Oribatidæ*, the first pair of legs being true walking legs in the *Oribatidæ*, and not used for any other purpose, whereas in the *Gamasidæ* they are usually tactile organs, little, if at all, used for locomotion, and, although pediform in shape and size, they are really more closely allied to palpi, and are placed in close proximity to the mouth organs.

The term *Oribatidæ*, from *oribata*, is, as Mr. Michael remarks, euphonious, but we fail to see its applicability, except upon the *lucus a non lucendo* principle, since it is derived from the Greek words *ὄρος*, a mountain, and *βαίω*, I go. Seeing the rate of progress at which these tiny creatures travel, the ascent of a mountain would be more than a life-long task. It is possible, as Mr. Michael suggests, that Latreille, the proposer of the name *Oribata* in 1804, may have based it not directly upon *ὄρος* and *βαίω*, but upon the proper name *Oribasus*, Actæon's dog, derived from these two words. At any rate *Oribata* is the name which has come to be universally employed for these Acarids, to the exclusion of Hermann's name *Notaspis*, bestowed the same year.

The *Oribatidæ* are all of microscopic size, the largest species known being not more than the twentieth of an inch in length, while the smallest are under a fifth of that measurement. It will be readily understood that this very small size renders it extremely difficult to ascertain their structure or to study their life-histories, particularly as they possess in the adult stage a chitinous exoskeleton of unusual brittleness, and often so black and rough that a very high concentration of light is necessary to see them properly, while the necessity for using moderately high amplifying powers renders strong reflected light more difficult to obtain; and moreover strong light is most unwelcome to the creatures, almost all of which live in comparative darkness, and avoid the light as much as possible.

These and other difficulties, however, Mr. Michael, by unwearied patience and careful manipulation, has contrived to

overcome; and, by keeping specimens under observation in a living state, he has succeeded in watching them through the various stages to the adult condition, tracing their development and noting many a curious fact in their life-history.

Dissecting them under the microscope, he has carefully ascertained the nature of their structure, which he has illustrated in detail in a series of beautifully-executed plates, and, in dealing with their life-history, has furnished an account which rivals in interest Darwin's observations on the habits of Earthworms, and Sir John Lubbock's experiments on Ants and Bees.

In marked contradistinction to all other groups of *Acarina*, the *Oribatidæ* at every stage of their existence are free organisms, not in any way parasitic, and not looking for any host either for nutriment or conveyance.

All the members of the family appear to be vegetable feeders, although Mr. Michael seems to be a little doubtful about *Pelops*, and none of them have been found to be injurious to man or his works. Their respiration is tracheal. They are extremely slow in their movements, sometimes remaining motionless for hours, and it is not always easy to distinguish some of the immature ones from the vegetable substances upon which they feed. A French naturalist, M. Nicolet, has taken the trouble to calculate the rate of progress of several species, and Mr. Michael has reproduced his table of results, believing them to be "fairly correct."

The amount of information elicited by patient research, and made known in the work before us, shows how much there is to learn about living creatures of whose very existence probably many people until now have been quite unaware.

Nests and Eggs of Australian Birds. By ARCHIBALD J. CAMPBELL.
8vo, pp. vi; 72; xxx. Illustrated with photographs of the eggs. Melbourne: published by the author. 1863.

THE mode of nidification and the character of the egg furnish such important indications of the nest-builder's affinities with other species, that well-authenticated specimens of the eggs of little-known birds are always welcome additions to a collection formed with a scientific object.

Of the nidification of Australian birds we still know, comparatively speaking, very little; for, although Gould described the eggs of a large number of species (about 262 according to Mr. Campbell out of the 670 mentioned in his 'Birds of Australia,') and Mr. E. P. Ramsay has since described between twenty and thirty more, this is but a very small proportion of the number of Australian birds whose breeding habits prior to the publication of Mr. Campbell's work were unknown to naturalists in this country.

In the work now before us, to quote the author's own words (Introduction pp. iii-iv), "Descriptions and dimensions are given of about 413, or nearly all the known, Australian eggs, 262 being taken from Mr. Gould's celebrated work on the Birds of Australia. The balance 151 were unknown to him or his collectors; of these 122 are described from authenticated specimens in my own collection, twenty-four from Mr. E. P. Ramsay's papers, and five from other authors."

The book is illustrated with full-page photographs of eggs (ten to sixteen on a page), all presumably of the natural size, and useful therefore as showing their relative proportions and the character of their respective markings.

It would be well, we think, if Mr. Campbell had confined his descriptions to the eggs of such birds as actually breed in Australia, omitting those which are only found there as accidental visitors. For instance, why describe the eggs of such well-known species as the Grey Plover, Ringed Dotterel, Common Sandpiper, and Greenshank, which are only stragglers to the Antipodes in winter, and whose eggs have already been described by other writers? We should like to know from what specimens (one or more) Mr. Campbell wrote down his description of the egg of the Curlew Sandpiper, *Tringa subarquata*, which species he notes as having occurred in Australia, Tasmania, and New Guinea. The egg marked as "previously undescribed," is thus depicted:—"Somewhat pyriform in shape; ground colour of a dull yellowish olive, or buff stone, fairly marked all over with round well-defined spots of umber of different shades, varying from very light to very dark. Length, 1 inch $2\frac{1}{2}$ lines; breadth, 11 lines."

The photograph of this egg (No. 523) gives the idea of its being somewhat too small for the bird, bearing in mind the size of that laid by its relative the Dunlin, *Tringa alpina*. No description of

the nest is given, nor any indication of the locality whence the specimen was obtained.

Here and there Mr. Campbell gives an interesting sketch of the situation in which a particular species is to be looked for. Take, for instance, his account of the haunts of the Victoria Lyre-bird, *Menura victoriae*, which we will here quote:—

“The toil attending the search for Lyre-birds’ nests, of all nesting out, is the most arduous, and must be experienced to be fully realised; because, firstly, these curious birds incubate in August, one of our wettest months of the year, consequently terribly boggy and greasy tracks have to be travelled; secondly, the nature of the country to be scoured is of the roughest and wildest that Gippsland can produce. You have to thread your way through thickly-studded hazel-tree scrub, with wet cat-head ferns up to your knees; then to tear through rank, rasping sword-grass which cuts your very clothes, not unfrequently nastily gashing your unprotected hands and face; next, entangled in a labyrinth of wire-grass holding you at every step, and hiding treacherous slippery logs, on one of which perhaps your right foot slips, causing you to perform a species of ‘double-shuffle’ with your left in order to preserve your equilibrium, which, however, is as often destroyed as not, and, as a natural consequence and *finale* to the ‘break-down,’ you land on your side with a grunt, and wallow amongst rank vegetation. To climb the opposite hill you cross on ‘all-fours’ a wet saturated log which naturally bridges the gully: in accomplishing this awkward task, overhanging tree-fern fronds dash in your face, drenching you nearly as much as if some individual had thrown a pail of water over you. Notwithstanding the chilly weather there is always a humidity in these forests, and with such wholesome exercise you are soon bathed in perspiration, and gladly halt now and again for breathing-time at the head of some lovely gully where the scrub is not so dense, and you stand in one of Nature’s silent picturesque temples. . . . Here the awful stillness of an Australian forest is hardly broken save by the somewhat soothing sound of a continual hissing and surging of the sea of *Eucalypti* foliage, some 200 feet towards the zenith, the chirp of the Yellow Robin, or a beautiful *cadenza* from a Lyre-bird down the gully.”

As a contribution to Oology we doubt not that Mr. Campbell’s book will be acceptable to many in this country, while in Australia it will be very useful in showing collectors what yet remains to be done. If, as the author supposes, some three hundred eggs of Australian birds have yet to be described, there is indeed a fine field for exploration open to young and ardent ornithologists.



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NOTES ON THE SEAL AND WHALE FISHERY OF 1884.

BY THOMAS SOUTHWELL, F.Z.S.

THE season of 1884 must be considered as a very unfavourable one for the Newfoundland sealing. It is probable that a larger number of young seals escaped this season than usual, and that the smallness of the catch is to a considerable extent due to the fact that the old seals took to the ice high up in the neighbourhood of Funk Island, where the pack was very heavy, rendering it impossible for the ships to approach them: later in the season they came farther south, and some of the vessels made good catches; but the general result was very partial and unequal. I fear, however, that even in this favoured locality the symptoms of exhaustion, which cannot fail speedily to result, are already making themselves apparent.

Of the twenty-one British vessels which left St. John's Harbour on March 10th, one missed the seals altogether, the remaining twenty ships killed 192,175 seals (against 286,000 last season); of these the great bulk fell to six vessels (the 'Neptune,' 41,000; 'Aurora,' 28,000; 'Ranger,' 24,000; 'Falcon,' 21,000; 'Hector,' 19,000; and 'Greenland,' 16,000); all the remainder had to be counted with much smaller numbers, the 'Arctic' only killing 100 seals. The average for the twenty vessels was 9608 each, against an average of about 14,000 for the season of 1883. If, however, we take the six Dundee vessels alone, and omit the 'Aurora,' which killed more thousands than any of the others did hundreds, and which therefore would render

the average delusive, the remaining five vessels would only show an average of 1235 seals, a result which must have entailed a very considerable loss on this portion of the voyage. The 'Resolute,' which killed only 495 seals in Newfoundland, afterwards went to Greenland, and shot 4227 old seals and three Bottle-nose Whales, which would help to make up her deficiency. One vessel, the 'Tiger,' was lost in the ice, but the crew were saved. Hitherto the practice has been to kill the young seals as soon after March 10th as they could be reached, and to continue the fishery until the end of May, thus enabling such vessels as succeeded in filling up early to discharge their cargoes at St. John's and make a second trip to the ice; this year, however, the owners voluntarily agreed to close the fishing on April 25th, consequently only five of the vessels had an opportunity of making a second trip; of these one was unsuccessful, and the remaining four killed only 4400 seals. There can be no doubt the owners exercised a very wise discretion in thus restricting the period of fishing, for, unless the seals are to be exterminated, the time allowed for taking them must be curtailed, and under no circumstances should a vessel which had once filled up be permitted to make a second trip to the ice. Unless some such means are adopted for ensuring the escape of some of the young brood, the Newfoundland seal fishery, like that of Greenland, must inevitably before many years are past be practically ruined.

For the particulars of the Greenland sealing I am again indebted to the kindness of my friend Capt. David Gray, a most interesting journal of whose voyage, kept by his eldest son who accompanied the 'Eclipse,' I was allowed to see. The 'Eclipse' left Peterhead on February 28th, and stopping at Lerwick to make up her complement of men (fifty-four) she made the first ice on March 17th in lat. $72^{\circ} 23' N.$, long. $5^{\circ} 40' W.$, and saw a few Greenland and Hooded Seals next day. A few Hooded Seals with young ones were seen on the 23rd and on the 28th. Mr. Gray writes:—"There are thirty-two sail in the Greenland seas all endeavouring to get amongst the seals before the close time expires; twenty-five of these are steamers more or less powerful and having each a great advantage over the sailing vessels, and the one over the other according to their steaming-power. Thus, as was seen to-day, the most powerful ships were farthest

in through the ice, steaming about in search of the seals, the sailing ships having to remain near the sea-edge, able only to watch the movements of the steamers. Half-way between, a few of the weaker class of steamers were working about, their only chance being to get into the wake of a stronger vessel and follow." Whilst thus cruising in the ice the motions of both seals and birds are closely watched, large numbers of gulls always frequenting the ice where the seals are breeding; the direction taken by every seal which is met with is closely watched, and if possible cross-bearings obtained from the different points, the better to indicate the position of the main body of the seals. On April 4th, after great exertions had been made to work through the ice, the breeding pack was discovered in lat. $73^{\circ} 43' N.$, long. $3^{\circ} 52' E.$, covering a space of about eight miles in extent from east to west, and about a mile and a half broad; five Scotch vessels were present and six Norwegians. The 'Eclipse' managed to get within about four miles of the seals, and at 1 o'clock a.m. forty-eight men were sent on to the ice to kill and "bing" the young seals. This went on till the united crews of the ships present had killed off and "binged" the whole brood, which was accomplished at about noon on April 7th. The "binging" was performed as follows:—As soon as the seals were reached the officer in charge planted a flag in a prominent piece of ice, and immediately the crew commenced to kill and flense and drag the skins towards it, until the ice was cleared within a radius of about two hundred yards; a "bing" was then completed and another flag planted farther on, and the work carried on as before, until the whole of the young seals were killed. Dragging the skins to the ship is an after-process, and is deferred till there are no more seals to kill; then comes the "making off" with the blubber, and the salting and stowing away of the skins. As no other breeding seals were met with, it may be fairly presumed that all the young brood perished.

The result of the Greenland sealing, so far as the twelve British ships are concerned (of the sixteen Norwegians and two Swedes I have no return, but the young sealing alone is estimated to have yielded 75,000 seals to the united fleets, about 26,000 of which fell to the share of the British vessels), was more satisfactory than that of Newfoundland, resulting in a total of 89,700 old and young seals, being an average of 3308 against a

total of 37,922, and an average of 2917, for the season of 1883. Capt. David Gray, of the 'Eclipse,' killed 7200, nearly the whole of which were young seals, as he did not take part in the old seal shooting later on; his brother, Capt. John Gray, of the 'Hope,' killed 6100 young seals, and in the month of May also shot 1200 old Hooded Seals; the remaining vessels secured smaller numbers, the lowest being forty-six seals only. It will thus be seen that the vessels which went to the Greenland sealing made a better average (admitting the one exception named) this season than did the Dundee vessels which went to the Newfoundland fishery. The value of the 1069 tons of seal-oil brought home by the Scotch vessels from both Newfoundland and Greenland last season, at £23 per ton, represents a sum of £24,587; and that of the 74,189 skins, which may be taken at 7s. each, a further sum of £25,966.

I have already said that the success of the St. John's vessels was very unequal, and that the average was helped up by some few of the vessels which were fortunate enough to get amongst the seals; but, assuming that it requires 15,000 seals to pay the very heavy expenses of one of these powerful steamers, there were only six out of a fleet of twenty-one which brought any return. Most of the others incurred a very heavy loss; the twelve Greenland sealers made an average of 3308, and the results were more evenly distributed; but with the present reduced value of produce in many cases the voyage must have proved a failure. It is not surprising, therefore, to find that the Newfoundland sealers closed the fishery earlier than usual, and that thoughtful men like Capt. D. Gray should plead for an extension of the Greenland close-time. As I said before, it is probable that a large number of the young seals which were produced on the Newfoundland ice this season escaped; this, however, was a mere accident, and rarely happens; but in Greenland it is not likely that any of the brood for several years past (with the exception of the season of 1882) have escaped. Although the close-time which came into operation in 1877 has somewhat retarded the extermination of the Greenland seals, it is evident that something else is required; and Capt. Gray, in a circular letter which he has issued to those interested, advocates an extension of the close-time to April 10th, and that the Hooded Seals should not be shot after some day early in July, after

which they are out of condition and valueless. This doubtless would have a very beneficial effect, but I venture to think that more is required.

I explained in a previous page the way in which the ships bore through the ice, each one more anxious than the other to obtain a good position near the breeding pack in readiness for the morning of April 3rd, when it becomes legal to kill the seals; some of these ships are in the neighbourhood of the pack for days before the opening of the fishery, and their presence there must of necessity have a disturbing influence on the mother seals, which is prejudicial to them in many ways, such as causing them to deposit their young in unsuitable situations, or even in the water, where they would be drowned. It seems, therefore, desirable that some restriction should be placed upon the sailing of the vessels (as at St. John's), in order to ensure their not reaching the ice too early. I am aware that the circumstances of the voyage to the Greenland sealing differ greatly from those of the St. John's vessels, and that in the one case they are close upon the sealing ground, whilst in the other 800 miles of stormy sea have to be passed over at an inclement season of the year, which may require five days or three weeks to accomplish, according to the state of the weather; also that winds which would suit the British vessels would be unsuitable to the Norwegians; then again, the difference between steam and sailing vessels would have to be allowed for, so that the difficulties in the way of this scheme seem to be altogether insuperable. Would it not be possible, however, to appoint a rendezvous nearer at hand from which the ships might depart simultaneously, as is the case from St. John's? I can only suggest Jan Mayen.

Capt. Gray's suggestion that a date should be fixed, after which it should be illegal to shoot the Hooded Seals, is an excellent one, and should be enforced; and this would entail no hardship, as the old Hooded Seals are all but valueless by the end of June. With regard to the Newfoundland fishery, it seems desirable that the second trip should not be allowed; a vessel having once filled up and secured a paying cargo should not be allowed to return to the ice. I make these remarks with great diffidence, feeling sure that the practical good sense of the sealers themselves, which has already shown itself in the wholesome restrictions, so far as they go, which are at present in existence,

will also dictate what further changes are desirable in their own interest if means are devised for carrying them into effect.

The Davis Straits whaling, which in the past season has been confined to the Dundee vessels, has been much more successful, if, owing to the very reduced value of the produce, not much more remunerative than that of 1883. Nine vessels visited the straits and returned with seventy-nine whales, the 'Arctic' heading the list with thirteen "fish"; these are estimated to yield 755 tons of oil and 39 tons of bone. Of the Peterhead vessels three visited the Greenland fishery, the 'Eclipse' capturing seven fine whales, the 'Erik' three (and fourteen Bottle-noses), and the 'Hope' only one; these produced 157 tons of oil and 7 tons 12 cwt. of bone. The joint produce of the twelve vessels was ninety whales, yielding 912 tons of oil and 46½ tons of bone (6½ tons of which would probably be under six feet long, and therefore worth only half price); at an estimate of £26 per ton for the oil and £1500 per ton for the size-bone would represent a sum of £88,587; but I am informed that Arctic produce is at present all but unsaleable. The whales proved fairly numerous, but were very shy and difficult of approach.

No White Whales were killed this year by the Davis Straits whalers, but, as Capt. Adams, late of the 'Arctic,' has been so kind as to give me some interesting particulars of the mode of proceeding in this fishery, I append them in his own words:—
"The White Whale is very shy and easily scared, quick in its movements, and very keen-sighted; it is consequently very difficult to capture in deep water. It is generally taken in the shallow bays after the ice breaks away from the land. The Grampus is a great enemy to the White Whale, and great numbers of the latter are often driven by them into the shallows. The fishermen are on the watch for such a chance, and when it occurs all boats are sent in pursuit; they are placed in a cordon round the school of fish, the boats being about equal distance apart and to the seaward of the fish; the boats gradually advance, driving the fish on shore at the most convenient place they can. When the tide recedes the White Whales are left aground or nearly so, and then the slaughter commences, the men jumping into the shallow water and despatching the fish with lances. Sometimes the fish turn and make a desperate rush seaward, great numbers escaping. Nets have occasionally

been used in endeavouring to enclose the fish, but I cannot say that on the whole the use of nets has been a success. It has sometimes helped to secure a good result, but at other times the fish in a rush seaward have carried nets and all before them." In this way, in the season of 1883, Capt. Adams killed 1200 White Whales.

A considerable decline has taken place in the Bottle-nose fishery; in 1883 eleven vessels were engaged in this fishery, and secured 535 whales; in the past season seventeen vessels captured only 317 fish, which produced 312 tons of oil worth about £12,480. The greatest number taken by one vessel (the 'Maud,' of Dundee) was fifty-six, whereas in the previous season Capt. Gray in the 'Eclipse' alone took 157. One reason for this falling off is that they have been over-fished; but the weather was also very bad indeed, very severe gales from the S.E. and E. almost incessantly prevailed frequently, rendering it impossible to send the boats away for days together. A very painful incident occurred to the boats of the schooner 'Chieftain,' of Dundee, on her first voyage as a whaler. Four of the 'Chieftain's' boats were away on May 26th, one of which with a Bottle-nose in tow succeeded in reaching the ship in safety, but returned to assist the remaining three boats, which were fast to another whale; a fog coming down, they sent the second mate's boat away to find the vessel; the remaining three boats, after waiting some time for her return, cut adrift from the whale and tried in vain for many hours to find the ship. The second mate's boat was eventually picked up by the Norwegian schooner 'Schrieder,' and the crew transferred to their own vessel, the 'Chieftain.' The remaining three boats, in one of which there was a compass, determined to shape their course in company for the nearest point of Iceland, about two hundred miles distant; but on the 27th a severe gale commenced, and the boats were separated; that commanded by the captain eventually reached Iceland all well, as did No. 3, commanded by the spectioneer, one of the crew, however, dying shortly after he landed. Previously to their parting company in the gale, a man from the fourth boat, in charge of Bain the harpooner, was washed overboard, and the others not being able to steer, James McIntosh was transferred from one of the other boats to assist Bain; the young lads in the boat succumbed one after another, till Bain

and McIntosh were left alone. When after three days the storm abated, McIntosh, who had remained at the steering-oar, found Bain dead in the bow of the boat, and fearing that he would not be able to restrain the pangs of hunger, the brave fellow to avoid temptation (a noble example to all future skippers of "Mignonettes") threw his dead comrade overboard, and after drifting about in a helpless and semi-conscious condition was, on the fourteenth day after leaving the ship, picked up by a shark-fishing vessel and conveyed to Iceland, the only survivor of the boat's crew; there both his legs had to be amputated. Happily such disasters are of rare occurrence, and in this instance I fear the result must be attributed to the unsuitableness of the vessel and the inexperience of her crew.

In the pages of 'The Zoologist' for September, October, and November, 1884, will be found a very interesting account by Mr. A. Heneage Cocks, F.Z.S., of the Finwhale fishery on the coast of Finmark, an industry which is assuming considerable importance.

TWO DAYS IN THE COMERAGH MOUNTAINS.

By R. J. USSHER.

On April 30th, 1883, having climbed an exceedingly steep spur, we got at length above the lofty range of cliffs that overlook the eastern half of the County Waterford, and parts of Wexford and Kilkenny. Here was an eyrie where a Peregrine had reared her brood successfully the previous year. It was a shelf of rock beneath an overhanging mass, with a precipice below it. I descended with a rope, but, with the exception of bones left by the birds the year before, and a quantity of London Pride grows plentifully on the Comeragh Mountains, now growing on it, I found it empty. We saw no Peregrines there that day, but three Kestrels, one of which I watched alight at a fissure near the Peregrine's breeding-shelf, and found that two or three hollows had been scratched by these birds in the earth within the fissure. Not far from the Peregrine's eyrie is a "castle" or spur of rock, where in 1882 I found her plucking-place, with feathers of a Corn Crake.

Farther north a tremendous castle or tower of rock projects from the rest of the cliffs. This has evidently been the haunt of

Ravens for many years. Their nest is in a niche beneath an arch of rock. Within this niche (which is of great size) is a pinnacle on which the nest rests. My 150 feet rope took me far enough down to see into it distinctly. It would make a large cartload, and is composed of crooked sticks of furze and ivy, green leaves of the latter adhering. It was rough within and without, and had no lining. Above this, in the same rock-castle, is a great horizontal crevice containing another old Raven's nest or nests (for there are two cavities, evidently of different years, one to the right of the other). This mass is likewise of sticks, and is closely overhung by the rock which shelters it. From hence the Ravens could survey the slopes at the foot of the cliffs and the distant country with its flocks.

We then proceeded over the top of the range (which rises to 2597 feet) to the cliffs over Crotty's Lake, where in May, 1882, I found Peregrines breeding. A long, toilsome walk over soft peat in a fog brought us to our destination. Crotty's Lake lies in a hollow scooped out of the mountain-side by some ancient glacier. At some distance above it rises an amphitheatre of precipices, some of the loftiest in the Co. Waterford, from which the view extends, across the northern part of this county and the Suir-valley, over Kilkenny, Tipperary, and to points beyond.

I ascended with my men by the help of the rope to the lowest ledge we could reach from the top of the cliff, where I placed them above the eyrie, the rope having first been made fast to a pillar stone above, and a second rope of 150 feet being added to the first. I then went round with the rest of the party to the foot of the cliff, and upon a gun being discharged the female Peregrine flew out with her shrill clamour, indicating the spot I sought. Finding that the rope could not be lowered to me, as ledges arrested it, I toiled round the end of the cliffs to my men on the top, and wishing to accomplish my work before dark, I descended on the rope the loftiest cliff I have attempted amid an increasing fog and the shades of evening. Unfortunately in coming down I left the eyrie to my right, my friends failing to direct me, for not until I was passing the eyrie did they discover the white fishing-basket I carried descending from the obscurity above. When once down my men could not lift me again. It now grew dark. The only sound was the shrill "pipe, pipe" of the Ring Ouzel resounding from the rocks near the lake. We

left the rope tied and hanging down the cliff, and after two hours of stumbling among rocks and hollows reached our car at 10 p.m.

On the following morning, May 1st, 1883 (a clear sunny day), after in vain trying to induce our assistants of the previous day to accompany us, I at last got two young men who had accompanied me to Crotty's Lake the previous year, and whom I found helpful intelligent fellows used to the mountains. I sent them on with O'D. to the rope on the top of the cliffs while I went to the foot. Our shouting from above and below did not move the Peregrine, but the moment that I swung the rope she took flight from a horizontal fissure above the smaller oven-shaped cavity where she bred in 1882. (I found on scaling the cliff that this latter recess contains an old Raven's nest, composed, like those visited the previous day, of crooked sticks). The attempt to pull me up from the foot of the cliffs proving fruitless as before, I again climbed round to the men above. Both the Peregrines were now careering about the amphitheatre of cliffs, uttering their rapidly-repeated cry; that of the male was hoarse, while the voice of the female was clear and shrill; she was a truly noble bird, one of the finest I ever saw. I now descended the cliff, coming right down on the eyrie this time, the female Peregrine as I approached her eggs sweeping angrily by with louder cries.

The cliffs of Old Red Sandstone conglomerate are more perpendicular and wall-like here than I have ever seen, but about one-third or one-fourth of the way from the bottom is the horizontal fissure, affording a good grassy shelf that one can stand on comfortably. On the inner side of this shelf, beneath the overhanging rock, a hollow was scraped among the grass; it contained three very round eggs; among them were small bits of stone and of rhizomes of bracken, but, as usual, no nest whatever. I now reached the ground with my hard-won prizes; they were found to be in an early stage of incubation. Were it not for the elevation of this locality, one might expect the young Peregrines to be hatched by the first week in May; but Crotty's Lake is nearly 1400 feet, and the top of the cliff more than 2000 feet above the sea-level. These three eggs measured respectively 2.11 by 1.71 in., 2.05 by 1.63 in., and 1.98 by 1.61 in. One is unusually colourless, another has patches of white showing out through the red, and the third is richly coloured and streaked

with red. On the 23rd I took four eggs of the Peregrine, measuring 2·21 by 1·65 in., 2·17 by 1·72 in., 2·17 by 1·74 in., and 2·1 by 1·72 in.; while two addled eggs of former years in the same eyrie measured 2·14 by 1·69 in. and 2·12 by 1·69 in.

THE MOLLUSCA OF THE COUNTIES OF KENT, SURREY
AND MIDDLESEX.

By T. D. A. COCKERELL.

I HAVE been surprised to find that there is no list in existence of the Kentish shells, that Surrey has never been properly worked out, and that even Middlesex might be explored with benefit, nearly every walk producing something new.* I therefore commenced collecting notes on the subject, with a view of publishing a list of which I had myself felt the want, and which I thought, however incomplete, would be better than none. Having accumulated a fair amount of material for the purpose, I have drawn up the following list, which, however, I do not pretend to call complete; indeed it is partly with a view to obtain addenda that it has been written. I have not dealt largely with the question of variation in the present paper, but have confined myself principally to the named forms. I may, however, remark that many varieties of great interest for which I have not found names have been met with in the district. To ensure greater accuracy, most of the species of *Pisidium*, *Odostomia*, *Rissoa*, &c., were submitted to the late Dr.

* The following local lists have been published for these counties:—

KENT.—Smith, "Mollusca of ~~Levendale~~," Zool. vol. xii. p. 4332, and Benson, Ann. Mag. Nat. Hist. 1856, p. 74; R. H. Smith, "List of Mollusca of Sevenoaks and Faversham," in Cassell's 'Floral Guide to East Kent,' p. 63 (1839); Leslie, "Mollusca of Erith," Quarterly Journ. Conchol. vol. i. p. 33.

SURREY.—Cooper, "Shells at Mickleham," Mag. Zool. & Bot. vol. ii. p. 471; Saunders, 'Mollusca of Reigate,' 2nd ed. 1864.

MIDDLESEX, LONDON AND ENVIRONS.—Cooper, Appendix to 'Flora Metropolitana,' 1836, pp. 120—127; Sheppard, "Mollusca of Fulham," Zool. vol. ix. p. 3120; Gray, Ann. Mag. Nat. Hist. 1856, p. 465; and Harting, 'Rambles in Search of Shells,' published by Van Voorst, post 8vo, pp. 110 (1875).—ED.

S/o/Ks

Gwyn Jeffreys, who most kindly named them, while the varieties of the slugs have been named by Mr. W. D. Roebuck, of Leeds.

I have included in the list [in square brackets] several records of interest referring to neighbouring districts.

BRACHIOPODA.

No recent species found. Fossil species of *Terebratula*, *Terebratulina*, *Argiope*, *Crania*, and *Rhynchonella* in the chalk of Kent. *Lingula tenuis* in the London Clay.

CONCHIFERA.

Anomia ephippium.—Margate (T. C.). [Hastings, type, common; v. *aculeata*, only one living specimen (E. Langdon).]

Ostrea edulis and var. *rutupina*.—Dead shells common near Margate; the variety is cultivated at the Reculvers (T. C.). [Hastings, type, common; v. *hippopus*, rare (E. Langdon).]

Avicula, *Lima*, *Spondylus*, and *Inoceramus* occur in the fossil state.

Pecten pusio.—Shellness, near Sandwich (T. C.). [Single valves scarce at Hastings; not uncommon at Brighton (E. L.).]

P. varius.—Common at Margate, &c.; very variable (T. C.). [Hastings (E. L.).]

[*P. opercularis*.—Shellness, &c. (T. C.). [Hastings, type and v. *lineata* (E. L.).]

P. maximus.—One small single valve at Shellness (T. C.). [Very common at Hastings (E. L.).]

[*Lima subauriculata* and *L. hians* v. *tenera*.—One valve of each at Hastings (E. Langdon).]

Modiolaria discors and *M. marmorata*.—Near Margate (S. C. Cockerell). [*M. marmorata*, Hastings (A. W. Langdon in Journ. Conchol.).]

Mytilus edulis.—Margate, Birchington, and Shellness (T. C.); var. *pellucida*, Margate. [Hastings, type and vars. *pellucida* and *incurvata* (E. L.).]

M. modiolus.—Single valves at Shellness (T. C.). [Hastings, rare (E. L.).]

M. barbatus.—Margate, &c. (T. C.). [Hastings (E. L.).]

M. adriaticus.—Shellness (T. C.). [Three dead shells at Hastings (E. L.).]

Nucula nuculeus.—Shellness (T. C.); var. *radiata*, Shellness (S. C. C.). [Hastings, type common; v. *radiata*, scarce (E. L.).]

N. nitida.—Shellness (T. C.). [Hastings (E. L.).]

Leda minuta v. *brevirostris*.—Shellness, single valves (T. C.); one perfect specimen (S. C. C.). [Hastings, 1882 (E. L.).]

Pectunculus glycimeris. Single valves at Shellness (S. C. C.). [Hastings (A. W. Langdon).]

Arca lactea.—Single valves very abundant at Shellness (T. C.). [Single valves rare at Hastings (E. L.).]

[*Lucina borealis*, one valve at Hastings (E. L.).]

Loripes lacteus.—Margate (T. C.). [*Montacuta substriata*, Hastings (E. L.).]

Montacuta bidentata.—Margate, in shell-sand (T. C.).

[*Kellia suborbicularis*, Hastings, rare, living (E. L.).]

Cardium echinatum.—Shellness, &c., single valves (T. C.). [Hastings, living (E. L.).]

C. exiguum.—Margate, single valves common; two perfect shells (T. C.). [Hastings, one valve (E. L.). Near Bognor, single valves (T. C.).]

C. edule.—Margate and Shellness (T. C.); var. *rustica*, St. Nicholas Marsh (T. C.). [Hastings, type and v. *rustica*, dead shells only (E. L.).]

C. norvegicum.—Shellness (T. C.). [Hastings (E. L.).]

Venus verrucosa.—Shellness, single valves, much worn (T. C.). [Hastings (E. L.).]

V. ovata.—Shellness (T. C.). [Hastings (E. L.).]

[*V. exoleta*, scarce; *V. casina*, two living; *V. gallina*, one valve, Hastings (E. Langdon).]

Tapes pullastra and v. *perforans*.—Margate (T. C.). [Hastings, type and var. *perforans* (E. L.). Near Worthing (T. C.).]

T. virgineus.—Ramsgate (J. T. Hillier). [Hastings (E. L.).]

[*T. decussatus*.—Hastings, single valves (E. L.). New Shoreham (T. C.).]

[*Lucinopsis undata*.—Hastings (E. L.).]

Donax vittatus.—Shellness, common; Margate and Birchington, rare (T. C.). [Hastings (E. L.).]

Psammobia vespertina.—A single valve at Shellness (S. C. C.).

Tellina crassa.—Shellness, single valves (T. C.). [Hastings (E. L.).]

T. balthica.—Pegwell Bay, Margate, and Birchington (T. C.). [Hastings (E. L.).]

T. tenuis.—Shellness (T. C.); var. *alba*, Shellness (T. C.). [Hastings (E. L.).]

T. fabula.—Shellness and Margate (T. C.). [Hastings (E. L.).]

T. donacina.—Shellness, one valve (S. C. C.); part of a valve (T. C.).

Syndosmya alba.—Shellness and Margate (T. C.). [Hastings (E. L.).]

S. prismatica.—Shellness (T. C.). [Hastings (E. L.).]

S. tenuis.—Pegwell Bay, abundant (T. C.).

Scrobicularia piperata.—Pegwell Bay and Reculvers (T. C.). [Hastings (E. L.).]

Lutraria elliptica.—Shellness, one valve (S. C. C.). [*L. elliptica* and *L. oblonga*, Hastings (E. L.).]

Maetra solida.—Shellness, with the varieties *truncata* and *v. elliptica* (T. C.). [*M. solida* and *v. elliptica*, single valves, Hastings (E. L.).]

[*M. subtruncata*.—One valve at Hastings (A. W. Langdon).]

M. stultorum.—Margate and Shellness; *v. cinerea*, Shellness (T. C.). [Type and *v. cinerea*, Hastings (E. L.).]

Solen ensis, *S. siliqua* and var. *arcuata*, and *S. vagina*, Shellness (T. C.). [Hastings (E. L.).]

Lyonsia norvegica.—Near Ramsgate (J. T. Hillier).

[*Thracia distorta*.—Hastings, rare (E. L.).]

Corbula gibba.—Shellness (T. C.). [Hastings (E. L.).]

Mya arenaria.—Pegwell Bay (T. C.). Reculvers (S. C. C.).

M. truncata.—Margate, &c. (T. C.).

M. binghami.—Margate (T. C.). [The two last at Hastings (E. L.)]

Saxicava rugosa.—Margate (T. C.). [Hastings (E. L.).]

Pholas dactylus.—Margate; *P. candida*, Shellness, Birchington and Margate; *P. crispata*, single valves only (T. C.). *P. parva*, a perfect specimen (S. C. C.). [All these species of *Pholas* at Hastings (E. L.).]

The genera *Thracia*, *Neæra*, *Panopæa*, *Pholadomya*, *Pholadidea*, &c., occur in the fossil state.

Teredo navalis.—Ramsgate (J. T. Hillier); various other localities have been recorded.

[The following have been taken in Sussex:—*T. bipinnata*, *T. malleolus*, *T. excavata*, and *T. cucullata*.]

Cyrena (Corbicula) fluminalis.—Fossil at Crayford with *Pisidium amnicum*, *Sphærium corneum*, *Bythinia tentaculata*, *Valvata piscinalis*, *Planorbis complanatus*, *Limnæa peregra*, *L. truncatula*, &c. (T. C.). The *Corbicula* has now died out in Britain, but the others still survive. I have a recent specimen of *C. consobrina* from Ismailia, given to me by Mr. W. Bendall, which does not appear to be specifically distinct from the Crayford fossil.

Sphærium corneum.—East Kent, Sarre, Herne Bay, &c. (T. C.); West Kent, Mottingham, &c. (T. C.); Surrey, Guildford, Barnes, &c.; Middlesex, Brentford, Regent's Park, &c. [Sussex, Pevensey Marsh; Berks, Reading (W. Holland); Bucks (Sclater, *vide* Roebuck); Herts, Watford (Selby), Ware (Jeffreys).]

Var. *flavescens*.—Middlesex, Brentford; Surrey, Croydon Nat. Hist. Club district* (M'Kean); [Herts, Sandridge (W. Griffith).]

Var. *nucleus*.—Middlesex (Rich); Surrey, East Kent (Faversham (J. W. Taylor); [Herts, Watford (Rich, *vide* Rimmer).]

Var. *scaldiana*.—Middlesex; [Herts].

Var. *pisidiodes*.—Middlesex.

S. rivicola.—Middlesex, River Brent, &c.; Surrey, River Wey, near Newark Abbey, near Weybridge, &c. (M'Kean); Sussex, dead shells near Hastings (Jenner).

S. ovale.—Middlesex, Paddington (Gray); Surrey (W. D. Roebuck).

S. lacustre.—East Kent, Minster (S. C. C.); West Kent, Chislehurst; Surrey, Guildford; Middlesex, pond near Wilsdon; [Sussex, Midhurst (T. C.), near Eastbourne and Brighton (Jenner); Bucks (Roebuck); Herts, Ware (J. Gwyn Jeffreys).]

[Var. *brochoniana*.—West Sussex (Jeffrey).]

Var. *ryckholtii*.—Tunbridge (A. H. Cooke).

Pisidium amnicum.—East Kent, rejectamenta of River Stour at Richborough (S. C. C.); West Kent, River Cray (H. Leslie); Surrey, Nutfield (E. Saunders); Middlesex, River Brent; [Sussex, Lewes (Jenner); Hants, Preston Candover (P. Fitzgerald); Berks, Reading (W. Holland); Bucks (W. D. Roebuck); Herts, River Lea (Griffith).]

P. fontinale.—East Kent, Ebbsfleet; West Kent, St. Mary

* This includes the whole of Surrey and the portion of Kent west of the River Darent.

Cray; Croydon Club district (M'Kean); [Sussex, Lewes (J. H. A. Jenner); Herts, Ware (Dr. Jeffreys).]

Var. *pulchella*.—Croydon Club district (M'Kean).

Var. *cinerea*.—Croydon Club district (M'Kean); Middlesex, Northend, near Hampstead (T. C.).

P. pusillum.—West Kent, Bickley and Sidcup; Surrey, Kew, in rejectamenta of Thames (T. C.), Wray Common (E. Saunders); Middlesex, Bedford Park (T. C.), Brentford (Mrs. Skilton); [Sussex, Lewes (Jenner); Hants, Preston Candover (Fitzgerald); Herts, Ware (J. Gwyn Jeffreys).]

Var. *obtusalis*.—Chislehurst Common (T. C.); Surrey, Wray Park (E. Saunders).

P. nitidum.—West Kent, Chislehurst Common (T. C.); [Sussex, Lewes (Jenner); Hants, Preston Candover (Fitzgerald); Herts, Ware (J. Gwyn Jeffreys).]

P. roseum.—Croydon Club district (M'Kean); [Ware (J. G. Jeffreys).]

Unio tumidus.—Middlesex, River Brent (T. C.); Enfield (S. C. C.); Surrey, Basingstoke Canal (M'Kean).

Var. *ovalis* and var. *richii*.—Middlesex.

U. pictorum.—Middlesex, River Brent; Surrey, River Wey, near Guildford (M'Kean).

Var. *radiata*.—Middlesex and Surrey.

[Var. *compressa*.—Ware (Jeffreys); type, Herts and Sussex.]

(*U. margaritifer*.—Specimens liberated in River Wandle, 1875, but probably all died out. Kent, M'Kean).

[*U. littoralis*.—Fossil in Essex, recent in North France.

U. batavus, North France.]

U. edwardsi and *U. deshayesii*.—Fossil in Woolwich beds.

Anadonta cygnæa.—West Kent, Beckenham; Surrey, Fetcham Common (M'Kean); Middlesex, Regent's Park (S. C. C.); [Sussex, Lewes (Jenner); Bucks (Roebuck); Herts (Jeffreys).]

Var. *incrassata*.—West Kent, Beckenham (S. C. C.).

A. anatina.—East Kent, Minster and Ebbsfleet; West Kent, between Lamberhurst and Paddock Wood; Surrey, stream west of Nutfield Marsh (M'Kean); Middlesex, Regent's Park (T. C.).

Var. *ventricosa*.—River Brent (Mrs. Skilton).

Var. *radiata*.—Croydon Club distr. (M'Kean). [Type, Sussex.]

Dreissena polymorpha.—Middlesex, dead shells in River Brent; Surrey, River Wey (M'Kean).

We have now come to the end of the bivalves: let us pause for a while. In the above list I have given only a few of the localities known to me for the various species, but have tried to select representative ones. Perhaps I have introduced too many localities not belonging to the district in question, but I have done it in the hope of making the list more generally useful. I have touched but lightly on the fossils, because I know but little about them; but I wish some one more experienced than myself would write a list of the fossil shells of the various formations which appear in the district. I will now return to the list.

[PTEROPODA.—*Hyalæa tridentata*, one at Hastings (E. Langdon).

SOLENOCONCHIA.

Dentalium tarentinum. — Shellness and Margate. [Hastings (E. L.).]

D. nitens. — London clay, *D. decussatum* and *D. ellipticum*, Gault.

(To be continued.)

HABITS OF THE LIMPET.*

BY J. R. DAVIS.

By far the larger number of Limpets (*Patella vulgata*) "roost" upon rocks whose only covering consists of minute green Algæ and nullipores, together with numerous acorn barnacles. These last are seen to be of very unequal degrees of "cleanness," some being covered with vegetable growth, others quite white and bare. Those immediately surrounding a limpet or group of limpets are invariably free from Algæ. As might have been anticipated, *Patella* is the cause of this freedom. At low-tide anyone on the look-out can hear a quick, regular, rasping sound in all directions, and see numerous limpets slowly crawling about. Scrutiny of any particular individual shows that the rasping noise is caused by strokes of the radula, which speedily sweeps away the incrusting Algæ. Whilst "on the feed" a limpet moves steadily on, pretty much in a straight line, and continually sweeps its elongated snout from side to side, feeling out probably suitable

* From 'Nature.'

patches whereon to graze. When such a one is discovered it is gradually licked quite clean. If the patch happens to be the surface of a moderate-sized barnacle, the circular lip is completely spread over it, almost tempting one to believe that the crustacean is about to be "sawn out." Such, however, is not the case, "house-cleaning" being the sole end in view. Indeed, limpets are often serviceable to one another by thus clearing away esculents growing upon their shells. To secure a dinner a good deal of licking is requisite, and perhaps this habit may help to account for the inordinate length of the tongue ribbon. Certainly it must be used up at a very great rate.

But this is not the only, though, I believe, the chief, way in which the limpet feeds. Those individuals which live near large sea-weeds, such as *Fucus*, feed extensively upon them, as their gnawed condition testifies. I can speak confidently in this matter, having caught more than one limpet in the act. The operation was as follows:—The edge of a thick flat part of the thallus was seized by the lip (as a traveller might commence on a colossal sandwich), and being, I suppose, held firmly by the upper jaw, a semicircular "bite" was gradually excavated by successive scrapes of the radula, the edges of the bite being bevelled on the under side. So far as my observation extended, limpets do not feed when covered by water, but always settle down firmly before the rising tide reaches them. The intervals between which any particular limpet feeds seem to be very irregular; but, as a rule, the largest limpets are apparently least fond of long fasts.

In regard to the second point, the locality-sense, great doubt seems to exist in the minds of naturalists as to whether limpets go back to the same place to roost. I believe the question was answered in the affirmative long since by a Mr. King, but, as far as is known to me, he did not publish any details of his observations, and this is my excuse for giving an outline of mine. Following a suggestion of Mr. Murray, I marked a number of limpets with white paint, and made corresponding marks near their "scars" with a view to "keeping my eye on them." As Dr. S. P. Woodward remarks, it seems probable from an *à priori* point of view, that limpets have a settled home, for they occupy scars, often sunk to a considerable depth, which exactly correspond to the outline of the shell. My observations, made

on numerous specimens of various sizes, completely confirm Mr. King's opinion, and the method of marking rendered cases of "mistaken identity" quite out of the question. The greatest distance from its scar at which I noticed a marked limpet to be was about three feet; yet this distance, though extremely rough and covered with barnacles, was re-traversed without difficulty. The excursions from the roosting-places were made in any direction where food offered; so there were nothing like beaten tracks formed. But a limpet always returns home before the rising tide reaches it, and invariably roosts with its snout pointing in the same direction. As might be expected, this direction is only constant for individuals. As the shape of the scar corresponds exactly with the shape of the shell, comfort, of course, could only be gained and a firm hold effected by limpets roosting permanently in the same direction on their scars.

The question now arises, What sense is employed by the limpet in finding its way back to its scar? The appreciation of locality displayed is certainly, for so simply-organised an animal, very keen. The sense of sight is evidently out of court, for an eye like the limpet's, consisting of no more than a sensitive cup, could do little if any more than distinguish between light of different degrees of intensity. The tentacles seemed at first sight to be extremely likely organs to use for the purpose, and to decide this I excised those of two marked individuals which were off their scars. One speedily found its way back; the other seemed confused by the operation for several days, but after that time was found on its scar. This shows a remarkable power of memory, unless the scar was found by accident, which is possible, as the individual was near home when the operation was performed. But even in that case the scar must almost certainly have been *remembered*. Thus the tentacles do not seem to be the means by which home is returned to. The sense of smell then suggested it, and it occurred to me that one reason why limpets kept on their scars when covered by the water was to prevent the "scent" of the track traversed from being washed off. With a view to determine this the space between a wandering limpet and its scar and the scar was carefully washed again and again with sea-water. In spite of this the limpet in question readily found its way back again. Further experiments are, however, needed on this head, for any

ordinary washing would be very ineffective compared with the prolonged soaking the tide would effect in the case of a limpet (like the one just mentioned) living some distance below high-water mark. Still some limpets live so near this last that they are covered but a very short time, and yet these remain on their scars during that time. Hence I think some other motive probably induces them to remain firmly fixed to the scars when under water. Of course they can hold on best when so fixed, and this suggests the most likely reason for the habit, *i.e.*, to avoid being washed off the rocks by the tide. I am inclined to think that the snout plays some part in helping the limpet to get home, as this organ is extremely sensitive, and certainly plays an important part in discovering suitable food. I intend carrying on more extended observations with a view to the more complete elucidation of this puzzling question in regard to the limpet's locality-sense, but this preliminary notice may possibly be of some interest.

[The observations here recorded were made last July at the Scottish Marine Station, Granton, Edinburgh.—ED.]

NOTES AND OBSERVATIONS ON BRITISH STALK-EYED CRUSTACEA.

BY EDWARD LOVETT.

(Continued from p. 20.)

Homarus vulgaris, Edw.

THE Lobster is certainly the most important and valuable of our crustaceans; it occupies the same proud position in this sub-kingdom as the Oyster does in the Mollusca. Occurring as it does on all our coasts wherever a suitable rocky shore affords it a home, this crustacean is the object of a large and widespread fishing industry, giving employment of a comparatively easy and fairly remunerative kind to thousands of men who draw their living from the deep and their wages from the rugged shore.

The very general favour with which the Lobster is regarded by all classes gives rise to an enormous demand for it; for it is somewhat curious that, whilst we meet with very few indeed who confess that they do not like Lobsters, it is by no means

uncommon, but on the contrary a very usual occurrence, to meet with individuals who could not swallow an Oyster under even the most toothsome and favourable circumstances.

Considering, therefore, what an important article of food *Homarus* is, although a comparatively expensive luxury withal, it certainly seems a very short-sighted policy that the fishing of lobsters should be carried on in the way it is. Certainly no lobster below a certain regulation size is permitted to be brought ashore under a penalty; but what about the "hen" lobsters with their masses of ripe eggs, or as they are called, "berried" lobsters? I often wonder how many people who are unable to touch "luxuries" would be able to do so if, say, for two or three years no "berried" lobsters were allowed to be caught. What is there to prevent lobsters costing from threepence to a shilling each, when we consider the thousands of square miles of good rocky breeding-grounds on our own shores, to say nothing of the enormous areas on the coasts of Norway and Sweden from whence our markets are largely supplied? It is to be hoped that among the many good results of the great International Fisheries Exhibition of 1883 something will be done in this direction. At present everything is devised and contrived for the purpose of *catching* the food contained in our seas, whilst beyond the praiseworthy efforts of a few with regard to propagating Salmon and Trout, and protecting Oyster and Mussel beds, little has been done to preserve or assist in replenishing the stock of lobsters, which we are doing our best to exterminate, but which by a little judicious legislation and management would prove a still greater source of food to the eater and wage to the fisherman, than it at present is.*

I will now briefly describe the species under consideration, although it is so well known that a description is scarcely necessary. The external skeleton or carapace is hard, solid, and somewhat cylindrical, being, however, in the cephalo-thorax vertically higher than broad, the regions being well marked by a furrow. The rostrum is not very prominent, and is serrated. Antennæ long, with basal spine. The first pair of legs or "claws" are massive (affording a choice morsel when cooked), and unequal; one claw being armed with rounded teeth, whilst

* I shall be glad to see any observations on this subject.

the movable pincer is more finely serrated, as also are the inner edges of the other pincers. This, I fancy, is to enable the Lobster to grasp firmly with the finely-toothed pincers, and to crush with the tuberculated pair. The second and third pairs of legs are armed with small pincers capable of grasping, whilst the fourth and fifth pairs terminate in a simple claw. The swimmerets or abdominal feet are fan-shaped and fringed, and when the groups of ova are attached to the basal joint of these, as they are in separate equally-distributed bunches, the waving to and fro of these fans causes a regular flow of water to circulate freely through them.

The usual colour of this crustacean is blue-black, with the lower edges of the carapace mottled, though many interesting varieties are frequently found. I recently described (Zool., 1884, p. 491) a beautiful variety from Jersey. It was of a delicate pale blue tint, with a peach-like tinge on the cephalo-thorax, the claws being of an intense blue. The specimen, which was a fine one, reached me alive and vigorous. I have also seen a very large and ancient Lobster which was dappled blue and grey; but the most remarkable one I remember was a fine well-grown female of a pale reddish colour, with the antennæ of a decided bright red; this specimen carried a full supply of ripe ova, which I carefully preserved in fluid. It would have been interesting to have known how many of the progeny would have had a tendency to follow the striking peculiarity in colour of the parent.

These specimens I examined living, so that I can vouch for the colours being natural, and not the results of any subsequent accident or treatment. As regards variation from the normal tint, Bell has recorded his opinion that it varies considerably, and that it is possible to tell the locality whence a specimen came by its tint. This may have been the personal experience of that author, but there certainly does not seem to be any hard-and-fast rule by which it can be said that a Jersey Lobster is of one colour and a Welsh Lobster another; for striking varieties do not appear to result from the peculiarities of any one locality, but from surrounding conditions, accidental or otherwise, of which we at present know very little.

I believe that colour varies slightly in accordance with the depth of water and comparative amount of light or shade in which the animals of a particular locality have passed

part of their time, combined perhaps with some change in the kind of food within reach. This question of colour-variation is of some interest, for the boring species of the genera *Axius*, *Gebia*, *Callianassa*, &c., are all of a pale hue, generally in fact of a most unhealthy-looking paleness, owing to the absence of light which these species generally experience during the greater part of their lives. With regard to Mollusca this feature is often very striking. When visiting the large caves in Sark, some years ago, I found some intensely white varieties of the common Dog Whelk, *Purpura lapillus*, in a very dark and sheltered cave, the floor of which was a rock-pool at low tide; whilst outside on the exposed and sun-lit shore the same species was to be found of red, yellow, brown, and blackish tints. I merely mention this to support what I say with regard to the question of habitat in respect to light, which I think is more likely to cause variation than geological or climatic conditions.

Many crustaceans adapt themselves to the pervading tint of surrounding objects, as, for instance, the common Shore Crab, *Carcinus mænas*, which is a dull brown in muddy harbours, yellow when living on a sandy shore, and beautifully mottled with green and white when inhabiting shelly rock-pools amongst *Ulva* and *Zostera*; many others also, being dwellers on sandy bottoms, are yellowish brown, as, for example, the genera *Hyas*, *Inachus*, &c.; or red and brown, as those which live among granite boulders, such as *Xantho* and *Maia*. The lobster, however, does not appear to enjoy such protection, possibly because able to hold its own by other means. It is quite possible when hauling lobster-pots to look over the side of the boat, if in clear still water, and see the lobsters distinctly when other crustaceans and fish are invisible, except when any movement on their part betrays their whereabouts.

The question of lobsters "shooting" their claws is an interesting one, inasmuch as such a performance is unwelcome to the fisherman, spoiling as it does the market value of the Lobster. All crustaceans, or at any rate all the stalk-eyed forms, appear to part readily with limbs under influence of fear or desire to escape, and to be able also to reproduce them during future exuviation and growth; some appear to be much more addicted to this peculiarity than others, for I once captured a specimen of *Xantho rivulosa* which cast the whole of its ten legs

whilst I held it; such an operation as this would of course prove fatal, since the animal would be deprived of any hold whatever.

Curious facts are mentioned by fishermen as to the timidity and loss of claws of Lobsters. It is said that severe thunderstorms often cause them to "shoot" their claws, as also does the discharge of heavy guns. I believe there is a story on record of a dispute between the local authorities of some district and the fishermen, the latter being ultimately coerced into submission by a threat to fire off all the guns at the fort. Now as the fort in question overlooked the lobster-grounds, the effect of such a proceeding was regarded with as much terror by the fishermen as it ultimately would have been by the lobsters themselves had such a threat been carried out; so the men gave way, and the Lobsters saved their claws and continued in a marketable condition for their future captors.

The reproduction of limbs thus lost or injured in fights with each other or their foes—for maimed antennæ, which are quite common, seem to point to such skirmishes—is also of great interest. The wounded part soon hardens over and forms a small bud, in which the future new limb is developed, not in a straight position, but, if a leg, folded, and in the case of antennæ the new member is coiled within the membrane in a spiral form, which of course assumes a straightened position at the next exuviation. I do not see how, after the first moult subsequent to a lost limb, a reproduced member can possibly grow more rapidly than the rest of the carapace; nor do I think it does, but that it always remains in the same proportion to the rest of the limbs as it did when it first threw off the membrane which had formed over the wounded part. I have in my collection a large number of specimens, including many genera and species that have lost limbs and reproduced them, and there is in nearly all a vast difference in size between the old and new members; and in the case of veterans whose "moulting" time has either ceased or else takes place at long intervals there is nothing, I think, to prove that, after the first casting-off of the membrane already referred to, the exuviation of one limb can be carried independently of the rest of the carapace. In this case, therefore, it would be absolutely impossible for a lost limb to be reproduced that would ever attain the size of the one it replaces.

Another curious "anecdote," for I cannot call it a fact,

referred to by Bell as coming from fishermen—and I have heard of the same thing myself—is that old Lobsters have “frequently” been seen with their brood of young ones round them, and, moreover, that such is the love shown by the mother for her young that she warns them of approaching danger by rattling her claws. Now all this is very pretty, but I fear it will not bear investigation. In the first place, considering that crustaceans undergo metamorphosis, as do insects, it would be quite as probable for a butterfly or moth to show maternal love for a swarm of young larvæ or caterpillars as for a “hen” lobster to recognise her young through the larval stages of their existence. But more than this, a lobster is a slow-moving, heavy creature, living on the floor of the sea, whilst its zoea when it emerges from the egg is a minute free-swimming surface-loving atom, millions of which form the regular food of a host of fishes, and a very small percentage of which ever reach the Lobster-stage at all. During this free-swimming period some of the various swarms unite, and probably wander far from their ponderous and unknown parent, and when ultimately the survivors sink to the bottom and commence life in the Lobster-stage, it certainly is most improbable, in fact impossible, that the few survivors of the immense zoea progeny should re-unite and recognise their original parent, or that the parent should recognise what it certainly never saw before, at any rate in the form then arrived at.

The Lobster, as I have already stated, is common on all our shores, and is elsewhere widely distributed. It is usually caught in “pots,” but its fishery is sufficiently well known as to need no description from me. I have a record that, after the great gale and snow-storm of January, 1881, large quantities of lobsters, some weighing eight or nine pounds, were thrown up on the coast near Shoreham for a distance of ten miles.

Though exercising common means of self-preservation, the Lobster is incapable of any discriminating faculty, and, I should imagine, could be caught in any kind of trap properly baited. I remember once watching a fisherman taking lobsters from his pots, when one of them seized the rim of the pot with one of its large claws and held firmly by it. I wondered how the man would make it let go without endangering the claw itself, when I saw him seize the other claw and hold it firmly

closed; he then irritated the mandibles of the lobster, whereupon it immediately let go its hold on the pot to attack the man, and so sacrificed its liberty at once. This I found was the usual way of making lobsters let go their hold, for when seized, they catch hold of anything that comes within range of their claws.

In conclusion, let me say that remarks upon the question of lobsters as an article of food, and also on the subject of colour-variation, would be of much value.

(To be continued.)

NOTES AND QUERIES.

Death of Mr. E. C. Rye.—The announcement of the unexpected death from smallpox, after a very short illness, of Mr. Edward Caldwell Rye, on February 7th, will have been received, we feel sure, by many of our readers with unfeigned regret. Those who enjoyed his friendship will miss the society of a most agreeable, well-informed companion, who was always ready, if asked, to impart the results of his experience or reading; while those for whose benefit he worked, both as a contributor and editor of 'The Zoological Record,' have been deprived of valuable services in a post by no means easy to fill. As a naturalist, Mr. Rye's name will perhaps be best known as the author of an excellent work on 'British Beetles,' published in Lovell Reeve's series, no less than by his connection with 'The Entomologist's Monthly Magazine,' of which he had been for some years part editor. Nor should we leave unnoticed his contributions to 'The Entomologist's Annual,' and to the new edition of 'The Encyclopædia Britannica.' As Librarian to the Geographical Society his services were invaluable, for, in addition to his ordinary duties in that capacity, the task of editing the bibliographical portion of the 'Proceedings' of that Society devolved upon him. For the last seven years he acted as editor of the Travel department of 'The Field,' for which undertaking he displayed an energy and a knowledge of the subject which were remarkable. As a Fellow of the Zoological Society, a Member of the Entomological Society, and Recording Secretary of Section E. at the meetings of the British Association, Mr. Rye had naturally a large circle of friends and acquaintances, whom he has now left to mourn his untimely decease at the comparatively early age of fifty-two.

MAMMALIA.

Polecat in Cornwall.—A Polecat, or “Fitchet-weasel,” *Mustela putorius*, has been captured near Madron, about two miles from Penzance. I know the animal well, having often seen it and taken it whilst I was resident on the confines of Dartmoor; but during all the thirty-seven years that I have been resident in West Cornwall I have never until now seen one alive or dead, and this is the more remarkable, seeing that until the last ten years it has not been kept down by any regular preservation of game.—THOMAS CORNISH (Penzance).

Common Rorqual stranded in the Severn.—On the 15th January a large Common Rorqual, “Finner,” or “Razorback,” *Balænoptera musculus*, Linn., was washed ashore dead at Littleton Pill, on the Severn, about four miles north of the New Passage. The total length of the body was 66 ft. Head about 15 ft. long; upper jaws straight and pointed; lower jaws slightly longer than upper, broad and gaping. The dorsal line showed a regular and very low curve from nose to tail-fork. The pectoral fins were black exteriorly, lanceolate in shape, about 7 ft. long, and placed 21 ft. from the nose. The dorsal fin, which was prominent, erect, and compressed, was placed far back—*viz.*, about 49 ft. from nose and 16 ft. in front of the caudal fork; the fin had a broad attachment to the body and a span of 14 ft. The colour of the body was black above, the belly being white, and in the fresh state considerably tinged with a deep pink. Belly (throat and thorax) traversed by numerous longitudinal grooves lying below and passing behind the pectoral fins. Baleen surrounding upper jaws a little within their outer margin, slate-coloured, with darker streaks outwardly and lighter streaks inwardly,—in short, curved triangular plates, breaking up on inner edges into white bristles, and rapidly diminishing, both in length and breadth, towards the snout. The animal was a female. After lying in the Pill for a few days, during which time it was visited by many thousands of people, the animal was sold by public auction by the agent for the Crown (who claimed the body as “flotsam and jetsam”), to a Bristol artificial manure manufacturer. The purchaser had the animal towed up the River Avon to his works by a steam-tug and horse-power, and having floated it ashore during a high-tide, has been publicly exhibiting it, prior to cutting up the body and preparing the skeleton.—E. WILSON (Bristol Museum).

[The right of the Crown to royal “fish” (the whale and the sturgeon), when stranded or caught near the coast, is mentioned in our oldest books, and is expressly claimed in the statute *De Prerogativa Regis* (17 Edw. 2, c. 11): “Also the king shall have wreck of the sea throughout the realm, whales and great sturgeons taken in the sea or elsewhere within the realm, except in certain places priveleged by the king.” Bracton tells us that

when a whale is taken off the coast, it shall be divided between the king and the queen. The king shall have the head, and the queen the tail, in order, say our ancient records, that the queen's wardrobe may be supplied with whalebone. We are not told how much whalebone her Majesty ever succeeded in extracting from a whale's tail.—ED.]

Grey Seal captured near Colchester. — My friend Mr. Southwell has drawn my attention to an account of a Grey Seal, *Halichærus gryphus*, recorded in the 'Annals and Magazine of Natural History' for 1841 (vol. vii.) as having been captured a few years previously to that date near Colchester by some fishermen in their nets. The specimen was of considerable age and blind, and was dissected and presented by the late Professor Clark, father of the present custodian of that institution, to the Cambridge Anatomical Museum, as appears by the Catalogue, 1862, p. 81. As the exact geographical range of animals is now exciting great attention, both Mr. Southwell and myself think the fact of this Seal occurring on the Essex coast of sufficient importance to warrant a re-insertion of the record in 'The Zoologist,' where it will probably come under the notice of a greater number of naturalists than in its present ancient entombment.—HENRY LAVER (Colchester).

BIRDS.

Reported occurrence of the Short-toed Lark in Kent.—Since Mr. Macpherson doubts whether the Short-toed Lark reported by me (p. 31) is a British specimen, it may be as well to state the facts on which my opinion was founded:—*first*, the birdcatcher informs me that he never has, nor has had, any birds from abroad; and the absence of Goldfinches, Bullfinches, and Siskins, as well as of foreign bird-cages, would lead me to believe him; *secondly*, he lives in the neighbourhood of Guy's Hospital, in which poor locality, if he had such birds, he would not be able to sell them; *thirdly*, I think it very unlikely that a poor man would spend five shillings for preserving and casing a bird, on the mere probability of being able, on some future occasion, to deceive a bird collector. That the birdcatcher did not have the Lark preserved with the idea of profit is the more evident since it was in the house of a friend, and was with reluctance sent for. When the bird arrived he showed little inclination to sell it; in fact, he told me that he would not have parted with it a few months before. Should it be supposed that this reluctance was assumed with the idea of obtaining a larger sum, I would remark that I paid very little for it, and would willingly have given double the amount asked. All but two of the Short-toed Larks obtained in England having been trapped by birdcatchers, it seems to me that, in the opinion of Mr. Macpherson, "the authenticity of the specimens amounts at most only to a probability of their being British."—THEO. FISHER (Guy's Hospital).

Ravens in Cumberland.—While staying in Cumberland last spring I determined to try and find a Raven's nest. These noble birds are still not uncommon in the Lake District, but, like the Buzzard, have suffered much from persecution. Forty or fifty years ago there was a certain fixed day upon which the farmers went round to the nests in their neighbourhood and shot the young birds outside them. A reward of I think half-a-crown was given for every Raven's head. Last year, after visiting several well-known breeding-places, I found a nest evidently containing eggs, to judge from the movements of the old birds. Long before we came to the nest the old Ravens circled over our heads, uttering from time to time their hoarse croak. The nest was placed on a ledge of rock about midway down a cliff of 150 ft., and 30 ft. above the nest the rock began to overhang. Having only one man with me I was unable to descend. This was on April 2nd; I came again on the 3rd, with a friend and two men to lower me, and they let me down to within about 15 ft. of the nest. The rock overhung considerably, and, as I had no stick to steady myself, I swung round in the most uncomfortable manner; the guy-rope, which was a new one, having become twisted round the body-rope, caused me to spin round with considerable velocity. The consequence of this twisting was to tighten up the ropes; and when they untwisted, my idea was that the rope was giving way. For what seemed ages to me, I remained twirling in mid-air; at last I was gradually pulled up. I had seen the eggs below me, and determined I would get them, if possible. One of the men was much exhausted, and all three sturdily refused to let me down again that day; they had heard my first call from below, but so faintly that they could not distinguish what I said, and imagined I simply wanted to stop still. On April 5th I came again, with three men to lower and my friend to stand below and signal. The farmer, who lived in the valley, lent me another man and a strong two-pronged alpenstock, wishing me every success. I brought a long fishing-rod with me with a small net at the end made of gauze, like a butterfly-net. Before we arrived at the spot we were joined by another man; I had thus five men to lower me, and my friend to signal below. Being gently lowered, I steadied myself with the alpenstock, and at length got to my old position. Holding the stock firmly in one hand, I managed with the other to get the six eggs into the net, and to ascend again without breaking them. The five men hauled me up in grand style, very different from the laborious exertions on the last occasion. The farmer who owned the valley was delighted, saying that he frequently lost sickly lambs in spring, and that the nest had never been taken before. I subsequently found three Ravens' nests, but did not take any of them, though two were in a much easier place than the one I took. I found a Buzzard's nest on April 1st in an unfinished state. On the 8th inst. the nest was much more finished; I never visited it again, but learned from an old keeper, who used to accompany me in my rambles, that one of the old birds was subsequently shot and the nest

deserted. During my three weeks' stay in Cumberland I frequently saw Buzzards, but regret that this noble bird is becoming scarcer year by year. A word or two about the Heron. This quarry of bygone days may be seen flying over, or fishing, in most of the larger lakes; but their breeding-places are now few and far between. By the Bassenthwaite Lake there is still a heronry of upwards of thirty nests, but many old heronries, as that of Rydal-water, are now forsaken. I am told that there was once a heronry near Buttermere, but that it no longer exists; I noticed several of the birds, however, flying over the lake there. The Woodcock breeds regularly now in Cumberland, and a man told me of a nest close to Derwentwater, but I did not go to see it. The Peregrine is very rare now, and I do not suppose there are more than three nests in the whole Lake District. Snow Buntings are sometimes seen in severe weather. A few Dotterels are generally observed every year, but I do not think a nest has been found for a long time. Lapwings are plentiful on the low ground between Derwentwater and Bassenthwaite Lakes, where Snipe, Teal, and Wild Duck also breed. The Ring Ouzel builds on ledges of the rock, and Rock Doves may frequently be seen darting from the crevices. — R. J. ATTYE (Ingon Grange, Stratford-on-Avon).

Sites of Dippers' Nests.—An instance has come under my notice of a nest placed similarly to those described (Zool. 1884, p. 468; and 1885, p. 25). A careful man, who collects eggs for me, wrote on April 4th as follows:—"I send the nest and eggs of Water Ouzel found April 2nd, 1884, in the upper part of Glenlicky River, on a large rock (boulder) of stone in the centre of the stream. I send this nest, as I considered it different to others in being built so as to resemble a part of the rock in which it was inserted." This nest is composed externally, as usual, of moss interspersed with grass-bents. The back is flat, having evidently been built against a part of the rock, but the top and sides are rounded, having been free. The orifice opens more directly at the side, and is not inclined downwards so much as in other nests built under bridges. Corroborating the attachment of the Dipper to a special site, I may mention that another nest was constructed last March on the inner flange of the iron girder of the railway bridge, similarly placed to that described by me (Zool. 1883, p. 118). The loud noise of trains passing within a few feet of this nest did not disturb the bird. The Dipper appears to me to jerk its tail downwards with a sort of curtsy when slightly alarmed, and never upwards, as shown in some figures of the bird. — R. J. USSHER (Cappagh, Co. Waterford).

Variety of the Greenfinch.—On the 23rd December last I shot a curious variety of the Greenfinch (*Fringilla chloris*), in which the whole of the back and breast were of a pale buff-colour, the under parts being

lighter towards the vent, which was nearly white. I have stuffed it, and propose to set it up with another Greenfinch of the normal colour. — E. J. WHITEHURST (Farnborough Rectory, Wantage).

House Sparrow with rufous breast.—The circumstance of my having received, on June 20th, a number of Sparrows from Holt, in Norfolk, for the purposes of the enquiry carried on for the Norwich Chamber of Agriculture (*cf.* Zool. 1884, p. 428), among which were three cocks with a mixture of strong rufous diffused through the black of the breast and chin, leads me to enquire the meaning of this state of plumage. It is not seasonal, for I have obtained similar Sparrows (of course always cocks) in August and September, as well as at Christmas; and in the late Mr. Dawson Rowley's collection at Brighton there are two such birds labelled as having been procured in February and June. In some of the specimens the abnormal feathers were quite a bright rufous, with a tinge of chestnut extending from the chin downwards. — J. H. GURNEY, Jun. (Northrepps, Norwich).

White's Thrush in Mayo.—A fine specimen of this very rare Thrush (*Turdus varius*, Pallas) has been presented to the Museum of Science and Art, Dublin, by Captain Robert Rutledge-Fair, who informs me that he shot it early in January last (about the 9th) at Westport, Co. Mayo. It was killed "while beating a wood for Woodcock. It rose from thick under-wood and flew much like a Woodcock, for which it was at first mistaken." This is the third specimen of this Thrush which has been procured in Ireland.—A. G. MORE (Science and Art Museum, Dublin).

Red Grouse in Somersetshire and Wiltshire.—The occurrence of a hen Red Grouse at Wrington, in Somersetshire, in September last (Zool. 1885, p. 66) is very remarkable, and possibly may be accounted for by the plenteousness of Grouse in Monmouthshire, the bird in question having probably flown across the Severn from some part of that county. It would be well to know whether it was alone when killed, for, if so, this would bear out my theory. I presume it was killed out of heather. With regard to the Grouse said to have been killed at Wedhampton, in Wiltshire, in 1794 (Montagu, Orn. Dict.), I am rather sceptical. At that time Black-game were fairly plentiful in the New Forest, and I think it most probable that in this instance a grey hen was mistaken for a Red Grouse, a very likely error in those days [the more so as Montagu says he was only shown "a part of the bird."—ED.]. Although a Wiltshire man myself, I do not know Wedhampton; but if at the eastern part of the county, Black-game might easily stray from either Hampshire or across from Surrey, where they then occurred more plentifully than at present. Has the late Mr. Marsh, of Sutton Benger, Wilts, made any mention of this bird? if so, I will say no more, for no one had a more extensive knowledge of the county of Wilts and

its Ornithology. Would that he had left us more notes than those which appeared in 'The Zoologist' five-and-twenty years ago.—E. CAMBRIDGE PHILLIPS (Brecon, S. Wales).

Ornithological Notes from the Isle of Wight.—Early in November last a Stone Curlew was procured; though not a common bird with us, it is occasionally met with in winter. Swallows and Martins were observed in the Undercliff till the first week in November, but they had all left Malvern by October 9th; they had been observed to resort to some lofty elms to roost. A Ringed Guillemot, a male, was shot off Ventnor early in January: a rare species on this coast, not more than three or four instances of its capture being recorded. This bird is in a transition state of plumage, more white than black on one side of the head, with which the bridle is blended; but on the reverse side of the head and neck it is well defined, so is the white encircling the eye. A bird has been observed of late (though not distinctly) skulking among the garden shrubs—the Whitethroat, I believe. The winter has been a mild one in the Undercliff: thermometer down to 32° twice only during the day, *viz.*, on January 13th and 14th.—HENRY HADFIELD (High Cliff, Ventnor).

Early Nesting of the Long-eared Owl.—On dissecting a female Long-eared Owl, sent for preservation on February 10th, I was surprised to find it showed signs of having recently laid and incubated. I found the ovary contained two eggs about ready for exclusion, besides others which were large, but not too far advanced. From these facts I conclude that the bird laid its first egg about February 3rd, and, as this species continues laying and sitting the whole season, the male taking part in the incubation, I think it is a very early commencement.—H. BARBER (Lincoln).

Heron preying on Field-mice.—As a proof that "all is fish that comes to the net" of the Heron, my brother-in-law writes me this morning (February 18th) that, having lately killed a Heron, it disgorged, on being picked up, four field-mice. I have known of rats having been thrown up, and in one case a Water Rail; but field-mice appear to me as somewhat unusual food.—E. CAMBRIDGE PHILLIPS (Brecon, S. Wales).

Interbreeding of the Thrush and Blackbird.—I was under the impression that this subject had been well-nigh exhausted, but, as Mr. Christy has quoted another case, let me just say that I perfectly agree with him that a female Blackbird was in this instance mistaken for a Thrush. Should any more instances be brought forward, let me ask that the length of tail of the supposed hybrid be accurately described, as without this—to my mind—distinguishing mark (the shorter tail of the Thrush being plainly discernible) I for one shall still adhere to my total disbelief in wild-bred hybrids, more especially those between the Thrush and Blackbird.—E. CAMBRIDGE PHILLIPS (Brecon, S. Wales).

Solitary Sandpiper in Cornwall.—A second specimen of the Solitary Tatler, *Totanus solitarius*, Wilson, has been killed on the marsh near Marazion. I noted the first from Scilly in 'The Zoologist' for 1882, p. 432. The present specimen was identified by Mr. W. H. Vingoe, in whose hands it now is (Jan. 26th), and, having examined it, I find it to be certainly a bird of the same species as that shot at Scilly in 1882.—THOS. CORNISH (Penzance).

The American Killdeer Plover in Cornwall.—A specimen of the American Killdeer Plover, *Ægialitis vociferus*, has been obtained by Mr. Jenkinson at Tresco, in the islands of Scilly. It attracted his attention by its peculiar cry. On sending it to Mr. Vingoe, who has set it up, Mr. Jenkinson telegraphed (Jan. 15) that he had "shot a large Ringed Plover with ash-coloured legs, tail-coverts chestnut-coloured, and tail very long." I have compared the specimen with Bonaparte and Wilson's figure of the bird, and it corresponds in every particular with it, except that in the coloured figure the back is more rufous than it is in the actual specimen. It is perhaps of more importance that the specimen corresponds in every point with Wilson's description of the Killdeer Plover.—THOMAS CORNISH (Penzance).

Cream-coloured Courser in Cornwall.—A specimen of the Cream-coloured Courser, *Cursorius gallicus*, has been procured by Mr. W. H. Vingoe, from Mawgan, near St. Columb, where it was taken in December last.—THOMAS CORNISH (Penzance).

An unobserved Habit in Long-tailed Tit.—When rabbit shooting the other day, and standing under some alder trees which overhang the lake here, the water being some three feet deep under them, I saw a troop of these interesting little birds, and watched them till they came into the trees close to me. They were, as usual, very busy searching the branches over for food; suddenly one dashed into the water and up in a second on to a branch, two more doing the same. It struck me they were picking up some food that had dropped on the water; but, as the habit was quite new to me, I watched with renewed interest. One or two more first flew down and touched the water, and then flew up; presently one flew out about six yards from the trees and dashed quite into the water, and, when he settled again, he shook his feathers out with great vigour, and seemed to have enjoyed his plunge immensely. I need hardly say how very interested I was, for both the picking food off deep water and bathing were quite new to me.—J. WHITAKER (Rainworth Lodge, Notts).

Reported Occurrence of the Blue-winged Teal near Redcar.—In 'The Zoologist' for 1882 (p. 92) I referred to a supposed specimen of the American Blue-winged Teal, *Querquedula discors*, shot on September 3rd
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in that year, in Cowpen Marsh, near Redcar. The bird has since proved to be a young male Garganey, *Querquedula circia*, and I am therefore desirous of correcting my former statement in regard to it.—T. H. NELSON (North Bondgate, Bishop Auckland).

Note on *Machæramphus alcinus*.—The information given by Mr. Pryer (*supra*, pp. 47, 48) as to the bat-eating propensities of *Haliastur indus* (or rather *H. intermedius*) and of *Machæramphus alcinus* is highly interesting, and, with regard to the last-named species, I wish to point out that its near ally, *M. anderssoni*, of Madagascar and South Africa, is also a bat-eater, as recorded by Andersson in his 'Notes on the Birds of Damara Land,' p. 24.—J. H. GURNEY (Northrepps Hall, Norwich).

[We may remind our readers that the common Hobby has been known to prey on Bats.—See 'Zoologist,' 1877, p. 472.—ED.]

Marsh Harrier in Dumbartonshire. — A young male specimen of the Marsh Harrier, *Circus aruginosus* (Linn.), was taken by a gamekeeper in a trap at Caldarvan, Dumbartonshire, on July 2nd, 1883. It had been observed for some days before flying about in the neighbourhood of a small loch, near which it was taken. Total length, 19½ inches; spread of wings, 48 inches. The birdstuffer who preserved the bird reported the stomach to be empty. The Marsh Harrier is now a rare bird in any part of Scotland, and very few specimens have of late years been recorded from any of the western counties. So far as I am aware, there is no authentic instance of the species ever having before occurred in the county of Dumbarton. It is included—under the name of Moor Buzzard—in the list of the birds of the parish of Luss by the Rev. Mr. Stewart ('Statistical Account of Scotland,' published 1796); but, although this gentleman was a good naturalist, we fear some of the species in his list must be accepted with care. — JAMES LUMSDEN (Arden, Dumbartonshire).

FISHES.

Food of Cod.—I have found in the stomach of a Cod the partly-digested remains of a common Squid, *Loligo vulgaris*. There is nothing at all remarkable about this beyond the fact that the Cuttle was perfect, with the exception of its sac or outer covering. It is curious that this should have first yielded to the gastric juice of the fish.—THOS. CORNISH (Penzance).

MOLLUSCA.

The Band-marking of *Helix hortensis*.—It may sometimes be observed that in specimens of *H. hortensis*, which were, when in good condition, bandless, that on the shell becoming weathered, there are tracts corresponding to the position of the bands of other shells, which become eroded and the epidermis destroyed more rapidly than other parts; thus

we occasionally see whitish bands (usually the 2nd and 3rd) on old shells caused in this way, because the locality of the bands, even when these are absent, is thinner and more easily destroyed than other parts of the shell. This phenomenon I have as yet only witnessed in the bandless forms of the varieties *lutea* and *lilacina*, but I doubt not that it occurs in other varieties as well. Another way of demonstrating the bands in an apparently bandless specimen is to put it into dilute hydrochloric acid. In this way I have produced somewhat transparent bands (No. 3 notably) in a specimen of var. *lutea* which before being so treated showed no traces of bands. I have not noticed that *H. nemoralis* is ever eroded in the same way, and I quite failed to get any marked traces of bands with hydrochloric acid.—T. D. A. COCKERELL.

Planorbis glaber in Surrey.—Towards the end of my paper on Surrey Mollusca I said that I expected that *P. glaber* would be found in Surrey, and it would seem that these expectations have been already realised, for two broken shells which I found in the rejectamenta of the Thames at Kew, on December 29th, have been named by Mr. W. D. Roebuck, the Recorder of the Conchological Society, as *P. glaber*. The Paddock Wood specimens, however, he considers a variety of *P. albus*. — T. D. A. COCKERELL (51, Woodstock Road, Bedford Park, Chiswick).

CRUSTACEA.

Ebalia cranchii at Penzance.—I send by post herewith two specimens of *Ebalia cranchii*. They were dredged in our bay on a fishing-ground known to us as the "White Houses," about two or three miles due south of our pier-head, and having a shingly bottom. Several other specimens were secured at the same time. I suspect that the presence of this crab in large numbers is due to the existence of some unknown law of Nature which occasionally causes little crabs of certain species to shoal. I have noticed it of *Portunus arcuatus* once, and of *Corystes cassivelaunus* many times.—THOMAS CORNISH (Penzance).

 SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

February 5, 1885.—FRANK CRISP, LL.B., Vice-President & Treasurer, in the chair.

The Rev. L. Klein, B.Sc., was elected a Fellow of the Society.

A paper was read "On the *Arbaciida*, Gray" (Part I., the Morphology of the Test in the Genera *Cœlopleurus* and *Arbacia*), by Prof. P. Martin

Duncan and W. Percy Sladen. The recent and fossil species of *Calopleurus* and the recent forms of *Arbacia* examined, present some structural details of both primary and secondary classificatory importance which have been hitherto neglected and unrecorded. The ambulacral plates differ from those of all other *Echinoidea* in the arrangement of the triplets, there being a central primary plate with an adoral and an aboral demi-plate, while there are no additional plates near the peristome in the species of *Arbacia*. The structure of the sutures, especially of the median interradials, is a modification of the dowelling which has been described in *Temnopleurus* by one of the authors. The double optic pore noticed by Lovén occurs in the fossil species of *Calopleurus* and in *C. Maillardi*, a recent species. The authors compare the different forms, and exclude *Arbacia nigra* from the genus *Arbacia*. The next part will deal with the classification.

Mr. W. F. Kirby read a paper "On the employment of the names proposed for Genera of Orthoptera previously to 1840." The author shows the application of every name proposed from the time of Linné to the publication of Serville's 'Histoire Naturelle des Insectes Orthoptères,' and appends a bibliography.

February 19.—Prof. P. Martin Duncan, F.R.S., Vice-President, in the chair.

The Rev. L. Martial Klein, D Sc., of St. Asaph, was elected a Fellow.

Mr. Thos. Christy exhibited some samples of excellent silk from Auckland, New Zealand, but the insect which had spun them was not identified.

The substance of Part III. of the Rev. A. Eaton's Monograph on the Mayflies (*Ephemeroidea*) was read by the Secretary. In this the fourth series of Group 2 of the genera are dealt with. Among miscellaneous representatives of the genera, adult and in good condition, *Cloëon* is easily distinguished by the absence of hind wings; *Callibates* by the large rounded costal projection and numerous cross veinlets of its broad, oblong, obtuse hind wings; *Batis* by hind wings as broad and obtuse as those of the preceding genus, but with the costal projection, if any, small and acute, and with scarcely a cross veinlet at all; *Centroptilum* by the extreme narrowness of its very small hind wings, and usually by the slenderness of their costal projection. The distinctive characteristics of Sections 10 and 11 of the genera are also taken into consideration, and full descriptions of many new species are given.

A paper was read by Prof. P. Martin Duncan, "On the Anatomy of the Ambulacra of the recent *Diademata*." The author described the arrangement of the compound plates of the genera *Diadema*, *Echinothrix*, *Centrostephanus*, *Astropyga*, *Micropyga*, and *Aspidodiadema*. The first

three genera have triplets consisting of primaries, the dorsal and arboral plates being low and broad, and the second, or central plate, being a large primary. Near the peristome there is deformity of this typical arrangement, and in *Echinothrix* a demi-plate may enter, but it is never the second plate. In *Astropyga* the triplets are arranged so that the majority are on the *Diadema*-type, the exceptions being recorded. The structure of the triplets of *Micropyga* is unique, and the arrangement, leaving out the position of the pores, is somewhat like that of *Cœlopleurus*. *Aspidodiadema*, as has been explained by A. Agassiz, is like *Cidaris* in its ambulacra.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

February 3, 1885.—Prof. W. H. FLOWER, LL.D., F.R.S., President, in the chair.

The Secretary exhibited a specimen of a rare South-American Lizard, *Heterodactylus imbricatus*, presented to the Society by Mr. G. Lennon Hunt; and a specimen of a rare beetle, *Julodis Ffinchi*, of the family *Buprestidæ*, from Beloochistan.

A letter was read from Dr. George Bennett, of Sydney, containing remarks on the Tree-Kangaroo of Queensland, *Dendrolagus Lumholtzi*, lately described in the Society's 'Proceedings.'

A series of specimens of lepidopterous insects, which had been bred in the Insect House in the Society's Gardens during the past season, was laid on the table.

A communication was read from M. Taczanowski and Count Berlepsch containing an account of the third collection of birds obtained by M. Stolzmann in Ecuador. The collection contained examples of 289 species, of which ten were new to Science.

Lieut.-Col. C. Swinhoe read the first of a series of papers on the Lepidoptera of Bombay and the Deccan. The present communication contained an account of the Rhopalocera, and gave the results of two years' daily collecting.

A communication was read from Mr. Robert Collett, giving an account of *Echidna acanthion*, a new species of Spiny Anteater lately discovered in Northern Queensland.

A communication was read from M. Jean Stolzmann, containing the description of a new Rodent, belonging to the genus *Cœlogenys*, from Ecuador, proposed to be called *Cœlogenys Taczanowskii*.

February 17, 1885.—OSBERT SALVIN, Esq., F.R.S., Vice-President, in the chair.

A report was read on the additions that had been made to the Society's Menagerie during the month of January, and special attention was called

to a Black-and-Yellow Hawfinch, *Mycerobus melanoxanthus*, from Northern India; an Andaman Starling, *Sturnia andamanensis*, from the Andaman Islands, new to the Society's collection; and a young male European Moose, *Alces machlis*, presented by Mr. Evelyn Hubbard.

Mr. F. E. Beddard read a paper upon the structure of the Cuckoos (*Cuculidæ*), and pointed out the differences in the pterylosis and the structure of the syrinx in the various forms which he had examined. It was proposed to divide the family into three subfamilies—*Cuculinae*, *Phœnicophainæ*, and *Centropodinae*.

Mr. F. E. Beddard read a paper upon the heart of *Apteryx*, and called attention to the variations in the condition of the right auriculo-ventricular valve observed in different individuals of this bird.

A communication was read from Mr. M. Jacoby, containing the first part of an account of the Phytophagous Coleoptera obtained by Mr. George Lewis during his second journey in Japan, from February, 1880, to September, 1881.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

Annual Meeting, Januagr 21, 1885.—J. W. DUNNING, Esq., M.A., F.L.S., &c., President, in the chair.

An abstract of the Treasurer's accounts for 1884 was read by Mr. H. T. Stainton, one of the Auditors.

The Secretary then read the Report of the Council for 1884.

The Secretaries not having received any notice proposing to substitute other names than those in the lists prepared by the Council, the following Members form the Council for 1885:—T. R. Billups, H. Druce, J. W. Dunning, E. A. Fitch, H. Goss, F. Grut, W. F. Kirby, R. M'Lachlan, R. Meldola, E. Saunders, J. W. Slater, S. Stevens, and J. J. Weir.

The following are the officers elected:—*President*, R. M'Lachlan, F.R.S.; *Treasurer*, E. Saunders, F.L.S.; *Secretaries*, E. A. Fitch, F.L.S., and W. F. Kirby; *Librarian*, F. Grut, F.L.S.

The President then delivered an address, at the conclusion of which Mr. H. T. Stainton proposed a cordial vote of thanks to Mr. Dunning for his services as President during the year, and requested that he would allow his address to be printed with the 'Proceedings.' The proposal was seconded by Jonkheer May, and carried unanimously. The President returned thanks.

Mr. M'Lachlan proposed a vote of thanks to the Treasurer, Secretaries, and Librarian, which was seconded by Mr. Waterhouse, and carried unanimously.

Messrs. Saunders, Fitch, Kirby and Grut made some remarks in acknowledgment.

February 4, 1885.—R. M'LACHLAN, Esq., F.R.S., &c., President, in the chair.

Mr. M'Lachlan returned thanks to the members for his election to the office of President, and nominated Messrs. Dunning, Stevens and Weir as Vice-Presidents for the ensuing year.

H. B. James, Esq. (Valparaiso) and Thomas Collett Sandars, Esq (46, Cleveland Square, Hyde Park, W.), were balloted for and elected Members of the Society.

Mr. J. W. Slater exhibited a specimen of *Polyommatus chryseis*, Hüb., captured on Cultor Moor, Aberdeenshire, in July, 1878, by Mr. James Mutch. The occurrence had not been previously recorded, as the captor was not aware of the rarity of the species; two other specimens were seen in the same locality.

Capt. H. J. Elwes said the specimen greatly resembled the boreal form *P. Stieberi*, Gerh., which is uncommon in Lapland, and this fact tended to confirm the genuineness of the capture. Messrs. Stainton and Weir also made some remarks on the exhibit.

Rev. A. Fuller exhibited a collection of insects, particularly rich in Lepidoptera, captured along the line of the Canadian Pacific Railway during his visit to the Rocky Mountains after last year's meeting of the British Association at Montreal.

Mr. W. Cole exhibited a wasp's nest from Woodford Bridge, Essex, from which he had extracted specimens of *Vespa norvegica*, Fabr., and stated that Master Chapman, the finder of the nest, had captured specimens of *Vespa sylvestris*, Scop., issuing from the nest.

Mr. E. Saunders stated that he had examined the specimens, and the circumstance of the two species occurring in one nest was very curious; they both belonged to the same section, and were not structurally distinct, except in the genitalia of the males; still the species differed much in size, colour, and pubescence.

Mr. W. L. Distant exhibited, on behalf of Mr. L. de Nicéville, of Calcutta, a series of wings of butterflies, illustrative of seasonal variation in Indian Rhopalocera collected in Calcutta. The point to be discovered is, as M. de Nicéville wrote to him, why "the ocellated forms should occur in the rains and the non-ocellated ones in the dry weather?"

Capt. Elwes made some extended remarks upon the subject of seasonal dimorphism and geographical forms, saying that Mr. Fuller's exhibits reminded him of one of the most interesting facts connected with geographical distribution, as many of the varieties in his collection made on the line of the Canadian Pacific occurred again over 500 miles south in the mountains of Colorado, and at no intermediate stations.

The President also remarked on the importance of M. de Nicéville's exhibition and discoveries of the temperature forms of various *Satyridæ*,

and hoped that this would serve as a warning to museum naturalists, as he firmly believed that a vast majority of the new species now being made on very slender characters would prove to be casual varieties or seasonal forms of one and the same species. In his younger days he well remembered how two or three distinct forms of our common white butterflies (*Pieris*) were recognised as good, but now exploded, species, and they were possessed of characters far more important than those now used to distinguish species by certain entomologists.

Mr. E. A. Butler exhibited the egg-sacs of three species of *Mantidæ* from Molepolole, Bechuanaland. One species was indicated by egg-cases exactly resembling, though rather smaller than, those figured at Proc. Ent. Soc. Lond., 1883, p. xxxv, and his correspondent had sent them as without doubt belonging to a certain Mantis.

Mr. W. F. Kirby, on behalf of Herr Buchecker, who was present as a visitor, exhibited three volumes of drawings of Hymenoptera.

Mr. Stainton exhibited bred specimens of *Chauliodus insecurellus*, Sta., which he had received through Mons. A. Constant from Gascony. The larva of this insect had at last been found, not on one of the *Umbellifera*, but on one of the *Santalaceæ*, *Thesium divaricatum*. No doubt in this country the larva would be found on *Thesium humifusum*, a plant which, according to Brewer's 'Flora of Surrey,' occurred on Banstead Downs. Unfortunately it is a somewhat inconspicuous plant, with which few entomologists were acquainted. It would now be their mission to learn to recognise this plant, known in England as "bastard toad-flax," and to find the larva of *C. insecurellus* upon it.

Mr. T. R. Billups exhibited two females of *Ranatra linearis*, Linn., captured at Loughton, Essex, on January 16th last, in a locality where there was probably no water within a mile.

Mr. E. P. Collett did not think the *Ranatra* was so rare as was generally supposed; he had captured as many as sixty specimens in one day.

Mr. Billups also exhibited a box containing Ichneumonidæ and Hemiptera, captured at Headley Lane on January 3rd, 1885.

The Secretary read a letter from Mr. A. Lloyd, requesting the Society to give an opinion to assist him, as Hon. Sec. of the West Sussex Natural History Society, in recommending the best system of arrangement and nomenclature to adopt for British Lepidoptera.

Mr. G. F. Mathew contributed the "Life-history of three species of Western Pacific Rhopalocera." *Papilio Schmeltzi*, H.-S., *P. Godeffroyi*, Semp., and *Xoïs Sesara*, Hew., were the species treated of.

Mr. George Lewis contributed a memoir, "On a new genus of *Histeridæ*." A very abnormal genus, previously referred to as probably belonging to the *Synteliidæ*, was described under the name *Nimponius*, and four new species were described from Japan.—E. A. FITCH, *Hon. Sec.*



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NOTES ON THE BIRDS OF MANITOBA.

BY ROBERT MILLER CHRISTY.

DURING the last two years I have several times had occasion to visit that newly-opened but much-talked-of region known as Manitoba; and as on each visit I devoted as much time as I was able to spare from other branches of Natural History to the study of the Ornithology of that country,—a subject to which very little attention has hitherto been directed,—I now propose to offer a few remarks upon it. It must, however, be clearly understood that my observations are put forward strictly as *notes*. Many, even of the commonest birds, are not so much as referred to herein, simply because they did not happen to come specially under my notice. Most of the following notes were made near the town of Carberry, 105 miles west of Winnipeg, during the months of August, September, and October, 1883. I cannot too fully acknowledge the assistance given by my friend Mr. E. E. T. Seton, of Toronto, who for several years past has resided in Manitoba, and has done much towards investigating its avifauna. The nomenclature used is that employed in the new edition of Dr. Coues' 'Key to North American Birds.'

The popular idea of Manitoba as an icy and inhospitable country is not altogether wrong, so far as the winter is concerned; but of the summer season it is wholly incorrect. While the latter lasts, bird-life in the greatest variety everywhere abounds. Meadow Larks, "Quailies," Prairie Chickens, Bay-wings, and a hundred other kinds breed on the open prairies;

Hawks, King-birds, and Nightjars swarm in the "bluffs" and woods; wild-fowl in the "sleughs."* Early spring and late autumn see a vast army of migrants on the move; whilst, even in winter, Hawk Owls, Snowy Owls, Shore Larks, Snow Buntings, Crossbills, Pine Grosbeaks, several Woodpeckers, "Chickadees," Grouse, Shrikes, &c., enliven the somewhat dreary scene.

It will be well to say something of the haunts of the birds spoken of in the following paragraphs. Carberry stands at the south end of what is known as the "Big Plain," which is merely a rather unusually large stretch of unbroken prairie. South of the town, and extending almost to the Assiniboine River, lies an extensive range of desolate sand-hills, which are seldom invaded by the foot of man, and are likely long to remain in their primitive condition; they consist merely of wind-formed dunes, with hollows between which are filled with water, and form the home of many a rare bird and mammal. The sand of which the hills are formed is so pure that it can only support a very scanty covering of grass; and it is to this circumstance that we are indebted for the fact that the sand-hills, unlike the prairies, support a fairly abundant growth of trees, such as spruce, poplar, and oak. Were the grass sufficiently long and dense to "carry fire," the trees would be quickly killed and burned to logs. Mr. Seton has just succeeded, after a long and exciting hunt, in killing a Moose in one of the woods on the sand-hills. Through the centre of the range of sand-hills runs Pine Creek, a sluggish stream clogged with water-lilies, and fringed with willows and bulrushes. For several miles on either side of the creek extends a huge swamp, covered thickly with trees of spruce and tamarac, where the Indian pitcher-plant, *Sarracenia purpurea*, grows by the acre, and all things combine to make a true naturalists' paradise. In winter, when everything is frozen hard, this swamp may be crossed with ease; but so wet and impenetrable is it in summer, that I have little hesitation in claiming that no one except Mr. Seton and myself have ever crossed it at that time of year. Of the prairies not much need be said; they are flat, covered with a fine growth of grass, and interspersed with bluffs, which are gradually disappearing before

* On the Manitoban prairies any isolated cluster of trees or a copse is known as a "bluff"; a "sleugh" is the invariable name for a wet, marshy spot or a shallow pond.

the hungry fire. If prairie-fires had been by some means arrested fifty years since, Manitoba would to-day have been a densely-wooded, instead of a prairie, country. The fire, too, annually destroys the young trees that spring up. In the moister parts, where lakes and ponds arrest the progress of the fires, extensive woods of poplar are found, in which many woodland birds are able to find a home, even though Manitoba is essentially a prairie country. Of the excessive fertility of the prairie soil there is no question.

The American Robin, *Turdus migratorius*, is a common bird among the trees on the sand-hills and in the bluffs, where it also breeds.

An almost equally common species in similar situations, and in the willow-clumps on the prairies, is the Cat-bird, *Mimus carolinensis*. It is a bird not easily overlooked, for on entering any dense copse one is almost certain to have several peering through the foliage and incessantly uttering their loud, harsh, and extremely cat-like mew, especially if the nest be near at hand. It approaches very close, and is easy to shoot. I found it breeding in a fringe of willows beside the creek which intersects the dry, treeless prairie round Moose Jaw, 398 miles west of Winnipeg.

The Long-tailed Chickadee, *Parus atricapillus septentrionalis*, is the only Tit I remember observing, and I believe it does not breed in Manitoba. I shot the first specimen on September 14th; two days later a pair entered a room in which I was sitting, and I captured them. The "chickadee-dee-dee" of this species is unmistakable.

Sitta carolinensis was not an abundant species, but I brought home one specimen.

On one occasion I was told that a Wren, *Troglodytes aëdon*, had built its nest in the pocket of a coat hung on the door of a ferryman's house on the Souris River.

The Shore Lark, *Eremophila alpestris*, is a common species, breeding on the prairie throughout Manitoba, probably raising more than one brood in the course of the year.

The eggs and nest of the Connecticut Warbler, *Opornis agilis*, taken by Mr. Seton in the extensive tamarac swamp south of Carberry, are now in the Smithsonian Institution. They are, I believe, the first that have been taken.

The Swallow-tribe seems to be usually scarce in Manitoba; but farther west, as far as the Saskatchewan, one species is abundant, and breeds round all the water-tanks and under many of the bridges along the railway. As three years ago this region, through which the line now runs, was practically uninhabited, and the Swallows consequently could hardly have then found suitable nesting-places, it seems probable that the range of the species has been considerably extended in that time—an instance, doubtless, of the rapidity with which some species follow man as he extends the area of civilisation.

At least one species of Shrike is common and breeds, building its nest largely of the stalks of a species of *Gnaphalium* in the branches of the low, scrubby oaks that cover the sand-hills.

The Goldfinch, *Astragalinus tristis*, is fairly common on the edges of the bluffs.

The little Baywing, *Poæcetes gramineus*, is one of the most familiar of prairie birds, and nightly sings a subdued kind of vesper-song as the sun goes down. Its most notable peculiarity, however, is its habit of flitting along a trail or pathway in front of an advancing waggon or person, alighting every few yards. As it is but comparatively recently that there have been any human trails over the prairies, it seems probable that this proceeding is a relic of a habit acquired by the bird of flitting before the buffaloes along the paths made by those animals.

About the second week in September the Snowbirds or Juncos, *Junco hyemalis*, began to become abundant, and remained so for at least a month.

The Bobolink, *Dolichonyx oryzivorus*, is of course common. I saw birds in both the black and buff plumage together near Carberry on August 30th.

The Red-winged Blackbird, *Agelaius phœniceus*, is very abundant, and breeds in the rushes round most of the lakes, afterwards collecting into flocks.

The gorgeous Baltimore Oriole, *Icterus galbula*, is far from rare, and its hanging nest is often to be found in the poplar trees growing on the sand-hills.

No bird is more characteristic of the prairies than the Meadow Lark, *Sturnella neglecta*. It is very common in summer, and breeds abundantly. Its clear, musical whistle (almost, if not

quite, equal to the song of the Nightingale) is uttered by the bird either when upon the wing, the ground, or a tree, and may be heard for a great distance. Towards the end of August, though the birds had not left, they had largely ceased whistling; but the arrival of a few warm days, about the 10th of September, set them off again for a time. When I left, about the middle of October, there were still a few small family-parties about, though the great majority had gone south. In the previous year (1882) Mr. Seton says the main body left about the 17th of October. It is decidedly a shy bird, even in a country where most birds are notably less wary than in England; and, common as the bird is, it is no easy matter to obtain a specimen just when one wants. As Mr. Seton remarked to me, it bears truly heraldic markings on its breast—or, *a chevron sable*. Late in July I shot a young specimen with a large festering sore upon its breast, doubtless caused by its having accidentally flown against a spike on one of the numerous “barb-wire” fences on which this bird frequently perches. Not long after, I shot a Purple Grackle with an old wound on its head, which was probably occasioned by the same means. I have often thought what a capital thing it would be to introduce the Meadow Lark into England. So far as plumage and song are concerned, it would take rank among our brightest-coloured and most admired songsters; while its hardy nature would allow of its remaining with us the whole year round, as indeed it often does in Ontario and other districts farther south than Manitoba. Perfectly harmless and accustomed to grassy countries, it would quickly become naturalised in our meadows, where it would find an abundance of insect-food, and would doubtless soon increase sufficiently in numbers to serve, if need be, as a game- and food-bird, as it largely does in the United States. No other songster that I ever heard equals this bird in the sweetness and mellowness of its notes.

Two specimens of Grackle, the Purple, *Quiscalus purpureus*, and the Rusty, *Scolecophagus ferrugineus*, are excessively abundant, and often collect into enormous flocks after the breeding-season. Under the name of “Blackbirds” they share in common the curses of the settlers, on account of the great damage they do in the harvest-field. They are both very noisy birds.

I did not meet with Brewer’s Blackbird, *Scolecophagus cyanocephalus*, in Manitoba, but shot a specimen—probably a young

male—at Maple Creek, 597 miles west of Winnipeg, on July 10th, 1884.

Before the beginning of September the Crow, *Corvus frugivorus*, did not seem to be particularly common; but after that it became more noticeable. Large flocks frequently flew over, their loud hoarse croak being audible for long distances over the prairie. On September 7th a specimen was brought in having a curious malformation of the bill, which was evidently due to a gun-shot, as the right humerus had also been broken. The upper mandible was bent a good deal to the left, as well as having the tip strongly turned downwards. A notch had been worn in the side of the lower mandible where the upper one crossed it, but the former was normal in all other respects. As the bird was only wounded slightly in the wing, we kept him alive in order to learn how, with such an awkward instrument for a bill, he contrived to take his meals; for the fine condition he was in clearly showed that he had some means of so doing; and in a few hours he was tame enough to show us how. We placed some pieces of bread upon the floor, which, being hard and flat, probably puzzled the bird more than if it had been soft or uneven; but, by standing directly over them and putting down his head till it was almost between his legs and the crown nearly on the floor, he contrived to get the piece of bread between his mandibles.

The Whiskey Jack, *Perisoreus canadensis*, probably breeds in the dense tamarac swamp south of Carberry, as a young specimen was shot there by Mr. Seton in August.

The Blue Jay, *Cyanocitta cristata*, is common, but appears to be migratory,—partially at least,—leaving in winter, though resident farther south.

The well-known King-bird or Tyrant Flycatcher, *Tyrannus carolinensis*, is abundant in Manitoba. A more fearless, inquisitive, pugnacious, and warlike bird it is difficult to imagine. Often when I have shot a bird as a specimen, up has flown a King-bird with a manner which gave him the appearance of saying—“Now, what’s going on here”? To see a King-bird dash at and attack a huge Harrier, for no other purpose whatsoever than to have a fight, is a thing of common occurrence, and the Harrier always tries to avoid and escape from his assailant. The King-bird breeds in the low scrubby oak trees

which cover the sand-hills, building, like the Shrike, a nest consisting largely of the stalks of a species of *Gnaphalium*. After the young are able to fly they often live round the settlers' houses on the open prairie, but about the end of August they all leave.

Among the trees on the sand-hills and in the bluffs the Night Hawk, *Chordediles popetue*, is abundant, and makes itself very conspicuous towards evening by its loud scream, by booming, and by displaying during flight the unmistakable white patch on each wing. Not unfrequently it may be seen on the wing at mid-day; and it always makes an appearance long before sunset, sailing about at a great height and screaming frequently. After flying awhile over the head of any intruder, it suddenly spreads its wings and, giving a wide swoop downwards, emits a loud booming noise, which has gained for it in some parts of America the name of "Bull Bat." That this noise is made over one's head in order to threaten or intimidate seems to me pretty certain, but I have also, I believe, heard it emitted at a distance, without any such object. It breeds commonly among the trees on the sand-hills. One day early in August we found a nest, or rather two young ones—for nest there was none—about three days old, with the egg-shells lying near. Though so young, one of the nestlings, which we afterwards proved by dissection to be a male, was very pugnacious, and snapped his bill menacingly when touched; the other was perfectly quiet, so we concluded, though we could not prove it, that it belonged to "the gentler sex." While we were at the nest the old birds were, as usual, very solicitous for the safety of their young, settling on trees, fallen logs, the ground, and fluttering round to draw off our attention. The number of old birds began to get very much less by the end of August, but a few were nevertheless seen until well on into September—one as late as the 11th. After the migration commenced they were not unfrequently seen in the evenings flying over in large straggling parties, circling about as they proceeded. These parties usually travelled south-west I believe, though this is not the direction usually chosen by the other birds of the district when moving south.

The Whip-poor-Will, *Antrostomus vociferus*, differs from its near relative, the Night Hawk, in several particulars. It seldom leaves the woods and comes out onto the open prairie; and,

even among the trees, it is seldom or never seen sailing about high overhead during daylight. It is also a much shyer bird; and, although its highly remarkable far-sounding voice may often be heard, it needs great caution to get within a sufficiently short distance to see the performer. About the end of August all the Whip-poor-Wills seemed to have departed, and I was therefore considerably surprised to hear the unmistakable voice of one in the woods near Carberry on the evening of September 11th. This bird also is very solicitous for its young. Going one evening into the woods to fetch home an easel Mr. Seton had left when sketching, we were almost mobbed by a pair, which kept on for some time, tumbling about among the bushes and settling on the charred logs of trees felled by the fire. We must have been very close to the nest; but it was too dark to find it, though we felt the ground all round.

Several species of Woodpecker are common in Manitoba, notably the Golden-winged, *Colaptes auratus*, which breeds frequently in holes in the trunks of poplar trees in the bluffs.

The Red-headed Woodpecker, *Melanerpes erythrocephalus*, also breeds, but is much less common.

The Short-eared Owl, *Asio accipitrinus*, seemed to be decidedly uncommon. On the evening of August 20th, 1883, just as it was getting dusk, I fired at one sailing overhead. I thought I had missed him, but it was just light enough for us to think we saw him alight in an open spot in a neighbouring field, so we decided to go and look on the morrow; however, the following day was so windy and wet that we did not go till the afternoon of the day after, when we were surprised to see the bird rise, apparently unhurt. It fell to Mr. Seton's gun, and after a careful examination we could not find that it had received any previous injury, except a slight graze on one wing; yet it had been foolish enough to sit moping in one spot for over forty hours with nothing to eat except one large dragon-fly and a great brown cricket, as we afterwards found by dissection.

The Marsh Harrier, *Circus cyaneus hudsonius*, is a very common bird throughout Manitoba, and may often be seen sailing over the prairies, the sleughs, or the wheat-fields. One morning late in August I remember counting a dozen round one house. It must breed there, but Mr. Seton has never discovered a nest. Nearly all the individuals I saw were in the brown plumage;

only three or four wore the adult bluish ash-coloured dress, but Mr. Seton says that adult specimens are much more often seen at the time of the spring migration. This bird often comes and inspects the settlers' chickens, but seldom carries off any except very young ones—gophers, mice, and grasshoppers being its usual prey. It is exceedingly easy to shoot, and one or two dead ones may often be seen lying round a farmer's house. The Harrier became a much scarcer bird as September wore on.

The Turkey Buzzard, *Cathartes aura*, is probably now a less common bird than when the Buffalo was an inhabitant of the prairies, but is still not unfrequently seen, especially if there be a dead horse or other animal in the neighbourhood. Its powers of flight are magnificent.

On the evening of September 4th a flock of sixteen noisy Wild Geese flew with a swift flight over Carberry to the south-eastward. They formed the vanguard of the great army of migratory birds which, going northward in the spring to breed in myriads on the shores of the Arctic Sea, returns south again in the autumn with its numbers increased by the yearling birds.

After the date mentioned, the migration among wildfowl and raptorial birds became much more marked. Goshawks, *Astur atricapillus*, though formerly unseen, became fairly common.

The Peregrine, *Falco peregrinus*, hitherto scarce, was now the reverse, though still not very numerous. On the 11th one perched on a fence close to the house; I was just on the point of firing at him with a rifle, when he rose; then, after sailing once over the chickens, he hovered over them for nearly half a minute as cleverly as any Kestrel could have done—indeed, so stationary in the air was the bird that I essayed a shot, but the bullet missed.

About this time, too, Buzzards became much more numerous. On the 14th an old male specimen of Swainson's Buzzard, *Buteo swainsoni*, in very ragged plumage, was brought to me.

The migration among raptorial birds at this period was made still more obvious by the decrease, as already mentioned, of the Harriers, and by the sudden increase in the numbers of the beautiful little American Kestrel, or as it is always called, the "Sparrow Hawk," *Falco sparverius*. Although I had during the summer found this in fair abundance in the woods and among the trees growing on the sand-hills (where it breeds in

the deserted holes of the Golden-winged Woodpecker), it became far more abundant round Carberry on September 7th, and on that day alone I saw more than during the whole of the rest of the time I was in the country. All day long they were round the house, sitting tamely on fence-posts and buildings, and often chattering like their European brothers. At one spot about a mile from the town, where there was a cluster of trees, I found what I can scarcely call by any other name than a *flock* of them, as from twenty-five to thirty remained there the whole day. For several days after the 7th they were fairly numerous, but all disappeared about the middle of the month. The few that were shot had been feeding on grasshoppers only, and on one occasion I watched through a telescope a bird that was catching grasshoppers among some potatoes.

A most comical affair happened one day in connection with three Goshawks. A friend of mine had shot a Harrier, and left it near his house. Some time after, as some chickens were feeding on the maggots in the body, three Goshawks appeared on the scene and quickly swooped at the birds, to all appearance carrying one off to a neighbouring field. Mr. Seton, who followed to avenge the death of this supposed hen, soon shot two of the Goshawks, when he found that, instead of carrying off a hen, they had possessed themselves by mistake of the putrid and dried-up body of the Harrier!

Numerous as were many of the larger Hawks at this time, I was told that they were far more so at the time of the spring migration northwards; so it appears probable that for some reason they follow different routes upon the two journeys, as is often observed in England. The same remark probably applies to the Whooping Crane, *Grus americana*, for, although in the autumn I did not see one, it is said to be common in spring-time.

The American Bittern, *Botaurus mugitans*, is pretty common in the moister parts of the country,—near the Red River, for instance,—where I have often seen it disturbed by the passing train.

On August 30th a friend shot a young specimen of the Passenger Pigeon, *Ectopistes migratorius*, as it sat upon a tree near Carberry, but this was the only specimen seen during my visit.

No small portion of the Manitoban settlers' diet is formed of

the flesh of the Sharp-tailed Grouse, *Pediæcetes phasianellus*, always known as the "Prairie Chicken." To this bird, which is resident in Manitoba throughout the year, Mr. Seton has devoted much attention, and has elucidated many interesting points in its natural history. The nest is usually formed in long grass, generally near trees. In it the hen deposits fourteen to sixteen eggs, which, curiously enough, are rather smaller, as Mr. Seton points out, than those of the "Quail" (Bartram's Sandpiper), a bird just one-eighth of its weight. The pairing is carried on in a very absurd fashion, parties of from one or two to twenty assembling in the early morning on some small hillock, and there dancing in a manner which is most ludicrous to behold. About the middle of August, or earlier, a row of stiff bristles commences to grow on each side of the toes of both old and young. These are fully grown by October, and henceforth the birds are provided with snow-shoes for use during the winter. In spring these bristles entirely drop off. The birds spend the summer out on the open prairie, and while it lasts they seldom perch on trees; but in winter they all adjourn to the bluffs and woods, and spend the time there feeding on the buds of the trees, and at night diving down into the soft snow-drifts for warmth and shelter. Although they bury themselves to the depth of about a foot, many are killed by wolves and foxes, whilst others are fatally imprisoned should a slight thaw and subsequent frost harden the surface of the drift. In early spring, before the snow is gone, they emerge again upon the prairies where the hips of the wild prairie-rose, which are held up above the snow, provide them with food, while the excessively hard seeds the hips contain act as a substitute for grit in the stomachs of the birds. Early in May they feed, like many other prairie animals, upon the blossoms of the abundant sandflower or prairie anemone, *Anemone patens*, var. *nuttalliana*; and later on they consume quantities of grasshoppers, together with seeds and berries, but they never, so far as Mr. Seton has observed, touch grain.

The Kildeer Plover, *Ægialites vociferus*, is not uncommon round some of the lakes.

On August 3rd we shot several specimens of the Lesser Yellow-shanks, *Totanus flavipes*, and one of the Greater Yellow-shanks, *T. melanoleucus*, round a lake near Carberry; they were clearly on migration, as they were the first of their kind seen.

On July 10th, 1884, I shot a specimen of the Solitary Sandpiper, *Rhyacophilus solitarius*, at Maple Creek, 597 miles west of Winnipeg; it was doubtless breeding. In the dry bed of the creek I also caught a nestling bird, which was probably of this species.

During the summer no bird is more familiar on the Manitoban prairies than the Upland Plover or Bartram's Sandpiper, *Bartramia longicauda*, commonly there known as the "Quaily," from its note. Surely no bird ever differed more completely from the generality of its relatives than this! It is a Sandpiper which does not appear to frequent marshes, which breeds habitually on the dry open prairies, and which is frequently to be seen perched among the branches of trees. Its tameness is excessive. Often when driving over the prairie I have seen it remain within three yards of the passing vehicle without the slightest concern. When on the wing, it offers a shot so temptingly easy that few can resist. Its note is a highly remarkable one, not easily forgotten when once heard. Dr. Coues well describes it as a "long-drawn, soft, mellow whistle, of a peculiarly clear, resonant quality." It breeds abundantly on the open prairie, and I have several times caught the young in down. The majority left Manitoba towards the latter end of August, but I was several times surprised at hearing or seeing a belated pair until quite late in September.

The Carolina Rail, *Porzana carolina*, is common during the summer among the reeds and rushes round the lakes, where it also breeds.

In the open and less frequented parts of the country, like the sand-hills south of Carberry and the prairies of the Upper Assiniboine, the Sand-hill Crane, *Grus pratensis*, breeds pretty commonly. They often feed in the swamps, and their loud, hoarse, rattling croak may be heard for long distances when their solitudes are invaded. Their speed when on foot is very considerable; I one day drove across a moist portion of country after a pair, which for a short time seemed inclined to rely for safety on their legs rather than on their wings. During September small parties of from ten to twenty were seen almost daily passing over southward at an immense height, and attracting attention by their loud croaking, which gradually died away in the distance as the birds disappeared.

During the whole of the autumn the southward migration of

wildfowl was very noticeable. Until late in September small flocks of from twenty to thirty Wild Geese were often to be seen flying over, generally in the shape of a well-marked V. They usually went towards the south or south-east, which latter especially is, I understand, the general direction of the autumnal migration over Manitoba; so that it seems probable that the birds, in coming from the extreme north, follow the line of great lakes extending from the Great Bear Lake to Lake Winnipeg, afterwards following the valley of the Red River, crossing the narrow watershed into the valley of the Mississippi, and wending their way along it still further to the southward. During this autumnal movement the number of ducks frequenting the lakes and ponds throughout Manitoba is prodigious. I shall not soon forget the hundreds I saw on the innumerable ponds between Rapid City and the Oak River, whilst on an excursion towards Fort Ellice, in the middle of October, 1883. Yet those I saw must have been as nothing compared with the abundance to be seen in some other places. A friend who had several days' shooting at Totogon, near the south end of Lake Manitoba, about the end of September, describes the ducks as being so numerous that only the terms "acres" and "millions" could adequately express their abundance. The majority were Mallards, *Anas boscas*, but there were also Blue-winged Teal, *Querquedula discors*, Green-winged Teal, *Q. carolinensis*, Scaups, *Fulix marila*, and others. The Mallard, with various Shovellers, Scaups, Pintails, and Teal, breeds regularly in the lakes and sleughs. When travelling towards Winnipeg by the line running northward from the United States boundary on June 13th last (1884), I saw many newly-hatched broods of ducklings, both Teal and Mallard, swimming about in the ditch beside the track; the old birds rose and flew off as the train approached. At least two species of Tern breed very abundantly on the islands in some of the larger lakes, while several Grebes are not uncommon in the same situations.

In conclusion, I will only add that there still is in Manitoba a large field for ornithological work. If only a few of the many young men of good education who have recently emigrated thither could be persuaded to turn some of their attention to the study of its birds, many highly interesting facts would certainly be brought to light.

ADDITIONAL NOTES ON THE FINWHALE FISHERY ON
THE NORTH EUROPEAN COAST.

BY ALFRED HENEAGE COCKS, M.A., F.Z.S.

TOWARDS the end of last summer (1884) I again visited some of the Finmarken whaling establishments, some account of which I have already given.* The season was rather an early one, and was virtually over before my arrival. The first whale I saw was a very unexpected sight; on my passage from England, when near the head of Christiania Fjord, only about six English miles from Christiania itself, at about 8 a.m. on July 28th, we passed a White Whale. As it repeatedly came to the surface to blow, swimming in its characteristic active manner, we obtained very good views of it; it appeared to be a full-grown example. Herr Collett afterwards informed me that it was seen several times in the Fjord; on the same day that we saw it, it was mentioned in the newspapers as having been seen at Fredrikstad, and the last occasion on which Herr Collett had news of it was as seen at Holmestrand on August 13th. He also informed me that a White Whale had been seen in Christiania Fjord during the previous summer as well.

Whales were conspicuous by their absence on the passage north from Thronthjem. When approaching the Lofotens, on August 2nd, there were a few small *Delphinidæ*, probably Porpoises—two or three being perhaps large enough for Dolphins; and the next day, while still among the islands (near Kjeö), after seeing a few more Porpoises or small Dolphins, we passed two small whales in company, each between thirty and forty feet in length; to the best of my belief they were of different species, one apparently a Humpback, the other a Rorqual (not *B. sibbaldii*, I think). On afterwards mentioning this to the foreman of one of the Vardö factories, he said it was quite likely that I should have seen two whales of different species in company, as he had himself, on the last day of July (1884), seen a male Common Rorqual pairing with a female Humpback. I give this statement of course on his authority; but he is a man as little likely to be mistaken on such a point as anyone, and I am quite sure it was made *bonâ fide*.

* See 'Zoologist,' 1884, pp. 366, 417, 455.

I reached Captain M. C. Bull's factory at Sörvær, on Söröen, a short distance to the west of the North Cape, on August 6th; up to the date of my departure (the 9th, and I believe no more whales were taken subsequently) his total for the season was thirty-five whales, against ninety in 1883. However, more oil was obtained from this smaller number, as a good many of them were Blue Whales, and only three were Rudolphi's Rorqual, against fifteen of this small species the previous year. The flesh of Rudolphi's Rorqual is good to eat, but that of all other kinds (or at least all the other *Balænopteridæ*) is of too loose a texture, and in every way inferior. Herr F. E. Weil, of Drammen, has an establishment here for tinning the "beef" of this whale—a branch of the widely-known "Christiania Preserving Co." The meat is best when the whale is not killed outright, but has time to bleed well. This season the business has been a very unprofitable concern, as Herr Weil has about a dozen men employed, who arrived at Sörvær in May, and the three Rudolphi's Rorquals only gave them work for six days! Capt. Bull showed me a bone which he said he had found loose in the flesh of a large Blue Whale seventy odd feet long, "near the flipper," where neither he nor any of his men had ever seen a bone before. It was on the left side, and there was no corresponding bone on the opposite side. It measures $11\frac{3}{4}$ inches in length, and $1\frac{3}{4}$ inch in circumference at the centre. It very closely resembles a clavicle; but it is perhaps more natural to suppose that there is some error as to the position it was found in, and that it is in reality simply a floating rib.

Capt. Bull manufactures excellent knitting-needles out of the mandibles of whales; this bone is the only one in a whale's skeleton sufficiently hard and compact for this purpose.

I here first obtained specimens (and they were to be had *ad. lib.*) of a Copepod, parasitic or rather epizotic upon the baleen-plates of the Blue Whale, which may apparently always (or at least very generally) be found there in almost any quantity; while, curiously enough, neither it nor any corresponding species has been found on the baleen of the Common Rorqual or any other whale. This Copepod was discovered by Herr Per O. C. Aurivillius, Licentiate of Philosophy of Upsala, and described by him under the name *Balænophilus unisetus* (nov. gen. et spec.) in a pamphlet published in Stockholm in December, 1879. I have brought home

a thousand or more specimens, but unfortunately did not have an opportunity this year of getting any from a freshly-killed whale. As this pamphlet is not likely to have had a wide circulation in England, and as the tiny subject of it has not been mentioned, to my knowledge, in any other publication, I copy the generic characters as given by Herr Aurivillius:—

“Char. gen.: Corpus fere cylindricum. Antennæ anticæ octoarticulatæ; posticæ biarticulatæ ramo secundario articulo uno parvo. Palpus mandibularum minimus, tuberculo setigero formatus. Palpus maxillarum simplex. Maxillipedes anteriores processibus cylindræis duobus instructi; posteriores validi, subchelati. Pedes primi paris prehensiles; rami ambo triarticulati; pedes secundi paris ramo interno bi-, externo triarticulato; tertii et quarti paris ramo interno uni-, externo triarticulato; quinti paris rudimentarii. Sacculi ovigeri duo. Nauplius transversaliter ovalis, tribus paribus extremitatum non articulatis, brevibus instructus.”

“Generic character:—The body nearly cylindrical. The foremost antennæ eight-jointed; the posterior two-jointed, with short, single-jointed ramus. The mandibular palp consisting only of a bristle-covered knob. The maxillary palp single. The anterior maxillipedes furnished with two cylindrical processes; the posterior powerful, with strong nipping-claws. The first pair of feet with strong claws, and three-jointed rami; the second pair of feet with the inner ramus two-, the outer three-jointed; the third and the fourth pairs with the inner ramus one-, the outer three-jointed; the fifth pair of feet rudimentary. Egg-sacks two. Nauplius broader than long, with three pairs of short, unjointed limbs.” [Translated from the Swedish.]

Herr Foyn has now a factory at Böle, on Söröen, in addition to his original one at Vadsö, which was not given up, as was reported at the end of 1883. He possesses four steamers (whether all whalers or any of them tugs I am not sure), and they come in either here or to Vadsö, according to whereabouts they have been cruising, and are not attached to either factory in particular. As the result of his “prospecting” off Iceland in 1883, Herr Foyn built a factory on that coast—in what part I do not know; just as it was finished (if my information is correct) an Act was passed by the Icelandic “Thing” forbidding whaling on that coast, presumably for fear of that happening

which many persons predict will shortly come to pass on the north coast of Norway, namely, that the whales, decimated and harried, will cease to drive the shoals of fish in to the coast within reach of the fishermen. Herr Foyn at once therefore ordered the factory to be pulled down again, and on our passing Mehavn (just to the east of the Nord Kyn), on the morning of August 12th, we found Herr Foyn's two sailing vessels with the materials of the factory lying there, having arrived the previous day; they were to begin discharging on the following day, and the factory will no doubt be completed in time to use next season.

On August 11th, between Repvaag and Kistrand (East Finmarken), we passed a small whale, fifteen or twenty feet long, which I did not see well enough to identify, but think it was most likely to have been a young example of one of the species of *Balænoptera*.

On the 13th I visited Jar Fjord. There are three whaling establishments in this Fjord, besides "Jar Fjord's Kraftfoder og Lim Fabrik" (= Guano and Glue Factory), which buys the krangs of whales from the other factories after the blubber has been removed, and reduces the whole mass to the above useful commodities. The krang of a large female Blue Whale was hauled up on the slip here, which measured (as I saw for myself) seventy-five Norwegian feet in a straight line from nose to fork of flukes, that is, about seventy-eight feet two inches English. It had lost something of its length, from the under jaw having been removed, which projects beyond the upper, and also the loss of this bone brought the nose down at an angle, still further shortening the length, but, on the other hand, the cutting-away of so much of the muscles, &c., would cause the remainder of the mass to settle down flatter, and thereby increase the length a little. The flipper measured eleven feet five inches; the skull twenty feet ten inches (both English). It had been shot on the 7th, and was said to have contained a foetus measuring about nine or ten feet. The unfortunate beast had been previously wounded, and when taken was found to be still living, with nearly all the flesh on the right side fallen away!

A lower jaw-bone of this species lying at the Jar Fjord Whaling Factory measured twenty-two feet eight inches English, following the curve on the outside. The manager of this

company, Capt. Evensen, talking of the length of Blue Whales, told me that his steamer is eighty-four feet long (presumably Norwegian feet, and = $12\frac{1}{2}$ inches English), and assured me that he had this season taken a Blue Whale which was longer than the steamer.

We took on board 600 sacks of "Kraftfoder," an artificial manure of krang and bones dried, ground, and mixed, the freight on which to Hamburg amounted to £75 (= 1500 marks). There, I understood, it undergoes some chemical process before it is ready for the market.

At Vardö, on August 15th, I had an opportunity of seeing a so-called "Bastard" (= hybrid) whale, which to me appeared to be simply a Common Rorqual. It was a male, measuring (I was told) sixty-four feet six inches English, and was picked up dead at sea. The left side of its under jaw at the tip end was black, while the corresponding portion of the right side was white. The black extended down the left side of its chin for a yard or so from the symphysis of the jaw, and thence only the concavities of the furrows were black. The concavities of the central furrows were buff-coloured, the first few concavities on the right side black, with slight streaks of white, which gradually widened so as to fill the whole width of the concavities. The flipper on the outer side was blue, with almost a brownish tinge at the proximal end; the inner side white, which extended round the anterior margin to the outer side; while the blue of the outer side overlapped at the posterior margin, and gradually faded into white—that is, a width of about eight inches was blackish blue, the colour running out about thirteen or fourteen inches short of the tip of the flipper, but another "wash" of grey-blue extended below this again. Length from head of humerus to tip, eight feet. The inside of the mouth and the tongue black, the latter with one or two small white patches.

The "Haabet" Company in Vardö, in addition to their steam whalers, had two schooners employed this season in Bottle-nose fishing in the direction of Iceland. One of them had returned, and was lying in Vardö at the time of my visit in August; she had taken nine Bottle-noses, which, I was told, gave from nine to ten casks of blubber apiece. The casks always used in Fiamarken are the American petroleum-casks. This would, I believe, amount to much less than the two tons of oil Capt. D.

Gray found them (Proc. Zool. Soc., 1882, p. 727) to yield, independently of spermaceti.

Contrary to what one would expect, the further east the longitude the later it appeared that whales remained off the coast. In West Finmarken the season was over by the beginning of August; at Vardö the last whale was the Common Rorqual previously mentioned as found dead at sea, and brought in on the 15th of that month; while such of the whalers as went out during the week I remained there invariably came back without having seen a whale; and at the date of my departure (the 21st) they were beginning at the factories to clear up ready for their return south, and all started, I believe, at the beginning of September; while on the Murmansk coast I met with the following whales at later dates:—As we passed Kobholm Fjord, on August 21st, we passed a whaler steaming out, towing the krang of a whale, no doubt on the way to the “Krafftoder” factory in Jar Fjord; this had been most likely killed within the last two or three days, and at any rate was probably captured later than the last taken into Vardö. On August 22nd, at the whaling station at Arra, there was a large Blue Whale; and on the same day, at the whaling station at Eretiki, a Blue Whale, and a Common Rorqual; all three, I believe, killed on the previous day. On the 24th we met one of the Russian whalers towing a Common Rorqual off Noknev Island about long. E. G. $38^{\circ} 30'$; and the evening of the same day, when off Swjatoi Nos (about long. $39^{\circ} 45'$), I saw a whale—apparently a Humpback—heading straight out from the land; when it had got well out to the N.N.E. of us, I made out with the help of a glass that it was joined by a second. A few minutes later I saw a third whale, probably the same species, ahead of the ship, and heading in the same direction as the first. Ten minutes or so later again I saw two whales in company, which I am tolerably certain were Common Rorquals.

I saw no whales in the White Sea while on the way to Archangel, but on September 7th, when leaving the White Sea and approaching Gorodetsk Point, we passed several. First a pair of Common Rorquals heading S., apparently playing together; they frequently made the water foam, and once or twice a flipper was raised straight out of the water, showing that the whale was then on its side. One of them, a male, turned

over on its back, when the white colour somewhat tinged with slate-blue helped to make me more sure of my identification. At least a furlong further *north* (perhaps more) than where I had last seen the couple heading *south*, I counted four whales blowing at once, and heading *north*; there must therefore have been at least six whales altogether, perhaps more. I watched them for about a quarter of an hour continually blowing; indeed one at least was almost constantly in sight. I feel sure they were all large Common Rorquals. They were all to landward of us, perhaps not so much as three miles out. The first mate (a native of the White Sea coast) said he had never previously seen whales so far in the White Sea. We thence went up the Novaya Zemlya coast (which we were unable to approach for pack-ice) as far as the north end of Möller Bay (lat. $72^{\circ} 29'$), thence back to Archangel, whence I returned westwards, coasting along the Murmansk and Finmarken coasts, but did not see another whale, a few Dolphins being the only cetaceans subsequently met with—in each case *D. tursio*, I believe.

At Eretiki, Herr Goebel, the manager, told me that all the last whales were taken off Swjatoi Nos, that is, the eastern limit of the whalers' cruising-ground, the latest dates of the capture of each species being—Common Rorqual, September 2nd; Humpback, September 16th; and Blue Whale, September 18th.

Capt. Andrieff (Imp. Russian Navy), of Arra, kindly showed me the different qualities of oil, of which there are six varieties, but only reckoned as three classes in the market, namely:—1st class: oil from the back of the Common Rorqual, which is clearer than that of the Blue Whale. 2nd class: 1st and 2nd qualities from the blubber of the under side, intestines, tongue, &c. 3rd class: 1st variety, from the under jaw-bone; 2nd do., from the muscles; 3rd do., from the residue.

When watching the first pair of whales, on September 7th, I noticed three or four gulls—apparently Kittiwakes—stooping as if to pick something off the water close behind them. This might have been small fish or some form of invertebrate animal, forced up to the surface in the whirlpools caused by the whales; or it may have been something coming directly from the whales, as parasites (though no parasite has as yet been found, I believe, on the Common Rorqual), or oil, or droppings.

I would suggest that it is probable that the whales leave the

coast, not, as is commonly said, in consequence of the water getting too cold for them, but when their various food-supplies have left; and that it is the latter, and not the whales, which object to the cold water.

Measurements are apt to be extremely untrustworthy, but, for want of more accurate information, I give the following list of fœtuses which I was told of last season:—

Common Rorqual—

Date of killing mother.	Locality.	Length of fœtus in English ft. & in.
April	Vardö	1 ft. 4½ in.
(each succeeding one bigger than the previous.—Capt. Berentsen.)		
June 13 (or 25)* . . .	Eretiki	4 ft. 6 in.

Blue Whale—

July 21 (or Aug. 2)* . . .	Eretiki	13 ft.
August 7	Jar Fjord	9 or 10 ft.†
Some days previous } to August 14	Vardö	15 ft.
August 15 (or 27)* . . .	Eretiki	15 ft. 6 in.

A comparison of the numbers of each species of whale killed does not show the relative degree of commonness of each, as, if Blue Whales are to be found, the other *Balænopteridæ* are left alone; if this species is not to be had, the Common Finner is the next sought after; and if this is not to be had, the whalers turn their attention to Humpbacks. Whether this last species or Rudolphi's Rorqual is the more valuable I do not know, but the former is certainly the commoner of the two. The example of Rudolphi's Rorqual killed by the Eretiki whaler was taken off Teriberka on August 15th; and in Vardö I was told that they appear at the end of the season, and that they were expecting to see some about the time I left there (August 21st). A man

* These first dates, which are those I was given, are probably according to the Russian style, and, if so, the dates enclosed in parentheses would be the equivalents according to our new style.

† This whale having been very seriously wounded some time previously, the growth of the fœtus may have been checked, or the reputed length may have been merely a guess; for I was likewise told of a Blue Whale fœtus (at Eretiki) from a whale killed at the end of July or beginning of August, which measured 18 feet (= 18 ft. 9 in. English).

I spoke to in Jar Fjord was three seasons with Herr Foyn at Vadsö, and during that time they only took one of this species; since he has been at Jar Fjord (I think this was his third season) they have not killed any; but, as before said, it does not follow from this that none were seen. Capt. Ellefsen, of Vardö, told me he had seen a good many Humpbacks this season, but they were so shy he had taken none.

The 'Vardö Post' for September 7th last, from which I have gained much of the matter in the following list of the Fin-whale fishers, adds the following paragraph:—"The total capture amounts therefore, as far as East Finmarken is concerned, to 379 whales, against 389* the previous year; the profit is reckoned, however, to be as good as the previous year, since the whales captured this year are larger. Some companies have sustained loss this year also, and possibly no company has made very considerable profits, owing to the bad price of oil. The Haabet Company's guano factory has been in activity the whole summer, and has done well; about 120 krangs of whales have been converted into guano by this company in the course of the summer. At the artificial manure (Kraftfoder) factory in Jar Fjord about seventy krangs have been worked up. The Christiania Whaling Company is building a larger guano-factory, which in a short time will be fully ready, but can hardly come into use this year (*i. e.*, 1884). With these three guano-factories the krangs of all the whales captured will probably for the future be manufactured into guano, to the great gain of all the whaling companies, since high prices are paid for the krangs by these factories."

* This is seventeen less than the total given by me in 'The Zoologist,' 1884, p. 463. I do not know how this difference is to be explained, but probably by the whales picked up dead not being all included in this total.

COMPANY.	MANAGER.	PORT OF REGISTER.	WHALEERS.	TUG.	BLUE WHALES.	COMMON BORDVAL.	RUDOLPH'S BORDVAL.	9 HUMPBACK.	TOTAL.	WHALEERS' NAMES.
<i>East Finnmarken</i> : Kobbholm Fjord.	A. Grønn ...	Sandefjord ...	2	1	14	28	0	1	47	Skjold, Væge.
Stokke, Pasvig	A. Ellevsen...	Tønsberg ...	1	(Part of) (time 1)	12	26 or 25	0	1 or 2	39	Varanger.
Jar Fjord	Evensen	Do.	2	1	11	28	1	5	45	Jar Fjord, Hvalen.
Do., Madvig	L. Hansen ...	Christiania ...	1	1	3	6	0	0	9	Madvig.
Do., Tamasjok	C. Bruun.....	Tønsberg ...	1	1	7	10	0	2	19	Emanuel.
Foy'n's Establish- ments { Vadsø Bøle	T. Bull.....	Do.	4	0	{	{	{	{	12	Gratia, Spes-Fides.
(W. Finnmarken)					{	{	{	{	1	Providentia, Martha.
Kilberg	Wiborg	Thronhjøm.	2	0	...	...	...	...	15	Kilberg.
Mainland opposite Vardø— Christiania Whaling Co. ... }	Castberg	Christiania...	2	0	11	19	0	4	34	Alpha, Beta.
Do., Laurvig Whaling Co.	Berentsen ...	Laurvig	2	0	18	12	0	6	36	Fiskeren, Nimrod.
Do., "Thekla"	G. Bryde.....	Sandefjord ...	1	1	12	12	0	2	26	Thekla.
Vardø, "Haabet"	G. Sørensen .	Do.	2	1	16	11	0	1	28	Vardøhus, Haabet.
Do., Skjærsvænes.....	H. Ellevsen .	Tønsberg ...	1	0	6 or 5	18 or 19	0	0	24	Nora.
Sylte Fjord	Foden	Bergen	1	0	...	...	...	...	25	Skytten.
Do., Dahl's Establishment	Berg	Tønsberg ...	1	0	...	...	...	...	24	Viktoria.
<i>West Finnmarken</i> : Tu Fjord .....	.....	.....	1	0	...	...	...	...	11	Nordkap.
Sörvær, on Söröen	M. C. Bull ...	Tønsberg ...	2	0	...	...	3	...	35	Fin, Fy.
			26	7					430*	

The steamer 'Duncan Grey', J. Gjøevar, Manager, of Tromsø, started near the end of the season to hunt from Vardø (without a factory), but captured nothing.

<i>Russia (Murmanski coast)</i> : Eretiki	Goebel.....	Petersburg ...	2	0	13	10	1	12	36	.....
Arva	Andrieff	Do.	2	1	6	8	0	5	19†	Vladymir (tug).
	(Capt. Imp. Russ. Navy)								55	

Total for North Europe, nearly 500 whales, if not quite that number.

* I do not know whether any of these lists include whales picked up dead at sea; but I know in the case of the "Haabet" Co. 4 such are to be added to the total given above, so that the grand total for Finnmarken is probably not far short of 450 whales. † Includes three found dead.

ON THE OCCURRENCE OF THE WHITE-BILLED DIVER,
COLYMBUS ADAMSI, ON THE BRITISH COASTS.

BY HENRY SEEBOHM, F.L.S., F.Z.S.

THERE can be little doubt that the White-billed Diver is perfectly distinct from the Great Northern Diver, and has as much claim to be regarded as a British bird as other more or less accidental visitors to our islands. It was first discovered about the year 1830 by Capt. James Clark Ross, who obtained three examples in Boothia, north of Hudson's Bay, during his cruise in the Arctic Regions in the 'Victory' (App. Sec. Voy. N.W. Pass., Nat. Hist., p. xlii). Unfortunately Sabine persuaded Capt. Ross, against his own better judgment, that the examples which he obtained were only very old males of the Great Northern Diver. One of these examples was presented to Audubon, and another of them, in full breeding plumage, may now be seen in the museum of the Literary and Philosophical Society in Hull.

Twenty years afterwards it was rediscovered by Mr. Adams, who obtained it in Alaska during the cruise of the 'Enterprise.' This example, also an adult in full summer plumage, may be seen mounted in the gallery of the British Museum in South Kensington. It was described by G. R. Gray, who named it after its discoverer (Proc. Zool. Soc., 1859, p. 167). In 1852 a British example was shot at Pakefield, on the Suffolk coast, in early spring, and is now in the collection of Mr. J. H. Gurney, at Northrepps Hall, near Cromer. It is in winter plumage (Selater, Proc. Zool. Soc., 1859, p. 206). A second British-killed example, also in winter plumage, is in the museum at Newcastle, and Mr. Hancock assures me that it was shot on the Northumberland coast, although the precise date is unknown.

The breeding range of the White-billed Diver extends in the Arctic Regions from Hudson's Bay across Alaska and Eastern Siberia, at least as far as the Taimoor Peninsula, and probably to Nova Zembla and the Kanin Peninsula. In winter it has been known to stray as far as Japan and the British Islands.

This species closely resembles the Great Northern Diver in the pattern of its plumage, but may be distinguished at all seasons of the year by its large ivory-coloured bill, which

measures from the frontal feathers to the tip from $3\frac{1}{2}$ inches in young birds to $3\frac{3}{4}$ inches in adults. The bill of the Great Northern Diver is black (paler at the tip in young birds), and only measures $2\frac{3}{4}$ inches in the young and $3\frac{1}{2}$ inches in adults. In summer plumage the white spots on the scapulars are larger in the White-billed species, whilst those on the flanks and upper tail-coverts are smaller than in the allied species. But the most important distinction is to be found in the number of white streaks in front of the throat and on each side of the neck. Of the former there are about half-a-dozen in *C. adamsi*, and about a dozen in *C. glacialis*, whilst of the latter there are about ten in *C. adamsi*, and about eighteen in *C. glacialis*.

It is extremely probable that other British-killed examples of the White-billed Diver may exist in collections. Any information on the subject would be of great value to the writer, and would be well worth recording in the pages of 'The Zoologist.'

NOTES AND QUERIES.

Important Additions to the National Collection of Birds.—Ornithologists will be glad to hear that the magnificent collection of Neotropical birds belonging to Messrs. Salvin and Godman has recently become national property by presentation. This collection is one of the most famous in the world, and comprises not only all the specimens obtained by Mr. Osbert Salvin and Mr. F. Du Cane Godman during their travels in Central America, but also all those received by them from their numerous collectors in different parts of Southern America. This is indeed a noble gift, and, with the recent acquisition of the Sclater collection, renders the series of American birds in the British Museum undoubtedly the finest in the world. The number of specimens in the Salvin-Godman collection is about 23,000; those in the Sclater collection about 9000 more.

The Zoological Record.—At a recent meeting of the Council of the Zoological Record Association, Prof. Jeffrey Bell was elected Editor in succession to the late Mr. E. C. Rye.

MAMMALIA.

Polecats in Cornwall.—Polecats, no doubt, are rapidly disappearing from the British Isles, but I was surprised to read Mr. Cornish's note (p. 107), to the effect that he had only met with one specimen in West

Cornwall in thirty-seven years. I received an adult male, alive, from a man named Marsh, then living in Penzance, about the summer of 1873 or 1874 (I am writing away from home, and consequently from my notes), which was presumably caught in the neighbourhood, though it is of course possible that he may have received it from a distance. It was freshly trapped when I obtained it, and having recovered from the injury to its leg, it eventually (during my absence from home) made its escape from its cage, which was enclosed in a large one containing Wild Cats, and was supposed to have been killed and eaten by them, although a fragment of skin shown me on my return looked remarkably like rabbit-skin. Anyhow I never saw or heard anything more of the Polecat. Some three or four years ago I was assured by a farm-boy at Madron (the very place where Mr. Cornish's specimen was taken) that "Fitchews" existed there, and that his father caught them sometimes; indeed he spoke as if they were not uncommon, and though that was very likely not the case, yet at least it seems to show that there were still a few thereabouts. In East Cornwall I have only heard of one occurrence of late years, an example having been obtained about 1880 on Col. Grylls' property at Lewarne, about five miles west of Liskeard; none had previously been seen there for many years.—ALFRED HENEAGE COCKS (Thames Bank, Great Marlow).

Bechstein's Bat not found in Berkshire.—In a note I sent you last December (Zool. 1884, p. 483) I mentioned Bechstein's Bat as having been found at Godstow. The specimen in the Oxford Museum, to which I referred, labelled and recorded ('Midland Naturalist,' July, 1883) as this species, is certainly *V. Nattereri*, possessing the hairs on the interfemoral membrane which are said to be a specific distinction, and not differing from the specimens on the same shelf labelled Natterer's Bat, in the length of its ears or otherwise. We know, moreover, from his notes in 'The Midland Naturalist,' that the captor was not acquainted with Natterer's Bat.—J. E. KELSALL (Ball. Coll., Oxon).

BIRDS.

Cuckoo's Eggs.—On June 5th of last year I found in a nest two eggs of the Common Whitethroat and a Cuckoo's. The Cuckoo's egg was unusually handsome, somewhat resembling a finely marked egg of the Greenfinch, but having a rich creamy ground-colour. Within a few minutes I found another, about a hundred yards away, also in a Whitethroat's nest, and of a precisely similar description; there were four Whitethroats' eggs slightly incubated. On June 17th another Cuckoo's egg was found in a Whitethroat's nest, precisely similar to the above two. The position of this nest was about equidistant from the others and some 120 yards away, and contained three Whitethroat's eggs. I have no doubt

but that these three Cuckoo's eggs had been laid by one bird. If this be so, it strengthens the idea that each female Cuckoo probably lays its eggs only in the nests made by one species of bird. It seems probable, too, that a Cuckoo reared in, say, a Whitethroat's nest would by-and-bye lay its eggs in Whitethroats' nests; and that Whitethroats' nests would be selected by a sort of hereditary instinct. Dr. Baldamus, if I remember correctly, thought that the Cuckoo when about to lay was influenced by the colour of the eggs in the nest before it; and that in consequence its eggs assimilated in colour to those already laid by the owner of the nest. If there be anything in such colour assimilation, would not the fact I have above recorded suggest that it may in part be due to gradual and hereditary influence?—A. B. FARN (Fairlawn, Stone, Dartford).

Edible Birds' Nests.—The Alga of microscopic dimensions found by Mr. Pryer in the cave inhabited by the Swifts which build the edible nests (noticed by him, pp. 43—50), is an undescribed species of *Urococcus*. The members of the group to which it belongs are very commonly found growing on the walls of caverns. In this case the incrustation produced by the accumulation of the Algæ is of unusual thickness and of horny consistency when dry, but turns pulpy when soaked in cold water. On the outer surface there is a dark layer (black to the naked eye, but very dark greenish yellow when viewed with the microscope), consisting of the living Algæ. Beneath this outer dark layer the mass of the incrustation is white, and consists of a dense accumulation of innumerable dead bodies of the Algæ, the structure of which is barely distinguishable. In none of the edible nests which I have examined, however, is there any trace of an Alga, and it appears to be definitely settled that these are constructed from materials which are the intrinsic product of the bird. Mr. Pryer states his opinion that certain nests are made from the black outer layer of the incrustation. If such a nest were examined it would give conclusive evidence either way, since the black layer, as just mentioned, consists of living Algæ, the structure of which would be far more readily discernible than the traces of the white part of the incrustation.—GEORGE MURRAY (British Museum, Natural History).

Red Grouse in Somerset and Wilts.—I have ascertained from Mr. Edwards, of Wrington,—who informed me of the occurrence of the Red Grouse near that place (as recorded by me, p. 66),—the following particulars, which may be of interest to Mr. Cambridge Phillips and others of your readers. In answer to some questions which I put to him in consequence of Mr. Phillips's note, Mr. Edwards writes:—"The bird was alone. The hill on which I killed it [one of the Mendips] is about 1500 acres in extent, and the highest point about 1064 feet, according to the last Ordnance Survey. I should estimate the extent of heather at about 200

acres. Every year part of the heather is burnt, so the growth varies from last year's burning, which is quite bare, to perhaps eight or ten inches high. It is very boggy in places on the top, with a good growth of what I call 'cotton-grass,' which I suppose is a rush with white silky blossoms, but I am no botanist. [Probably *Eriophorum polystachyum*; see Dr. Prior's 'Popular Names of British Plants.'] The heather covers the top, and below that we get heath, heather, wortleberry, and bracken, which forms an excellent covert for Black-game. I killed the grouse very nearly on the top, in the heather. I might add that my old keeper declares it spent the winter of 1883 there, as he flushed a bird three times in the winter close to where I killed it, which he was certain was not a Grey Hen." I cannot agree with Mr. Phillips, or with the editorial note, in being sceptical about the Red Grouse at Wedhampton. I do not think an ornithologist like Montagu would have recorded the bird if he had not had some good evidence before him, such as Mr. Poore's word, who no doubt, like Mr. Edwards, was well acquainted with both birds, and "the part of the bird" which he says he saw. He appears to have been much struck by such an unusual occurrence, but does not seem to have had the least doubt about it. His words are, "We never remember but one instance of its [the Red Grouse] being found at a distance from the Moors. This was a female taken alive near Wedhampton, in Wiltshire, in the winter of the year 1794, and communicated by the late Edward Poore, Esq., who showed us a part of the bird." This seems to admit of no doubt, nor did he afterwards doubt either Mr. Poore's communication or his own identification of the part. As between a female Red Grouse and a Grey Hen I think that, like Montagu, I should have been quite satisfied with seeing "a part of the bird," and so I think would the Editor, in spite of his note. I may add that Mr. Edwards tells me in his note he had a good Black-game season on his part of the Mendips, as we had also on the Quantocks.—CECIL SMITH (Bishops Lydeard, Taunton).

Breeding Habits of the Lake Gull.—One of the prettiest of the water-fowl of the alpine country in New Zealand is the dainty little Lake Gull (*Larus pomara*, Bruck.), the very picture of neatness and purity of feather; but it is my intention to address myself to the peculiarities of its breeding habits rather than to give a description of the bird itself. In the hot days of the month of December this bird is fully occupied with domestic cares: it seems somewhat fanciful as to the selection of a site for the nursery; numbers flock to one special spot, which for some reason is preferable to any other within a radius of many miles. It is gregarious; of that no one could entertain a doubt who has once been through a nursery or breeding-station. Last season choice was made of a position on the narrow pebbly shore of Lake Camp, that lies under the Harper Range, in the Upper Ashburton district. The place selected was not far from a

track, near a fence; the opposite side of the tarn would have been far more private, as few, very few, persons in that neighbourhood would have taken the trouble of a ride or walk round the shore to disturb the community. As one descends the steep slope to the narrow rim of beach, with noisy clamour the scared birds ascend from their eggs or young; reluctantly they rise, loth to leave their charge; the whole scene is enlivened with winged motion, as the pretty gulls fan the air, or wheel across the clear waters of the lake. Their flight is joined by swift-flying Stilt Plovers, who add their discordant squeals to the general noise. With the gulls circling in ceaseless flight, doubled on the calm surface of the mountain lake, there was a charming picture of bird-life, set in a frame of uniform dull tussock and snow-grass, tawny-coloured. Just above the water, on the bare shore, without any attempt at nest-building, the Lake Gull lays one or two eggs, in close proximity to hundreds more; one can scarcely walk through this nursery without causing damage by breakage, or by treading on some newly-hatched dark-eyed youngster, clad in grey. The eggs are remarkably beautiful, far handsomer and bolder in their markings than those of any other species of New Zealand gull. In shape they differ much, for some are very broad at the top, with the smaller end quite obtusely rounded; others ovoid, oval, or so narrowed towards the smaller end that they might be termed almost pyriform. In the 'Birds of New Zealand' Dr. Buller gives a good description of the eggs of this bird, from my collection in the Canterbury Museum. Those eggs came from a nursery on the Upper Rangitata River; I see from my note-book they were obtained on December 14th. Looking at a series of the eggs, the ground colour usually is pale olive-brown or greenish gray, with very rich splashes and large blotches of umber and dark brown. Some have most of the surface covered with round-edged marks of indistinct grey, apparently sunk into the shell; others have greenish brown or olive splashes, with large irregular shaped blotches of purplish grey; or angular fantastically-shaped marks or streaks. I referred to the appearance of certain Pied Stilts on the scene of disturbance; this is to be accounted for, because about ten yards distance from the thickly-spread carpet of gulls' eggs, was a long hollow in the flat by the narrow beach. In this natural rent, that gave something of a ditch-like shelter, were six small grassy nests of the Pied Stilt (*Himantopus leucocephalus*, Gould). Five of these nests contained in each four richly-marked eggs; the sixth contained five, an unusual number, and worth recording. It will be seen from the above account that the habits of *L. pomaræ* differ considerably from those of *L. Novæ-Hollandiæ*. I have been struck with the appearance of some eggs of the last-named sea-bird, which my son Randal Potts brought from the Chatham Isles. He collected them in a cave-like opening in the cliffs near Waitangi, into which the sea entered freely at high tide. These eggs show a remarkable uniformity

in their colour and markings, the ground colour of a dull greenish brown, with round-edged marks of dark brown. Amongst the eggs of *Puffinus tristis*, all of snowy whiteness, was one specimen three inches two lines in length, with a breadth of two inches one line. Out of a number of burrows examined, in one only was an old bird at home; in this burrow lay a dead young one. Was this visit caused by affection, or by a want to rid itself of the oily food collected for the young bird? This was at Cape Young, near Aharekauri, Chatham Isles.—T. H. PORTS (Ohinitaki, New Zealand).

Iceland Gull at Scilly.—The Iceland Gull has occurred at Scilly, but I do not think it can be considered a rare species in this district. Mr. Vingoe, jun., tells me that quite recently he saw a flock of more than fifty on the rocks in Lamorna Cove, about three miles from Penzance. He also showed me a specimen of the Greater Black-backed Gull, killed on March 11th, with a stretch of wing five feet nine inches.—THOMAS CORNISH (Penzance).

Hybrid between a Stock Dove and Tame Pigeon.—During the last summer I was told by one of the labourers on the Haywood Oaks Farm (Col. Seely's), near here, that a Stock Dove with white wings had been seen there. I may mention that round the house are about forty large and very old oak trees, all of them more or less hollow, and they are frequented by a good many Stock Doves. The bird was seen, off and on, all the summer, and when shooting there with Col. Seely I asked him if his keeper might kill it for me; this, after a deal of trouble, he did. When he brought the bird I said that it must be one of the tame ones,—there are a good many on the Farm,—but he said he was sure it was not. He said that the bird was so wild he had no end of trouble to get it, and at last shot it at quite fifty yards. This was fully borne out by the clean way it was killed. On enquiry I found out that it had been noticed as soon as it left the nest, and was always in the oak trees, and went in and out of the holes in them, and was seen feeding in the fields far away from the Farm with the Stock Doves, and never on the buildings or with the tame birds, and that it was if anything wilder than the Stock Doves. I at once decided that it must be a hybrid, and as this is the only case I have ever heard of, I think it will interest the readers of 'The Zoologist.' The description of the bird is as follows:—First six or seven flight-feathers white, others slate-grey; wing-coverts slate-colour, with a few dark marks; back white; tail and rump slate-colour, just like Stock Dove; head slate, with white patch; the neck has the lustrous colour as in Stock Dove; breast grey; legs red.—J. WHITAKER (Rainworth Lodge, Notts).

Abundance of Greenfinches last Winter.—During the past winter Greenfinches were unusually plentiful about Norwich and also about Brighton. I have been told that a Norwich birdcatcher netted upwards

of twelve hundred in one week, and that some Brighton birdcatchers took as many as five hundred each in a single morning. The Norwich men report that though Greenfinches have been so numerous, they have at the same time taken hardly any Sparrows.—J. H. GURNEY (Northrepps, Norwich).

ERRATA.—Page 89, line 23, for “I ascended” read “I descended.” Page 91, first line, after the words “on the 23rd” insert “April.”

FISHES.

Destruction of young Fish by Larvæ of Dragonflies.—In the Hungarian ‘Rovartani Lapok,’ for December last, L. Biró states that the larvæ of some *Libellula*—species not determined—have made such ravages in the piscicultural establishment of Count Pulffy at Szomolány that in a pond in which 50,000 young fish were placed in the spring of 1884, only fifty-four could be found the following September, but there was a large quantity of the larvæ of the *Libellula* referred to.

 SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

March 5, 1885.—Sir JOHN LUBBOCK, Bart., F.R.S., M.P., President, in the chair.

Messrs. James Epps, James Groves, and William Ransom were elected Fellows of the Society.

Dr. F. Day read a paper “On the rearing, growth, and breeding of Salmon in fresh water in Great Britain.” Referring first to the statements and opinions of the older authorities, he dwelt at length on the more recent experiments of Sir James Maitland at Howieton. In December, 1880, Sir James obtained salmon-eggs and milt from fish captured in the Teith, and from which ova hatched in March, 1881. In July, 1883, it was seen that some of the young Salmon, then two years and four months old, were in parr livery, or had assumed the dress of the silvery smolts, the latter in certain lights showing parr-bands. On November 7th, 1884, a smolt 1½ lbs. weight jumped out of the pond, and from this fish about 100 eggs were expressed. As they seemed to be ripe they were milted from a Lochleven trout. On January 23rd, 1885, eighteen of these eggs hatched, and the young were strong and healthy. On November 11th, 1884, about 12,000 Lochleven trout-eggs were milted from one of the foregoing smolts, and they hatched on January 28th, 1885. On December 1st, 1884, 1500 eggs were taken from two of the foregoing smolts, and milted from one of the males. On the 9th about 4000 eggs from these smolts were fertilised from one of the males, and on the 13th 2500 smolt-eggs were milted from

a parr. Dr. Day further stated that pure salmon-eggs have been hatched in the Howieton fishery; that the young have grown to parr, smolts and grilse; that these latter have yielded eggs, and their eggs have been successfully hatched. Although some time must elapse before it can be ascertained how these young Salmon will thrive, how large they will eventually become in fresh-water ponds, and whether a land-locked race may be expected from them, still the following points seem to have been established:—That male parrs or smolts may afford milt capable of fertilising ova; but if taken from fish in their second season, at thirty-two months of age, they are insufficient to produce vigorous fry. That female smolts or grilse may yield eggs at thirty-two months of age, but those a year older are better adapted for the production of vigorous fry; wherefore to develop ova a visit to the sea is not a physiological necessity. That young male Salmon are more matured for breeding purposes than are young females of the same season's growth. That female *Salmonidæ* under twenty-four months of age, although they may yield ova, are of little use for breeding purposes, the young, if produced, being generally weak or malformed. That at Howieton hybrids between Trout and Salmon have so far proved to be sterile. Furthermore, it was stated that the size of eggs of the *Salmonidæ* vary with the age and condition of the parent; but, as a rule, older fish yield larger ova than the younger ones. Even among the eggs of individual fish variations occur in the size of the ova. From larger ova finer and rapidly growing fry are produced; consequently, by a judicious selection of breeding fish, races may be improved, while it is only where segregation is efficiently carried out that such selection is possible.

March 19, 1885.—Sir JOHN LUBBOCK, Bart., F.R.S., M.P., President, in the chair.

Dr. John Grieve, of Bridge of Allan (N. B.), and Mr. Charles T. Drury, of Forest Gate, Essex, were elected Fellows of the Society.

Dr. G. J. Romanes exhibited two human crania from South Africa. One was that of an aboriginal Bushman from Kruis River, Congo district, Gudtsboora, obtained through Dr. Stroud.

A communication was read "On new Hydroids," by Prof. Allman. The paper consists of diagnoses with more detailed descriptions of hitherto undescribed species of *Hydroida* contained in a collection belonging to Miss Gatty, who placed it in the author's hands for determination and description. Thirty-eight species, distributed among twelve genera, are described as new. Among these the new Plumularian genus *Podocladium* is very remarkable, not only by the possession of both fixed and movable nematophores, in accordance with which, like *Heteroplou* of the 'Challenger' collection, it holds a position intermediate between the typical Eleuthero-plean and the Stetoplean genera; but by the fact that every hydrocladium

is supported on a cylindrical pointed peduncle. Among other remarkable and significant forms is one of which the author gives the name of *Thuraria heteromorpha*. In this are found combined in the same hydrophyton no less than three morphological types, which if occurring separately would be justly regarded as representing three genera, *Thuraria*, *Dermoscyphus*, and *Sertularia*. Notwithstanding this singular combination of forms, the author does not believe that the characters of the specimen justifies the construction of a new genus; and he regards the generic position of the hydroid as determined by that one of the three forms which most decidedly prevails in it. *Thuraria heteromorpha* thus shows in a very marked way the indefiniteness of the boundaries between different zoological groups, and calls to mind a phenomenon known to occur among plants, as in certain epiphytcal orchids, in which the same stem has been observed to carry flowers referable to several generic types.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

March 3, 1885. — Prof. W. H. FLOWER, LL.D., F.R.S., President, in the chair.

Dr. E. Hamilton made some remarks on the supposed existence of the Wild Cat, *Felis catus*, in Ireland, as stated at a former meeting, observing that there was no record of the Wild Cat being indigenous to that country. Dr. Hamilton believed that the cat shown at the meeting in question was only the offspring of domestic cats born and bred in the woods of that district.

A letter was read from Mr. J. H. Thomson, giving the locality of *Helix* (*Hemitrochus*) *flicosta*, which had been previously unknown.

Dr. A. Günther exhibited and made remarks on the skin of a singular variety of the Leopard which had been obtained in South Africa. The back in this specimen was black and the tail reddish grey, while the usual characteristic spots of the ordinary Leopard were nearly altogether absent.

Mr. H. H. Johnston gave a general account of the principal animals observed by him during his recent journey to Kilimanjaro and his stay on that mountain.

Mr. Oldfield Thomas read a report on the Mammals obtained and observed by Mr. Johnston during his expedition.

Capt. G. E. Shelley read a report on the birds collected by Mr. H. H. Johnston in the Kilimanjaro district. The collection contained examples of fifty species, six of which were believed to be new to science.

Mr. Charles O. Waterhouse read a paper on the insects collected in Kilimanjaro by Mr. H. H. Johnston, and gave the descriptions of six new species of Coleoptera, of which examples occurred in the collection.

Prof. F. Jeffrey Bell read a description of a Nematoid Worm, *Gordius*
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verrucosus, obtained by Mr. Johnston on Kilimanjaro, which was found to be parasitic on a species of *Mantis*.

Mr. E. J. Miers communicated the description of a new variety of River Crab of the genus *Thelphusa* (*T. depressa*, Krauss, var. *Johnstoni*), which had been obtained by Mr. H. H. Johnston in the streams of Kilimanjaro.

Mr. Francis Day read the fourth of the series of his papers on races and hybrids among the *Salmonidæ*, continuing the account of the Howie-town experiments from November, 1884, to the present time.

Prof. Ray Lankester read some notes on the heart described by Sir Richard Owen, in 1841, as that of *Apteryx*, and came to the conclusion that the heart in question was that of an *Ornithorhynchus*.—P. L. SCLATER, *Secretary*.

NOTICES OF NEW BOOKS.

The Cruise of the 'Alert': Four Years in Patagonian, Polynesian, and Mascarene Waters. By R. W. COPPINGER, M.D. Third Edition. 8vo. London: Sonnenschein & Co. 1885.

Report on the Zoological Collections made in the Indo-Pacific Ocean during the Voyage of H.M.S. 'Alert,' 1881-82. Printed by order of the Trustees of the British Museum. 1884.

THE surveys made by the 'Adventure' and 'Beagle' in 1826-36, and by the 'Nassau' in 1866-9, were excellent, so far as the requirements of their times were concerned; but the great increase of ocean navigation within the last few years had rendered it necessary that the charts should contain more minute surveys of certain places which were not formerly of importance. Accordingly in 1878 it was decided by the Lords of the Admiralty to equip a vessel for the threefold purpose of continuing the survey of the Straits of Magellan, of investigating the nature and exact position of certain doubtful reefs and islands in the South Pacific Ocean, and of surveying a portion of the northern and western coasts of Australia.

The vessel selected for this special service was the 'Alert,' already so well known in connection with the Arctic Expedition of 1875-6, and the command was given to Capt. Sir George Nares, K.C.B., who was subsequently succeeded by Capt. Maclear. Needless to say, the equipment included apparatus

for deep-sea sounding and dredging operations, and various instruments and appliances not usually supplied to H.M.'s ships.

That the opportunity which this expedition would afford of making valuable Natural-History collections in little-known regions might not be lost, it was decided to appoint as surgeon one who would also undertake the duties of naturalist, and Staff-Surgeon Coppinger was selected for this post. To judge by the results, as set forth in the two volumes the titles of which are given above, it would seem that a better appointment could hardly have been made; for Dr. Coppinger has more than realised the expectations of naturalists in regard to the collections made by him.

The whole of these collections were presented by the Lords Commissioners of the Admiralty to the Trustees of the British Museum, and no less than 3700 specimens referable to 1300 species (irrespective of duplicates) have thus been incorporated in the National Collection.

The specimens procured during the survey of the southern extremity of the American continent were reported upon in the 'Proceedings of the Zoological Society,' 1881; but such was the extent and importance of the material acquired during the rest of the voyage round the coasts of North-Eastern Australia and Torres Straits, and amongst the oceanic islands between the Seychelles and Madagascar, that the Trustees of the British Museum considered it best that a special Report should be published as a separate work. This has accordingly been prepared by the Zoological Staff of the Museum, and is now available to the public. It forms a thick octavo volume of 684 pages, with 54 plates, some of them coloured—an enduring monument to the industry and zoological acumen of the contributors.

Without going into special details, it may be said that, with the exception of the 'Challenger' expedition, none of the recent voyages has contributed so much to our knowledge of the Littoral Invertebrate Fauna of the Indo-Pacific Ocean as that of the 'Alert.'

To give a brief outline of the voyage, it may be said that sailing from Plymouth in September, 1878, the ship touched for a few days at Madeira and St. Vincent respectively, and crossing the South Atlantic *viâ* the Hotspur and Victoria Banks,—submerged coral reefs where some remunerative dredging was carried

on,—came to anchor in the estuary of the River Plate off Monte Video on November 17th. A course was next shaped for the Falkland Islands, and entering the Straits of Magellan on the 1st January, 1879, the vessel, after stopping for a few days at the Chilian settlement of Sandy Point, proceeded to the surveying ground among the channels on the west coast of Patagonia. Here the greater portion of the succeeding two years was spent, executing surveys of previously uncharted waters, and adding to those which had previously been only partially effected. During the more rigorous winter months some time was spent at Coquimbo, on the coast of Chili, where the ship was refitted and fresh supplies of stores obtained.

Leaving the South American coast in June, 1880, the next place visited was Tahiti, where twelve days were spent ere journeying on towards the great Fiji group. Here the 'Alert' anchored off Levuka for three weeks, and after visiting the Friendly Islands for ten days, returned to Levuka, whence, after another ten days in harbour, she steamed to Sidney, which port was reached on the 23rd January, 1881.

After refitting, the vessel steamed up the east coast of Australia, visiting all the more important islands *en route*. At all the anchorages marine specimens were collected, as well as in the more open parts of the Prince of Wales Channel, where the depth rarely exceeds thirty fathoms. A good many interesting specimens were also obtained through the assistance of the pearl-shell divers, who have an extensive and lucrative industry in these waters.

From Port Darwin to Singapore in November, 1881, whence, in the following month of February, the vessel left for the Seychelles and Amirante Islands, touching at Coquimbo on the way. With a survey of the Glorioso Islands, 120 miles north of Madagascar, the scientific work of the 'Alert' was brought to a close, and the vessel returned home *viâ* the Cape and St. Helena, arriving in Plymouth Sound on the 3rd September, 1882, after an absence of nearly four years.

Such is a brief outline of the voyage, the scientific results of which are embodied in the two volumes before us. It need scarcely be said that the general reader will find Dr. Coppinger's narrative pleasanter reading than the more voluminous Report issued by the Trustees of the British Museum; but the naturalist

who would be well and accurately informed will of course consult both volumes.

Did space permit we should like to give a few extracts from the narrative of the voyage, which in many respects is highly interesting.

The distance at sea to which land birds and insects sometimes wander is very curious, and was often noticed by Dr. Coppinger. On the 25th September, when 155 miles west of Cape Finisterre, and during a fresh easterly breeze, a Sparrowhawk settled on the rigging and was captured. On the 4th October a Swallow appeared and flew for some time round the ship. The nearest land at that time was the island of Porto Santo, 254 miles distant. On the 22nd November, when a hundred miles from the Brazilian coast, and in almost the latitude of Rio, great numbers of moths appeared hovering about the ship and settling on the rigging. Sphinx moths were particularly conspicuous, and later in the day several butterflies appeared. No less than seventeen species were captured, of which fourteen were moths and the rest butterflies.

The haunts of the Magellan Sea Otter, *Lutra felina*, are described, p. 58. It is stated to be abundant about the brackish lagoons in the islands, where its "runs" were found to be strewn with the shells of a large spiny crab, *Lithodes antarctica*, its principal food. Dr. Coppinger has seen a Magellan Otter rise to the surface with one of these hideous crabs in its mouth—an unpalatable morsel, one would suppose, being armed all over with strong spines.

That remarkable bird, the Steamer-duck or "Loggerhead" (*Tachyeres cinereus*, Gmelin, *Anas brachypterus*, Latham), is of course noticed as being one of the commonest wildfowl in the Straits of Magellan. The chief peculiarity of this bird is the shortness and unusually small size of the wings, which, not having sufficient power to raise the body, serve only to propel it along rather than through the water, and are used like the paddles of a steam-vessel. Aided by these and its strong broad webbed feet, it moves with astonishing velocity. Its speed has been estimated at from twelve to fifteen miles an hour. The peculiar form of the wing and the short rigid feathers which cover it, together with the power this bird possesses of remaining a considerable time under water, constitute a striking link

between the genera *Anas* and *Aptenodytes*. When adult it measures about three feet from tip of bill to end of tail, and is said to weigh from thirteen to fourteen pounds. Think of that, ye English sportsmen who are wont to pride yourselves on bringing down a fine Mallard of three pounds!

Dr. Coppinger is inclined to think that there are two species of Steamer-duck in the fresh-water lakes of Central Patagonia, one of which possesses the power of flight. This also was the opinion of Capt. King (Voyage of the 'Adventure' and 'Beagle'), but the late Robert Cunningham, in his excellent 'Notes on the Natural History of the Strait of Magellan' (1871), expressed his belief that "the variations in size, capability of flight, and colouring of plumage are chiefly dependent on the age of the birds."

Land-shells in this part of the world seemed scarce. Dr. Coppinger says:—

"I met with representatives of only four species, of which one, a specimen of *Helix*, I found on the frond of a *Hymenophyllum* at Tom Bay. Two others of the same genus were taken from the rotten trunk of a tree in the same locality. At Port Henry, in the Trinidad channel, and other parts in the neighbourhood, I collected several specimens of a species of *Succinea* which clings to dead leaves and decayed pieces of driftwood lying on the shore just above high-water mark. These four species of shells have since been described by Mr. Edgar Smith, of the British Museum, as new to Science. In a fresh-water lake, where I made some casts of a light dredge, I obtained, from the bottom of stinking mud, several examples of a large *Unio* shell and some small shells of the genus *Chilinia*. I afterwards found species of *Unio* in a stream issuing from the lake. North of the English Narrows, many pond-snails of the genus *Chilinia* were also found abundantly in the stream-beds."

Of course the most important portion of the collections made during the voyage of the 'Alert' was that comprising the marine Invertebrata, amongst which many new forms were discovered and fresh specimens of little-known species obtained.

The circumstances under which these were collected will be found fully detailed in Dr. Coppinger's narrative, while the scientific descriptions, with remarks on their affinities, structure, and so forth, have been given with great care in the British Museum Report.

Elementary Text-Book of Zoology. Vol. II. Special Part : Mollusca to Man. By Dr. C. CLAUS; Translated and Edited by A. SEDGWICK, M.A. Sonnenschein & Co. 1885.

IN noticing the appearance of the second volume of Mr. Sedgwick's edition of Prof. Claus' Text-book we cannot, we regret to say, speak in the terms of unqualified admiration which we were able to use of the first volume (*cf.* Zool. 1884, p. 494).

To put the matter summarily, we would say that it would have been just as well if the part relating to the Vertebrata had never been translated at all. This will seem to be a severe judgment, but we think we can justify it, even if we cannot place it beyond the range of criticism.

Firstly, Prof. Claus adopts systems of classification which everybody knows to be based on false views of facts, and when we say everybody we include the author himself; for example, he makes the *Leptocardii*, of which *Amphioxus* is the type, the *Cyclostomi*, of which the Lamprey is the type, orders of the group Pisces, equivalent in value to the *Selachii* or *Teleostei*. The author justifies this course on the ground that it is more convenient "to preserve the unity of the class Pisces"; but a class in which you have forms with brains and without, with and without lower jaws, is about as compact a class as Mr. Gladstone used to think the Turkish Empire was in 1876. The truth of the matter is that the class Pisces is most definite and distinct the moment you take away the cephalo-chordate *Amphioxus* and the round-mouthed Lamprey, or, in the words of Lord Beaconsfield, "consolidate" it. So, again, the division of the Mammalia into *Aplacentalia* and *Placentalia* requires to-day only to be mentioned to be condemned. Prof. Claus might answer, if one said that it was a little late in the day to reproduce with but one modification the old Cuvierian classification of Birds, that ornithologists are unable to come to any agreement among themselves; this would not be a very dignified kind of answer, and at any rate it would only be a part of the truth, for all ornithologists are, for example, satisfied that Swallows and Swifts are not to be placed next to one another even in a linear classification. And, lastly, there are not only more modern, but more satisfactory classifications of the human race, than that of Blumenbach.

In the second place, such advances in vertebrate taxonomy as are due to the investigations of English naturalists are quite neglected; among the Fishes, no notice is taken of Prof. Huxley's researches on the mode of articulation of the lower jaw, or of Prof. Bridge's classification of the *Ganoidei*. Among Birds, we look in vain for any notice of Huxley's researches on the value of the palatal bones as our aid to classification, or of Garrod's studies on the muscles. Among Mammals, the remarkable results of Balfour on the mode of formation of the placenta, and the studies of Turner, which have given a death-blow to the "placental classification" of Mammals, are quite neglected; notwithstanding the labours of Prof. Flower, *Tragulus* still figures in the family *Moschidæ*, and no notice is taken of his classification of the Carnivora. There is no need to continue a line of criticism along which there is much more to be said.

Finally, there are too many of what in an examination-paper we should have to call blunders; fossil Monotremes have been known since 1868, and the editor might have added a reference to Sir Richard Owen's lately published paper in the 'Philosophical Transactions.' What we should some months ago have called a blunder, namely, the statement that many Marsupials live in islands of the Pacific Ocean, we can now explain; the Germans have not only seized on New Guinea, but, in deference to the feelings of the Australians, they have moved it several hundred miles eastward. Man is not the only animal that has a chin; the Hoolock Gibbon, as Mr. Mivart has pointed out, has one also. Rathke, Hoffmann, and Gegenbaur have shown that the so-called abdominal sternum of Crocodiles does not consist of ribs.

It will be seen, then, that there is some reason for the judgment we have given; whether the value of the greater part of the book does not outweigh the incompleteness of the account of the Vertebrata is a point on which our readers are now sufficiently informed to be able to pass judgment for themselves. For ourselves, we must say that it is, on the whole, a better text-book of Zoology than we have yet in English; we will not say that "it is the best manual of Zoology yet published, not merely in England, but in Europe," for this has already been said of Prof. Nicholson's manual, and is not, therefore, a compliment that Prof. Claus would care to have paid him.



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NOTES ON THE VERTEBRATE ANIMALS OF LEICESTERSHIRE.

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UP to the present time, so far as I am aware, no complete account of the vertebrate animals of this county has been attempted, although scattered notes have appeared in various Natural History journals, and a few lists—more or less imperfect—have been from time to time published. Thus in 1840 Macgillivray, in his 'British Birds,' printed a "Catalogue of the Land Birds of the County of Leicester, by Mr. Jas. Harley." In 1842 Potter published, in his 'History of the Antiquities of Charnwood Forest,' an "Appendix on the Ornithology of Charnwood Forest, by Churchill Babington, Esq.," in which some few mistakes occurred, but which was nevertheless noteworthy as chronicling for the third time in Great Britain the occurrence of *Cursorius isabellinus*. It is probable that this list was written, if not published, previously to that of Harley. Nothing further, I believe, was published for many years, until my friend Mr. Thomas Macaulay, M.R.C.S.L., contributed to 'The Midland Naturalist' for 1881-2 "A List of the Birds of Leicestershire," to which I added a few notes. This list was, all things considered, the most complete then published, although deficient perhaps in not noting the nesting-habits of the rarer species, and in introducing certain rare British birds on the mere *ipse dixit* of observers little competent to discriminate closely-allied species. Since

then a list, by Mr. F. T. Mott, of "The Mammals of Leicestershire" appeared in 'The Midland Naturalist' for November, 1884, a contribution so amusingly vague, and dealing to such an extent with probabilities and generalities, that, for practical or scientific purposes, it may be passed over without further remark.

Having had the opportunity since my appointment to the curatorship of the Leicester Museum of examining the whole of the MSS. (1840-55) of the late James Harley, and being now in possession of many additional notes acquired during my five years' residence in this county, it has been suggested to me that, considering the imperfect nature of the existing lists, I might undertake the revision and editing of those MS. notes, together with my own more recent observations. In essaying this I have been of course greatly aided by Harley's MSS., and by the generosity of Mr. T. Macaulay, of Kibworth, already referred to, who has kindly handed me his MSS. extending over twenty-five years' observations. Our mutual friends, the Rev. A. Matthews, M.A., of Gumley, and Mr. H. S. Davenport, of Skeffington, have also given me copious notes. To Messrs. W. Ingram, of Belvoir Castle, R. Widdowson, of Melton Mowbray, Theodore Walker, of Leicester, several members of the Ellis family, and to "Section E" of the Leicester Literary and Philosophical Society, my grateful thanks are due for many valuable and interesting notes, especially on the avifauna of the district.

The order in which the Vertebrata are noted in the following pages is that which has been followed in the arrangement of the collections in the Leicester Museum, and is generally founded on the lines laid down by Professor Flower, Dr. A. Günther, and Dr. P. L. Sclater. The birds are, however, arranged as in the recently published "List of British Birds," compiled by a committee of the British Ornithologists' Union.

In each class of the Vertebrata the most highly specialized form will be placed first, in accordance with general practice; and I intend rigidly to exclude from this list all birds merely "seen" by unskilled observers unable properly to discriminate species. In conclusion, I would ask naturalists to favour me, during the publication of these notes, with any information on the occurrence of more species or varieties which they may consider of interest, together with notes upon little-known habits of the commoner forms.

Class MAMMALIA.—Order CARNIVORA.

Family FELIDÆ.

Felis catus, Linn. Wild Cat.—Extinct within historic times. No authentic records are extant relative to the occurrence in this county of the Wild Cat, which without doubt disappeared from the ancient forests and fastnesses about the same time as the Wolf and Wild Boar. Potter, Babington, and Harley, writing from forty to fifty years ago, are all silent on the subject; and the Rev. A. Matthews, who has been resident twenty-five years in the county, writes word that he has never heard of any occurrence of the Wild Cat in Leicestershire. Large specimens of the Domestic Cat, which have taken to a wild life, have been often shot as game-destroyers in the various woods of the county, and have been forwarded to the Museum as the true *Felis catus*. But for this fact, and in order to correct a misleading reference to the Wild Cat in the pages of the 'Midland Naturalist' for November, 1884, I should not perhaps have referred to the species.

Family CANIDÆ.

Canis lupus, Linn. Wolf.—Extinct within historic times. In Potter's 'History and Antiquities of Charnwood Forest' (1842) he writes—"Charnwood formed part of the ancient Celtic Forest of Arden, which extended from the Avon to the Trent, and the Leicestershire portion was bounded on the east by a line running through High Cross to Barton, in Nottinghamshire. . . . Previous to the time of Edgar, the district was greatly infested with wolves." Selden, in his notes to Drayton's 'Polyolbion' (ix. 76), refers to the Manor of Piddlesey, in Leicestershire, which was held by one Henry of Angage *per serjeantiam capiendi lupos*, and quotes as his authority 'Hist. Leicesters. 27 Hen. III. in Archiv. Turr. Lond.'*

Canis vulpes, Linn. Common Fox.—In such a fox-hunting county as Leicestershire it is needless to say that the Fox is generally distributed and common; resident and breeding. Mr. H. S. Davenport writes on February 4th, 1855—"We occasionally draw coverts blank, and find foxes up great trees." Mrs. Shackelford, of Husband's Bosworth, Rugby, writes as follows:—"In September, 1881, a friend and I were shooting over a large field of turnips in the parish of Saddington, accompanied by two beaters, a marker on horseback, and a spaniel dog. On our first

* Harting, 'Extinct British Animals,' p. 142.

beat we put up three foxes; my friend then said, 'It will be of little use walking over these turnips any longer, for we shall find no birds, there being so many foxes.' I, however, persuaded him to try another beat; we did so, and found a good covey of partridges, at which we had four barrels, my friend bringing down a brace, and I one bird; my friend's second bird dropping from eighty to a hundred yards in front of us, when to our great amazement the last fox we had started deliberately turned round, met us, fetched the wounded bird, and ran off with it over a brook on to the brow of a hill, where we watched it enjoying its repast, notwithstanding all our shouting and the mounted marksman galloping after it as far as the fence by the brook." The 'Illustrated Sporting and Dramatic News' of November 12th, 1881, gave a full-page illustration showing one beater only, two pointers, two guns, a mounted marker, and a fox carrying off a partridge in turnips; but no details were published, except that it was an actual occurrence, and that the bird was a hen pheasant! Thus do stories become altered as they are repeated. A telegram from Atherstone, published in the 'Leicester Daily Post' for January 10th, 1885, narrates a singular hunting incident. While the Atherstone hounds were out they started a fox, and pursued him hotly for some time. Reynard made for Atherstone, and after passing some distance down the main street, darted into the "George and Dragon" public-house, and took refuge upstairs. On the huntsmen coming up he was captured, and the head and brush were presented to the innkeeper. Poor fellow! he deserved a better fate. The following incident, related by my friend Mr. Macaulay, occurred on the farm of Mr. J. Perkins at Laughton, who vouches for the facts:—A labourer at work in a ploughed field saw a fox come through the hedge with a rabbit in his mouth; proceeding some distance into the field he laid the rabbit down, and, scratching a hole, placed the rabbit therein, covered it over, and then took his departure. So soon as the fox was gone the man went to the place and took up the rabbit. About an hour afterwards he saw two foxes come into the field and go straight to the spot where he had seen the rabbit buried. One of them began to search for the rabbit, but not finding it, he cast round in every direction, being joined in this operation by the other. After a few minutes had been thus spent in fruitless search, the two foxes fell upon each other, and a fierce battle ensued until

the spectator approached the combatants and separated them. Probably the first fox had invited his friend to dine, and the latter, thinking himself the victim of a hoax, endeavoured to be revenged on his friend by thrashing him.

Family MUSTELIDÆ.

Martes sylvatica, Nilsson. Pine Marten. — Possibly extinct. Harley says of this species (which he calls "*Mustela foina*")—"Annually becoming rare. Occurred a few years since in the woods of Gopsall. The writer had an opportunity afforded some years since of examining a female and young of this species of *Mustela* which had been captured on Earl Howe's estate, situate on the western side of the county. The occurrence of the Marten in the district around Leicester must therefore be considered rare and unusual. It affects decayed and hollow trees, in which it brings forth its young, and preys much on young birds and small Mammalia." I can find no recent notices of its capture in Leicestershire; there is, however, an old specimen in the Leicester Museum, supposed to be from Wellsborough; and another specimen I had an opportunity of examining at Bradgate House is reported to have been killed at Bradgate many years since. Mr. R. Widdowson, of Melton Mowbray, writes:—"When I first came to reside in Melton I went over to Leicester several times, and used to call on a Mr. Pickard, a hairdresser, who lived in the little lane leading out of the market-place, just above the 'White Swan' Inn. He was a taxidermist also, and I well remember seeing some Martens which he had just stuffed, an adult female and two young ones, which, he told me, were killed a few miles away, I believe at Bradgate. He had the adult a long time, and used to exhibit it in his window; and was very fond of talking about it, declaring that it was brought to him alive. I also remember hearing that one was killed at Stapleford, but I did not see it, as it was years before I was employed by Lord Harborough."

Mustela putorius, Linn. Common Polecat. — Generally distributed, but rare. Harley says—"Commonly diffused over the county. Met with most frequently in the more densely-wooded parts of it. Occurs not seldom in the vicinage of such woods as those of Oakley, Piper, Grace Dieu, and Gopsall." Although I have heard of a few, I have not yet seen a Leicestershire specimen in the flesh; and my friend W. Ingram, of Belvoir, writes on

February 7th, 1885—"I cannot hear that a Polecat has been seen or destroyed of late years in our woods." Mr. R. Widdowson, of Melton Mowbray, writes on February 6th, 1885—"Not heard of any here for many years."

Mustela erminea, Linn. Common Stoat.—Generally dispersed and common, breeding close to the town of Leicester. Harley says that he "has seen it chase the Squirrel." My friend Macaulay described to me a most exciting chase which he witnessed, and which ended in a singular manner. I give it in his own words:—"On February 16th, 1884, I was driving from Stoughton to Tur Langton, in company with Mr. Miles J. Walker, when our attention was attracted by the scream of a rabbit, a sound which—like the cry of a hare—is never heard except the animal is in fear. Looking into the adjoining field we saw a rabbit being coursed by a stoat. The rabbit was screaming with terror all the while it ran, and the stoat was rapidly gaining ground. After going about 150 yards the stoat was within a yard of the rabbit, when the latter suddenly stopped and squatted, and at the same time ceased to scream. The stoat stopped also, but, instead of attacking the rabbit, squatted also in front of and face to face with it about a foot off, and there they remained motionless, the rabbit apparently paralysed with fear. The occupier of the farm, who happened to be on the road, went into the field, and on his approach the stoat ran off; whilst the rabbit allowed him to pick it up, and he brought it to us and placed it in my carriage. The animal's eyes were closed, the heart was palpitating most violently, and the breathing very rapid. It lay on its side for some minutes motionless, and I thought it would die. A careful examination failed to detect any injury whatever. After a time it slowly recovered, and we turned it loose again." Several examples of the stoat have occurred in the county, in partial "ermine" or winter dress. I have not seen any purely white local specimens.

Mustela vulgaris (Gmel.). Weasel.—Generally met with, and resident. One, presented to the Leicester Museum on November 14th, 1851, was killed in Princess Street, close to the Museum. Harley says—"This species hunts down the Grey Rat with wonderful daring and spirit. It also preys on the Water Rat, and for that purpose, the writer of these notes on its history, has seen the little intrepid fellow trace out the runs of that quiet, harmless

animal with much address and great cunning, surpassing even the adroitness and agility of the Ferret." During the early part of December, 1856, according to a MS. note dated December 5th, 1856, by Harley, who examined the specimen, a Weasel, pure white, even to the extremity of the tail, was captured near Leicester. Bell, in his 'British Quadrupeds,' remarks on the rarity of such variation in the Weasel; and Harley states that the white specimen above noticed is the only one of the kind he ever met with. It might be supposed that Harley had possibly mistaken a small Stoat for a Weasel; but he adds:—"The Stoat—its congener—becomes white in the dreary season of the winter, throughout, save the tip of its tail, the hair of which generally remains black. The change of dress and the variegated exterior of the Weasel is certainly of less common occurrence, if not very rare."

Meles taxus (Bodd.). Common Badger.—Generally dispersed, but not common. Writing of this animal 1840-50, Harley appears to have found it, even at that date, increasingly rare; for he writes—"Formerly well distributed over the county, abounding in most large woods, especially those verging on the Forest of Charnwood. The woods of Gopsall and Oakley also bore marks of its retreat, even till within a very recent date. Used also to occur at Mere Hill Wood, near Loughborough. Not common." The Leicester Museum possessed two specimens marked "Leicestershire," and the Donation-book of the Leicester Museum records the presentation—on April 2nd, 1860—of a Badger shot at Keythorpe Hall. Mr. Geoffrey Palmer, of Withcote Hall, informed me that it bred in the adjoining woods. There is no doubt that, although rare, it is still to be met with breeding in the county; for the Rev. A. Matthews, of Gumley, forwarded a half-grown living specimen—a male—to the Leicester Museum on June 28th, 1884. Mr. H. S. Davenport writes (February 4th, 1885)—"Badgers are bred in Owston Wood; Ram's Head, at Keythorpe; and Sir F. Fowke's spinneys at Tilton-on-the-Hill, most years." Mr. R. Widdowson writes, February 6th, 1885—"A great many instances of Badgers being killed within a few miles of us within the last year or two; have had two from Hoby. A friend residing at Eaton, near Waltham-on-the-Wolds, had, about four months ago, three within a week; two were young." Mr. W. Ingram, writing February 7th, 1885, says—"Badgers

breed in our woods, but are rarely found away from their earths. I have known of but two instances of Badgers being found above ground by the fox-hounds and killed. Keepers tell me that they occasionally see a family of Badgers returning to their lair, trotting in a line behind a leader just before daybreak."

Lutra vulgaris, Erxl. Common Otter. — Resident, and breeding occasionally, but rare. According to Harley's observation, the Otter "occurs occasionally, being found on the banks of the rivers Soar, Trent, and Wreke." He was present at the capture of a female Otter and four young ones in the spring of 1817. The young Otters were taken from a rude lair, matted with rushes and flags which the dam had carefully conveyed through a hole, and concealed within a decayed pollard willow on the banks of the River Soar, near to the upper mills in the parish of Loughborough. On being surprised the old Otter fought the dogs furiously, and was with difficulty overcome. The young, which had attained to the size of a large water rat, were still blind. Loughborough seems to have kept up its breed of Otters since Harley's time, for seeing a notice in the local papers as to the occurrence of two young Otters near Loughborough in March, 1884, I sent a telegram on the 22nd to Mr. Dakin, a fishmonger of this town, hoping to get the specimens for the Museum; and received a reply—"Two were killed, but only one obtained. There are more about." Mr. R. Widdowson, writing February 6th, 1885, says—"I heard last week of one being seen at Brentingby; I had one some years ago from the same locality." The Leicester Museum possessed one killed near Enderby, September 28th, 1849; and "J. B.," writing in the 'Chronicle and Mercury,' February 28th, 1885, says—"Between sixty and seventy years back Squire Smith, of Enderby, kept a pack of Otter-hounds. A large Otter, stuffed and in a case, has been at the 'Narborough Inn' for many years past. The late Mr. Wm. Sansome was gamekeeper, and, I believe, shot it."

FOSSIL CARNIVORA.—It is somewhat singular that no remains of this Order should have, as yet, been discovered in the post-tertiaries of Leicestershire. Taking into consideration the fact of the occurrence in the county of several Ungulates contemporaneous with such Carnivora as *Ursus spelæus*, *Felis spelæus*, &c., it is really extraordinary that no vestiges of the latter Order have been discovered. Writing to my friend Mr. H. E. Quilter, a

well-known Leicestershire geologist, upon this subject, I received the following reply:—"I have thought over the question as to remains of Carnivora in our post-tertiary deposits, and, although I have seen a good many remains of other orders, have never recognised any as belonging to the Carnivora. They are not mentioned, I find, in Ansted's 'Geology of Leicestershire,' in J. W. Judd's 'Geological Survey and Memoir of the County,' nor in Harrison's 'Geology.' This seems strange, as they are found in post-tertiaries near Stamford and Peterborough: *Hyæna* in a cave near Stamford, *Hyæna spelæa* and *Canis lupus* in estuarine gravels near Peterborough. Possibly other conditions prevailed which prevented their living hereabout, or, it may be, we have not representatives of the beds in which their remains (Carnivora) are found in neighbouring localities."

(To be continued.)

ON TWO FORMS OF RANA FROM N.W. SPAIN.

BY VICTOR LOPEZ SEOANE.

THE increasing interest which is paid to the variations of European Reptiles and Batrachians has led to the discovery of many forms which link together species hitherto regarded as perfectly separated. The Spanish Peninsula has yielded several such forms, but there remains a great deal to do, especially in the comparison of the commonest species with their representatives in other countries. This induces me not to delay further the publication of the following notes on *Rana esculenta* and *R. temporaria*.

1. *RANA TEMPORARIA PARVIPALMATA*, subsp. nov.—Although too closely related to *R. temporaria* (*R. fusca*, Rös.) to justify a specific separation, the land frog of Galice is so easily distinguished from it that it deserves a special denomination. The most striking difference resides in the shorter web between the toes, as well during as after the breeding season. In the typical *R. temporaria post-nuptias* the toes are always at least two-thirds webbed, phalanges II. of the first toe, II. and III. on the inner side and III. on the outer side of the second and third, III. and IV. of the fourth, and III. of the fifth, remaining free; and *nuptiis tempore* the membrane reaches to nearly the extremity of

all the toes on the outer side and to the very tip of the fifth toe. In *R. t. parvipalmata*, in summer, the following phalanges are free:—I. and II. of first toe; I. and II. of second on the inner side, and II. and half of I., or even both I. and II., on the outer; half of I. and II. and III. (or all three) on the inner side, and II. and III. on the outer side of third; II., III. and IV. of fourth, and II. and III. (or only half of II.) of fifth.

During the breeding season the web is a little more extensive, but never greater than that of *R. temporaria typica* when most reduced. The toes in the latter form may be termed three-fourths webbed in the spring, and two-thirds in the summer; and in *R. parvipalmata* two-thirds webbed in the spring and half webbed in summer.



Feet of *Rana temporaria parvipalmata*.

Although so short a web is not known to occur in *R. temporaria* of Northern and Central Europe, an allied species, *R. arvalis*, not unfrequently resembles the Spanish frog in this respect. In other characters this form agrees with the typical *R. temporaria*, except that the interorbital space is usually a little narrower, and the nostril is nearer the eye than the tip of the snout. There are likewise specimens with shorter and blunter or longer and more pointed snout, and with longer or shorter limbs; the tibiotarsal articulation, however, never reaches beyond the tip of the snout.

The coloration of the upper parts varies considerably, and nearly to the same extent as in the typical form; reddish specimens are the most frequent. The lower surfaces are usually yellow or cream-coloured, more or less profusely spotted with red, and with small brown spots or vermiculations on the throat. After immersion in spirits the lower parts assume a rather peculiar aspect, which, in many cases, readily distinguishes this form from its ally. The red and yellow having entirely disappeared, these parts are white, with brown vermiculations on

the throat, leaving an unspotted median longitudinal zone, as seen in *R. latastii*; the belly is immaculate, except sometimes with a few brown spots on the sides near the breast.

The skull differs slightly from that of *R. temporaria*, the frontal-parietal being slightly convex, and the upper part of the ethmoid acute anteriorly.

The testicles are very large and abundantly pigmented, often entirely black.

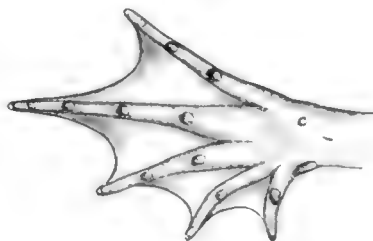
DIMENSIONS.		Male.	Female.	Young.
From snout to vent ...	... millim.	60	65	55
Length of head (to occiput)	..	18	18	15
Width of head (at angles of jaws)	..	17	19	15
From eye to end of snout ...	..	7	7	6
" nostril ...	..	3	3	2.5
Diameter of the eye ...	..	6	6	4
Interorbital space ...	..	3	3	2.5
Diameter of the tympanum	..	4	4	3.5
From eye to tympanum ...	..	2	2	1.5
Fore limb ...	..	36	38	31
Hand ...	..	13	14	11
Hind limb (from vent) ...	..	101	105	89
Tibia ...	..	26	31	25
Foot ...	..	32	32	27
First toe ...	..	5	6	5
Inner metatarsal tubercle ...	..	3	2.5	2

Rana temporaria parvipalmata inhabits the north-west of Spain, equally common from the level of the sea to an elevation of 1422 feet. Near Pontevedra, Tuy, and Ferrol, it occurs conjointly with *Rana iberica*.

2. *RANA ESCULENTA PEREZI*, subsp. nov.—The aquatic frog of North-western Spain and Portugal differs so considerably from the typical *R. esculenta* figured by Rösel, that it surely deserves to be regarded as a distinct race or subspecies; although nearer the Prussian race, *R. esculenta fortis*, and the Algerian *R. esculenta latastii*, I should not feel disposed to unite it with either.

Head not much depressed, the snout rather short and very obtuse, the loreal regions not very oblique; nostril nearly equally distant from the eye and the tip of the snout; interorbital space barely half the diameter of the upper eyelid;

tympanum two-thirds the diameter of the eye. Hind limb variable in length, the tibio-tarsal articulation reaching either the posterior border of the orbit, or half-way between the eye and the nostril, or between those points. Inner metatarsal tubercle extremely small, elliptical, not at all prominent; its length one-third or one-fourth that of the inner toe. Skin feebly warty; glandular lateral fold moderately prominent, narrower than the upper eyelid. Upper parts of a brighter or duller green, spotted with black; a lighter green vertebral line present in most cases; tympanum and glandular lateral fold bronzy; flanks marbled with black. Limbs with more or less irregular black cross bars; no yellow on the hind side of the thighs. Lower surfaces white, spotted or marbled with blackish.



Foot of *Rana esculenta perezi*.

DIMENSIONS.				Male.	Female.	Female.
From snout to vent ...	...	...	millim.	59	65	72
Length of head ...	...	...	„	22	22	24
Width of head ...	...	...	„	23	24	27
From eye to end of snout ...	...	...	„	9	10.5	11
„ nostril ...	...	...	„	4.5	5	6
Diameter of the eye ...	...	...	„	7	7	7.5
Interorbital space ...	...	...	„	2	2	2.5
Diameter of the tympanum ...	...	...	„	4.5	4.5	5
Fore limb ...	...	...	„	35	36	37
Hand ...	...	...	„	14	15	16
Hind limb ...	...	...	„	98	110	108
Tibia ...	...	...	„	27	33	32
Foot ...	...	...	„	31	37	36
First toe ...	...	...	„	8	9.5	9
Inner metatarsal tubercle ...	...	...	„	2.5	2.5	2.5

Found everywhere, up to an elevation of 1424 feet.

In describing this new form, I have pleasure in associating with it the name of my esteemed friend Prof. Perez Arcas.

ORNITHOLOGICAL NOTES FROM NORTH NORFOLK.

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

ROLLER.—On June 6th a very good female Roller was shot at Gresham, near Cromer, and is now in the possession of Mr. Page.

BLACK REDSTART.—On October 21st and 22nd I went to Blakeney with Mr. H. Seebohm; the weather was propitious, but the Sandpipers very wild. No Bluethroats showed themselves, but a pair of Black Redstarts had taken up their quarters on the coastguard's little house, standing by itself far away from any other habitation, and Mr. Seebohm shot the female. This is a very rare Norfolk bird, though in December, 1875, a male in change was shot at Blakeney (Zool., p. 4894), and about four others have been obtained in the county.

ROCK PIPIT.—There had evidently been a great arrival of Rock Pipits, a species which is rare on our coast (where there are not any rocks), except on migration, and we must have seen at least four hundred. There is good reason for supposing it has bred with us once (*cf.* Norw. Nat. Trans. iii. p. 346). Half-a-dozen shot for identification did not include an example of the Scandinavian form (*Anthus rupestris*), said to be "not infrequent on the Yorkshire and Lincolnshire coasts in the autumn" (Fifth Report on Migration, p. 41), and which has occurred thrice in Norfolk, but each time inland. On November 16th six Rock Pipits were caught alive in clap-nets at Yarmouth, and taken to Mr. G. Smith, who informs me that he has had eighteen brought to him alive. It is not so long since this bird was considered nearly as rare in Norfolk as the Shore Lark.

HOODED CROW.—Seen by us at Blakeney on the 21st constantly coming from the sea, and flying by the compass W.N.W. If they pursued this course from starting their last resting-place must have been Amsterdam. It is solely owing to the wind that they are made to cross the sea in this retrograde fashion.

GULLS.—Exactly the same course was being pursued by parties of Gulls—mostly the Herring and Greater Black-backed. I do not think five minutes ever elapsed until the evening, when their numbers slackened, without some passing overhead. This is not so remarkable while we have a westerly or north-westerly

wind,—and these winds prevail very much in the autumn,—but that they should continue to go west when the wind had changed to the south, as it did on the 22nd, was a new thing; for Gulls almost invariably fly against the wind, but it is true the wind was moderate. If there had been much I am sure they must have flown against it. By far the largest migration of Gulls we had last year at Cromer was on October 11th. There had been a gale in the night from N.N.W., and at 11 a.m. not a Gull was to be seen. Exactly when the “passage” began I do not know, but it must have been soon after this. I did not go down to the shore again until 3 p.m., when the wind was still west, but greatly moderated; numbers of Gulls were then passing Cromer. How long they continued passing I am unable to say, as I could not stay and watch it out, but if they continued passing six hours, which I am sure is a low computation, 10,800 Gulls must have passed,—a number which the sea-board of Norfolk could not supply,—chiefly young Herring Gulls and Lesser Black-backs, with some Common Gulls, and a few adults of the Greater Black-backed, and now and then, though much more rarely, a Black-headed Gull. This is reckoning that three flocks passed every two minutes, varying from fifteen to thirty in each flock. Every bird was going in the same direction, *viz.*, following our coast-line, which is W.N.W. On the 12th, the next day, I had the curiosity to go down to the shore at 8 a.m., and again at 4 p.m.; the wind was in much the same quarter,—N.W., and strong,—but not a Gull was to be seen.

WOODCOCK.—On the same day that the Gulls were passing Cromer, a gunner at Blakeney, a very intelligent man named Brett, on whose word I can depend, picked up four drowned Woodcocks, and saw also a number of Grey Crows, Larks, and Thrushes washed up by the sea, and met another man named Striker, who had six more Woodcocks, all picked up. They also saw two which had reached land alive. This shows that Grey Crows, which are by some people supposed to be exclusively day migrants, migrate also at night. It also shows that Woodcocks do not wait for an easterly wind, as many gamekeepers will tell you, and many an old sportsman, too, but generally cross the North Sea with a westerly one. In 1883 I had three or four from lighthouses, which were killed during westerly or north-westerly winds. In 1884 a flight was distinctly noted at Cromer, in the

woods near the sea, on November 6th. The wind the day before was S.S.W., and the Woodcocks probably arrived in the night. I know that many writers, in 'The Zoologist' and elsewhere, have asserted that Woodcocks come with an east wind, but my observations rather coincide with Mr. Hele's on the coast of Suffolk (*vide* 'Notes about Aldeburgh,' p. 122). From the 1st of October to the 1st of January we only had the wind from the east three times. On October 5th we had three days of it, on November 18th four days, and on December 21st a longer spell, but there was no special arrival of Woodcocks coincident with any of these dates. At the same time it would be wrong to deny that there are exceptions to the rule, though they are certainly rare on this coast. In 1883, as we learn from the 'Report on Migration' (p. 51), the great flight, covering the whole of the east coast from Yarmouth to the Farne Islands, was on the nights of October 28th and 29th, and on those two dates the wind was registered by the Meteorological Office as S. to E., light, and E.S.E. to N.E., light.

THE MOLLUSCA OF THE COUNTIES OF KENT, SURREY AND MIDDLESEX.

By T. D. A. COCKERELL.

(Continued from p. 97.)

MARINE GASTEROPODA.

Chiton fascicularis, *C. cinereus* and *C. marginatus*.—All occur at Margate; the last seems to be the commonest. [All these at Hastings, but *marginatus* not so common (E. L.).]

Patella vulgata is of course common. Var. *elevata* is found at Margate, and I have obtained much worn shells of var. *depressa* at Shellness.

Helcion pellucidum.—Abundant and fine at Margate. Var. *lævis* is sometimes found. [It is notable that while var. *lævis* is not rare alive at Eastbourne (S. C. C.), only one specimen of the typical form has been taken on that coast, at Hastings (E. L.), while at Margate the type is very much more abundant than the variety].

Acmaea (Tectura) virginea.—Common at Margate. [Scarce at Hastings (E. L.).]

Emarginula fissura.—Shellness, rare.

E. rosea.—Shellness (S. C. C. and D. B. C.). [Both rare at Hastings (E. L.).]

Fissurella græca.—Shellness, abundant. I have a specimen of a variety which has the shell more raised and the outer surface more convex than in the type.

Capulus hungaricus.—Shellness, a very worn specimen (S. C. C.).

Calyptroea chinensis.—Near Ramsgate (J. T. Hillier).

Trochus tumidus.—Shellness, common, but worn.

T. cinerarius.—Margate, abundant. Var. *electissima*, Shellness.

T. striatus and *T. montacuti*.—Shellness, worn specimens of each (S. C. C.).

T. exasperatus.—Margate (Hanley). [Also said to have been taken in Sussex.]

T. zizyphinus.—Margate, &c., common. Var. *Lyonsii*, Shellness (S. C. C.). [Hastings (E. L.).] At Shellness I found a very much worn and broken specimen of var. *laevigata*, which seems to agree exactly with the definition of this variety. [*T. magus*, Sussex.]

Phasianella pulla.—Margate and Shellness, abundant.

Lacuna divaricata and *L. puteolus*.—Margate.

L. crassior.—Shellness.

L. pallidula.—Margate. The specimens belong to a variety allied to, but possibly not identical with, var. *patula*.

Littorina obtusata.—Abundant and very variable.

L. rudis.—Margate, locally abundant. Var. *tenebrosa*, Kent (Capt. Brown).

L. litorea.—Margate, &c.

Rissoa cancellata.—Shellness (S. C. C.). *R. costata*, Margate.

R. parva and var. *interrupta*.—Margate; the variety is much more numerous than the typical form.

R. membranacea.—Margate, scarce.

[*R. violacea*.—Sussex].

R. striata.—Margate, abundant. [One dead shell only at Hastings (E. L.).]

[*R. costulata*.—Worthing (Rich.).]

R. semistriata.—Margate. [Hastings, scarce, living (E. L.).]

R. striatula and *R. calathus*.—Both these are recorded as Kentish in Gwyn Jeffreys' 'British Conchology.'

R. reticulata.—Sandwich (Capt. Brown).

[*R. inconspicua* var. *ventrosa*.—Essex (Jeffreys).]

[*R. cingillus*.—Scarce, but living, at Hastings (E. L.).]

Cæcum glabrum.—Near Ramsgate (J. T. Hillier).

C. trachea.—Sandwich (Walker).

Homalogyra rota.—Sandwich (Jeffreys).

Turritella terebra.—Shellness, worn (S. C. C.).

Scalaria communis.—Shellness and Margate.

S. clathratula.—Margate, not rare.

Aclis unica.—One individual occurred in shell-sand; it was identified by the late Dr. Gwyn Jeffreys. *A. gulsonæ* has been reported as Kentish. [*A. supranitida*, Hastings (Brit. Conch.).]

Odostomia acuta, *O. plicata*, *O. lactea*, *O. indistincta*, and *O. unidentata*.—Found in shell-sand; *lactea* abundantly.

O. rissoides.—I have a specimen from Shellness which I believe to belong to this species.

O. dolioliformis.—Sandwich (Jeffreys). [The Hastings members of this genus are *O. pallida*, *O. acuta*, *O. spiralis*, and *O. lactea*, all of them scarce (E. L.).]

Eulinea polita.—Margate, in shell-sand.

Natica catena.—This species is found in a semi-fossil state in a raised beach at Pegwell Bay, with *S. piperata*, *T. balthica*, *C. edule*, *M. stultorum*, and others. Living specimens are common at Shellness.

N. alderi.—Margate. [Hastings, type common; var. *lactea*, rare (E. L.).]

Adeorbis subcarinatus.—Margate, rare. [Hastings, rare (E. L.).]

Lamellaria perspicua.—Margate, rare (S. C. C.).

Velutina levigata.—Pegwell Bay (S. C. C.); one very young shell at Margate.

[*Aporrhais pespelecani*.—One dead shell at Hastings (E. L.).]

Cerithium reticulatum and *C. perversum*.—Both at Margate, the latter more rarely.

Cerithiopsis tubercularis.—Margate, common.

Purpura lapillus.—Common. Var. *major*, Shellness (S. C. C.). [Hastings (E. L.).]

Buccinum undatum.—Very abundant. [Var. *littoralis* not uncommon at Hastings (E. L.).] Monst. *sinistrorsum*, m. *carinatum*, m. *imperiale*, and m. *acuminatum*, near Ramsgate (J. T. Hillier); monst. *conico-operculatum* and m. *bioperculatum* have also been found. [Monst. *sinistrorsum* and m. *acuminatum*, Hastings, rare (E. L.).] I once found a nice specimen of m. *acuminatum* in a ditch with other whelks at Acton, in Middlesex! and many good things would, I doubt not, fall to the lot of anyone who should assiduously search these refuse-heaps of whelks in the neighbourhood of the Metropolis. In this way I obtained numbers of *Fusus gracilis*, and a still more remarkable capture was a number of *Crypta fornicata*, an American shell, allied to *Calyptræa*, which had come on New York oysters, and had been thrown away with the shells.

Murex erinaceus.—Shellness and Margate.

Fusus antiquus.—Common. Monstrosities caused probably by the growth of an annelid in the suture, such as the one recorded by Mr. Lovett, are occasionally found. There are some in the British Museum labelled "Pegwell Bay."

F. gracilis.—Near Ramsgate (J. T. Hillier). [Not uncommon at Hastings (E. L.).]

Nassa reticulata.—Margate, common.

N. nitida.—Muddy estuaries of Thames and Orwell, abundant (Brit. Conch.).

N. incrassata.—Very abundant. The Shellness specimens are larger and more elongated than those from Margate.

[*N. pygmæa*.—Rare at Hastings, dead (E. L.).]

Defrancia linearis.—Margate, not very rare. [Hastings (S. C. C.).]

Pleurotoma rufa and *P. turricula*.—Margate; the first is the most common. *P. septangularis*, Shellness, 1883.

P. lavigata.—Shellness, broken, worn, and very rare.

P. attenuata and *P. costata*.—Margate (S. C. C.).

[*P. costata*.—Three dead shells at Hastings (E. L.).]

Cypræa europæa.—Abundant. There are two forms, one spotted and the other spotless. Var., shell small, about a quarter of an inch in length. Margate (D. B. C.).

Utriculus obtusus.—Margate. I have also two specimens which seem to belong to the var. *Lajonkaireana*.

U. mamillatus.—One shell taken, apparently this species.

Actæon tornatilis.—One at Margate (S. C. C.).

[*Scaphander lignarius*.—One shell at Hastings (E. L.).]

Philine aperta.—Shellness (S. C. C.). *P. catena*, Margate, rare.

Pleurobranchus membranaceus.—Pegwell Bay (Science Gossip, 1870, p. 64).

Of the Nudibranchs I have found a small light-coloured *Doris* in a rock-pool at Dover, and two specimens of *Eolis* have been taken at Margate. I do not know this section sufficiently well to be able to identify them with certainty. [Hastings Nudibranchs, *Doris bilineata* (*bilamellata*?), *Eolis papillosa*, *E. pellucida*?, *Idalia aspersa*? (Science Gossip, Sept. 1869).]

ESTUARINE GASTROPODA.

Hydrobia ventrosa.—Greenwich Marshes, with *L. peregra* and *Planorbis spirorbis*. East Kent, Richborough (S. C. C.). [Hastings (E. L.).] Var. *elongata*, Erith Marshes, with *H. ulvæ* (Leslie).

H. similis.—Woolwich.

H. ulvæ.—St. Nicholas Marsh and Pegwell Bay, abundant.

Hydrobia marginata is found fossil at Crayford and Erith (R. W. Cheadle and B. B. Woodward), and still survives in France.

Assimineia grayana.—Sandwich (D. B. C. & S. C. C.). Nagden (M. A. Oldroyd). Near Greenwich.

Melampus myosotis.—Richborough, in rejectamenta of River Stour; type abundant, var. *ringens* one only. Type at Erith (Leslie).

M. bidentatus.—Richborough, one in rejectamenta of River Stour (S. C. C.).

Otina otis.—Sandwich and Reculvers (Brit. Conch.).

FLUVIATILE GASTROPODA.

Neritina fluviatilis.—Abundant in the Thames at Hammer-smith. Weybridge (M'Kean). Dead shells are sometimes thrown up by the sea at Margate, but their derivation is doubtful. [This species is also reported from both divisions of Sussex, and from Bucks.]

N. consobrina, *N. globosa*, and *N. elegans* are found in the fossil state.

Ampullaria occurs fossil in Surrey (E. H. Rowe).

Paludina contecta.—Middlesex, West Drayton (R. W. Cheadle). Flanchford, near Reigate (E. Saunders); it does not appear to live

there now (K. M'Kean). [Reading (W. Holland); also reported from Bucks.]

P. vivipara.—River Brent, Guildford, &c. Var. *efasciata*, Richmond. River Lea near Tottenham (C. Ashford, S. Tuke, and T. Godlee). [Type, Sussex, Hants and Herts; var. *efasciata*, Herts.]

Fossil species, *P. aspera*, *P. lenta*, and *P. rugosa*, in Woolwich beds; *P. vivipara* and *P. contecta*, Pleistocene (Cheadle and Woodward).

Bythinia tentaculata.—Kent, Ebbsfleet, Herne Bay, St. Mary Cray. Surrey: Kew, Guildford. Middlesex: Regent's Park; my brother (S. C. C.) has some interesting banded specimens from this locality. [Hants, Sussex, Herts, and Bucks; Dagenham Lake, Essex (E. H. Rowe).] Var. *ventricosa*, Richmond. Var. *excavata*, Woolwich. Var. *albida*, Regent's Park (S. C. C.); also found in East Kent; [Hants: Preston Candover, scarce (P. Fitzgerald).] Monst. *decollatum*. Surrey: Barnes.

B. Leachii.—East Kent: Ebbsfleet. Surrey: Guildford; rejectamenta of Thames at Kew. Middlesex: Paddington Canal. [East Sussex: Pevensey. Herts: Ware (Jeffreys). Essex: Dagenham Lake (E. H. Rowe).] Var. *elongata* is reported from Woolwich Marshes.

Valvata piscinalis.—Middlesex (S. C. C.). East Kent, Richborough; West Kent, St. Mary's Cray. Surrey: rejectamenta of River Thames at Kew; Waddon (M'Kean). [Also reported for Hants, Herts, Sussex, and Bucks.] Var. *subcylindrica*, a dead shell near Hammersmith, on Surrey side of river.

Valvata cristata.—Middlesex: Ealing (T. C.); River Lea at Tottenham, on caddis-cases (C. Ashford). Surrey: rejectamenta of River Thames at Kew; Barnes (T. C.); Waddon (M'Kean). East Kent: rejectamenta of River Stour at Richborough; Ebbsfleet; Minster. West Kent: St. Mary's Cray (S. C. C.); pond near Sevenoaks. [Hants, scarce at Preston Candover (P. Fitzgerald). Sussex: Pevensey. Herts: Ware (Jeffreys).]

Melania and *Melanopsis* are found fossil in the Woolwich beds.

(To be continued.)

NOTES AND QUERIES.

The Ornithology of Japan.—Capt. Blakiston, who has been resident in Japan for more than twenty years, has published an amended list of the birds of that country, with the Ornithology of which he certainly possesses a better practical acquaintance than any one else. The list is founded on a previous catalogue prepared in 1882 by himself and Mr. H. Pryer; but the species are now arranged geographically, so as to show the distribution of birds through the different islands of Japan. The author draws attention to the natural division in the fauna of Japan, which is marked by the Strait of Tsungaru, to the southward of which the true Japanese avifauna is emphasised, while north of this Strait the avifauna is Siberian in character.

The Marine Biological Association.—We understand that a paper treating of the aims and objects of the Marine Biological Association will be read at the rooms of the Society of Arts, on Wednesday, May 13th, at 8 p.m. The site for the building which is to be erected at Plymouth has, with the consent of the Town Council, been approved by the authorities of the War Office.

BIRDS.

Notes on the Ornithology of Northamptonshire.—I resume my notes from my last date, Sept. 14, 1884 (*Zool.* 1884, p. 455):—

Sept. 19. A Cuckoo was seen near Lilford on this day.

Sept. 20. The last Landrail, *Crex pratensis*, of the season shot near Titchmarsh.

Sept. 23. Three Teal, *Anas crecca*, seen near Aldwinckle for the first time this autumn.

Sept. 24. Two Green Sandpipers, *Totanus ochropus*, at Lilford Park ponds; this species has been unusually scarce in our neighbourhood this summer.

Sept. 26. Grey Wagtails, *Motacilla melanope*, appeared about this date in some numbers.

Sept. 30. We saw the first Merlin, *Falco aesalon*, of the season.

Oct. 2. A small trip of Golden Plovers, *Charadrius pluvialis*, observed for the first time this autumn.

Oct. 5. Four Wild Geese, *Anser* sp.?, seen on pasture land near Thorpe.

Oct. 6. A Grey Crow, *Corvus cornix*, shot near Lilford; we have little doubt, however, as to having seen one of this species, at a great distance, on the 1st inst.

Oct. 11. Fieldfare, *Turdus pilaris*, first seen in our neighbourhood this autumn.

Oct. 14. Two Siskins, *Chrysomitris spinus*, seen near Lilford, for the first time this season.

Oct. 15. A wild Tiercel, *Falco peregrinus*, male (the first of its species seen by us this autumn), came to assist one of our trained Falcons in a flight at Partridges, near Wigsthorpe; this bird, or another of the same species and sex, was seen near the house at Lilford on the 17th inst. Seven Bramblings, *Fringilla montifringilla*, caught by a birdcatcher in our employ, near Achurch, on this and previous day.

Oct. 16. First Woodcock, *Scolopax rusticola*, of the season seen in our neighbourhood.

Oct. 18. A large slow-flying hawk, which, from the description given to us, must have been a Harrier, *Circus cyaneus* or *C. cineraceus*, was twice seen by our head gamekeeper near Achurch.

Nov. 6. Swallow, *Hirundo rustica*, seen near Pilton.

Nov. 13. Tufted Duck, *Fuligula cristata*, female, shot by one of our gamekeepers, on the Nene near Thrapston.

Nov. 22. Pochard, *Fuligula Rufina*, shot on the Nene near Aldwinkle.

Nov. 27. A young Puffin, *Fratercula arctica*, sent to Lilford, alive, for me, but died the next day. This bird, as I was informed by my brother-in-law, who sent it to me, was picked up about three days previously in a farmyard at Yoke Hill, near Benefield.

Dec. 6. Two large trips of Golden Plover, *Charadrius pluvialis*, observed going southwards up the Nene valley near Aldwinkle.

Dec. 18. Cirl Bunting, *Emberiza ciris*, female, caught by a birdcatcher in our employ, on a farm of ours not far from Bythorn. This is only the second instance of the occurrence of this species in our own county which has come to our knowledge. The individual just recorded was taken alive, but only survived its capture for a day or two.

Dec. 29. A Gadwall, *Anas strepera*, male, one of two which had haunted the ponds near Lilford for some days, was this day shot at our aviary pond. This is the first Northamptonshire specimen which we have handled in the flesh; but we have little doubt that this species is not so rare with us as is generally supposed.

Jan. 2, 1885. We this day, in answer to our enquiries, received a letter from Mr. H. Capron, of Southwick Hall, Oundle, in which he informs us that during the month of July last, he several times met with young Snipes, *Scolopax gallinago*, only just able to fly, on the banks of the Nene, near Tansor. This is the first positive evidence we have received of the breeding of this species in our neighbourhood, though we have long had reason to believe that a pair or two of Snipes occasionally remained to breed in our swampy meadows.

Jan. 20—25. Three Tufted Ducks, *Fuligula cristata*, were shot by Mr. G. Hunt on the Nene, in our neighbourhood, between these dates.

Feb. 11. We received a young Kittiwake, *Rissa tridactyla*, in the flesh, from the Rev. E. Freeman, rector of Clapton, who informed us that the bird had been picked up near this village a few days previously. We have met with this species in our neighbourhood on several previous occasions, but consider it the least common of the six species of Gull which occasionally visit us.

Feb. 26. First eggs of Wild Duck, *Anas boschas*, of the season, found near Lilford.—LILFORD (March 22, 1885).

Red Grouse in Somerset and Wilts.—Some doubt seems to have been thrown on the occurrence of Red Grouse in Somerset and Wilts, as recorded in recent numbers of 'The Zoologist.' A Red Grouse was killed, within my own recollection, in a far more improbable locality than the Mendips—namely, at Knowlton Court, the seat of the late Admiral Hughes D'Aeth, within two miles of my own residence, and about ten miles inland from Dover. I cannot give the date, as the time is so far back, and my memory does not serve me, and the present owner, Mr. D'Aeth, has no record to refer to; I should think, however, it is full fifty years since. The bird, a female, is still in the hall at Knowlton Court, and I saw it only a few days ago. It was killed in the "Home Wood"—to add to the singularity of the locality. Whether these birds in Somerset and Kent had drifted south from the Derbyshire moors, or were escaped birds, it is difficult to say. But the latter conjecture, though I think it the least probable of the two, is not impossible, since I remember a Red Grouse having been brought from the Yorkshire moors to a house (Hampton's) in West Kent, where it lived for several years in a cage in the hall. This was an old cock bird, and its constant call in the morning used to echo through the house. Had this bird made its escape by any accident, and been shot, it would have been but one more instance, and there is no reason why Grouse may not have been kept in confinement elsewhere and escaped.—W. OXENDEN HAMMOND (St. Albans Court, Wingham, Kent).

Unusual congregation of Carrion Crows.—About 4 p.m. on the 28th December last my brother and I saw collected in some trees near an oak spinney at Bloxham Grove, Oxon, where these birds always roost in winter, an assemblage of Carrion Crows, which we calculated must have numbered 200 birds at least—small bodies of them frequently shifting their quarters made it impossible to count accurately. In severe weather our Crows almost entirely leave us, and as there were only a few about the roost the evening before, I think this great congregation may have consisted of passing visitors, moving gradually southward, the wind being N.E., and the weather cold about that time. I do not think they could have been our home birds,

collected together in view of a migration, because, in the first place, common as the Crow is here, I do not think we could muster quite such a host as this in any one part of the district; and, secondly, it is usual for them to disappear by degrees, and not all at once.—OLIVER V. APLIN (Great Bourton, near Banbury).

Variety of Jackdaw and Chaffinch.—A Jackdaw was shot Dec. 10th and brought to my stuffer, who purchased it for me; it is of a dark stone-colour all over, with the outer edges of flight-feathers cream-colour. A neighbour sent me a Chaffinch the other day of several shades lighter than one in normal plumage, the white in the wings being replaced by yellow, back blue-grey, rump yellow, and tail light yellow-grey; a male bird.—J. WHITAKER (Rainworth Lodge, Notts).

Natural History Notes from Yorkshire.—I had few opportunities of field observation in this county last autumn, but I have since collected a few notes from competent observers, adding my own limited experience. The Grey Wagtail, which visits these lowland districts in late autumn, retires to the N.W. moorland streams in spring; it rarely breeds in South Yorkshire. On November 26th Hooded Crows were in the low-flooded grounds about Wath-on-Dearne, and Fieldfares, Redwings, Jack Snipes, and Woodcocks had arrived from northern countries. The Woodcock has bred rarely near Cannon Hall and Stainborough parks. On December 2nd Golden Plover, Lapwing, and Common Snipe were observed. These breed on the west moors, rarely on our low lands. On December 8th heard the Sky Lark uttering its cheery notes. The Robin sang throughout the winter. On December 20th Jackdaws and Rooks were seeking food after frost or rain in fields near the town. On January 2nd a female Merliu was brought to me from Thurnscoe. This small falcon is scarce; I have seen one take a bird on the wing, and one was caught in a thick bush near Barnsley. Several have been noted by the late W. Talbot in his list of the Birds of Wakefield. On January 4th Mr. Hailstone, of Walton Hall, wrote to me that the lake was visited by a flock of from 400 to 500 wild ducks; a female Goosander had been observed on several days, at times close to the hall. He has informed me, in former winters, of hundreds of waterfowl on and about his lake, where I am happy to say they still have protection, as in Waterton's time. The Herons are occasional visitors, but could not be induced to stay after their nesting-trees were cut down. On January 9th a Water Rail (scarce), Little Grebes, Herons, Pochards, and Kingfishers were reported on pools and streams. Most of our resident songsters uttered their songs in February and early in March.—T. LISTER (Barnsley).

Grey Shrikes in Oxfordshire.—A fine example of the Great Grey Shrike, the typical form with two well-developed white wing-spots, was shot on the borders of Oxfordshire, near Chacombe, on December 26th last. It

was not sexed, but, from the breast being marked with small semilunar dark marks, and the clear grey upper parts giving it otherwise an appearance of maturity, I imagine it is a female. On February 26th another was shot on the borders of Oxon and North Hants, in the neighbourhood of Chipping Warden, and came into my possession in the flesh. It has only a little white at the bases of the secondaries, quite hidden by the coverts, and, although a female, is only very slightly marked on the under parts—hardly at all, in fact. To which form would this belong? If a young bird of *excubitor*, it would be more marked beneath; and the true Pallas' Shrike is said (Yarrell, 4th ed., vol. i., p. 203) to be marked at all ages. Is it intermediate? Mr. Darbey has informed me that a fine example was shot at Tackley, near Woodstock, in November last; this I have not seen. On April 7th (since writing the above) I saw two Grey Shrikes near Banbury. They frequented some pollard willows in the vicinity of the Cherwell, but made excursions into the neighbouring market gardens close to the town, where they resorted to the tallest pear-tree in the gardens as a look-out post.—OLIVER V. APLIN (Great Bourton, near Banbury, Oxon).

Grey Lag Goose in Nottinghamshire.—The keeper at Papplewick Hall shot one of these geese on the pond near the house on the 16th February last. It was by itself and in good condition. The Grey Lag is now a rare bird,—at any rate in these parts,—and though sometimes a few may be seen passing over, they are very seldom shot. Mr. Walter has kindly given me the bird. I need hardly say that, as a Nottinghamshire specimen, it is a great prize.—J. WHITAKER (Rainworth Lodge, Notts).

Netting Wood Pigeons in the Pyrenees.—There is a special phase of local sport, if it can be so termed, to be seen within some twenty miles of Biarritz, in the commune of Sare, in the shape of *Palombières* or Wild-Pigeon netting stations, where the birds are caught during their autumnal flight. Never having seen anything of this kind, I and a companion arranged to pay a visit to the nearest of these stations, and one morning started in a pony trap for that purpose. Ascending the hill beyond the Biarritz railway, we beheld a splendid panorama of the valleys of the "pays Basque," backed by the chain of Pyrenees, with the "Trois Couronnes" and the Rhune towering high above their smaller brethren. It is somewhere behind the Rhune that the point we were bound for is situated. After passing the small hamlet of Arcangues there is a choice of two roads, both of which lead to the little market town of St. Pée. We chose the road to the right, hoping, as it is the less frequented and passes for the greater part of its length through a dense forest of oaks, to chance on a Pigeon or two or something worth shooting. We did see one lot of Pigeons, but much too far off; also, in the distance, a large flock of Peewits making their way from the coast towards the meadows, where they

proposed spending the night. Beyond these and one Jay we saw nothing during the full hour of our passing through the forest. The road was infamously bad, and we had to walk up several hills to ease the pony, so our progress was but slow. However, there is an end to even twelve miles of bad hilly road, and at six o'clock we drove up to the Hotel de la Nivelles at St. Pée, the hostelry we had decided on to patronize for the night, as being, according to information we had received, but an easy walk from the *palombière*. The result of a conversation, however, was that the *palombière* was a long way from St. Pée, but close to Sare, a village nearly five miles off, to which we could drive early next morning, and that the landlord could find us a first-rate reliable guide. Three-quarters of an hour brought us to Sare, where we stopped at the door of a large old farm house, and were received by a fat, jolly-looking Basque woman, who assured us that she could put us up well, and that as for a guide, her own husband should attend us at any hour in the morning, but that it was a good two hours' walk to the *palombière*. How pleased we were that we had come on to Sare instead of sleeping at St. Pée! At about half-past six next morning, in answer to a shout from the chief, some dozen or fifteen boys emerged from the house and its vicinity, each armed with a big white flag on a pole about five feet long; having received some instructions, they disappeared in different directions in the woods. After an interval of a few minutes the chief summoned his men and we all proceeded to the scene of action, it being now grey dawn. After ascending about one hundred yards from the house, we found ourselves on the ridge of a spur of the Pyrenees, running east and west, and about two thousand feet above the level of the sea. I will now endeavour to describe the general arrangements, premising that I am standing on the top of the ridge and facing to the north. In front and below are spread the valleys of the Nivelles, Nive, and Adour, with several villages dimly visible in the uncertain light. On the right and left fronts are chains of comparatively low hills, which converge towards where we stand; on the left, about a mile off, is the Rhune, 2953 ft. above the sea; while behind is a deep, thickly-wooded valley towards Spain. The ridge is more or less level for some two hundred and fifty yards, which space has been cleared of all wood with the exception of six huge oaks standing in line, but rises abruptly from the level to the eastward. At the height of about 40 ft. in each oak was fixed a spar from which depended a rope, with the lower end pegged to the ground and carrying a wooden travelling ring weighted with iron. Each spar also had a block and halyards, the standing part of the latter being fast to the wooden ring. The nets, $1\frac{3}{4}$ in. mesh and about fifty feet broad, have their upper corners hooked on to two of the wooden rings, and are thus hoisted into position; the lower ends are drawn backwards, *i.e.* southwards, for about thirty feet and pegged down; the

two halyards of each net are hooked to a single trigger, and all is then ready. The above preparations having been completed to the chief's satisfaction, he pointed out to us the spots where the flag boys were posted to the distance of nearly a mile on either side along the converging hills, and then proceeded to ascend to his post in a very tall beach on the rising ground to the right, and about fifty yards to the northward. Just below the ridge to the south, and almost in line with the nets, were some small huts only high enough to creep into, covered with bracken and intended for hiding places. While we stood about chatting and waiting for the Pigeons, we were warned that we must only shoot at such Pigeons as turned back from the net, and to the westward, the latter caution being given in the interest of the chief in the tree. At a quarter-past seven we began to hear the cries of the flagboys in the distance announcing that the first of the birds were in sight, and the fears we had entertained of a possibly blank day were dispelled. In a couple of minutes a shrill whistle from the chief was the signal for everyone to rush into hiding. A few seconds of breathless suspense, and the silence was broken by a roar such as I have only heard equalled by a chorus of howling monkeys in the depths of a Paraguayan forest. Before we could realize what was the matter, there was a rushing sound overhead and a simultaneous collapse of the four nets (one was out of order) with seventeen grand blue-rocks fluttering on the ground underneath them. I admit that it was not perhaps sport, but it certainly was most exciting. The net men rushed out and retrieved them. Each bird as it was gathered was plucked of the feathers of one wing, and put into the front pocket of a sort of apron the net men wore, and eventually transferred to a receptacle formed of boughs built round the trunk of a tree. As soon as the last bird was gathered the nets were smartly hoisted again, as the shouts of the flagboys were already heard. In a few minutes, another whistle and another rushing of wings, but, instead of the rattle of the falling nets, there ensued a perfect hurricane of the most awful Basque oaths from the nest in the beech tree, proclaiming to the initiated that the Pigeons had passed over the nets and gone on their way untouched. And so the game went on, with varying success, until at half-past eight six dozen and a half of birds had been netted, and we were obliged to leave. We found that shooting was impossible without interfering with the legitimate business, and only fired one shot, scoring a miss. The Pigeons were first sighted by the extended flagboys, who, by waving their flags, confine the birds to the valley, and force them in the direction of the nets. As they approach, the chief shows himself in his nest, utters the roar I have mentioned, and throws out a wooden disk about six inches in diameter; this the Pigeons take for a Hawk, and, swooping to avoid it, plunge into the nets. One of the lessees of the establishment, M. Goyèche, was on the ground on

the morning of our visit, and gave us the following particulars. The right to net Pigeons on this ridge is rented from the Commune of Sare by twelve partners. Each partner provides a flagboy, who is paid forty francs for the forty days. The passage is supposed to last, say, from Michaelmas to Martinmas Day. These boys have to obey the chief, and each has to carry home his master's share of Pigeons at the end of the day. There are five net men and the chief, among whom and the twelve partners the day's catch is equally divided. The net men receive no pay. M. Goyèche said " We spend a little money on the sport, but we amuse ourselves, and we have the Pigeons to eat all the year round. The average catch is about two hundred and thirty dozen, though three hundred and sixty dozen has been reached. On one occasion one hundred and twenty-four birds were taken in a single net at one flight, each of the other four nets taking a few. There are about ten of these *palombières* to the eastward as far as Luchon, and one to the westward, about a mile, at Echalar; in the latter case the nets are in Spain, while the chief and the flagboys are on French ground, and pay, therefore, to the nets we visited a tribute of two dozen Pigeons yearly. There is no other spot in the Commune of Sare adapted for placing nets, though several have been tried, the desideratum being a level ridge with a rising ground to the east.—*The Field*.

Scarcity of Greenfinches in Cumberland.—I have read with interest Mr. Gurney's note on the abundance of the Greenfinch during the past winter in the South and East of England. It is correlative to a scarcity of the species in the North—at all events in North Cumberland. I do not think I have seen half a dozen this winter, and my friend Mr. Senhouse considers that this species entirely withdraws from his district before winter. The number netted by London birdcatchers in autumn, when most birds are on flight, often far exceeds the demand, and I have seen the dealers thankful to sell them retail at a penny each.—H. A. MACPHERSON (Carlisle).

Suggestions for Egg Collectors.—As the season is approaching when the egg collector will be once more able to add to his collection, I would like to call attention to a method of egg-blowing that I happened to hit on in 1882, and which I used with perfect success last year. Any one who has been in the habit of blowing eggs in the usual way, either with the lips direct or through the medium of the blowpipe, will know the great difficulty there is in regulating the force with which one blows. This is especially the case in eggs in which incubation has just commenced: directly you begin to blow the albumen of the egg generally begins to flow pretty freely. Encouraged by the result you keep on blowing, but suddenly either the yolk-sac or the thickened yolk itself stops the flow of the contents, and bang goes your egg-shell. I know the number of accidents that occur to *expert* egg-blowers is small, but that they do occur occasionally I think even

the past masters of the art will admit. Now, to remedy this I use a glass tube with one end drawn to a point and the other connected with a small india-rubber ball (I always use the instrument supplied with a stylographic den for refilling). If the point be inserted into the egg to be blown, after the hole has been drilled, and the ball gently pressed with the finger and thumb, the contents of the egg will begin to be evacuated; the air-pressure can be regulated to the greatest nicety with very little practice. Sometimes it seems to answer better to reverse the action of the instrument by expelling the air from the bulb and then inserting the pointed end; on the pressure being removed the egg-contents are either drawn up into the tube or if there seems to be anything stopping their being sucked up, if the tube be cautiously withdrawn, the cause of the obstruction may be drawn to the hole in the egg, still being held to the point of the instrument by the suction, and may then be caught by the forceps and dealt with in the usual way. After the contents of the egg have been evacuated, the instrument can be used as a syringe to thoroughly wash out the interior. Should any of the readers of 'The Zoologist' employ this method of egg-blowing, I should be very pleased to hear of its success in their hands. — HERBERT LANGTON (115, Queen's Road, Brighton).

A New Heronry in Suffolk. — Early last year a party of Herons were seen frequenting Lord Waveney's estate at Flixton. Care was taken not to disturb them, and they took up nesting-quarters in a grove of large oaks near the Hall. Six nests were built here, and one more in a neighbouring wood. In the same grove there has been for many years a large rookery. For some time after the Herons appeared quarrels took place, and the newcomers were seen chased by the Rooks, but the differences seem eventually to have been settled. This year there are at present (March 20th) three Herons' nests in the oak grove, while the Rooks' nests in the vicinity of the Herons' trees are untenanted. The keeper tells me that, until last year, no Herons had reared young at Flixton; but as they will be sure of protection there, and the River Waveney, within two miles, will give them a good food supply, it is to be hoped they will permanently establish themselves in the park, and another name will be added to the list of Suffolk heronries.— C. CANDLER (Harleston, Norfolk).

Late Stay in Autumn of the Green Sandpiper. — The Green Sandpiper, which was much more common than usual in North Oxon during the past autumn, made a rather late stay with us. On November 8th I watched a party of five on the mud at Clattercutt Reservoir; and on the 19th a female example was picked up under the telegraph-wires at Somerton, and came into my possession the next day. The stomach of this bird only contained a few wing-cases and other remains of minute beetles; it was, however, in very good condition, the musky odour not particularly strong. On

the 22nd I saw another bird at the Reservoir; and lastly, Mr. W. W. Fowler wrote me word that he had seen two in the Evenlode, near Kingham, on December 24th.—OLIVER V. APLIN (Great Bourton, near Banbury).

Note on the Snow Bunting. — Mr. Henry Williams, principal light-keeper on Aranmore Island, off N.W. Donegal, has sent me two Snow Buntings in plumage which are worth noting. They were shot in the first week in May, 1883, and are almost in full summer attire. I forwarded the most advanced specimen to Prof. Newton, and he observes that the bill is not absolutely black; and that some feathers on the rump have not shed their fringes, and that therefore it cannot be said to be in *full* summer attire; but he adds, "I am sure I have seen Snow Buntings breeding in a far less advanced condition." Mr. Williams is well acquainted with the species in its ordinary winter dress, but did not recognise these as Snow Buntings at all; and entered them in his schedule as "Lapland Buntings," adding that the oldest person on Aranmore had never seen the species before. At the time I was not aware the skins had been preserved; and the Lapland Bunting not being known as an Irish species, Mr. More and I added a note to the effect that it was probably some state of plumage of the Snow Bunting (see 'Report on Migration of Birds,' 1883, p. 101). On April 27th, 1883, another Snow Bunting shot, but Mr. Williams observes that it was "one of the common birds" which remained on the island during the winter. The so-called "Lapland Buntings" arrived after these had departed. The first week in May is the latest date recorded in Ireland for this species, and it is early for the summer plumage to be so far advanced (but see Newton's 'Yarrell,' vol. ii., p. 12, footnote). Prof. Newton remarks in his letter to me that if the birds have been "wintering well," the summer plumage is likely to appear early. This is entirely borne out by the condition of the best specimen from Aranmore—a large quantity of fat still adheres to the skin, and our best taxidermist states that it will be impossible to mount it for this reason. Mr. Williams has entered a Snow Bunting on August 18th, 1883, which he states was in winter plumage, and appeared wounded.—RICHARD M. BARRINGTON (Fassaroe, Bray, Co. Wicklow).

The Glaucous Gull in Skye. — When rowing across Dunvegan Loch, on April 10th, I was pleased to detect a single example of *Larus glaucus* in a mob of *L. argentatus* gathered round the 'Assistance.' I attempted to stalk it in shore on the 11th, but unsuccessfully, though my keeper shot it later in the day. To the naked eye it appeared to be altogether of a creamy white, but my glasses showed clearly the mottled wing-coverts. Judging from Saxby's observations, the date is a late one; but the weather had been cold, and the wind easterly. I may add that the iris of this bird, which I believe to be approaching adult plumage (*i. e.*, in the following

winter), was dark brown. The legs and toes were flesh-coloured, but much whiter than those of an example of *L. argentatus* which I shot for comparison. The claws of *L. glaucus* are much stronger than those of *L. argentatus*. My friend Capt. Macdonald has shot examples of *Larus glaucus* in Skye, but only in mid-winter; and I fancy it is only a straggler to Skye from the Outer Hebrides.—H. A. MACPHERSON (Carlisle).

The estimated Speed of American Wildfowl.—In his instructive book entitled ‘Fifty Years with the Gun and Rod,’ Mr. D. W. Cross estimates the speed of various species of wildfowl as follows:—Mallard, from 45 to 50 miles an hour; Black Duck, from 45 to 50 miles an hour; Pintail, from 50 to 60 miles; Wood Duck, from 55 to 60 miles an hour; Widgeon, 65 to 70 miles an hour; Gadwall, 60 to 70 miles an hour; Red-head, 80 to 90 miles an hour; Wild Geese, 80 to 90 miles an hour; Blue-wing Teal, 80 to 100 miles an hour; Broadbill, 85 to 110 miles an hour; Canvass-back, 85 to 120 miles an hour. Allowing an initial velocity of 1800 to 2000 feet per second for small shot, the sportsman can by a slight mathematical calculation learn the proper distance to “hold ahead” in shooting at ducks on the wing.

FISHES.

Early Arrival of Mullet on the Coast of Cornwall.—On March 28th I received from Prussia Cove, Mount’s Bay, two Red Mullet, *M. surmuletus*, taken in a trammel on 26th inst. I have recorded much larger specimens; but these are very early arrivals, and of a size which at this time of the year deserve record. The larger one weighed one pound eight ounces, and measured over all one foot two inches. The lesser one weighed one pound six ounces, and measured over all—the same as the larger—one foot two inches.—THOMAS CORNISH (Penzance).

CRUSTACEA.

Loss of Limbs in Stalk-eyed Crustacea.—Mr. E. Lovett’s notes on the habits, &c., of the Lobster have been read with much interest; but being somewhat sceptical as to some of the alleged facts related in the March number of ‘The Zoologist’ (p. 103) as to Lobsters “shooting” their claws through fear, I sought information from an old and well-known fisherman, who has probably caught as many Lobsters and Crabs as any man living, having done nothing else for sixty years. On being questioned as to the stated fact of the Lobster parting with its claws through fear, he said he had never known an instance, nor had he ever heard of one, though Lobsters occasionally, in struggling to escape when laid hold of at the mouth of the pot, leave a claw in the fisherman’s hand. Crabs sometimes lose a claw when endeavouring to force their way among the rocks. As to the healing of injured limbs, my informant says that both the Lobster and

Crab die—"bleed to death"—if the claws are broken or the leg disjointed, except near the body, *i. e.*, at the first joint from it. He was amused at the idea of thunder causing the Lobster to lose its claws, or noises of any kind! Moreover, we have yet to learn that in the tropics, where thunderstorms are more frequent than in this country, the Stalk-eyed Crustacea are more often found clawless!—H. W. HADFIELD (High Cliff, Ventnor).

INSECTS.

Injurious Insects.—Miss E. A. Ormerod's 'Report of Observations of Injurious Insects and Common Farm Pests during the Year 1884' embodies the remarks of numerous observers in the United Kingdom on insects injurious to farm and garden crops, and the extent of their depredations, with suggestions for prevention and remedy. The plan of the Report is alphabetical, arranged according to the name of the plant attacked, as, for instance, the apple, beans, birds (with especial reference to the depredations of sparrows), cabbage, carrot, &c. In the matter of sparrows, Miss Ormerod says: "The injury continues to be widespread and serious, not only with regard to corn, but likewise fruit-farming districts and garden crops." Her numerous correspondents all agree that sparrows will not feed on insects when seeds, grain, fruit, and other vegetable food is within reach, and that, consequently, their numbers must be kept down if any farm or garden crops are to be harvested. Miss Ormerod is careful to point out that in advocating a judicious destruction of the House Sparrow, other small birds are not included. The Report is published by Messrs. Simpkin, Marshall & Co.

ARCHÆOLOGY.

A shoal of Porpoises in the Thames.—In the 'Gentleman's Magazine and Historical Chronicle' for 1747 (vol. xvii), it is recorded that on Monday, the 20th July of that year, "Above 20 large porpusses came up with the tide almost to London Bridge, and after continuing near an hour playing on the water return'd in a body."—OLIVER V. APLIN (Great Bourton, near Banbury).

SCIENTIFIC SOCIETIES.

ZOOLOGICAL SOCIETY OF LONDON.

March 17, 1885.—Prof. W. H. FLOWER, 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 Viverrine Phalanger, *Phalangista viverrina*, from Australia, new to the collection; to an Isabelline Lynx, *Felis isabellina*, received in exchange

from the Zoological Gardens, Calcutta; and to two Brown Pelicans, *Pelecanus fuscus*, as being of special interest. Attention was also drawn to a fine living example of a Bird-Spider, *Mygale fasciata*, from Burmah, presented to the Society by Mr. H. R. P. Carter.

Mr. Sclater exhibited and made remarks on a Duck shot on Lord Bolton's estate in Yorkshire, which appeared to be a singular variety of the Scaup, *Fuligula marila*.

Mr. W. B. Tegetmeier exhibited and made remarks on a pair of abnormal Deer's antlers obtained in India.

Prof. F. Jeffrey Bell exhibited some living and dead specimens of two species of phytophagous Coleoptera from Bombay, to show the remarkable loss of colour that takes place after death.

Dr. F. H. H. Guillemard read a paper on the Ornithology of the Sulu Archipelago, showing that the *ornis* of that group is purely Philippine, and that the line of separation between the latter Archipelago and Borneo lies between the islands of Sibitu and Tawi-tawi. Dr. Guillemard added fifty species to the list of birds hitherto known from Sulu, two of which were new to Science.

A communication was read from Mr. T. Kirsch, of the Royal Zoological Museum, Dresden, containing descriptions of some new Butterflies obtained by the collectors of Mr. Riedel in Timor-Laut.

A communication was read from Prof. W. Nation, containing some notes on the Peruvian Cliff-Swallow, *Petrochelidon ruficollis*.

A communication was read from the Rev. H. S. Gorham, containing a revision of the phytophagous Coleoptera of the Japanese Fauna, of the subfamilies *Cassidinæ* and *Hispinæ*.

A communication was read from Lieut.-Col. C. Swinhoe, being the second of his series of papers on the Lepidoptera of Bombay and the Deccan. The present paper treated of the first portion of the Heterocera.

Dr. Hans Gadow gave an account of the anatomical differences observed during an examination of examples of the three species of Rhea, *R. americana*, *macrorhyncha*, and *Darwini*.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

March 4, 1885.—R. M'LACHLAN, Esq., F.R.S., &c., President, in the chair.

William E. Poole, Esq. (11, Chandos Street, Cavendish Square, W.), Richard South, Esq. (12, Abbey Gardens, St. John's Wood, N.W.), Robert Wylie Lloyd, Esq. (32, Grafton Square, Clapham Common), and Arthur Bliss, Esq. (Pennennis, Allenby Road, Forest Hill), were balloted for and elected Members of the Society.

Mr. G. H. Verrall alluded to the probable use that might be made of micro-photography in illustrating the neuration of transparent winged insects; and exhibited many prints and negatives illustrating the wings of *Scatopse*, *Tipula*, and other Diptera.

Mr. T. R. Billups exhibited specimens of *Ceraleptus lividus*, Stein., captured at Chobham on the 23rd February last.

Rev. W. W. Fowler exhibited the unique specimen of *Cerylon atratum* from Hungary, which had been lent to him by Herr Reitter; also specimens of an Indian *Cassida*, which had been soaked in a preparation to preserve their brightness of colour.

Dr. Sharp said the last exhibit raised the curious question, On what does the colouring matter of the *Cassida* depend? The application of glycerine under the wing-cases of certain Coleoptera maintained the bright colour for a short time, and moisture probably had something to do with colour, as he had often revived lost colours by soaking specimens in water for a day or two.

Mr. Fowler also exhibited a microscopic movable stage of ingenious construction and efficient application, made by Messrs. Smith and Beck.

Mr. W. F. Kirby exhibited, on behalf of Mr. Waterhouse, a beautiful variety of *Spilosoma lubricipeda*, Esp., recently captured by a policeman in the British Museum (Natural History), South Kensington.

The Secretary then read a paper, by Mr. A. G. Butler, entitled "A few Observations touching Mr. De Nicéville's recent Suggestions on Seasonal Dimorphism in the Lepidoptera."

Rev. T. A. Marshall contributed Part I. of a "Monograph of British Braconidæ."

Rev. W. W. Fowler read "Descriptions of new species of *Languriidæ*."

Mr. R. M'Lachlan read a note "On the discovery of a species of the Neuropterous family *Nemopteridæ* in South America, including general considerations regarding the family."

April 1, 1885.—R. M'LACHLAN, Esq., F.R.S., &c., President, in the chair.

Hastings Charles Dent, Esq., F.L.S., C.E., &c. (20, Thurloe Square, S.W.), and Ernest Sabel, Esq., F.R.G.S., F.Z.S., &c. (6, Grove Road, Clapham Park, S.W.), were balloted for and elected Members of the Society.

Mr. T. R. Billups exhibited specimens of *Pezomachus immaturus*, Först., and *P. vulnerans*, Först., species new to Britain, captured at Headley Lane on January 3rd last.

Mr. E. A. Fitch exhibited a large moth, belonging to Mr. W. H. Harwood, which was captured by Dr. Wallace on the wall of his garden at Colchester, in October, 1883. It apparently was one of the *Chilonidæ*, and

a new species coming nearest to *Erupa (?) titanalis*, Felder and Rogenhofer, Reise d. Nov., pl. cxxxvii, fig. 4.

Mr. R. M. Christy, who was present as a visitor, read the following note:—

“As requested by my friend Mr. Wm. Cole, I wish to bring under your notice what I think will be regarded as a remarkably obvious case of naturally protective colouring. I was in America in the autumn of 1883, and on the 26th August, near Carberry, Manitoba, I found a large larva feeding ravenously on the leaves of a small bush (*Eleagnus argentea*), which is common on many of the drier parts of the prairies of the Canadian North-West. A short search brought to light quite a number of others, all feeding on the leaves of the same bush. These I carefully kept, and in due time they entered upon the pupa stage, enclosing themselves in hard brown pear-shaped cocoons open at one end. Unfortunately, however, the mature insects emerged last spring (1884), while I was again away in America, with the result that I am now only able to exhibit two very dilapidated—instead of two very handsome—specimens of that local form or subspecies of *Platysamia columbia* which is peculiar to the prairies of the Canadian North-West, and which has very recently been named *Platysamia columbia uokomia* by my friend Mr. Brodie, of Toronto, in accordance with the trinomial system of nomenclature so general across the Atlantic.

“I have brought up for exhibition specimens of *Eleagnus argentea*. It will be observed that the leaves are of a very peculiar pale silvery green colour, quite unlike that of the leaves of most other shrubs. I have also brought for exhibition a coloured drawing of the full-grown larva of the insect, made by my friend Mr. E. E. T. Seton, of Toronto. It is observable that the colour of the larva exactly corresponds during life with that of the leaves of the food-plant; and, as these themselves are of an unusual colour, I think it may be regarded as an obvious case of naturally protective colouring.” A description of the larva followed.

Mr. Christy also exhibited a twig of *Betula glandulosa*, and made the following remarks thereon:—

“On the 7th August, 1883, as I was crossing a very extensive swamp, covered with trees of spruce and tamarac, and lying on the banks of Pine Creek, Manitoba, I observed a butterfly, either belonging to, or closely allied to, *Papilio asterias*, fluttering over the bushes, evidently in search of flowers. As I watched it, it settled momentarily, and exactly as if it had mistaken it for a yellow flower, on a twig of *Betula glandulosa*, Mich., bearing withered leaves of a light yellow colour. This identical twig I now exhibit. There were other similar twigs on the same bush. Of course I am perfectly well aware that it is impossible to say for certain that the insect mistook the leaves for a yellow flower; but it certainly settled upon them in such a manner as to leave little doubt on my own mind that they did so.”

Mr. J. W. Dunning called attention to a "Note on a peculiar sense-organ in *Scutigera coleoptrata*," one of the Myriapoda, by Mr. F. G. Heathcote (Proc. Camb. Phil. Soc., v. 219). The organ is situated on the ventral surface of the head at a short distance from the mouth, near the base of the mandibles; and the author believes it to be homologous with the tympanic organ of insects, and to belong to the class of organs usually described as auditory.—E. A. FITCH, *Hon. Sec.*

NOTICES OF NEW BOOKS.

Catalogue of the Lizards in the British Museum (Natural History).
Second Edition. By G. A. BOULENGER. Vol. I. 8vo,
pp. 436, with 32 Plates. Printed by order of the Trustees.
1885.

THE first edition of the Catalogue of Lizards in the National Collection was prepared by Dr. J. E. Gray so long ago as 1845. At that date the number of specimens in the Museum did not exceed one-eighth of their present number; consequently a new edition has been for some time a desideratum, not only as a guide to the collection, but as a much-needed text-book for students. For it should be remembered that, although nominally a catalogue, it is not a mere list of names, but contains the synonymy with detailed descriptions and measurements of every species included in it, an indication of the habitat of each, and the localities where the Museum specimens have been obtained. As upon a moderate estimate the order *Lacertilia* comprises some 1700 species varying considerably in form and structure, the preparation of such a catalogue is evidently no slight undertaking. In the volume before us we have the first of three instalments, extending to 436 pages, with 32 plates, upon which 112 species are figured either entire or in part.

To understand the classification adopted by Mr. Boulenger, the reader should refer to his "Synopsis of the Families of Existing *Lacertilia*," published in the 'Annals and Magazine of Natural History' for August, 1884. Here it will be seen that Mr. Boulenger considers the classifications proposed by Dumeril and Bibron, and Gray (which with slight modifications are still generally in use) to be as unnatural as can be; for he believes

physiognomy to be useless as a guide in the formation of higher groups, and the characters afforded by the scales deceptive and unreliable, unless considered in relation with other characters. He prefers, like Prof. Cope, to lay more stress on osteological characters, and on the structure of the tongue. He attaches special importance also to the presence or absence, and the structure of dermal ossifications on the head and body, which are found to correspond with many other characters.

He divides the order *Lacertilia*, then, into two primary groups, the Chameleons on the one hand, and all the other Lizards on the other. The Amphisbænians, which by nearly all recent authors are separated as a suborder, or even as an order, he includes among the true Lizards, and regards them as a degraded type of the *Teiidæ*, with which they are to some extent connected by the *Chalcides* and their allies.

Leaving the Chameleons to be dealt with last, he commences with the true Lizards (*Lacertilia Vera*), which suborder he divides into twenty families, regarded as perfectly natural groups. Of these twenty families the volume before us deals with five only, the greater portion of this instalment being occupied with the Geckos and their allies, which are represented in all the warmer parts of the globe, but are most numerous in the Indian and Australian regions.

The habits of the Geckos, says Mr. Boulenger, are highly interesting, and deserve special attention, since few observations have been made on them. Some inhabit arid regions, sometimes burrowing in the sand; others are arboreal, living on shrubs or in woods, concealing themselves under stones or under the bark of trees during the daytime; others live on rocks; others have become the commensals of man, and they again may be divided into two groups—those living inside, those living outside houses. Most are nocturnal, but some are diurnal. Col. Tytler, in a very interesting paper on the habits of Geckos, observes that, "Although several species of Geckos may inhabit the same locality, yet, as a general rule, they keep separate and aloof from each other; for instance, in a house the dark cellars may be the resort of one species, the roof of another, and crevices in the walls may be exclusively occupied by a third species. However, at night they issue forth in quest of insects, and may be found mixed up together in the same spot; but on the slightest

disturbance, or when they have done feeding, they return hurriedly to their particular hiding-places."

Many Geckos utter sounds, probably produced chiefly by a movement of the tongue against the palate, and in which "yecko," "chucko," "tockee," or something similar, is distinctly audible. Sir Andrew Smith says that a South African Sand-Gecko (*Ptenopus garrulus*) utters during the day a sharp sound somewhat like "chick, chick"; and he adds that the number thus occupied is at times so great, and the noise so disagreeable, as to cause the traveller to change his quarters.

The plates with which this volume is illustrated have been carefully drawn by Messrs. Mintern and Smit, under the supervision of Dr. Günther, from whose preface we learn that this Catalogue may be expected to be completed in the course of next year, the manuscript of the second volume being far advanced.

Recollections of Fly Fishing for Salmon, Trout, and Grayling, with Notes on their Haunts, Habits, and History. By EDWARD HAMILTON, M.D., F.L.S. Post 8vo, pp. 190. London: Sampson Low, Marston & Co.

Few persons enjoy better opportunities of studying Natural History than fishermen. The natural retirement of the haunts they prefer, the quietude which attends their avocation, the stealthiness, so to say, of their movements, all tend to facilitate the uninterrupted observation of Nature in her workings, and heighten the enjoyment of a day's sport. The beautiful and romantic scenery also through which many trout and salmon rivers flow increases the charm and delight of fishing them.

It seems therefore quite natural that one who has been a fisherman all his life, and attentive to Nature's teaching, should sit down to place on record some of the many lessons he has learnt while following his favourite pursuit.

In Dr. Hamilton's lately published 'Recollections of Fly Fishing' we have a very agreeable book of this kind, and although many such volumes have appeared, it cannot be said that this is a superfluous addition to the literature of Fishing. On the contrary, it strikes us that there is much that is fresh and original in his book, and if the subjects discussed therein are not always

new, the facts bearing upon them which have been collected by the author in many places seem to throw a new light upon the questions at issue.

Four of the chapters deal with the Natural History of the Salmon, Trout, Sea Trout, and Grayling; the remaining chapters contain directions when, where, and how to fish for all these in turns, with many entertaining reminiscences of good and bad days' sport enjoyed by the author, and an attempted explanation of the causes which he supposed contributed to his success or the want of it.

At p. 168 Dr. Hamilton discusses the subject of variation in the colour of Trout, and how produced:—"Some with dark backs, silver sides, and black spots: others, splendid fellows, with yellow sides, and red spots predominating."

It has been noted, he says (p. 169), that in the swift-running streams over gravelly beds the fish for the most part have red spots and yellow flesh—perhaps owing to the greater exposure to light; in the deeper rivers and more sluggish streams Trout are more black-spotted.

After examining the opinions of previous writers on this subject, Dr. Hamilton concludes (p. 173):—"Taking all the various causes for change of colour in the Common Trout, I can only come to the conclusion that there is only one species of the *Salmo fario* in Great Britain, and that the so-called species of Couch and other authors are only varieties of this fish."

The Grayling appears to have received its name *thymallus* from the odour of the fish when first taken out of the water. "Some people," says our author, "are unable to distinguish this peculiar smell, but it is unmistakable. I have caught hundreds of Grayling, and have never found it absent in any fish over half a pound. But it is more like the smell of cucumber than thyme much the same as that which emanates from the Smelt."

Three peculiarities of this fish strike the observer at once—the triangular pupil of the eye, the large beautiful violet-coloured spotted dorsal fin, and the two longitudinal orange-coloured stripes extending from each pectoral fin. The name Grayling is said to be a corruption of "gray lines," from the longitudinal lines along the body. It is called "Oumer" in Northumberland, and the smaller fish prior to breeding are known on the Teme as "Shutts" or "Spots." Salviani says the name *Umbra* is derived

from the fish being a very swift swimmer; it disappears like a shadow—

“The smooth-scaled *Umbra* as it passes by,
Flits as a shadow o'er the gazer's eye.”

With an account of this fish the book closes; but we must not omit to notice the capital mezzotint of a Salmon-pool, engraved by Mr. Seymour Haden as a frontispiece to the volume, nor the many pretty woodcuts from sketches made by the author during some of his fishing expeditions.

A Highland Gathering. By E. LENNOX PEEL. With illustrations by CHARLES WHYMPER. Post 8vo, pp. 185. Longmans, Green & Co. 1885.

DESPITE the Shakespearian dictum, “What's in a name?” experience tells us that in selecting a title for a book a great deal may depend upon the name which is bestowed. Mr. Lennox Peel's title is not a happy one, for it conveys to the reader's mind no adequate idea of the nature of the contents. Before opening it we supposed it to be a novel, in which we expected to find a more or less dramatic description of “the gathering of the clans,” with descriptions of Scottish life and scenery. We have been agreeably surprised to find that it is nothing of the kind, but embodies some of the highland experiences of an enthusiastic sportsman, in whose narrative incidents of sport and Natural History are pleasantly mingled.

Deer-stalking, salmon-fishing, ptarmigan-shooting, and other kindred occupations which tend to make life pass so agreeably in the Highlands are all described in turn, and the reader is often reminded, by the truthfulness of the descriptions, of similar turns of good or ill fortune within his own experience.

Some thirty illustrations from the facile pencil of Mr. Charles Whymper, many of them capitally drawn, appeal almost as much to the sympathies of the naturalist as to those of the sportsman. Deer crossing a hill, “black and gaunt against the drifted snow” (p. 177), and Ptarmigan on the wing (p. 180) may be especially noted as sketches in which the artist has happily caught the true expression of motion in these “children of the mist.”



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ON THE RANGE OF THE DORMOUSE IN ENGLAND AND WALES.

BY G. T. ROPE.

IN the following pages an attempt has been made to arrange the numerous notes relating to this subject, which appeared at intervals in the Natural History columns of 'The Field' last year, in a more compact form, and one more convenient for reference; in addition to which I have been enabled, through the kindness of several well-known naturalists, resident in various parts of England and Wales, to add the result of their valuable observations, obligingly communicated by letter.

The Dormouse being, from the nature of its food and habits, essentially a dweller in woods, thickets, and plantations, is consequently most numerous in well-wooded districts, its comparative abundance or scarcity being regulated perhaps as much by the character of the country in this respect as by climatic influences. A marked scarcity of this little rodent is observable in the two most easterly counties of England, *viz.*, Norfolk and Suffolk, and apparently the same may be said of a great part of Lincolnshire, its presence having been detected, as far as I am aware, only in a few isolated spots. This it seems hard to account for, unless occasioned by the cold and cutting east winds to which that part of the country is exposed. Yet the occurrence of the species much further north, as in East Yorkshire and Durham, seems to refute that supposition; possibly a thorough search in likely-looking spots might, in some cases, reveal the hitherto unsuspected presence of this shy and

retiring little creature. The large area occupied by the "fen country" would, it need hardly be observed, be for the most part ill adapted to its habits. As might be supposed, some slight variation has been observed in the habits of dormice, occasioned by the natural features, &c., of the district they inhabit. Beech and oak woods and hazel copses seem to have great attractions for them. Captain Hadfield informed me that in the Isle of Wight their nests were frequently found by a friend in ivy, growing on rocks and the trunks of trees, and also in old ricks. In a letter which appeared in 'The Field' (April 19th, 1884), signed J. B. R., the writer, speaking of the habits of this animal in Oxfordshire, says—"They are found mostly in the vicinity of the parasite 'Old Man's Beard,' with which they line their nests before laying up for the winter. . . . They are fond of daisy seed." The nest of the Dormouse has been found in furze, thorn, and various other bushes, in laurel and other evergreens, in hedges, and even on the ground, two instances of which are given in a letter received from Mr. J. Gatcombe, of Plymouth, the first mentioned nest having been found near Plymouth by a friend of the writer, Mr. T. A. Briggs, the other by Mr. Bignall in Cann Wood, near the same town. Mr. Briggs on one occasion discovered two old dormice in one nest; this, however, appears to be quite an exceptional occurrence.

From the following particulars it may be gathered that this species is distributed in more or less abundance throughout the southern, western, and midland counties, and is found in some parts of Wales, as well as in a few suitable localities in the counties north of Yorkshire.

To begin with the south-western corner of our island, taking CORNWALL as a starting-point from whence to trace the distribution of this species northwards, we find the following editorial note referring to that county, occurring in 'The Field' (May 3rd, 1884):—"Couch in his 'Cornish Fauna,' Bullmore, and Cocks in his 'Fauna of Falmouth,' all testify to this little animal being found in Cornwall, where, in particular localities, it is said to be not uncommon," a statement since confirmed by Mr. Gatcombe.

From DEVONSHIRE there is abundant evidence of its occurrence in many parts of the county. Mr. J. J. Phillips reports it as very common at Morebath, on the borders of Somersetshire. Near the south coast both Mr. D'Urban and Mr. Gatcombe consider it

not uncommon in the woods near Plymouth ; and the Rev. G. C. Green finds it also far from rare about Modbury. Mr. D'Urban mentions its occurrence in the neighbourhood of Axminster. Mr. Gatcombe also states that it is common in some places near Exeter, but that he believes it to be scarcer than it formerly was in South Devon. He says—"Bellamy, in his 'Natural History of South Devon,' speaks of it as 'not uncommon, perhaps commoner than in most counties.'" Mr. J. Brooking Rowe, one of the revisers of Couch's 'Cornish Fauna,' lately told Mr. Gatcombe that he also considered the species to be less frequently met with in the south of the county than in former years. Miss Henchcliff informs me that it occurs about Instow and Westward Ho ; and Mr. A. L. Allen mentions the neighbourhood of Honiton as a locality where he has caught specimens and found the animal fairly common. ('Field,' April 19th, 1884).

Reports from DORSETSHIRE and HAMPSHIRE are very meagre ; perhaps, however, this may arise from the commonness of the species rather than its rarity. Mr. Thos. Ruddy, of Corwen, has received a pair from the neighbourhood of Winchester, and the writer of an anonymous letter in 'The Field' (March 29th, 1884) mentions having found a disused nest near Blandford, in Dorsetshire. As regards the ISLE OF WIGHT, the following editorial note occurs in 'The Field' of May 3rd, 1884 :—"We have the authority of Mr. A. G. More for stating that it (the Dormouse) is common in the Isle of Wight." Captain Hadfield informs me that at the present time it is fairly common throughout the Undercliff, and at Shanklin ; but that owing to building and increase of traffic, it is not so abundant as of yore. He also particularises Lincombe, a place where there is a hazel copse, about two miles from Ventnor, as a favoured locality.

In SUSSEX, KENT, and SURREY the Dormouse appears to be a common and well-known species, numbers being often caught in some districts for sale as pets. The boys at the school attached to the Royal Medical Benevolent College at Epsom used to catch and keep them ; I have known them to occur also at Holmwood, near Dorking, and have frequently seen them advertised for sale from Leapale, near Guildford. Mr. W. Ashby, writing in 'The Field' from Faversham, Kent, says—"The woodmen turn them out of old stumps when cutting wood in the winter."

From GLOUCESTERSHIRE there are no reports, but from its

occurrence in nearly every adjoining county there can be little doubt that the Dormouse is to be found there.

In BERKSHIRE the Rev. H. A. Macpherson informs me that about Reading, according to Mr. Aplin, it is quite common; and in North OXFORDSHIRE he (Mr. Aplin) has had more than one report from good observers of its occurrence. Mr. John Worley, writing in 'The Field,' says "the Dormouse is to be found in the forest of Wychwood, Oxfordshire," and another correspondent, J. B. R., in 'The Field' of April 19th, 1884, writes:—"Dormice are not at all uncommon about Henley-on-Thames. A boy who used to live at Nettlebed (a village five or six miles distant) and come to school every day, has brought in scores. This is no exaggeration."

Mr. J. Fletcher Woods, of Newmarket, writes:—"In 1856 I found several in the parish of Woburn, BEDS, and in that and the following year I took several in the parishes of Great Brickhill and Bow Brickhill, both in BUCKS, whilst only as late as last year (1883) I found one in its nest in the Devil's Ditch, in CAMBRIDGESHIRE, within a mile and three-quarters of Newmarket. They were by no means rare in those parts of Beds and Bucks from whence I got my specimens, during the time named." Mr. F. H. Parrott, of Aylesbury, states (April 19th, 1884) that "Dormice occur in the beech woods on the Chiltern Hills in Buckinghamshire, and are locally known by the name of 'Sleepers.'"

No reports are forthcoming from MIDDLESEX, though this animal has been observed in every adjacent county. It may be as well to state here that this being merely a summary of the evidence published in 'The Field,' supplemented by some additional information supplied by various naturalists, I have consulted no county lists, having in fact no convenience or leisure for doing so; though doubtless, by that means, aided by an examination of local collections, a better idea of the distribution of this interesting little rodent might be attained.

In HERTFORDSHIRE the Rev. H. A. Macpherson informs me that it was very plentiful a few years ago, and in all probability it is so still.

As regards ESSEX, Dr. H. Laver, of Colchester, writes me that the Dormouse is found distributed over nearly the whole of the county, and in some parts very abundantly; but he is not sure that it extends to the Stour, which river apparently forms a

barrier to the range of this animal towards the coast northwards as far as the Wash.

With the exception of a district in the south-western part of the county, and near Ipswich, I can up to the present hear of no single well-authenticated case where the Dormouse has been observed in a wild state in SUFFOLK. An anonymous correspondent of 'The Field' speaks of it as "not uncommon in parts of Suffolk," but unfortunately omits to say in *what* parts. He mentions having lately received one from West Suffolk; and its occurrence at the Devil's Ditch, within less than two miles of Newmarket, as recorded by Mr. Woods, renders the existence of this animal near the confines of Cambridgeshire a thing to be looked for where the country is adapted to its habits. Through the kindness of Dr. Laver I am enabled to indicate one district in the south-west of the county where the Dormouse is found, on the authority of Dr. Bree; who, in a letter to Dr. Laver, dated from Long Melford, says—"The Dormouse is well known about here," and goes on to state that two "sleepers" were quite recently caught by a man while at work in a large wood near Lavenham. Both these places are within a short distance of the Stour. A gamekeeper on the Tendring Hall estate near Nayland, on the Suffolk side of the Stour, in reply to an enquiry from Dr. Laver, stated that he had found very few nests on that estate. Mr. H. Miller, jun., of Ipswich, has on more than one occasion, during entomological excursions, seen the Dormouse "at sugar" at Dodnash and Old Hall woods, in the parish of Bentley, near Ipswich, and once possessed a specimen which was found in its nest near the Gold Road, in the parish of Stoke, Ipswich. He believes it to have been not uncommon in that neighbourhood as recently as twenty years back.

As regards the county of NORFOLK, Mr. Southwell, of Norwich, in a communication to 'The Field' states that though recorded in Paget's list as occurring in that county, twenty years' observation and enquiry among the numerous naturalists distributed throughout Norfolk have not enabled him to confirm that statement. Of late years, however, a colony of dormice has made its appearance in a district situated in the south-east. For this intelligence, together with the following interesting account of its probable origin, I am indebted to Mr. W. M. Crowfoot, of Beccles, who, in a letter dated April 11th, 1884, says—"I find on

inquiry that the Dormouse has been taken during the last few years in the parishes of Gillingham, Geldeston, and Stockton. J. Spencer, the gardener at Geldeston Hall, tells me that he frequently finds them. His master, the late Mr. T. Kerrick, turned off six or seven dormice procured from Surrey about forty years since; but it is now so common that Spencer doubts whether the present mice can all have sprung from those six or seven; and if so the species has now spread to Stockton Wood, a mile and quarter to the north-west of Geldeston Hall; and to Dunburgh, nearly a mile to the south of Geldeston, in both of which places it has been taken."

With the exception of Mr. Wood's account of the finding of a Dormouse in its nest in the Devil's Ditch, there are no reports from CAMBRIDGESHIRE, and the same may be said of HUNTINGDONSHIRE.

The evidence received from NORTHAMPTONSHIRE is also scanty and unsatisfactory, and consists of an anonymous letter to 'The Field,' in which the writer states that he has occasionally seen dormice in the spinneys and hedgerows at the south-western extremity of the county.

Coming next to WARWICKSHIRE, I am informed by the Rev. H. A. Macpherson that Mr. O. V. Aplin has a stuffed specimen caught at Edgehill, while two notes from anonymous contributors to 'The Field' testify to its occurrence in that county, in one of which the writer speaks of having seen and watched one in April, 1883, near Yardley Wood.

As regards WORCESTERSHIRE, in 'The Field' of May 3rd, 1884, the following editorial note appears:—"In Hasting's 'Illustrations of the Natural History of Worcester' the author states (p. 61) that the Dormouse is abundant in most of the woods in that county." Mr. H. Shaw, of Shrewsbury, has also informed me of its occurrence there, as well as in HEREFORDSHIRE; and an anonymous letter in 'The Field' confirms the statement as regards the latter county.

In SHROPSHIRE Mr. Shaw tells me it is far from rare, and he frequently has specimens brought him. He states that it is found too in the adjoining county of STAFFORDSHIRE, as also appears from the following note by Mr. J. R. B. Masefield (Abbots Haye, Cheadle), which lately appeared in 'The Field':—"I recently had occasion to make enquiries as to its occurrence

in North Staffordshire, where it is no doubt commonly to be found in most of our woods. In January last an intelligent woodman informed me that he had frequently seen and caught dormice in the woods around here, and to prove his words he brought me a living specimen a few days afterwards; . . . another living specimen I saw last year, also caught in this immediate neighbourhood. I have also received reliable evidence as to the frequent occurrence of the Dormouse in other parts of the county."

Mr. W. Ashby, in a note published in 'The Field,' mentions having found dormice on the borders of LEICESTERSHIRE and WARWICKSHIRE, which is the only evidence I am able to adduce of their existence in the former county.

From DERBYSHIRE there are no reports whatsoever.

As to NOTTINGHAMSHIRE, Mr. J. Whitaker, of Rainworth Lodge, near Mansfield, writes me that notwithstanding numerous inquiries he can only hear of its existence in one locality (a wood near Worksop), where there are two colonies.

From RUTLANDSHIRE no information has been received.

Mr. Cordeaux informs me that he has never met with the Dormouse in any part of LINCOLNSHIRE, nor has he any note of its occurrence within the bounds of that county, but thinks it quite possible there may be localities where it is to be found, which appears to be the case in the south-west, as shown by the following extract from a note by Mr. H. Rudkin, of Old Trafford ('Field,' May 24th, 1884):—"I believe it is to be met with in most of the woods of South Lincolnshire, or at least those between Grantham and Bourn. About the year 1868 I saw one in a labourer's cottage, which the man had found in a torpid state among the sale lots in Ripsley Rise Wood. . . . Some years after I saw in the possession of the same man another, which he had obtained while working in the woods, but I forget the exact locality, although it must have been within a few miles of the spot where he found the other."

Mr. Shaw, of Shrewsbury, writes me that the Dormouse is found in CHESHIRE.

The only evidence received relating to its occurrence in LANCASHIRE is comprised in a note by Mr. J. P. Thomasson in 'The Field,' who says—"Some fifteen or twenty years ago I found some nests of the Dormouse on the banks of the River

Hodder, dividing Lancashire from Yorkshire, and saw the owner." One of these nests is stated to have been built in a scraggy furze-bush.

The range of the Dormouse in YORKSHIRE, taken in hand by Mr. W. Denison Roebuck, has been more carefully and completely worked out than is probably the case with any other county. The result of his researches, as published in 'The Field,' is as follows:—" . . . Taking the records geographically, we will begin with Cleveland, a district which it has been known to inhabit since 1808, in which year it was enumerated in the catalogue of Cleveland animals, which was printed as an appendix to Graves' 'History of Cleveland.' Coming now to the manuscript information, I find that Mr. George Page considered it rather scarce near Guisborough, Mr. T. H. Nelson that it was not numerous near Redcar, and Mr. Robert Lofthouse, of Middlesborough, stated that in the spring of 1881 he met with it near Pinchinthorpe. Mr. James Carter, when staying at Saltburn-by-the-Sea some years ago, saw a specimen which had been taken near Lofthouse-in-Cleveland. Mr. George Abbey only saw a single specimen during the time that he resided at Grinkle Park, near Lofthouse, of which place he was a native; it ran out of its nest, which was situated in a thorn-bush about a yard from the ground. There are specimens in the Whitby Museum which have been taken in the district, but Mr. Thomas Stephenson does not consider it a common species there. A few are found at Glaisdale in Upper Eskdale, according to Mr. William Lister, of that place—a statement which is corroborated by Mr. John Braim, of Pickering. Mr. R. Clarke, of the last-named place, has been shown several specimens taken in woods above Pickering, though he had found none himself. Passing now to the beautifully wooded upper vale of the Yorkshire Derwent, I find that Mr. William Scoby reported it as frequently met with about Helmsley, Kirby Moorside, and Pickering, while Mr. James Brigham, of Slingsby, stated that, although it is sometimes found with its nest in the woods about that place, the captures are rather unusual, and he did not think there were many in the district. Mr. Walter Stamper regarded it as not common about Nunnington, and Mr. Peter Inchbald has found it at Hovingham. On April 21st, 1871, the latter gentleman recorded one found asleep in its 'drey'; this was formed of dry grasses, chiefly

Holcus lanatus, and a little wool. For the East Riding of Yorkshire the only record is one by Mr. W. B. Brigham, of Driffield, that there are many about Neswick, near that place. He added that they store up for winter an immense amount of nuts, and remarked upon their beautiful eyes. In South Yorkshire Mr. C. J. E. Broughton reported it as occasionally found in the extensive woods at Wharnccliffe, some parts of which are, I may add, in their pristine condition. Mr. George Roberts is my authority for stating that the species occurs at Bretton, near Wakefield, while Mr. J. H. Salter had not seen it about Ackworth, but had been told that it is found about Huddersfield. Probably this impression sprang from a perusal of Mr. Hobkirk's 'History and Natural History of Huddersfield,' where we read that it is rare at Storthes Hall Woods, and at Kirkheaton. Further north I can personally vouch for its occurring in small numbers in the coppices and woods of the Meanwood Valley, near Leeds, a considerable portion of which is within the limits of the parliamentary borough. I have seen various specimens from these woods during the past ten years. They have been found in West Woods, near Wetherby, Mr. John Emmet told me, but he had not heard of their appearance in late years. At Ryther, near Cawood, Mr. Walter Raine considered it not a scarce animal, a few being killed by the farmer's sons annually during the nutting season; but at Aldborough, near Boroughbridge, Mr. H. Andrews considered it rare. In the North-western Fell (or hill) district it is found in several localities. In the woods about Hornby Castle, near Catterick, Mr. John Grassham's father used to meet with it not uncommonly; and at Middleham, in Wensleydale, Dr. J. E. Miller regarded it as pretty plentiful in the woods. It occurs near Fountains Abbey, as I was informed by the Rev. H. H. Slater, on the authority of Mr. Lickley, the Ripon bird-stuffer. This is confirmed by Mr. James Ingleby, of Eavestone. In Wharfedale a few are found in Bolton Woods, as I was informed by the late Mr. J. Petyt, the Duke of Devonshire's agent there. In Airedale, Mr. George Bishop regarded it as very scarce about Skipton; and Mr. John T. Calvert expressed a similar opinion as to Keighley, in which neighbourhood he has known a few to have been taken in Houdin Wood. For the western slope of the Pennine range of hills there are two records to give, additional to that of Mr. Thomasson's in last week's

‘Field.’ About Austwick, a village at the base of Ingleborough Hill, Mr. T. R. Clapman considered it a very occasional species; but Mr. F. S. Mitchell, of Clitheroe, says that it is occasionally found in all parts of that corner of Yorkshire which lies between Clitheroe, Slaidburn, and Bolton-by-Bowland, and in certain localities therein it may even be called common. This mass of detailed and concurrent evidence goes far to show that the species ranges over the wooded portions of our large county, of which it is most undoubtedly a native; and there can be no reason to doubt the correctness of the identification made by the gentlemen whose names I cite as authorities for the records, as several of them are naturalists of not inconsiderable attainments, and all of them are careful and painstaking field observers.”

Mr. W. Storey, Pateley Bridge, Leeds, in a note published in ‘The Field’ of May 3rd, 1884, says:—“Mr. Joseph Kirkley, of Brinham Rocks, Pateley Bridge, informs me that during the summer of 1877 he found a nest containing several young Dormice in Brinham Woods. Last spring I observed one in its wild state in Guyscliffe Woods, Pateley Bridge. Mr. George Charlton, of this place, has in his possession at the present time a live Dormouse, which was taken hybernating in Wath Woods, Pateley Bridge, about a fortnight ago. Woodmen in this neighbourhood meet with a few annually.”

As regards DURHAM, Mr. Roebuck, in the article lately quoted, says—“It has long been on record for the county of Durham. So far back as 1863, Messrs. Mennell and Perkins published a list of the Mammalia of Northumberland and Durham, in which they cited the Dormouse as of rare occurrence, taken occasionally in the woods which clothe the valley of the Derwent at Gibside, Winlaton Mill, and near Ebchester.” Besides the above, Mr. N. M’Lachlan, of Lambrook, Bracknell, Berks, in a recent issue of ‘The Field,’ writes as follows:—“ Some fourteen or fifteen years ago I observed the Dormouse in the county of Durham, at Headlam, a small village about half-way between Darlington and Barnard Castle. For several days a pair of these little creatures had frequented a large peach-tree growing on a warm south wall in the Hall gardens, and eventually one of them was drowned in a bottle of beer and sugar which had been hung on the tree to catch the wasps, as the fruit was just ripening.

IN WESTMORELAND the Dormouse appears to be of rare occurrence. A correspondent of 'The Field' (April 12th, 1884), writes as follows:—"The late Dr. Gough, in his list of Mammalia found within six or seven miles of Kendal, Westmoreland, published in 1861, describes the Dormouse as "not infrequent." Whatever it may have been then, its occurrence there now is very infrequent. Another anonymous correspondent, writing under date April 19th, 1883, mentions having found one in its nest, some years ago, on the lower slopes of one of the fells at the southern end of Lake Windermere; but it may be observed that the value of such communications as the above would be greatly enhanced if accompanied by the name of the writer.

Again, as regards CUMBERLAND, the only information I am able to bring forward is taken from another unauthenticated note, to which the initials only of the writer (T. N. P.—[Hallthwaites]) are appended. He says:—"I have frequently met with this animal in the district of Millom, South Cumberland. One was shown me, some winters ago, frozen to a piece of wood; and last year, while trout-fishing, a boy with me found one amongst the rocks on the banks of the stream."

As to NORTHUMBERLAND, with the exception of Messrs. Menell and Perkins' list above referred to, I can find no evidence of the occurrence of the Dormouse in that county. The places mentioned in the above list (see DURHAM), quoted by Mr. Roebuck, are on the Durham side of the Derwent, and I am not aware that any locality in Northumberland is given.

That this little animal is found in Wales is proved by reports from several districts. In GLAMORGANSHIRE I am told that it is occasionally found by wood-cutters, but am not at liberty to give the name of my informant, the accuracy of whose statement, however, I have no reason to doubt.

Mr. H. Shaw, of Shrewsbury, tells me it occurs both in RADNORSHIRE and MONTGOMERYSHIRE. A note appeared in 'The Field' (April 5th, 1884), signed "Laisters Lort," in which the writer states that he found a Dormouse rolled up in its nest, in the parish of Llanllugan, in the latter county, during the winter of 1881-2; and an anonymous writer, 'Field' (May 3rd, 1884), also bears witness to the existence of this animal in Montgomeryshire some five or six years back.

AS to MERIONETHSHIRE, Mr. Thos. Ruddy, of Palé Gardens, Corwen, in a note published in 'The Field,' says—"It was found on the estate of Mr. Robertson, M.P., at Tyfos, near Corwen, in a dormant state, in early spring, by men employed in planting forest-trees. Several were brought to me by one of the men, to know what they were. He said they were found rolled up in leafy balls, the leaves being gummed together, as it were." He adds, "None of my near neighbours ever saw the Dormouse in Merioneth before, and I have not heard of its occurrence in any other part of the county."

The following note by Mr. J. B. Catterall, of Denbigh ('Field,' April 19th, 1884), refers to DENBIGHSHIRE:—"The Dormouse breeds freely at Parc-Mostyn, a few miles south-west of Denbigh, in a hilly and wild country." In the same paper, under date May 24th, 1884, another correspondent states that he picked up a dead Dormouse at Mostyn, FLINTSHIRE, on May 19th, just outside Lord Mostyn's park. Two anonymous contributions to 'The Field' also bear witness to the existence of dormice in a wild state in the two last-mentioned counties; and in one of these the writer mentions the Leeswood Woods, near Mold, Flintshire, as a locality where they used to be plentiful.

This scanty and imperfect sketch can only be taken as giving some slight indication (a mere outline, as it were) of the distribution of this interesting little rodent in England and Wales: the lack of notes from many parts of England, such as Derbyshire, Rutlandshire, Northamptonshire, &c., may perhaps indicate a lack of observers rather than an entire absence of the species in question; and the same may be said of Wales, though doubtless many districts of that mountainous corner of our island would scarcely be adapted to its habits. From among the mass of material from which the foregoing has been compiled, but few facts have transpired relating to the Natural History of the Dormouse, apart from the bare announcement of its existence: such as have appeared are, however, of considerable interest.

Bellamy, in his 'Nat. Hist. of South Devon,' says—"In the unique collection of G. Leach, Esq., comprising a nearly perfect cabinet of British Mammals, there is a white variety of the Dormouse, taken in Devon." Not long since an example having a white tip to its tail was advertised for sale in the 'Exchange and Mart' by a person living at Berkhamstead, Herts. With

respect to the age to which this little animal attains in a state of confinement, a correspondent of 'The Field' (East Sussex), who states that he is accustomed to feed dormice exclusively on apples and nuts, goes on to say—"Four years is the longest time I have known them live in confinement; and in a letter received from Capt. Hadfield, that gentleman mentions a second instance of a pet Dormouse attaining this age. I believe this exceeds the average duration of life of the white and coloured varieties of *Mus musculus* so often kept as pets. The provincial name of "Sleeper" seems to be very generally adopted, but I am informed by Mr. D'Urban that in South-eastern Devon the Dormouse is universally known as the "Seven Sleeper," whereas in Cornwall, according to Mr. J. Brooking Rowe, the word "Dormouse" frequently becomes "Dorymouse." In conclusion, I must express my thanks to those naturalists (too numerous to mention by name) who have supplied so much of the material for this paper.

Since writing the report for the county of Suffolk, as given above, I have received a letter from the Rev. Churchill Babington, of Cockfield, near Bury St. Edmunds, who says—" . . . My man, Alfred Parish, has repeatedly found the Dormouse in this part of Suffolk when a boy, and also subsequently." The following statement by Parish, kindly taken down and forwarded by Mr. Babington, shows that this species recently existed, and in all probability is still to be found, in the neighbourhood of Bury St. Edmunds, the district in which it has been found comprising at least six parishes in close proximity to each other:—"Dormice have been found in Bull's Wood, Cockfield, about two years ago, in September; many nests found also with their young. In Rougham, one within ten years; in Thurston, Beyton, Bradfield St. George, and Rushbrook, nests found about thirty or thirty-five years ago. Not at all uncommon in the neighbourhood, and probably as common now."

NOTES ON THE VERTEBRATE ANIMALS OF
LEICESTERSHIRE.

BY MONTAGU BROWNE, F. Z. S.

Curator, Town Museum, Leicester.

(Continued from p. 169).

Order INSECTIVORA.

Talpa europæa, Linn. Common Mole.—Generally distributed and common, breeding in the county. Harley was informed by a man who had been a professional mole-catcher for more than sixty years, that he had never seen a mole alive in a state of freedom. Mr. Macaulay tells me that some few years ago (1881 or '82) he observed one whilst driving between Mowsley and Saddington, and succeeded in catching it before it had time to bury itself. Harley says:—"Buff and white, or parti-coloured individuals occasionally occur." One in Leicester Town Museum, labelled, "From Belvoir. Mr. Jno. Ryder." This specimen I find noted in old MS. Donation Book as being presented on April 25th, 1862. It is of a uniform cream-colour, inclining to ferruginous on the limbs. The Rev. Andrew Matthews, M.A., Rector of Gumley, showed me one precisely similar, caught by a mole-catcher in an adjoining parish during the first week of June, 1884, the man stating at the time that he had met with several other examples during the course of his trapping. This specimen was recorded in 'The Zoologist' for July, 1884, page 271. Curiously enough, Mr. Matthews procured another on March 20th, 1885, which had been caught in a trap at Laughton Hills. He describes it as being the handsomest he ever saw, a large male of an amber colour, with the nose white nearly to the eyes, cheeks and back of the head and neck bright orange.

Sorex vulgaris (Linn). Common Shrew.—Generally distributed and common, breeding in the county. Harley remarks upon the great numbers found dead in pathways every autumn.

Sorex fodiens (Pall.) Water Shrew.—Harley says:—"Not common. Occasionally met with on the banks of water-courses and drains in the meadow lands near Loughbro'." Mr. Widdowson writes, February, 1885:—"I know one locality they frequented a few years ago, namely, Sysonby, about a mile from Melton."

Erinaccus europæus, Linn. Common Hedgehog.—Generally

distributed and common. I have received several from Knighton—close to the town of Leicester—where it breeds. On 13th September, 1883, an old female hedgehog and four young ones were brought to me from thence. Another one, caught also at Knighton, we endeavoured to keep. It remained for some time in the work-room at the Leicester Museum, hiding itself during the day under the box of a step leading from one room into another. Our porter, who was very kind to it, tells me that he saw it several times away from its retreat, but that it was not at all tame, although he constantly fed it with bread and milk. One day it came out while several of us were there, and the next day it ran around our feet squeaking and trying to nibble at our boots. It would not, however, eat bread and milk, so we procured meat, liver, apples, potatoes, carrots, anything we could think of, but it refused everything, though apparently very hungry. The next morning it was dead.

Order CHIROPTERA.

Plecotus auritus (Linn.). Long-eared Bat.—Generally distributed and breeding. Harley writes:—"Widely diffused over the county. Partly gregarious. Plentifully found in Bradgate Park, where, no doubt, it finds shelter by day in the pollard oaks, ruins, crannies of rocks, and holes which abound there. Breeds in the county." Mr. W. A. Vice, M.B., brought me a specimen procured by him at Blaby Mill about 1883.

Synotus barbastellus, Blas. The Barbastelle.—Not common. The Rev. A. Matthews showed me one specimen of this curious little bat, procured at Gumley about 1876.

Vesperugo pipistrellus, Blas. Pipistrelle; Common Bat; "Flutter-mouse."—Commonly diffused and breeding. I have procured several specimens at Aylestone, the last, a male and female, on 23rd April, 1885. Harley notices that this species is often observed on the wing during the day, and remarks that in this it differs from the Great Bat.

Vesperugo noctula, Blas. Noctule, or Great Bat, or "Rat Bat."—Generally distributed and breeding. Harley remarks that this species appears to be most common in the vicinity of the Town of Leicester, and is most often observed on still summer evenings. I have observed it once or twice each summer since 1880, but last year (1884) so many were flying near the Aylestone

Mill on an evening at the end of June that I brought out my little .410 walking-stick gun, and in a few minutes killed several, one of which (a male) measured nearly fourteen inches in extent of wings. During the fine weather between the 17th and 23rd of April, 1885, several were observed in the evening, and on the 21st I shot a young male at Aylestone. The Rev. A. Matthews tells me (March, 1885) that one broiling-hot day in July, some years ago, at mid-day, when the air was perfectly bright and clear, he observed swallows circling at an immense altitude, and above them, at a much higher elevation, four large bats, which he supposed to be of this species.* No doubt this is the species (the Noctule) about which Widdowson writes me (12th February, 1885), under the heading of "Red Horse-shoe Bat."† He says:—"We were cleaning up the church, and at the end of a beam there was a hole where it went into the wall. I could smell the bats within (very warm and acrid); I put my arm in, then called the men for a cement tub which stood near, and brought them out by handfuls, I should think thirty or more, and not one of them bit me. Being very busy, and not being much up in bats, only knowing three or four at that time, I let them go; but on describing them to a gentleman some time after, he said they were rare. They were a ruddy brown colour, nearly as big again as a short-tailed grass Mole; he called them the 'Red Shoe Bat.' I did not notice the nose."

Vespertilio nattereri, Kuhl. Reddish-grey Bat; Natterer's Bat.—Rare. I am enabled to add this species, which is rather rare in Britain, on the authority of the Rev. A. Matthews, who showed me a specimen caught in his house at Gumley some few years ago—he cannot recall the exact date. It will be observed that of the fourteen species of Bats which, according to Bell (second edition), are found in Britain, but five have as yet been noted in Leicestershire; here then is a field for investigation open to county naturalists, and I would therefore ask them to kindly forward all unknown bats to me for identification, and the specimens so forwarded shall be returned if desired.

* Our correspondent has overlooked the fact that Gilbert White named this bat *Vespertilio altivolans*, from this very habit of feeding high in the air. See Letter 36 to Pennant.—ED.

† *Rhinolophus ferrum-equinum* has—so far as I am aware—not yet occurred in the county.

Order RODENTIA.

Lepus europæus, Pall. Common Hare.—Generally distributed and common; breeding. Some winters ago, I forget the exact date, the local papers recorded the fact of a hare running through the principal streets of the Town of Leicester, and being ultimately caught in Lancaster Street.

Lepus cuniculus, Linn. Common Rabbit.—Generally distributed and common. Breeding. Harley mentions that in Bradgate Park, where it abounds, “black and parti-coloured varieties are met with.” I received a white one in the autumn of 1881 from thence, and in the spring of 1884 I saw a black one run out from a little spinney at Knighton, on land farmed by Mr. Lander. On April 17th, 1885, I was with Mr. John Hunt at Thurnby, on land in his possession, and, amongst a great number of rabbits which were feeding out, we saw several white and parti-coloured ones, no less than five being seen at one time. Of course, at our approach they bolted into their burrows amongst thick scrub; but, by keeping perfectly still, we were enabled to get a near view of those which, deceived by our quietude, shortly re-emerged. So near were they, that we were able to see that two or three had sandy patches on their ears and other parts of their bodies, whilst others were pure white. A fact which struck us as singular was that these white rabbits should retain their snowy appearance after scampering through wet grass, muddy places, and up and down their burrows. Being in close proximity to dwelling houses, it is, of course, possible, nay probable, that these varieties may have been produced by crossing with tame ones.

Mus rattus, Linn. Black Rat.—Probably extinct in this county. Rev. A. Matthews writes me, 26th January, 1885, that he has never heard of its occurrence in the county. Messrs. Widdowson and Ingram, writing in February, 1885, say the same.

Mus decumanus, Pall. Brown Rat. — Its distribution in the county is unfortunately too general.

Mus musculus, Linn. House Mouse.—Far too common. Several specimens of a curious variety were caught at Kibworth in middle of March, 1885, in taking down a corn stack belonging to Mr. Buzzard. One of them, handed to me by Mr. Macaulay, was of a dingy white, with the exception of the back, which

retained faint traces of original mouse-colour, caused by the tips of the hairs being of a dusky whity-brown. As the specimen was placed in spirits I was unable to judge if the eyes were pink or black, but they appeared to be of the latter colour—and indeed this has since been stated to be the case. Whether a cross between escaped albino mice and the common mouse, or merely an accidental variety, it is hard to say, but as the owners of the house do not appear to have ever kept “white mice” the presumption is in favour of the latter supposition. In evidence of the fecundity of this species I may state that Mr. A. W. Evans, of Soar Lane Mill, brought me a litter of no less than twenty-two naked young ones on 31st March, 1884.

Mus minutus, Pall. Harvest Mouse.—Rare. Harley states that it is not certain that this species is found throughout the county, having been met with by him in only one or two parishes in the southern division, as for instance at Cosby and Whetstone. It has also occurred in the eastern portion of the county, namely, in the parish of Wolstrup, on the estate of the Duke of Rutland. Mr. Ingram, writing from Belvoir, does not mention it, but Mr. Widdowson says, February 6th, 1885:—“A few—not many—have come into my hands.” Writing again on the 12th, he says:—“The last Harvest Mouse I had was from Burton Lazars. Distributed thinly, I think, near here.”

Mus sylvaticus (Linn.). Long-tailed Field Mouse.—Generally distributed and breeding. Harley says:—“Common. Distributed over the county.” He examined the winter retreat of one of these mice near Bradgate Park, and was astonished at the quantity of stores which had been carried in, and which he computed at the fourth part of an imperial bushel.

Arvicola amphibius (Linn.). Water Vole.—Generally distributed and breeding. Harley remarks that “this species is much preyed upon by the Weasel and Stoat. The Heron, moreover, attacks it, and preys on it occasionally. Liable to variety.” Regarding the last statement I was always of opinion that this species, with the exception of the black variety mentioned by Bell, was most constant in its coloration, having had the opportunity of examining some hundreds—from all parts of England—since boyhood, but Mr. R. Widdowson, the well-known taxidermist of Melton Mowbray, assures me that he can, any season, procure near Melton a constant light-red variety,

and in proof of his assertion he sent me, a year or so ago, a mounted specimen which, though apparently sun-faded on the one side, appears to be of a very light red, almost yellowish-rufous on the other. I was witness to a curious trait in the character of this animal on April 11th, 1885. Walking in the meadows at Aylestone with my dogs, I observed some rat-catchers at work on an old hollow willow tree, from whence they dislodged, with the help of their ferrets and dogs, several common rats and three Water-Voles, two of which evaded them by swimming. The third one was, however, caged with three of the common Brown Rat. The latter appeared abjectly terrified at our approach, and at that of the dogs, and huddled together with their heads tucked under their bodies. It was otherwise, however, with the Water-Vole, which upon our approach reared himself upon his haunches, bared his teeth and snapped them, squeaked, and shook his paws at us with the most threatening gestures, and would have flown at us outright had it not been for the protection of the bars. His conduct regarding the other rats was fair in the extreme, for he bit them in the most severe and impartial manner whenever they approached his corner. Indeed, one rat nearly "left his tail behind him" under the quick strokes of the plucky Water-Vole's formidable incisors.

Arvicola agrestis (Linn). Common Field Vole; Short-tailed Field Mouse.—Generally distributed, common, and breeding.

Arvicola glareolus (Schreber.). Red Field-Vole.—I have not yet met with this species in Leicestershire, but it doubtless occurs, as Mr. Ingram, writing on 7th February, 1885, and enumerating the mice and voles, says, "and another, also short-tailed, but of a light fox-coloured skin."

Muscardinus avellanarius (Linn.). Common Dormouse.—Rare. Harley says:—"Not common. Met with in a small wood which lies over against Ravenstone, and between that village and Normanton on Heath," but in no other woods of the county did he discover it. Widdowson writes, February 6th, 1885.—"Not heard of for a certainty, save one brought in a load of oak bark." Mr. Ingram writes, 7th February, 1885:—"I have never met with it."

Sciurus vulgaris, Linn. Common Squirrel.—Generally distributed and breeding. Harley writes:—"It more especially abounds in our enclosed parks and woods. Garendon,

Donnington, and Gopsall abound with it. . . . Subject to much variety." On this point I think Harley in error. The only varieties I have met with are the ordinary ones due to sex, age, and season; the young being bright red in summer, and at all ages changing at the approach of winter to greyish red, due, I think, to what in birds is called "point-casting" of the hairs. A curious, though not very uncommon example, exhibiting malformation of the teeth in this animal, was presented to the Leicester Town Museum by Mr. R. Wingate, on April 18th, 1876. In this specimen the upper incisors have become prolonged and curved into a half-circle in this manner:—The right upper incisor is considerably lengthened, coming below the lower jaw; it then ascends and curls around, reaching to just below and in front of the eye, forming a perfect half-circle, measuring $1\frac{5}{8}$ in. on its inferior curve. The left upper incisor follows the curve of the other until it reaches the lower jaw, when it bends slightly away, and enters the mouth, curving upward, inside, until it touches the palate. Both the lower incisors are pushed away to the left side; the right lower incisor not only bending outward, but growing to the length of $\frac{3}{4}$ in. No locality is given with the specimen, and I therefore assume it to have been a caged animal, fed, doubtless, upon food too soft to allow the natural grinding down of the teeth necessary to prevent such malformation.

(To be continued.)

ON THE SEASONAL CHANGES OF PLUMAGE IN BIRDS.

BY ALFRED CRAWHALL CHAPMAN.

No doubt naturalists have frequently observed the great dissimilarity in the seasonal plumages of many species of birds. This is strikingly noticeable in the case of the Golden Plover. On the Northumberland moors the Golden Plover may be said to breed commonly. Small parties of them may be seen frequenting the lower grounds all through the winter. About the beginning of February the change from the white breast of winter to the black of summer commences, and gradually increases until the bird has attained its full summer dress. When on the wing these dark-breasted birds appear to be much blacker than they really are. Having shot what appears to be a very black-breasted bird,

one finds that many of the white feathers of winter are still visible, giving the bird a checkered appearance.

What appears most strange is that these birds never reach what is considered the typically adult summer plumage of the Golden Plover. It matters not at what period of the breeding season, this undeveloped plumage is always conspicuous. Now, I would ask, what is the natural cause of this ?

Even in Shetland the summer dress of the Golden Plover is much darker, *i.e.*, more developed than in Northumberland ; but if we visit Lapland or Siberia, we find there the Golden Plover in what we consider their typically adult summer dress. If they had to endure greater cold or stress of weather at their northern breeding-stations, one could perhaps account for the more adult form of plumage by a greater thickness of feathers ; but such is not the case. Indeed, I venture to say that the Northumberland birds have, if anything, the greater cold to endure. Perhaps it is that the birds which frequent our moors in winter are not the birds which remain to breed with us ; possibly all these birds migrate northwards to Lapland and Siberia, their places being taken by another and different set of birds, which have spent their winter in more southerly latitudes, and which make our counties the northern limit for their spring migration. This is a theory difficult to solve. It may be that the reverse is the case, and that the birds which winter also remain to breed with us, and that there is a great migration from the Mediterranean direct to the morasses and tundras of Siberia.

I think, perhaps, this is most likely to be the case, as many specimens of birds which seldom breed south of the Arctic circle are regularly obtained in their adult summer plumage in the very south of Europe, about the middle of May.

My brother, Mr. Abel Chapman, shot Curlew Sandpipers (*Tringa subarquata*) in their rich rufous plumage, as well as Grey Plovers (*Charadrius helvetica*) in adult summer dress, on the Guadelete, near Jerez, in Southern Spain, on May 8th, and these birds would have about 3000 miles to travel northwards before they could find a suitable breeding-ground ; although perhaps it is not necessary to mention here that the Curlew Sandpiper is, I believe, the only British bird whose nest has never yet been discovered. The rapidity with which birds execute their spring and autumn migrations must be something marvellous, for I have

shot Bartailed Godwits on the coast of Northumberland returning from breeding as early as August 11th, while by the 25th most of the northern breeding species, such as Greenshanks, Reeves, Sanderlings, Knots, Turnstones, &c., can be obtained.

On comparing skins of the Brambling (*Fringilla montifringilla*) shot in the Dovre Fjeld in Norway, with those obtained at a similar season in East Finmark, I notice the same relative difference in their stages of mature plumage as I have remarked in the case of the Golden Plover. The Finmark birds have the head, neck, and upper part of the back, of a rich glossy black, like our common Rook, whilst the Dovre Fjeld birds have the ends of the feathers edged with buff, showing the undeveloped change from their winter plumage. This would seem to indicate that the further north a bird goes to breed, the more perfect must the condition of the bird become, each feather seeming to obtain greater vitality than in the more southerly species, and, as a consequence of this, the gradual change of colour is extended further down each feather, till the whole of the feather, with the exception of that portion which wears off, becomes black. Probably the change from spring to summer and from summer to autumn plumage is effected both by means of change of colour in the feather itself, and by moult, according to the physical condition of the bird at the time.

It seems probable that the theory which holds good with regard to the changes of plumage in the true Falcons applies also to the case of the common Buzzard (*Buteo vulgaris*), and perhaps the following notes on the plumage of the latter species may be of interest.

During the months of May and June, 1878, my brother and I obtained many beautiful specimens of both old and young Common Buzzards in the large woods near Hesse-Cassell, in Central Germany. They seemed to be very common there, probably because they were quite unmolested.

On May 11th we found a nest containing two down-clad young, which were pure white, and one egg hatching; both the old birds were a uniform dark-brown, the male being much the smaller of the two.

On May 26th we found two nests, each containing two eggs; in the one case nearly hatching, in the other quite fresh. We trapped the old birds, and found them in similar plumage to those already described.

On June 8th found a nest containing two half-grown young. Their breasts were a spotless cream-colour, their backs mottled not unlike an unfledged Lesser Black-backed Gull. We reared these two young ones; by the beginning of July they had moulted their nest plumage; the breasts and under parts still remained a spotless cream-colour, the upper parts coming mottled brown, but divided by broad pale yellow stripes running longitudinally down the back. The tails were already a fine russet colour, barred with brown. We kept these two birds till the autumn of the year after they were hatched, and at this time they still maintained the plumage of the first moult unchanged. Their irides, however, which had been a pale transparent blue, were now gradually turning yellow. This change in the colour of the irides seems to be, in some cases, contemporaneous with the change of colour in the plumage of the bird's head, and is especially conspicuous in the case of the Marsh Harrier (*Circus æruginosus*) and Red Kite (*Milvus iclinus*). In both of the latter the irides change with the colour of the head, being nearly black when the head is very dark-coloured (as in the young Marsh Harrier), hazel when the head is brown, and pale yellow, approaching to white, when the head becomes white, as in the old birds.

With regard to the plumage of the parent birds of the two young ones which we reared, nothing could exceed the beauty of the male. With the exception of a fawn-coloured bar across the breast, the dark primaries and secondaries, a few bold blotches of brown on the back, and a golden-coloured tail barred with brown, his whole plumage was nearly pure white. The female had a cream-coloured breast and under parts, a handsome brown and white checkered back, the head brown, and the tail as in the male.

Though I have seen a good many nests of both the Rough-legged and Common Buzzard, I never saw the former nesting in a tree, or the latter otherwise than in a tree, usually rather high up. All the nests of the rough-legged species which I have seen have been on fell-crags, nor does the plumage of this species seem to exhibit nearly so great a variation as in *Buteo vulgaris*.

The irides in *B. lagopus* darken in colour with the age of the bird, the adults having a hazel iris, those of the immature birds being yellow. This is certainly a striking anomaly, and shows how difficult it is to establish, even from observation, any reliable code for Nature's rules.

NOTES ON THE ZOOLOGY OF MANITOBA.

BY THE LATE T. B. WOOD.

(Communicated by T. H. NELSON.)

[THE following notes are extracted from the letters of my late friend Mr. T. B. Wood, of Middleton, near Manchester, who went out to Manitoba in the spring of 1882, and who lived for some time at Brandon, in the North West, the then terminus of the C. P. Railway. Mr. Wood was an enthusiastic naturalist, and, unfortunately, fell a victim in the cause of his favourite pursuit. One day, towards the end of October, 1883, having shot a rare Duck (a Buffel-head, I believe) on a slough, he incautiously waded into the water up to his waist to retrieve the bird, thereby contracting a severe cold and inflammation, which resulted in his death in a very short time.

As may be seen from his notes, the neighbourhood of Brandon abounds in animal life, especially at the periods of the vernal and autumnal migrations.

Mr. Wood was busily engaged in forming a collection of skins of the birds and other animals which are found in the North West, and it was his intention to have prepared a list of Manitoban Birds for publication in 'The Zoologist,' when his career was prematurely cut short, in the manner I have mentioned, at the early age of twenty-six.

The period over which his observations extended was from the end of May, 1882, to October, 1883, the first letter after his arrival at Brandon being dated May 31st, 1882, in which, after detailing his first experiences of Canadian life, and describing the town of Brandon, he proceeds in manner following.—T. H. N.]

On the journey from Minneapolis to Winnipeg, and thence to Brandon, we saw great numbers of Ducks, Herons, Bitterns, Goatsuckers, Plovers, Buzzards, Hawks, Prairie Chickens, Geese, and other birds which I did not recognize; as also a great many Foxes and Squirrels. The land all around here is as flat as a pancake, with a few scrubby trees occasionally, and here and there swamps on which you will always see Ducks and a Bittern or two. The day after my arrival I saw a herd of Bisons.

June 15th.—Early this month, B. and I drove out to Jeoman city and thence south across the prairie; we camped out about ten miles from Brandon and resumed our journey next day,

until we were about eighteen miles in a southerly direction from Brandon. It is about the finest country you could imagine in the wildest flights of fancy; Ducks getting up under your feet at every yard; Hawks, Goatsuckers, Prairie Chickens, and small birds in all directions; and, what do you think? the Black Tern breeding in hundreds; over a space of six miles I saw them in countless numbers. The Ducks were principally Blue-winged Teal, Pintails, Shovellers, and a black-looking Duck which I could not identify. I shot a Teal and a splendid Shoveller drake for the pot. I can fancy I hear you exclaiming against the barbarism of eating such a bird; but I am getting daily accustomed to birds which are considered rare in England, and regard them now from a more utilitarian point of view. I also saw a splendid pair of [Wilson's] Phalarope swimming on a pool only a few yards away; one of them kept rising and flying round, and I could distinguish the beautiful red and black neck quite plainly. We camped for the second night on the prairie, and the mosquitoes were very troublesome to my companion, but fortunately, they did not attack me; and we returned to Brandon next day.

July 2nd.—About the end of June we paid another short visit to the swamp and brought home a few more Shovellers. I have a Goatsucker sitting on two eggs just in front of my tent; and there are any number of Prairie Chickens' nests all round, most of them now containing young ones. Brandon looks lovely at night with fireflies flashing about like diamonds all over the prairie. I killed a Badger, a Goatsucker, and a Pintail, near here yesterday.

July 19th.—Early this month I was staying with a friend twelve miles away, at Badger Hill, close to the Assiniboine River, and surrounded by immense forests of oak, pine, and tamarac. The first evening of my arrival my friend and I sallied forth in search of game. I spied something moving along in the grass, and immediately firing at it with my rifle, had the satisfaction of seeing the beast roll over. On a nearer approach, however, we were unpleasantly apprised of the nature of the animal, for the odour which greeted our nostrils proclaimed the everlasting Skunk. Needless to say, we beat a hasty retreat. Next day we were busy cutting down trees, fencing and digging; now and then rushing with the gun after some *rara avis* passing near. I shot half-a-dozen large Hawks and Owls, and skinned two; one, I think, the Hawk Owl (*Surnia funerea*),

and the other, one of the Harriers (*Circus Swainsoni*), almost the colour of a common Gull. I also got a beautiful little Hawk, about the size of a Merlin, with blue wings and back like a Kestrel, blue and red head and red feet, apparently *Tinnunculus Sparverius*; and a fine Grey Shrike, exactly like our English species. I could shoot any number of birds if I liked, but only secure specimens when I have time to skin them, except in the case of Hawks, which I slay on most occasions when opportunity offers. All I have got so far I have skinned, though I have to do that part of the collecting when the day's work is over. When at Badger Hill we got up at 5 a.m. every morning, made up the fire, and then strolled down to the river with the gun and looked at our fishing lines; then back to cook what we had caught for breakfast. We got some immense fish at times. After breakfast we had a drive over the prairie or a row down the river. One day we were driving out, when suddenly we were saluted by the well-known cry of the Curlew (bringing back recollections of the Tees Mouth and Mostyn to my mind). There they were in couples; one foolishly passed over us, and I fired at it from the carriage; down it came, and then another bit the dust. They were very like our English Curlew, but buff-coloured on the breast and under the wings, and the same tinge runs all over the body. I guess it was the Esquimaux Curlew.* We plucked and ate them; but I will get specimens to preserve. Prairie Chickens are getting strong on the wing, and in another fortnight I shall be after them. The other night I scared a Wolf outside my tent, but did not get a shot at it.

August 5th.—I have been staying at Badger Hill a good deal lately, and I have done a little shooting. One day early in the month two guns bagged twenty-two Ducks and two Grebes. The Ducks are difficult to retrieve, and we lose quite one-half of what we shoot in the reeds. I shot two Yellowshanks (*Totanus flavipes*), and could have killed many more, but don't waste cartridges on such small game. On the way out here I got a fine Buzzard; its crop was full of grasshoppers and mosquitoes.

* [As nothing is said as to size, length of bill, wing, or tarsus, it is impossible to identify the species with certainty; but if "very like our English Curlew," it was most probably *Numenius longirostris*; for *Numenius hudsonicus* would have reminded the shooter of our Whimbrel, while the Esquimaux Curlew is so much smaller than either of these that it would have at once attracted attention on that account.—ED.]

The sail down the Assiniboine is very grand; woods on both sides resound with the songs of myriads of birds of different kinds. I only fired two shots down the river and secured two beautiful Kingfishers (*Ceryle alcyon*). They are a little larger than our Green Woodpecker, and about the same shape. I saw some Sandpipers very like our common Sandpiper [doubtless the Spotted Sandpiper, *T. macularius*]. Birds are beginning to flock, and in a few weeks the migration south will commence.

(To be continued.)

NOTES AND QUERIES.

The Zoology of Central Asia.—The latest news from Col. Prjevalsky is contained in a letter dated Lob Nor, February 10th, from which the following is an extract:—"A year and a half have quickly passed since our departure from St. Petersburg, in which time we have accomplished two-thirds of our expedition. We have traversed 5200 versts of Central Asia, and successfully explored hitherto unknown regions. From a geographical point of view the results have been excellent, and, although less satisfactory, the additions to Natural History are not inconsiderable. The poorest collection is that of birds—1000 specimens, of which only one is new; this is a kind of Finch, *Leucosticte Robowosky*, with red plumage. We have been more fortunate in quadrupeds, having obtained 33 specimens of *Ursus lagomyiarius* (?), of various sizes; and among the novelties are four animals of the cat tribe; two lynxes; a new deer, *Capreolus magnus*; a wild sheep; an antelope, *Antelope Cuvieri*; and several probably new types of *Lepus* and *Lagomys*. The number of fish and aquatic animals is also considerable. We have passed the autumn and winter in the western regions of Zaidan and Northern Thibet, where we made many geographical discoveries. We arrived at Lob Nor yesterday (Feb. 9th), and shall pass the month of February here, observing the migration of birds. In March we shall start for the town of Kirta, where our collections, loaded on ten camels, remain; while we are to pass the summer in the mountains of Northern Thibet, with the intention of re-entering Turkestan in the autumn. We have heard no news from Europe for twelve months, and have not seen a human being for three months."

The Marine Biological Station.—On the evening of May 13th Prof. Ray Lankester gave a lecture before the Society of Arts, John Street, Adelphi, on "The Value of a Marine Laboratory as a Means of Improving Sea Fisheries." Mr. E. L. Beckwith, Prime Warden of the Fishmongers' Company, presided.—The chairman stated that the daily supply of fish to

Billingsgate Market amounted to 500 tons. A ton of fish was about equal in weight to 28 sheep, so that 500 tons of fish were equivalent to a flock of 14,000 sheep.—Prof. Ray Lankester began by pointing out that while agriculture is in this country a refined branch of chemistry, our fishing industries were still barbaric; we recklessly seized the produce of the sea, regardless of the consequences of the method, the time, or the extent of our depredations. In point of fact we knew exceedingly little about the minute details of the life of marine animals; and he submitted that a laboratory on the sea-shore, provided with boat and fishermen, and having within its walls tanks for hatching eggs and watching sea fish and conveniences for the work of naturalists trained in making such observations, was the only way to meet the deficiency in our knowledge of the subject.—A considerable portion of the lecture was taken up with a rehearsal of the work done by the United States Fish Commission. Stress was laid upon Prof. Spencer Baird's attempt to cultivate sea fishes artificially, and the actual results in the production of Cod and Shad were stated. Experiments and observations similar to those carried out by the American Commission are to be undertaken by the Biological Association at Plymouth. The artificial cultivation of the Sole is to be at once taken in hand; and when something has been discovered about the spawning of the fish, and hatching accomplished, "vast numbers of young Soles" are to be turned into the Sound. Other fishes, of course, will be subjected to similar experiments. The Association recognises it as a first duty to obtain a "thorough-going knowledge of all the conditions" affecting the English Oyster. It will cast about in search of new and effective baits for line fishermen, and will do something towards cultivating on some system the familiar but much wasted Mussel and Limpet. A site for the Marine Laboratory has been obtained on Citadel Hill, Plymouth, by permission of the War authorities. The ground-floor will comprise large and small tanks, with a series of working rooms fitted with small tanks above. From reservoirs in the basement, replenished two or three times in the year, a stream of sea-water will be driven by pumping apparatus through the establishment. A steam launch is required, besides small boats. A resident superintendent, "who will be a thoroughly qualified naturalist," is to be appointed at a salary of £200 a year. The two or three attendants, constituting his staff, must be fishermen. Competent investigators, appointed from time to time to carry out particular inquiries, will be paid from special sources, and not at first from the general income of the Association. Naturalists, at their own expense, may attend at the laboratory for purposes of study. Important assistance is naturally expected from the local fleet of fishing-boats. This, as remarked by Prof. Ray Lankester, is a modest beginning. The funds do not allow of more at present. The estimate of ways and means was, on May 13th, a capital sum of £10,000, and an income, from annual subscribers, members, &c., reckoned at £500 a

year. On the following day the Fishmongers' Company made the scheme a grant of £2000. The full capital has yet, however, to be raised, the Council of the Association having only secured one-half the amount.

MAMMALIA.

Squirrels destroying the Eggs of *Picus major*.—As there are still some tender-hearted people who hesitate to believe in the egg-stealing propensity of the graceful and bright-eyed Squirrel, I think the following account of the destruction of a nest of *Picus major* may help to enlighten them:—In May of last year (1884) I found a nest of this bird in Hampshire in a dead Scotch fir, about thirty feet from the ground, containing a single fresh egg. This was lying on the usual flooring of chips, about nine inches below the entrance-hole, and in order to examine the nest without causing the birds to desert it I carefully cut a piece of the wood out of the side of the tree and replaced it, leaving the entrance untouched. A week afterwards I paid another visit to the tree, and to my surprise found the nest, which had been excavated to a depth of three or four inches more, empty. Having safely fastened my “window” again, I climbed up another dead tree about thirty yards distant, thinking perhaps the birds had taken fright at my first examination and were nesting elsewhere. My astonishment was great at finding, near the top of this other tree, wedged into a crack in the wood, an egg of *Picus major*, perfectly sound, except for a small tooth-mark in the side. I removed this egg, which was quite twenty feet above the ground, and descended to search for the shells of any other eggs there may have been, finding the remains of three lying close to the foot of the tree. Feeling sure as to the robbers, and thinking from the recent deepening of the nest that the birds might use it again, I got some tar and laid on a good coat of it round the trunk of the nest-tree. My plan succeeded admirably, for a week later I found there were four eggs in the nest, and the hen bird was sitting close on them. I have known Squirrels to remove the eggs from the nest of the Long-eared Owl and other species nesting in the pine-woods, but this is the first instance which has come to my knowledge of their interfering with those of a Woodpecker, and it is a marvellous thing how they could have got the eggs out of such a nest through a small hole without, apparently, breaking them. There is no doubt that they were the delinquents on this occasion, and I have registered a solemn vow to spare them no longer from any sentimental qualms of conscience. Perhaps the simple remedy adopted (the boughs of adjoining trees not affording communication with the nest-tree) may prove of service to lovers of bird-life.—S. G. REID, Capt. R.E.

Albino Field Vole. — I have lately received a pure albino Field Vole, *Arvicola agrestis*, which was killed in March last, near Horsham. This is

the first albino of this species I have heard of, although I have a cream-coloured one which was obtained last year (1884) in Leicestershire.—J. WHITAKER (Rainworth Lodge, Mansfield).

[Donovan has figured an albino of this species in his 'British Quadrupeds,' pl. 48; and another caught alive at East Bergholt, near Colchester, in November, 1872, is recorded in 'The Field' of November 30th, 1872. Mr. Borrer, of Cowfold, near Horsham, has in his collection a very pretty variety, procured some years ago in his neighbourhood. It is of a uniform clear buffy white.—ED.]

BIRDS.

Common and Honey Buzzards in Lancashire and Staffordshire.—A male and female Common Buzzard, *Buteo vulgaris*, were taken in traps, in February last, on Bleasdale, in North Lancashire; and a female Honey Buzzard, *Pernis apivorus*, was shot by a keeper at Swynnerton, in Staffordshire, on September 17th last.—W. FITZHERBERT BROCKHOLES (Claughton-on-Brock, Garstang).

The Species of British-killed Spotted Eagles determined.—In his article on the Spotted Eagle (Hist. Brit. Birds, vol. i., p. 107) Mr. Seebohm says—"In 'The Ibis' for 1877 Mr. Gurney refers the two Spotted Eagles killed in Cornwall, and recorded in 'The Zoologist' for 1861 to *Aquila clanga*, the Larger Spotted Eagle. In Dresser's 'Birds of Europe' this decision is quoted and endorsed. I believe, however, that I am in a position to prove that this is an erroneous one, and that it is the Lesser Spotted Eagle (to which species Dresser gives the name of *Aquila pomarina*, but which the great majority of ornithologists have called, and doubtless will still continue to call, *Aquila navia*) which has occurred in Britain." Mr. Seebohm then proceeds to argue from the measurements given by Mr. Gurney that the Cornish birds must be referable to *Aquila pomarina*, but he has never taken the trouble to examine either of the two specimens which have been obtained to test the question by a critical examination, as Mr. Gurney did before hazarding an opinion; and the consequence is that Mr. Seebohm has jumped to a wrong conclusion. When in Cornwall, last November, I visited Trebartha Hall, where the late Mr. Rodd's collection is now placed, purposely to see the specimen of the Spotted Eagle in that collection. There had recently been a fire at the Hall, and the collection had been taken out of the museum-room; but Mr. T. Rashleigh Rodd (the late Mr. E. H. Rodd's nephew), the present owner of the place, most courteously gave me full access to it, and afforded me every facility for examining the birds. The glass of the case containing the Spotted Eagle had been broken in the hurry and confusion of removal at the outbreak of the fire, so that I could thoroughly examine the bird; and can now state without hesitation that it is referable to *Aquila clanga*, and not *Aquila pomarina*. It is a very dark boldly-spotted bird, not having the

rufous nuchal patch, and closely resembles the profusely-spotted specimens so many of which have been sent to this country from India by Mr. W. E. Brooks and the late Mr. Andrew Anderson. I did not see the specimen shot at St. Columb when I visited the Truro Museum, and was told that it had been destroyed by moth; but Mr. Rodd assured me that it closely resembled the specimen in his collection in the large spots and profuse spotting, as also in the absence of the rufous nuchal patch, so that it may be safely inferred that it also was a specimen of *Aquila clanga*. — H. E. DRESSER (Topclyffe Grange, Farnborough, Kent).

Habits of Starlings.—Starlings usually flock here in great numbers in the autumn and commencement of the winter. In March it is well known that they are engaged in nesting-operations. In this neighbourhood these were arrested this year by the cold weather in the early part of April. To my astonishment they appeared again in large flocks, wending their way from 6.45 to 7.15 in a N.W. direction to their roosting-places, among fir-trees near some water on Col. Beme's property. The latter days of April were exceedingly warm, and during these few days the flocks were broken up; and one evening I noticed the passage of a great number in the same direction, all in pairs. The following evening not a single Starling was visible. The beginning of May there was another fall in the temperature, and again appeared large flocks of Starlings. I do not think that cold is entirely the cause of this phenomenon, for I have seen them in flocks during harvest, and I remember one instance in which a flock alighted upon the sheaves of a field of wheat; they only stayed there a short time, and then flew off to an arable field close at hand, where they busily employed themselves searching for insects. It was a grand sight to see a 14-acre field covered with them, and then to see them rise and perform those marvellous evolutions, which they execute in mass, before going to roost. I have a view from my sitting-room, looking a long way eastward into the country, from whence the flocks accumulate and pass under my observation. I believe the nesting of the Starling has this year been postponed, as at this time I generally see several on my lawn every morning.—C. R. BREE (Hill House, Long Melford).

Great Crested Grebe in Rutlandshire.—While watching the Moorhens and Coots on the water in Extou Park, near Oakham, on May 4th last, I observed amongst them an unusual bird, which on closer examination proved to be a male Great Crested Grebe. On further search I made out the female bird also, who, from her appearing suddenly in the open water, had probably dived off the nest, which I afterwards had the satisfaction of seeing at the edge of the reeds bordering the pond. On obtaining a boat and visiting the nest, it was found to contain two eggs, apparently recently laid, being both of a clear white. These were loosely covered with bits of

rushes and water-weed, according to the habit of this species. A few days later, on the 10th inst., the female was again seen sitting on the nest. The birds appeared not at all shy, and the nest was in a decidedly exposed situation, being easily discernible from a boat passing along the water. I have not had an opportunity of observing the nest since the date last-mentioned, but trust that these interesting birds may be successful in bringing off their brood. I am only aware of one previous instance of the Great Crested Grebe having been met with in Rutlandshire, when Mr. Evans, taxidermist, of Bourn, Lincolnshire, received, as he informs me, a specimen from the village of Great Casterton, in this county, some years since. There may, however, have been others of which I have not information.—GAINSBOROUGH (Exton Park, Oakham).

Bartram's Sandpiper, Little Bustard, and Hoopoe in Cornwall.—When at Penzance, in November last, I was told by Mr. Vingoe, the bird-stuffer, that a doctor at Truro possessed a specimen of Bartram's Sandpiper shot by his brother at the Lizard (as already recorded in 'The Zoologist'), but he could not remember the name of the doctor. When at Truro some days afterwards, I called on the various doctors resident in that city, and after one or two unavailing visits I found the bird in the possession of Dr. H. S. Leverton, 68, Lemon Street, who most courteously handed it over to me for examination; and I at once recognised it as my old friend *Bartramia longicauda*, which I had so often shot when in Texas. Dr. Leverton informed me that this specimen (which is remarkable as being a rather pale-coloured example) was shot by his brother, between two and three years ago, on the cliffs near Coverack, a village a few miles on the Truro side of the Lizard, and sent to him in the flesh. He was unable at first to make out what the bird was, but soon succeeded in identifying it by reference to Mr. Gould's work on the Birds of Great Britain. In the same room at Dr. Leverton's I saw in another case a very fine female of the Little Bustard, *Otis tetrax*, also killed in Cornwall; and in a letter subsequently received Dr. Leverton informed me that his brother saw a Hoopoe last summer on Goonhilly Downs, near St. Keverne, which bird was subsequently shot by the keeper at Trelowarren (Sir V. Vyvyan's). — H. E. DRESSER (Topclyffe Grange, Farnborough, Kent).

Variety of the Goldeneye.—Mr. Pratt, of Brighton, has recently mounted an interesting variety of the Goldeneye Duck, *Clangula glaucion*, having three white facial spots instead of two, the third one being on the chin. It is an adult male, and is the property of Mr. S. A. Walker, by whom it was shot at Stromness, Orkney, in December last. It is curious in slightly-pied birds how often the white feathers show themselves about the head—especially noticeable in Rooks, Ring Ouzels, and Blackbirds. On the other hand, there are some species very liable to be pied, as the

Sky Lark and Starling, in which this is not the case, they being more often than not pied in some other part of the body.—J. H. GURNEY, JUN. (Northrepps, Norwich).

Golden Eagle in Co. Leitrim.—On April 25th a bird of this species, in splendid plumage, was shot at Lough Rynn, County Leitrim, by Mr. Taylor, gamekeeper to Colonel Clements, in the act of taking away a young lamb. The Eagle measured five feet from tip to tip of wings.—WILLIAM J. HAMILTON (Castle Hamilton, Killashandra, Co. Cavan).

Curious Site for a Sparrow's Nest.—Some very curious sites for nests have been recorded from time to time in 'The Zoologist'; witness the case of a Titmouse nesting in one of the buffer-plungers of a railway carriage in daily use (Zool. 1884, p. 387), and a Sparrow building between the spokes of a wheel in frequent motion upon a gas-retort (Zool. 1883, p. 125). A still more remarkable case has just been noted. Prof. Flower informs me that during a recent visit to Woolwich Arsenal his attention was directed to a hen Sparrow sitting upon her nest containing five eggs in one of the axle-tree boxes of a 9-pounder bronze gun *which is fired twice daily*, at 1 p.m. and at 9.30 p.m. ! One would have supposed that at the first discharge of the gun the bird would have deserted the nest for ever, and that the consequent recoil and vibration would have disturbed the eggs so materially as to render them unproductive. It is satisfactory, however, to learn from Col. Noble, R.A., that on May 16th five young Sparrows were hatched, and will probably be reared in due course.—J. E. HARTING.

Ornithological Notes from Somersetshire.—Although there has not been much to record, I send a few notes, mostly of the arrivals of migrants, which have been exceptionally late with us this spring; but, in the first place, I must mention a few very late stayers, which I suppose, owing to an exceptionally mild winter, did not leave us as usual in autumn. The first of these was a Landrail killed near Taunton on the 15th January, an adult bird, but slightly differing from those killed at the more usual time, the pale bluish grey over the eye and on the sides of the throat not being so visible as the feathers are much margined with pale brown. On the 2nd of February I got a note from Mr. Gatcombe, telling me he had seen a Green Sandpiper in a poulterer's shop at Bridgwater, which had been killed near that place shortly before. Curiously enough I got a note from the Rev. A. P. Morris, vicar of Britford, near Salisbury, in which he said his son had killed two Green Sandpipers during the Christmas holidays. As I do not think that either of these have been recorded it may be worth while to mention them. I did not hear any more about Green Sandpipers till a more legitimate time,—namely, the 22nd April,—when I found one at Mrs. Petherick's, birdstuffer, Taunton, doing duty as a Summer Snipe, *Totanus hypoleucus*; it had been killed at Wiveliscombe on the 16th,

and sent to Mrs. Petherick's as a Summer Snipe, which she considered it to be till I saw it. On the 11th February Mr. Coates, birdstuffer, Taunton, brought me a male Blackcap, which he said had been killed in a trap set for Blue Tits and baited with fat. It was in ordinary summer plumage, with a pure black cap, and showing no trace of the brown head of the female, which would probably have been the case had it assumed the brown cap of the female. Prof. Newton says that in winter some if not all the males lose their black caps and have their heads coloured like those of the females (Yarrell's Brit. Birds, 4th ed. vol. i. p. 422). I mention this for, besides Prof. Newton's note above referred to, the subject has been mooted in 'The Zoologist' for 1875 and 1876. I did not see or hear anything of the Chiffchaff till the 31st March, when one of my daughters told me she heard one, and the next day I saw one. I did not see a Swallow till the 16th April, when, as I was driving to Williton, I saw one or two at Torweston, near that place, and on our return late in the afternoon, I saw several about the house here, though there had been none when we left in the morning; these probably passed on, as after that first arrival they disappeared, and we did not see any more for a day or two. The first House Martin I saw in the street of the village on April 18th, and, last of the lot, the first Sand Martins on the 22nd, when I saw two or three about their old nest-holes in my quarry, rather reversing the usual order, as the Sand Martins are usually the first to arrive; they were rather scarce for the first few days, but now they are here in more than usual numbers, and the colony which frequents my quarry must be more than double its usual number this year. On the same day, April 22nd, my son told me he had seen a Swift at Williton, when drilling his volunteers; but I think Williton, though only ten miles off, is generally nearly a week before us—the occasional reports of summer migrants from that place in 'The Field,' I think, show the same thing. The Cuckoo did not make itself heard till April 24th, and even then was rather hoarse. I did not see a Redstart till the 27th, when I saw two in one of my orchards, and on the same day several Whitethroats made their appearance. I also saw a single Whinchat on a hedge by the road to Taunton, but not far from here; though the Stonechat is tolerably numerous, and not unfrequently remains throughout the winter, the Whinchat is by no means common, as I have not seen one here since May 1st, 1869, and they never remain to breed; in other parts of the county, especially about Clevedon, I have seen Whinchats tolerably numerous, and evidently breeding. None of us saw a Blackcap till the 1st of May, but I suppose they escaped observation, as one of my daughters found a Blackcap's nest with eggs on the 6th. I saw the first Yellow Wagtail on May 1st. As early as the 19th January the Red-legged Gulls, *Larus ridibundus*, in confinement began to show their dark heads, and by the 24th February one of them had completed the change and the

others nearly so, though at that time neither the Ruffs nor the Black-tailed Godwits had begun to show any change. On the 21st April I was told that the Peewits near Minehead had eggs hard-set; mine, however,—in the same place as the Ruffs and Godwits,—had not shown any signs of change to summer plumage, and indeed on the 6th May only one of them has assumed the black throat of the breeding-season, though the Ruffs and Black-tailed Godwits have quite completed their breeding-plumage, and the white mark on the fore part of the throat of a pair of Oystercatchers, in the same place, is rapidly becoming invisible. Two Knots, however, in the same place, show no inclination to change; whether they will do so when the weather gets warmer I cannot say—at present there is a miserably cold wet N.E. wind. On the 5th April, when out hunting at Halswell I saw the Herons again on their nests, though the keeper told me he thought there were not quite so many nests as last year, for, though none of their nesting-trees had been felled, one or two of the taller trees which they were in the habit of using as look-out places had been cut down in thinning the plantation, and the Herons did not approve of it. On the 17th we were there again, and the greater part of the Herons were sitting hard, but the keeper said he did not think any young ones had been hatched. One pair of the tame Herring Gulls have two eggs, and the Herring Gull and Lesser Black-back have paired again and made their nest, but there is no egg yet, and two pairs of Pink-footed Geese are sitting.—CECIL SMITH (Bishops Lydeard, Taunton).

FISHES.

The Basking Shark.—In 'The Zoologist' for July, 1884, Mr. Cornish recorded the capture of a female Basking Shark, 9 ft. 4 in. long, which was "gorged to repletion with Hake and Mackerel," remarking, that "the teeth of this specimen were conical and recurved, about half-an-inch long in the longest," in two rows, except in the middle of the lower jaw, where there were three. This observation, so entirely at variance with my remarks (Brit. and Irish Fish.), published two months previously, rather surprised me, for I had asserted that it is not a voracious fish, and (judging from the small size of its teeth and the large size of its gill-openings, which permit the passage of a great amount of water, as well as the presence of a peculiar sifting apparatus to detain minute structures) that I believed it fed on small animals. But not having examined a specimen in the flesh, I was unwilling to offer any reply at the time in your columns. When at Mevagissey, in Cornwall, this month, I was told of some Sharks which had been seen among the Mackerel, many of which latter fish had been observed bitten in two, and the fishermen supposed these Sharks were the culprits. On the morning of May 7th I received, at Cheltenham, a specimen (by rail) of a female, 11 ft. long, captured the previous morning off the "Deadmans," and which had been secured for me by Mr. Dunn. Being of the same sex

as Mr. Cornish's example and $1\frac{1}{2}$ ft. longer, the first investigation I made was naturally into the size of its teeth, and the longest in either jaw was 0·09 of an inch, or merely $\frac{2}{11}$ ths of the length of those in the smaller Penzance specimen. These teeth also were not in rows parallel to the edge of the jaw, but passing obliquely over that bone. An excellent figure of a single tooth will be found in Prof. Turner's paper in the 'Journal of Anatomy and Physiology' for April, 1880. It is evident that this species of Shark has no teeth anything like "half an inch long." Its stomach was gorged with "red stuff like bruised crabs or the roe of the sea-urchin," as described by Low and others, and which on being placed under the microscope was seen to consist principally of *Amphipoda* and *Copepoda*, among which was a small piece of sea-weed, possibly swallowed inadvertently. Two quarts of food then practically consisted of small sessile-eyed Crustacea, and no vegetable substance. The Penzance fish was possibly a Porbeagle, *Lamna cornubica*, a fierce and destructive species, by no means rare off the coast of Cornwall. The Basking Shark may be killed for its intrinsic value as an oil-giver, or for the damage it does in disturbing fisheries, or for consuming the minute crustaceans on which some of our best table-fish subsist; but I submit that we have no evidence of its devouring any fishes, especially such as are suitable for the market, while its teeth conclusively demonstrate that they are not adapted for such a purpose.—FRANCIS DAY (Cheltenham).

Food of Sea Fishes.—For a period of more than twenty years I have noted that the surface of the sea off the coast of Cornwall in spring assumes at certain times a deep olive colour, which in favourable seasons extends full twenty miles from land. Our fishermen call it "cowshiny water," no doubt on account of the similarity which it presents to the excrement of the cow when diluted. On looking carefully into the sea I found it full of olive-coloured jelly-like forms, which for some time I thought were small *Medusa*, but under the glass they were found to be globules of olive matter, varying in size from ordinary gunshot to that of small garden peas. They permeated the water for many yards in depth; their numbers were as incalculable as the sands on the shore. On further observation it was noted that all our surface-feeding fishes were exceedingly fond of them as food, and that the stomachs of Mackerel, Herring, and Pilchard were often quite distended with them. Moreover, the success of the inshore Mackerel-fishery on this coast, in the months of March and April, seems to depend much on the quantity of this food which may then exist. Further investigation showed that the existence of these globules in the sea depends entirely on the occurrence of showers during the months above mentioned. If there is no rain there will certainly be no olive-colouring in the sea and no olive globules. The earliest date at which I have noticed them was about March 10th, and the latest about May 20th. By those professionally interested in our fisheries the first change of sea from blue to olive is more

anxiously looked for than is the first primrose by the farmer, the immediate results being so important. The germs of these olive globules, if floating in the sea prior to the advent of rain, must be extremely minute, since they do not give a tinge to the water. Up to this point I could go no further for years, and could only watch the rain and the change. But last summer, while scanning the sea after some heavy showers, I noticed that close to land the water had turned to a deep green colour, caused by quantities of green globules much resembling the olive-coloured ones of spring. It then occurred to me they were nothing more than the spores of sea-weeds, the latter being really the seeds of green Algæ (*Chlorospermeæ*). I believe then I am correct in saying that these myriads of olive globules which furnish such abundant food to the surface-feeding fishes, and which colour the sea in the manner described, are nothing more than the fully developed spores or seeds of the *Melanospermeæ*, or olive sea-weed. The number of spores thrown off in one season by a single full-grown plant must be prodigious. The last I observed was a *Fucus serratus*, and the figures representing them could not be less than two millions. What our scientific authorities have to say on the matter I do not know; the books I have on sea-weeds contain no allusion to rain-water playing any part in the development of the spores. But it now seems probable that there can be no fructification of the olive and green sea-weeds without the aid of genial showers in spring and summer.—MATTHIAS DUNN (Mevagissey).

Ova of the Ling.—About the middle of April last a Ling, *Molva vulgaris*, was landed at Mevagissey with the spawn running freely from it. As the fish was only just dead, and good strong sea-water was at hand, I at once procured a pailful, and put in some of the spawn. It all floated on the surface of the water, each egg free and distinct from its fellow, without any appearance of any adhesive matter around them. On dipping some up into a hand-glass all the eggs looked bright and transparent, although when a quantity were driven together they had a grey tinge. On one side of every ova, just under the sac or egg-case, there was a minute speck of clear matter, and this was uppermost in all the ova when floating. As all the *Gadidæ*, to which family the Ling belongs, when in the act of spawning part with the oil in the liver, it would be interesting to know whether these bright globules in the eggs are composed of oil, one of its uses being to keep the matter floating on the surface of the sea. Later in the day I found a male Ling with the milt running free; this I also found floated on the surface of the water.—MATTHIAS DUNN (Mevagissey).

ECHINODERMATA.

Method of Preserving the Colour of Starfishes.—The Starfish Gallery of the British Museum (Natural History) has received an addition which, though it is only of specimens of common British species, is of

interest and importance. The specimens, which are examples of *Asterias rubens* and *Solaster papposus*, were killed by immersion in boiling water, and have, especially the latter, retained their original coloration. This method is so simple, and appears to be so successful, that we commend it to our readers; it will, no doubt, be as efficacious with foreign as with English species, and may be an important factor in improving the exhibited series of Echinoderms in the National Collection. We hope that Mr. Sibert Saunders, of Whitstable, will have many imitators.

SCIENTIFIC SOCIETIES.

ZOOLOGICAL SOCIETY OF LONDON.

April 21, 1885. — Prof. W. H. FLOWER, 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 female Roan Kangaroo, *Macropus erubescens*, being the third specimen of this Kangaroo acquired by the Society, and the first of the female sex: also to six Wattled Starlings, *Dilophus carunculatus*, from South Africa, and two Striated Colies, *Colius striatus*, both species being new to the collection.

Mr. Sclater exhibited and remarked on a pair of Pheasants from Bala Murghab, Northern Afghanistan, belonging to H.R.H. the Prince of Wales.

Mr. G. E. Dobson exhibited some skulls of *Crocidura aranea*, and pointed out that they possessed supernumerary teeth (premolars) in the upper jaw.

The Secretary exhibited, on behalf of M. George Claraz, an egg of Darwin's Rhea; and read some notes by M. Claraz on the habits and distribution of this Rhea.

Mr. G. A. Boulenger exhibited a specimen of a Brazilian Snake which had partly swallowed an Amphisbænid Lizard. The Lizard had in its turn partly eaten its way through the body of the Snake.

A communication was read from Sir Richard Owen, containing remarks on the structure of the heart in *Ornithorhynchus* and in *Apteryx*.

Mr. Oldfield Thomas read a paper on the characters of the different forms of the *Echidna* of Australia, Tasmania, and New Guinea, all of which he was inclined to refer to one varying species.

Dr. St. George Mivart read a memoir on the anatomy, classification, and distribution of the Arctoidean Carnivorous Mammals. The author, after briefly noticing the papers of other naturalists who have of late years treated of this subject, described the main facts concerning the anatomy of the various Arctoid genera, especially as regards their osteology and dentition, and gave detailed comparisons of the proportions of the various

parts of the skeleton, comparing them with those of the *Æluroids* and *Cynoids*.

Dr. F. H. H. Guillemard read the second part of his report on the collection of birds made during the voyage of the yacht 'Marchesa.' The present paper gave an account of the birds collected in Borneo. It also contained notes on some birds obtained on the island of Cagayan Sula, on the north-east coast of Borneo.

May 5, 1885.—Prof. ALFRED NEWTON, F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of April, and called special attention to a pair of Rhinoceroses, apparently referable to the Sumatran species, *Rhinoceros sumatrensis*; to a Tibetan Wild Ass, *Equus hemionus*, received on deposit; and to two Gouldian Grass Finches, *Poëphila gouldiæ*, presented by Mr. C. N. Rosenfeld.

A communication was read from Mr. Jean Stolzmann, containing observations on the theory of sexual dimorphism.

Mr. J. Bland Sutton read a paper on hypertrophy and its value in evolution, in which he attempted to show that material changes in structure might be the result of what was originally a pathological condition.

Mr. E. T. Newton read a paper on the remains of a gigantic species of bird, *Gastornis Klasseni*, which had been obtained by Mr. H. M. Klaassen from the "Woolwich and Reading Beds" of the lower Eocene series. The author observed that these fossils proved that in early Eocene times England was inhabited by a race of birds which equalled in their proportions some of the more massive forms of the New-Zealand Moas.

A communication was read from Mr. R. B. Sharpe, containing the description of a new species of Hornbill from the island of Palawan, which he proposed to name *Anthracoceros lemprieri*.

Prof. E. Ray Lankester read some notes on the right cardiac valve of the specimens of *Apteryx* dissected by Sir Richard Owen in 1841.

A communication was read from Lieut.-Col. C. Swinhoe, being the third of his series of papers on the Lepidoptera of Bombay and the Deccan. The present paper treated of the second portion of the Heterocera.

A communication was read from Dr. St. George Mivart, containing a correction of a statement concerning the structure of *Viverricula* contained in a former paper.

May 19, 1885.—F. DU CANE GODMAN, Esq., F.R.S., in the chair.

A letter was read from the Rev. G. H. R. Fisk, respecting the capture of a Sea-Snake amongst the rocks at the entrance to Table Bay, which he believed to be referable to *Pelamis bicolor*.

A letter was read from Mr. B. Crowther, stating that he was about to send the Society a pair of Duckbills, *Ornithorhynchus paradoxus*, and giving some instructions as to the treatment of these animals in captivity.

Mr. F. Day exhibited and made remarks on a curious specimen illustrative of an extensive injury to the intestines of a Trout, and its subsequent recovery therefrom.

Mr. Day also exhibited a piece of the sifting-apparatus of the Basking Shark, together with specimens of the food upon which it lives; and an example of the Vendace taken in Derwentwater Lake.

Mr. Osbert H. Howarth exhibited a specimen of coral of the genus *Dendrophyllia* attached to a brown stoneware bottle, which had been dredged up in the Atlantic, off Madeira, at a depth of about 15 fathoms.

A communication was read from Prof. J. von Haast on *Dinornis oweni*, in which the author gave a detailed description of the bones of this recently discovered new species of the extinct wingless birds of New Zealand, which was remarkable for its small size.

A communication was read from Dr. St. George Mivart, containing notes on the genetic affinities of the group of Pinnipeds.

Dr. F. H. H. Guillemard read the third part of his report on the collection of birds formed during the voyage of the yacht 'Marchesa.' The paper dealt with the birds obtained on the Island of Sumbawa, a locality hitherto almost unknown to ornithologists. During the 'Marchesa's' short visit examples of thirty-nine species were collected. Of these, two (*Turnix powelli* and *Zosterops sumbavensis*) were new to Science. The remaining species had been previously recorded from islands to the eastward or westward in the same group.

A communication was read from Dr. Hubrecht, containing the description of a Pennatulid obtained by Capt. St. John in the Japanese Sea at a depth of 71 fathoms. A careful examination of the specimen in question induced the author to assign it to a new genus and species, which he proposed to name *Echinoptilus mackintoshii*.

Mr. Herbert Druce read a paper on some new species of Lepidoptera-Heterocera, founded on specimens obtained by the late Mr. C. Buckley in Ecuador, to which were added descriptions of some recent acquisitions of the same group from various other localities.

Mr. F. D. Godman read descriptions of the Lepidoptera collected by Mr. H. H. Johnstone on Kilimandjaro. The collection contained examples of twenty-one species of the Rhopalocera, and six of Heterocera. Of the Rhopalocera the author described three species as new. — P. L. SCLATER, *Secretary*.



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NOTES ON THE ZOOLOGY OF MANITOBA.

BY THE LATE T. B. WOOD.

(Communicated by T. H. NELSON.)

(Concluded from p. 227).

August 11th.—Last week I got five Shovellers, two Black Terns, and an unknown Duck; also paid another visit to the Terns' colony. The Black Tern is first seen in great numbers about the 20th or 21st of June, and is then in full summer dress, with black breast, head and throat, and dark grey back. The greatest numbers were found fifteen miles south-west of Brandon round some large swamps, one of which is about a mile long and half-a-mile broad. The birds there are as "thick" and noisy as those we saw at the Farne Isles; hundreds were flying over every small pond or slough, had several pairs hovering about, and the air was filled with their cries. I paid a second visit to this place in July, and again on August 6th, when I found great numbers still there, and shot two specimens; they were changing plumage and losing the black on the head and breast. The feet of this Tern are only partially webbed. I never noticed them taking food as other Terns do, but the swamps are full of long grass and reeds, choking up the place, so that even if the birds are feeding it is impossible to observe what they are taking. Ducks, Curlews, Cranes, and other birds are now constantly passing over, showing that the migratory season has commenced.

August 18th.—About the middle of the month I drove out about fifteen miles south-west, and had a good time amongst the

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wildfowl; my bag was made up of seven Blue-winged Teal, one Green-winged Teal, four Shovellers, two Pintails, one Mallard, one nondescript, two Bitterns, four Yellowshanks, one Coot, one large Hawk, one Grebe, two Black Terns, and a Grey Shrike. One of the Terns was in full plumage, with coal-black head and breast, back and tail grey, under tail-coverts and thighs white. We got a Duck in a rather curious manner. I saw a Falcon suddenly drop into a bed of reeds, so walked up until I got within a few yards of the spot, when he rose and I knocked him over; he had struck a Shoveller, which I picked up, more frightened than hurt. I could have killed any number of Sandpipers, Yellowshanks, and Snipe, but as cartridges are precious here, I am obliged to be rather careful of my ammunition.

September 1st.—Late in August I was out at Badger Hill for two days, and had fair sport with the Ducks and Prairie Chickens, getting eighteen brace of the latter. I also shot two large Hawks, a Woodpecker, a Grackle, and a Thrush. One day we drove within thirty yards of two Deer, but did not get a shot; on the same day we saw a two-year old Bear. The heat is still very oppressive, nearly as bad as it has been all through the summer; for the last fortnight it has been 114° in the shade. I saw the first flight of Geese this week (end of August) going south.

September 25th.—In the middle of this month I was again at Badger Hill, and added to my collection two Peregrines, a Bittern, several small Hawks, and three kinds of Woodpeckers, and saw many other birds too numerous to mention. Bitterns were very common, and are capital eating. We had a few days' fishing, and caught some good sized pike, ten pounds to twelve pounds in weight. The weather has changed considerably, and winter is fast coming on; the nights are bitterly cold, with hard frosts. Large flocks of Shore Larks are flying about Brandon, and small birds something like a Black Redstart. Of the two Peregrines I shot, one was when I was out looking for my ponies: I was watching a flock of Sandpipers when the Falcon made a dash at one of them; the Sandpiper at once ran into a pool close by and ducked under; of course the Peregrine missed his aim, but I did not miss mine. The other Peregrine I caught asleep on a tree! I got within 100 yards of a magnificent eagle one day, but had not my rifle near; on the same day I

drove close to a Prairie Wolf, which calmly looked at me for a while and then galloped off.

October 8th.—There has not been much shooting during the early part of October. I generally have a drive along the river, which swarms with Ducks. I have secured an American Wigeon, and fired at an Eagle on the 4th, but lost it among some timber.

November 4th.—Ducks are beginning to leave us now, and are going south, but there is still pretty good shooting. I got a Short-eared Owl one morning on going out before breakfast; there was evidently a migration of these birds going on, for they rose at every few yards from out of the long grass, just as they do on the sand-hills at Redcar. The country is now covered with snow, but the days are very delightful, and more enjoyable than during the heat of summer with mosquito plagues. I hear Moose are to be had down at the Souris, so am going there soon. Snow Buntings mingle with the Shore Larks in the streets, and are as tame as our English Sparrows.

November 16th.—The weather is still very cold, and the thermometer registers 20° below zero. I saw a very fine Ermine to-day. Foxes and Wolves are increasing in numbers and boldness. We get an animal like a Mountain Hare here, which turns white in winter [*Lepus americanus*].

December 25th.—About the end of this month there was a fearful snow-storm, and the snow now lies thick on the ground; the cold is still intense, 20° below zero. My bag of eatable birds this season has been about 300, and includes 129 Ducks, 119 Prairie Chickens, and 14 Bitterns.

January 24, 1883.—It is heavy work shooting in the snow, but I managed about the middle of the month to bag a brace of Ruffed Grouse; they sit in the bushes, and you may almost knock them over with a stick. I also secured a Tanager [*Pyrrhuloxia rubra*], very like the American Grosbeak; the bill is black, head, breast, and back crimson: wings black and white, and tail black, size about equal to a Hawfinch. There was a pair of them, and I secured the male. On the same day I got a large Shrike and some very good Snow Buntings.

February 22nd.—About the beginning of the month I shot another Tanager, and a third towards the middle of the month. About the 10th I was going out with the gun, when I saw a large bird coming straight over me, about sixty yards high. I gave it

a charge of No. 2 and down it came. Imagine my delight, when I picked up a splendid male Snowy Owl, pure white, except for three black marks on the wings. The weather is not quite so severe now,—10° below zero, and I have ventured out wolf-shooting, but have not been successful hitherto. One day I saw a few Tits and Redpolls.

March 5th.—At the beginning of this month I shot another Snowy Owl, a female, in speckled plumage. It has snowed heavily for some days, and the Wolves are very daring. I have secured a few, and am tanning the skins for mats.

March 11th. — Towards the middle of the month the weather became milder. We shall all be glad when the snow disappears and the grass becomes visible again.

April 25th.—The spring migration commenced this year almost a fortnight earlier than usual. Ducks put in an appearance on April 13th, and by the 15th large flocks of both Ducks and Geese passed over. The spring duck-shooting is preferable to that in the fall; the birds are in so much finer plumage, and the weather, too, is more bearable. I append a few dates of spring observations, which will give a slight idea of what we see here:—March 20th, Shore Larks appear; snow still covering prairie and sleighing good. April 10th, saw two Crows and a Marsh Harrier; snow melting fast, trail very bad. 12th, two Ducks going W.; trails broken up, sleighing over. 13th, a Mallard shot. 14th, large numbers of Marsh Harriers from 9 a.m. till 1 p.m., a continuous flight going W.; also a few Yellowshanks and Crows. 15th, Marsh Harriers going W. 16th, large flocks of Ducks and Geese going W., also Marsh Harriers sailing over the sloughs, and a few small birds appearing; small Hawks passing; snow almost all gone. 17th, Ducks going W.; Marsh Harriers sailing about; shot at a Yellowshank; large flights of summer visitors appearing. 18th, a snow storm; shot two Mallards, saw a Yellowshank; tried to stalk a Goose on the ice on the river, but failed; saw a Short-eared Owl. 19th, shot a Mallard; saw Pintails, and a friend shot a Marsh Harrier. 20th, saw Robins and Black Grackles [*Scolecophagus ferrugineus*] in large flocks, also a few Pintails and one flock of Green-winged Teal; a Goose shot; a friend shot a male Scaup and a Green-winged Teal. 21st, I shot three Mallards and a Green-winged Teal; a friend shot a Snipe; saw a Peregrine and several Snipe.

22nd, saw two Sand-hill Cranes going N. 23rd, ice on the river breaking up. 24th, a friend shot a male Pintail; river almost clear. 25th, Anemone in flower; grass showing green.

May 9th.—About the end of April I saw a Woodpecker, and shot a fine Buffel-headed Drake—a grand specimen. On the 28th I observed a Ring Plover [*Ægialitis semipalmatus*]. On the 29th shot a Pochard; saw numbers of Snipe, Sand-hill Cranes, Martins, and a Short-eared Owl, also a butterfly like a Camberwell Beauty. Early in May I got specimens of Meadow Larks [*Sturnella magna*], Red-winged Starlings, and Buntings; and on the 8th saw eight Lesser Yellowshanks [*Totanus flavipes*]. By the first week of May most of the Ducks had arrived, but the large flights of Blue-winged Teal had not yet appeared. Thus far the Ducks noticed this spring are Mallard, Pintail, Shoveller, Scaup, Pochard, Buffel-head, Blue-winged Teal, Green-winged Teal, Wood Duck, Butter Duck (Buffel-head), American Wigeon (called "Summer Duck" by the Indians), and a Duck very like a Scaup, which I am not able to identify. [Probably the American Scaup, *Fuligula affinis*.—ED.] Two friends of mine were away shooting in the second week of May, and brought home (amongst other birds) three Slavonian Grebes, an Esquimaux Curlew [? footnote, p. 226], and a Canvas-back Duck.

May 25th.—The close time begins on May 15th for all kinds of wildfowl, so I had a last day before the season ended; my bag was thirty-seven head, including four Plover, a Buzzard, Bittern, and two species of Grebe, ten Eared and Slavonian Grebes. Since then I got a Golden Plover in full summer plumage, and a Ring Dotterel exactly like our Tees-mouth friend; when I picked it up I could almost imagine myself at Redcar again. [Doubtless *Ægialitis semipalmatus*.—ED.] A great many Gulls passed over here about the middle of May, and I also heard that the Black Terns had arrived at their breeding-quarters. The Blue-winged Teal is now in great force; in fact, most of the summer birds have arrived. The weather now (end of May) is very hot, and the mosquitoes are beginning to be troublesome. Last evening I saw a Goatsucker and heard the Whip-poor-Will.

June 4th.—Early in June I had a ramble out to the Brandon Hills, eight miles south of here. I discovered a lake, about a mile long by about half-a-mile broad, full of Ducks; it is right amongst the hills, which are clothed with woods on two sides of

the lake. I was looking for the Wood Duck, but not seeing any on the lake did not disturb the fowl there. In wandering through the woods I spied a mighty nest of large twigs in a tree on the edge of the lake. On my approach a bird flapped off, and I promptly shot it, when I found it to be a fine Red-tailed Buzzard; I skinned it, as also a Yellow-headed Grackle (?) which I shot.

June 20th.—In the middle of June I was out at Plum Creek, thirty miles S.W., where I added a few birds to the collection. Amongst others I got three Phalaropes, a few Black Terns (of which there were large numbers), and a very good Bar-tailed Godwit, *Limosa foeda*, which I found breeding there. I also found numbers of Ducks' nests, the eggs all incubated, except two Blue-winged Teal's. A Black-headed Gull was following the plough just as they do in Northumberland. In the first week of July I noticed a flock of these Gulls flying round, screaming and coming quite close to where I was standing. They appear to be very like our English Black-headed Gull, but I did not manage to get a specimen for identification; they breed on some large lakes or sloughs round Portage. I shot a couple of Dunlins in Brandon one day, and so have added this species to my collection. The eggs of many birds which are considered rare in England are easily obtainable here, *viz.*, Marsh Harrier, Shore Lark, Buzzard, Ducks of various species, Black Tern, Bar-tailed (Marbled) Godwit, Bartram's Sandpiper, Yellowshanks, and many others. I shot a Killdeer Plover [*Ægialitis vociferus*] about the second week in July, and took the eggs.

August 5th.—The close time for Ducks and Prairie Chickens has been extended to September 1st, but I went out on the 1st of August, and shot a few Killdeer and Upland Plover (Bartram's Sandpiper). I also shot three small Sandpipers from a flock of about a dozen; they are very like a Dunlin, but the breast shows no signs of any black feathers, and I have shot similar specimens in June; they are also smaller than the Dunlin. [They may have been Bonaparte's, or Baird's Sandpiper.—ED.]

August 25th.—H. had a day's shooting about the middle of the month, and bagged seventy head, including fifty-two Ducks. I have reared a tame Bittern, a fine handsome full-grown bird now; he seems very fond of frogs, small birds, and insects; it takes me nearly all my time to supply him with food. On the

20th I heard that a Gyr Falcon had been observed; at the same time a friend of mine caught two young Canada Geese down by the river. You have no idea what a place this is for birds. I am often lying outside the tent, smoking, when perhaps a pair of Marsh Harriers will come sailing past; then a big Buzzard will perch about fifty yards away and remain motionless for hours, in spite of my firing my catapult at him; then a flight of Ducks passes over, or perhaps a few Sand-hill Cranes, or Geese, Passenger Pigeons, &c. This is an ordinary occurrence, and if I take the trouble to get my gun and walk down to a slough a quarter of a mile away, I am sure to flush Sandpipers, Plovers, Snipe, Yellowshanks, and other waders, a few Ducks, or perhaps a couple of Water Rails or a Bittern, and see the Musk Rats swimming and diving in all directions. I am getting almost indifferent now to the sight of so many birds, and rarely shoot one unless it be something uncommon.

September 16th.—Three guns had good sport early in this month; they got 600 head in five days, mostly Duck, Snipe, and Prairie Chickens. Amongst the dead I found another species of Phalarope, smaller than those I got previously; it is in autumn plumage. [Possibly the Red-necked Phalarope.—ED.] There were also several species of small waders, but I was too late to save them. Prairie Chickens are scarce this season, owing no doubt to the settlers shooting them during the close time. Amongst the birds I have got lately are Scaup, Grebes, Kingfishers, Blue Jay, Velvet Scoter, and Peregrine. Hawks are particularly abundant this autumn, especially Marsh Harriers, but I rarely take the trouble to shoot at one now.

October 12th.—Winter is coming on fast, and the wildfowl are leaving us for the south. I have shot eighty Ducks in three days during the early part of this month. Snipe are still plentiful, but will soon be leaving. I have seen several Mergansers and Buffel-heads, and secured one of the former for the collection. The other day I saw a Pelican [*Pelecanus trachyrhynchus*] exposed for sale in a shop; it was shot in South Manitoba, and measured eight feet from tip to tip of the wings. I have added to my store a Little Crake, which I shot out of a reed-bed early this month; it is the first of the kind I have ever seen here.

NOTES ON THE VERTEBRATE ANIMALS OF
LEICESTERSHIRE.

BY MONTAGU BROWNE, F. Z. S.
Curator, Town Museum, Leicester.

(Continued from p. 220).

Order UNGULATA.—Family ELEPHANTIDÆ.

Amongst extinct species, remains of Elephants occur in the post-tertiary river gravels lying above, or at some distance from, the present river-beds of the county. At Belgrave, a suburb of Leicester, river gravels occur (probably post-glacial) in which are frequently found bones and teeth of Elephants, &c., usually resting on the under-lying Keuper marls.

Elephas primigenius, Blumenbach. Mammoth.—A remarkably fine tusk of one of these extinct pre-glacial Elephants was found in October, 1865, in Sydney Street, Belgrave Road, Leicester, eleven feet from the surface, in the drift gravel, and resting upon the upper Keuper marls. It measured *in situ* nine feet on the curve, but being extremely friable, in spite of the utmost care, some portion of it was lost. The remaining portion, after being skilfully treated by Mr. J. E. Weatherhead, the then Curator, found a resting-place in the Town Museum, where it still remains. Its measurements are:—Length of curve, 6 ft. 2 in.; circumference, 2 ft.; diameter, 8 in. A portion of a smaller, but longer, tusk was found a year or so afterwards in the drift in Hutchinson's gravel-pit, Sydney Street, Belgrave Road. The Belgrave river-gravels have also furnished numerous bones and teeth, many of which are shown in the Leicester Museum. The late Dr. Leith Adams, in his beautiful monograph on "Fossil Elephants" (Palæontographical Society, 1877-81), figures profile and crown views of a left upper last true molar, from Kirby Park, Melton Mowbray, marked No. 35 in the Woodwardian Museum, Cambridge.

Elephas antiquus, Falconer. Ancient Elephant.—Mr. W. J. Harrison, in his 'Geology of Leicestershire,' has recorded the finding of a complete skeleton of this species at a depth of six feet, resting on lias clay at Barrow-on-Soar. Unfortunately but two or three fragments could be preserved. Dr. Leith Adams also has noticed the occurrence of this species at Barrow-on-Soar.

The Leicester Museum possesses two teeth—one from Barrow-on-Soar, and the other, a remarkably fine one, from Thorpe Arnold. These were originally both labelled *E. primigenius*, but, suspecting that they were referable to *E. antiquus*, I took the opinion of Mr. R. Etheridge, F.R.S., of the British Museum (Nat. Hist.), who kindly settled the matter by confirming my impression.

Family RHINOCEROTIDÆ.

Rhinoceros tichorhinus, Cuvier. Extinct Hairy Rhinoceros.—A few bones and numerous teeth of this extinct species have been found in the Belgrave and other gravels with the remains of Elephants. The Museum possesses a fine series of teeth from Belgrave and Thurmaston.

Family BOVIDÆ.

Bos primigenius, Bojanus. Extinct Wild Ox.—Bones of the fore and hind limbs, the pelvic girdle, teeth, and nearly perfect crania with horn-cores attached, have been found in excavations in the post-tertiary gravels. One fine skull with horn-cores attached—from the Abbey Meadow, 1880—is in the Town Museum. A fine left metacarpus, very much larger than that in existing cattle, was discovered in post-tertiary gravel at Willow Bridge in September, 1881, by Mr. J. Hay, who sent it to me for identification, and afterwards kindly presented it to the Museum. A large horn-core from Archdeacon Lane, discovered some years since, and having about one-third of its length broken, measures in girth, just above burr, nearly 14 inches, and, at 7 inches above that point, nearly 11 inches.

Bos longifrons, Owen. Extinct Long-faced Ox.—A nearly perfect skull with horn-cores attached, found in the Abbey Meadow, is in the Leicester Museum. It is always exceedingly difficult, in such a town as Leicester, inhabited as it has been by man from a period long anterior to the Roman occupation, to draw the line between bones of the oxen of historic and those of pre-historic times; but there is, I think, no doubt that many of the specimens found in Leicestershire may be, from their peculiarities and the position in which they are found, fairly credited to one or the other of the two pre-historic cattle mentioned. On the other hand, in the case of the *Equidæ* (Horse, Ass, &c.), whose remains are so constantly found in

Leicester, I have, as yet, been unable to claim for them a higher antiquity than that of historic times.

FAMILY CERVIDÆ.

Cervus elaphus, Linn. Red Deer. — Semi-domesticated in a few parks in the county; nowhere more numerous than at Bradgate Park, the seat of the Earl of Stamford, where it breeds. Nothing apparently is known of its introduction, and it is extremely probable that the deer now to be seen there may be the descendants of ancient herds which formerly ranged at large in the Forest of Charnwood, of which Bradgate once formed part. Some interesting figures of these deer are given in a book written about 1840, by a Mr. John Martin, of Steward's Hay, entitled 'Sketches of Deer, in Bradgate Park, by an amateur.' A fine specimen of a "Royal Stag" was shot at Bradgate in 1881, expressly for the Museum, for which it was subsequently mounted. Horns and bones, those of the limbs especially, of an ancient race of *C. elaphus*, much larger than corresponding bones and horns of the existing type, are occasionally found. These, if not pre-historic, are certainly of great antiquity, probably contemporary with those of the Wolf and Wild Boar. The Leicester Museum possesses a portion of a fine right antler dug up at the North Bridge (marked No. 519), the measurements of which are—Circumference above "burr," 9 in.; inside curve of "brow" antler, $11\frac{1}{2}$ in.; length of "bay," broken at extremity, 10 in.; "tray" absent; circumference below tray, 6 in.; length from burr to end of broken "beam," 22 in. Another perfect left antler of 8 points from the Abbey Meadow (No. 287), measures—Circumference above burr, $7\frac{3}{4}$ in.; inside curve of brow antler, $10\frac{1}{2}$ in.; ditto bay, 9 in.; ditto tray, 7 in.; crown (of five) from point to point, 14 in.; length from burr to end of beam, 2 ft. 3 in.; ditto measured along curve, 2 ft. 9 in.; circumference below crown, 7 in.

Dama vulgaris, Gray. Fallow Deer.—Resident and breeding in semi-confinement in the Deer parks of Bradgate, Beaumanor, Gopsall, &c. Probably introduced into the county at the time of the Roman occupation of Leicester. The dark race, common at Bradgate and Gopsall Parks, is stated by Bell ('British Quadrupeds') to have been introduced from Norway by James I.; but Mr. Harting has shown ('Essays on Sport and Natural

History') that this statement, which has been repeatedly copied, is without foundation, and that a dark race of Fallow Deer existed in England at least two centuries earlier. An old deed, dated 1247, quoted in Potter's 'History of Charnwood,' relates to the hunting and taking of Deer in Bradgate Forest, and is interesting as being the earliest known hunting agreement in existence.

Capreolus capræa, Gray. Roe. — Extinct within historic times. This species certainly inhabited Leicestershire in former days. The museum contains two basal portions of skulls, found at excavations in Leicester. Potter says, speaking of the manor of Roecliff—now written Roecliffe—"It is said to have derived its name from the circumstance of its having been a 'stocking' or hunting ground for the Roe in the days of the Earls of Leicester." So late as the early part of the 16th century the Priors of Ulverscroft (then called Alwayscroft) "did hunt, course, and hawk throughout the waste of Charnwood unto the saulte of the Parks of Bradgate, Groby, and Loughborough; that is to say, Fallow Deer, *Roe*, Foxes, Hares, &c."

Rangifer tarandus, Linn. Reindeer. — Extinct. A few limb bones and horns are occasionally found in the Belgrave and other "river gravels," and also in the "drifts." The remains of this Ungulate clearly date back to pre-historic times.* Some good specimens of horns are in the Leicester Museum; one, a very fine specimen, part of a right antler, was found April 7th, 1866, in Grafton Place, at a depth of 11 ft. in the drift gravel, and presented by Mr. George Holmes. A portion of another right antler was found in Hutchinson's gravel pit, Belgrave Road, in August, 1878; and a third portion in the Abbey Meadow in June, 1880.

FAMILY SUIDÆ.

Sus scrofa, Linn. Wild Boar.—Extinct within historic times, and formerly inhabited Leicestershire. Several tusks have been dug up, pierced for rude ornaments; and the Leicester Museum possesses a Roman vase of "Upchurch" ware, in which were found some remarkably fine Boar's tusks. Wild hogs, according to Potter, abounded in the forest of Charnwood.

* But see art. "Reindeer" in Harting's 'Extinct British Animals.'

ORDER CETACEA.

Two portions of the mandible of a huge Cetacean, resembling, if not identical with, the existing Greenland "Right" Whale, *Balæna mysticetus*, Linn., were found during the excavations for the Abbey Park in 1881, and forwarded to me. Mr. T. Griffiths, C.E., who was at the finding of the largest (or condylic) portion, described it as resting upon the post-tertiary gravels, at a depth of ten feet, under apparently undisturbed soil; and from what Davis and Gunn write as to the "Chillesford" and "forest" beds, it was at first supposed that we might possibly discover in Leicestershire a formation somewhat analogous to those; but on referring the matter to Mr. J. D. Paul, F.G.S., of Leicester, we decided to submit the bone and its history to Professor Flower, F.R.S. This was accordingly done, and Professor Flower subsequently wrote me that I was, no doubt, correct in my supposition as to the bones in question having been brought from a distance and used for posts, or similar purpose, at some remote period, and having afterwards become buried in the morass and gradually covered over with soil, &c., but that they showed no trace whatever of what might be called a fossil origin. Probably this is the true explanation, for at Knossington I saw, in 1883, the rami of the mandible of a large Whale, used as an entrance archway to a garden, and these were of considerable antiquity.

The foregoing list gives a total of 40 species of mammals, exclusive of the Horse and Whale. Original notes are now invited with reference to the following:—Polecat, Pine Marten, Water Shrew, any Bats (excepting the Long-eared, Pipistrelle, and Noctule), Black Rat, Harvest Mouse, Red Field-Vole, Dormouse; also upon any extinct Ungulates, or upon varieties of any mammals inhabiting Leicestershire.

ADDENDA.

Page 215-216. I am now enabled to add another species of Bat (making the sixth now recorded) to the list of CHIROPTERA, viz.:—*Vespertilio daubentonii*, Kuhl. Daubenton's Bat.—Rare. An adult female of this species (nine inches and three-quarters in expanse of wings) was brought to me, whilst still alive, on June 19th, 1885, having been knocked down with a stone (two or three evenings previously) whilst flying over water

at Aylestone, by Master George Snoad, who kindly presented it to the Museum.

Page 219. *Arvicola agrestis* (Linn.). Common Field-Vole.—Mr. J. Whitaker, of Mansfield, Notts, informs me of a light buff or cream-coloured variety of this species, procured at Wistow Grange in 1884.

ERRATA.—Page 163, six lines from bottom, for "1855," read "1885"; five lines from bottom, for "Mrs." read "Mr. S." Page 166, eleven lines from top, for "Stoughton," read "Stonton." Page 216, thirteen lines from bottom, for "Mole," read "Vole."

(To be continued.)

NOTES AND OBSERVATIONS ON BRITISH STALK-EYED CRUSTACEA.

By EDWARD LOVETT.

(Continued from p. 106.)

Nephrops norvegicus, Leach.

THE Norway Lobster, as this species is called, is one of the most beautiful, as it is one of the most remarkable, forms frequenting our shores. Its graceful form and brilliant colour would be calculated to give the idea that its habitat was the luxuriant coral groves and pools of tropical islands; whereas it is really a species which, if not actually confined to northern areas, is certainly more abundant as a boreal type, and, as far as the British Islands are concerned, it is undoubtedly rare—if indeed it occurs at all—on our southern coasts, whereas it is exceedingly abundant on the shores of the cold unfriendly north.

This fact is a curious and interesting one when viewed from the standpoint of colouration as adapted to surrounding conditions. *Nephrops norvegicus* is a lobster of a decidedly pink colour, and occasionally the tint is quite coral-like in its brightness; it is therefore an animal easily seen, and consequently easily captured by its enemies, contrasting as it does with the dull muddy shores of the Northumberland coast, or even the coast of Norway, where it is particularly abundant; whereas if its habitat had been a southern one, where brilliantly tinted Algæ crowded the bright granitic rock-pools of an almost semi-tropical shore, its peculiarly striking tints would appear to be of some service in protecting it from the attacks of predatory fishes.

In the insect world we find that many Lepidoptera for which birds have a liking gradually adapt themselves, by the survival of the least conspicuous, to their surrounding conditions as regards colour and markings, so that they are not readily discovered by their enemies, and therefore escape extermination, which would certainly ensue did they combine the qualifications of being easily seen and being attractive also as a dainty morsel. On the other hand, some insects, owing to their bitter or otherwise disagreeable flavour, are not sought for by birds, and these are consequently enabled to develop brilliant colours, as in the case of the common Garden Tiger moth, *Arctia caja*.

Now it is curious that this theory does not hold good with the crustacean *Nephrops norvegicus*, for although an animal of a striking colour living in a dull region, and a region, moreover, swarming with crustacean-eating fish, it is one of the most palatable and favourite foods of these fish, as it is also a recognised and rather valuable article of human food. It is possible that there may be conditions of which we are ignorant that enable this species to reproduce itself to a greater extent than is the case with others, but whatever these conditions may be, it is certain that a species which is a favourite food for fishes, and one readily distinguished on account of its prominent colour by its enemies, is able to hold its own in the struggle for existence under the, apparently, most disadvantageous circumstances.

The carapace of the Norway Lobster differs considerably from the common or marketable lobster; it is slender and elongated, pink in colour, and flattened at the sides in the cephalo-thoracic region; the abdominal somites are barred with a darker colour, and the tail-plates are rather broad and fan-shaped. The anterior pair of legs, or claws, are unusually long, deeply furrowed, and the ridge armed with spines; the difference in size between the right and left claw is not so marked as in the common lobster; the pincers are also elongated, the inner edges being tuberculated in the larger claw and more finely toothed in the smaller. The second and third pairs of legs are armed with small pincers, but the fourth and fifth pairs terminate in a simple claw. The rostrum is long and strongly toothed, the antennæ long and slender, and the eyes are unusually large and kidney-shaped,—another rather striking peculiarity, considering that *Nephrops norvegicus* is a somewhat deep-water species, under

which conditions organs of vision tend to decrease in power and structure, as in the remarkable instance of the sightless deep-water species *Calocaris macandreae*, referred to in a former article. The animal we are now considering possesses perhaps the finest eyes—certainly in proportion to its size, &c.—of all our stalk-eyed species.

The colour of *Nephrops norvegicus*, as I have already stated, is pink, or salmon-colour, varying slightly in shade. Its length is eight or nine inches, exclusive of the anterior pair of legs, which are about the same length.

This species is really a boreal one, although Bell records it from the Mediterranean, and alludes to its occurrence in the Adriatic, as chronicled by Prof. Milne-Edwards; he also notes it as being not at all uncommon on the Berwickshire coast, and amongst other localities he enumerates the Firth of Forth, Loch Fyne, Belfast Lough, Strangford Lough, and off the coast of Down. It is also said to be largely used as food in Dublin—human food, of course, although it is commonly found in the stomachs of the Dublin Bay codfish, showing that it is also valued as food by crustacean-eating fish. In Newcastle it is sold very cheaply indeed, and is there called a prawn. In the Reports of the British Association, and in the 'Natural History Review,' this species is also recorded from Dublin Bay, Galway, and Moray Firth.

In the Transactions of the Tyneside Naturalists' Field Club (p. 154), my friend Mr. Henry Tuke Mennell says:—"Owing to the recent introduction of trawling in this district large numbers of the pretty little lobster *Nephrops norvegicus* have been caught, and have been sold at fish-shops in the town. It has been a favourite article of food in Scotland; but in this district it has been unknown in this capacity. Its flesh is more delicate in flavour and less tough than that of the common lobster, but unfortunately there is less of it."

As regards the embryology of this species I am unable to say anything, as I have never seen its ova or zoea.

Nephropsis cornubiensis, Bate.

In the British Association Report for 1880, p. 160, a figure is given of the above, and it is said to have been dredged off the Dudman, but I do not know more regarding it; and if it be a new species it is not apparently much known.

(To be continued.)

NOTES AND QUERIES.

The Darwin Memorial Statue. — On June 9th, H.R.H. the Prince of Wales, as Principal Trustee of the British Museum, attended at the Natural History Museum, South Kensington, for the purpose of accepting in his own name and that of his co-trustees a life-sized marble statue of the late Charles Darwin formally presented to the Natural History Department of the British Museum by Professor Huxley on behalf of the Darwin Memorial Committee. The execution of the statue was entrusted to Mr. Boehm, R.A., who, considering that he had never seen Mr. Darwin, has produced a really excellent likeness of the deceased naturalist in a seated position. It has been placed on the staircase at the end of the entrance-hall, on a brown stone pedestal, and bears the simple inscription, "Charles Darwin, born Feb. 12, 1809; died April 19, 1882." In a brief address, previous to unveiling the statue, Professor Huxley intimated that, after deducting the cost of the statue from the amount collected by the Memorial Committee, the balance would be devoted to the furtherance of biological science, either by the foundation of studentships under the control of the Royal Society, or in some other way to be decided later. The Prince of Wales in reply said that the Committee and Subscribers to the Darwin Memorial Fund might be assured that the Trustees of the British Museum had willingly assigned a place of honour in the Hall of the Natural History Museum to the statue of an Englishman who had exerted so great an influence upon the progress of Zoology and Botany, the advancement of which sciences was the object of the vast collections now arranged there.

Experiments on Living Animals. — In a return relating to experiments on living animals lately issued by the Home Office, Mr. Busk reports that 49 persons held licences during 1884, and the total number of experiments of all kinds performed was about 441. The animals operated upon were all rendered insensible during the experiments. Of 145 experiments 99 consisted of simple inoculation with a morbid virus, in which no operation beyond the prick of a needle was required, and for which the administration of an anæsthetic would only have entailed needless annoyance and distress to the animal. In these experiments any appreciable suffering would be felt only in those cases in which the inoculation took effect, involving about the same amount of pain as ensues on ordinary vaccination, for the brief period the animals were allowed to survive. Of such cases about 16 occurred. Of the remaining 46 experiments under these certificates, 24 were performed for the purpose of medico-legal inquiries in cases of suspected poisoning, resulting in the death by tetanus of 3 frogs and 6 mice, which survived, however, only a few minutes; 10 other cases under the same head were experiments on the infection of fish with a species of

fungus, very destructive in certain rivers and streams; and 5 on the effects of immersion of fish in distilled water, which proved fatal to about 30 minnows and sticklebacks. In none of these cases could it be said that any appreciable suffering was inflicted. In 7 cases, in which salts of ammonia were hypodermically injected, 2 are returned as suffering pain, but of a very trifling character. Of 76 specimens under certificates, 47 required a simple operation, but this being done under anæsthesia was unfelt, and the after effects, though in many of the cases resulting in partial paralysis, are reported as having been unattended with actual pain in any case. The remaining 29 were by simple inoculation, and none were attended with pain. The amount of direct or indirect actual suffering, as the result of physiological and therapeutical experiments performed in England and Scotland under the Act in the year 1884, was wholly insignificant.

The Marine Biological Station.—That a site has been obtained from Government for a Marine Laboratory, as stated in the last number of 'The Zoologist' (p. 227), is something gained, though it may be questioned whether the Citadel Hill, Plymouth, is a fit place for it—where the "sea-water will have to be driven up by a pumping apparatus." It is to be regretted that we have nothing on our own coasts to compare with that great work at Concarneau (Britanny)—no pumping of sea-water required there, the tanks being filled and refilled by the tide. Having in 'The Zoologist' for 1874, p. 3947, given a slight description of these far-famed tanks, I need only say, for the information of those interested in the subject, that they cover a space of a thousand square yards, partly hewn out of the rock; all this, as I was informed, the work of an enterprising individual, unaided by the Government till of late years. — HENRY HADFIELD (Highcliff, Ventnor, Isle of Wight).

MAMMALIA.

Dormouse in Cumberland.—Referring to Mr. Rope's article on the distribution of this little animal in England, I may point out that the earliest record of its occurrence in the Ullswater district, is that of Dr. Heysham, since borne out by the observations of Mr. W. Hodgson, A.L.S. In August, 1884, Mr. Hodgson wrote to me that he had frequently met with the Dormouse in Ullswater, its most recent appearance having been noted at Watermillock. With regard to the south-west of Cumberland, there is the evidence of Mr. T. N. Postlethwaite. I have two notes of its occurrence in North Cumberland, with regard to which further evidence could be adduced if required.—H. A. MACPHERSON (Carlisle).

Dormouse in Northamptonshire.—With reference to the paper by Mr. G. T. Rope in the June number of 'The Zoologist,' on the range of the Dormouse, *Muscardinus avellanarius*, in England and Wales, I beg to inform your readers that this little animal was formerly common enough

in the neighbourhood of Lilford; it appears to be less abundant now, but is by no means extremely rare in our old woods.—LILFORD (June 3, 1885).

Dormouse in Wales.—As Mr. Rope, in his article on the range of the Dormouse, has left out this county (Breconshire) and also the adjoining county (Carmarthenshire). it may interest him and others to learn that it certainly occurs in both these counties, though very sparingly, and it is, I think, commoner in Carmarthenshire than Breconshire. I have heard of and seen four or five since I have resided here, now nearly twenty years, and a connection of mine living in Carmarthenshire—an excellent field naturalist—writes me that Dormice are not very common there. I have received very much the same information concerning Cardiganshire, my informant adding that he has himself seen this little animal there several times. The Welsh for Dormouse is *pathew*, and there is an old Welsh saying commonly used in Cardiganshire, *Can dewed â pathew*,—i. e., “As fat as a dormouse,”—which shows conclusively that it is well known in South Wales.—E. CAMBRIDGE PHILLIPS (The Elms, Brecon).

BIRDS.

Ornithological Notes from the Isle of Wight.—Though the spring was cold and backward, the Song Thrush had well-fledged young by March 3rd, and a Blackbird's nest with eggs was found early in the month; the latter part of February had been mild, the thermometer up to 50°. On March 5th Starlings were seen about the eaves, inspecting their nesting-holes; whether they remain paired from one season to another I am not prepared to say, but the same holes are frequented year after year; they had young by the second week in May, egg-shells being found on the lawn. Though one Swallow was seen on April 8th, it was not till the middle of the month that I heard of others being observed; nor were Martins seen till the 20th. The Nightingale first heard at St. Lawrence—its favourite resort—on April 10th; a showery day, though cold, thermometer 46° only. Cuckoo not heard till late in the month. On May 14th young Rooks were observed perching on and about the nests in the lofty elms at Bonchurch, occasionally taking short flights and clamouring to be fed. It is amusing to see them swaying to and fro on the branches as if about to fall, though they seldom do. A Golden Eagle was shot near Ryde some weeks since; it had previously been observed in the neighbourhood of Cowes. An intelligent young man, who takes great interest in Ornithology, having examined the bird, is of opinion that it had been in confinement, of which there can be little doubt, the tail-feathers being worn and ragged. I had some doubt as to the Eagle shot near Carisbrook—and recorded in ‘The Zoologist’ at the time—being a wild one, as it had lost a toe, but the plumage was perfect.—HENRY HADFIELD (High Cliff, Ventnor).

Sparrow feeding on Ants. — I do not know whether Ants have been noted as being eaten by Sparrows at home. Here, where Red Ants swarm in countless numbers, it is of common occurrence to see *Passer domesticus* in his eastern dress devouring numbers of them.—E. F. BECHER, Capt. R.A. (Karachi, Sind).

Hoopoe in Northamptonshire.—I regret to say that a Hoopoe, *Upupa epops*, has fallen a victim in our county. Mr. J. G. Field, of Kettering, informs me that, about 6th May ult., the unfortunate bird in question was found alive, with a broken wing and damage to tail-feathers, between Ged-dington and Brigstock, and is now in his possession. This is about the fifth instance of the massacre of this most ornamental and interesting species in Northamptonshire that has come to our knowledge. — LILFORD (June 3rd, 1885).

Albino Rooks. — Three young cream-coloured Rooks, with light pink eyes and fully fledged, were found in one nest at Skellingthorpe during the first week of June by some boys, who stated that the hen bird was spotted with white, but the cock was of the usual colour. I think the occurrence of three albinos in one nest is very unusual. — J. F. MUSHAM (Blenheim House, South Park, Lincoln).

Occurrence of Buffon's Skua in June. — On June 4th last I had the pleasure of receiving from my friend, Dr. Macdougall, an adult male of Buffon's Skua, which had been shot the previous day upon the Eden, a few miles below Carlisle. It proved to be in rather poor condition, and had been feeding on earthworms. In coloration the legs and feet agreed exactly with the description of a bird recorded by the late Mr. Rodd as killed off the Lizard about the same date (Zool. 1877, p. 300), the irides being dark brown, interior of mouth pale flesh-colour. The central rectrices exceeded the next pair in length by $7\frac{1}{2}$ inches.—H. A. MACPHERSON (Carlisle).

Variety of Common Snipe. — Last cold weather an unusual variety of the Common Snipe was shot near Hydrabad. It was described to me as the colour of a Quail, but, unfortunately, it was sent to Karachi with others and was eaten.—E. F. BECHER, Capt. R.A. (Karachi, Sind).

Canada Geese and Merlin in Leicestershire.—On May 9th last we saw a Merlin, *Falco aesalon*, a rare bird in this county, on the wolds a few miles N.E. of this town. As it rose from the moorland within a few feet of us, we were well able to identify it. On the 11th we were fortunate enough to obtain the eggs of the Canada Goose, *Anser canadensis*, from an island in the middle of a large fishpond on the Garendon Estate. The nest was raised from the ground on the edge of the water, the foundation being of reeds and the lining of down, the diameter of the inside measuring over a foot. The eggs, which are white and seven in number, measure $3\frac{1}{4}$ inches in length, and $2\frac{5}{8}$ inches in breadth, with slight variations. The bird

stayed on its nest till we got within a few yards of it, and then flew off, circled round, and finally settled in the water. This is not a case, we are positive, where birds have escaped from ornamental waters, as a large flock—about forty—of this species took up their quarters here last winter. The keeper informs us that some winters ago a much larger flock was here, but, owing to the late owner allowing a large number of people to skate on this pond, it was dispersed; and no others, as far as we are aware, have been seen till last winter.—E. OSCAR LEVER; WILFRED MOSS (Loughborough).

Pheasant and Partridge laying in the same Nest.—When wandering in a copse near here, on June 3rd, a little dog which accompanied me started a hen Pheasant; I quickly found the nest, but was surprised to see in it twelve Partridges' and nine Pheasants' eggs, on which the hen Pheasant was evidently sitting. The eggs of the two birds were thoroughly mixed in the nest, that is, the Partridges' were not all at the bottom and the Pheasant's at the top, or *vice versa*, from which it would appear that both the Partridge and the Pheasant were using the nest at the same time for the purpose of laying. It would have been less strange had the Partridge laid her twelve eggs first and the Pheasant then taken possession of the nest, but such was plainly not the case. I visited the nest again on the 12th, and found it quite empty. On searching the ground round the nest I came upon two Pheasant's eggs and the shells of two Partridge's eggs. The Partridges had evidently been hatched, and probably some keeper had taken the Pheasant's eggs, for I found no shells.—JOHN H. WILLMORE (Queenwood College, near Stockbridge, Hants).

[This is not the first time we have heard of Pheasant and Partridge laying in the same nest, and we have heard of a similar partnership between the Common Partridge and the Red-leg.—ED.]

Redstart Nesting in the Co. Wicklow.—On June 18th I had the pleasure for the first time of seeing the Redstart in this country. At the request of a lady ornithologist resident in the neighbourhood, I visited Lord Powerscourt's demesne, and there was shown the nest and young ones. After a short time the hen approached to feed them, and not long after, the cock, who was in beautiful plumage, flew down and entered the nest. Mr. Anton, the head keeper, a very kindly and intelligent man, informed me that this was the first year in which he had seen these birds there—CHARLES W. BENSON (Rathmines School, Dublin).

[Want of space has necessitated the omission of the latter portion of our correspondent's letter.—ED.]

Blackcap breeding in Co. Waterford.—I have received from an intelligent man, who collects eggs for me, a nest composed of dry grass-bents, mixed externally with a little moss, and internally with a few fibres and hairs, loosely constructed, like the nest of a Whitethroat. It contained five fresh eggs, which appear to be those of the Blackcap Warbler. This

nest was taken on May 18th, about six miles from Youghal (at the estuary of the Blackwater, a famous locality for rare visitants). It was found by the above-mentioned person suspended from the shoots of a hawthorn, among briars and ferns, in a tangled marshy plantation in a little dell. He saw both the birds, which were remarkably fearless, the female even pecking at his hand when he went to take the eggs. He said that the male, which was a beautiful songster, was "slate-coloured, with a head as black as a Bullfinch": but that the head of the female (who otherwise resembled him) was brown. He had never seen such birds before, nor had he ever heard of the Blackcap. Though I have observed Irish birds for more than thirty years, the only Blackcap I have identified in Ireland was one, a male, which I found recently dead in a cow-house here on December 18th, 1856. I do not know the Redstart, Garden Warbler, Reed Warbler, nor Wood Warbler as Irish birds. The Whitethroat, Sedge and Willow Warblers, and the Chiffchaff are numerous here, while I find the Grasshopper Warbler much commoner than I had supposed, and have got its nests and eggs from the man who found the Blackcaps. On June 3rd I saw the pair of Blackcaps above referred to, and a second nest which they had constructed about fifty yards from the former one in the same tangled covert. It is in a mass of blackberry-briars, which form the under-covert of the plantation, and is well concealed. The female was sitting on five eggs, similar to the former clutch. I soon heard the song of the male, but had I not been told what it was by my conductor (to whose careful observation I owe these facts) I should have supposed it proceeded from a Blackbird, it was so clear and loud. As often as I followed it the bird changed its place, eluding my observation for full half an hour, while it drew me farther from the nest. At last I got a full view of him, an unmistakable Blackcap, with his jet-black cap, white throat, and Warbler shape and actions, ever on the move, yet keeping in the shade, and avoiding observation. I have not touched this second nest, and trust it may lead to Blackbirds colonizing this county.—R. J. USSHER (Cappagh, Co. Waterford).

[Our correspondent has been good enough to forward the first-discovered nest and eggs for our inspection, and there is no doubt they have been correctly identified. The discovery is a most interesting one.—ED.]

Virginian Nightingales nesting at liberty in England.—To all interested in the subject of acclimatising and naturalising birds, the following experiment seems worth relating:—A pair of Virginian Nightingales (*Loxia cardinalis*), or, as they are more aptly called, Red Cardinals, had been in a large outdoor pheasantry since February, 1883, during the summer of which year, as well as the following one, they built a nest, though the hen never laid any eggs, for what reason it was difficult to find out, for she seemed to have every inclination to incubate. However, in the middle of May this year both birds accidentally escaped, and, as they

seemed to take their newly-found liberty happily and reasonably, I took no trouble to catch them again, but allowed them to fly from bush to bush in the shrubbery close by the house, which they seemed to take to, and where the loud musical notes of the male bird could be heard all day long. Sometimes a glimpse of him as he flitted across the pathway could be caught, looking most brilliant with his beautiful scarlet coat, or when perched on the top of some hawthorn or syringa shrub, evidently in high delight at the elysium in which he suddenly found himself. The day after they escaped I saw a rough nest of dead grass and leaves, or rather the beginning of one, in a decidedly bare yew tree of small dimensions,—in fact only about six feet high. I thought the construction and materials of the nest were of an uncommon kind, but never imagined that the red birds could have got so soon to work. The next day the gardener told me that he had seen the hen on this nest, whilst the cock was perched on the top of the tree it was in. So this was proof positive; and in two days more an egg about the size of a Lark's, dull white spotted with reddish brown, was laid. By the end of five days there was a corresponding number of eggs. For a fortnight the hen sat closely, when four young birds hatched and prospered for a week. At the end of that time I went, meaning to take the brood to rear up by hand and make them tame, so that the old birds might lose no time in nesting once more. To my great disappointment two of the young ones had disappeared, whilst the other two did not look flourishing, and the nest was pulled to one side. A Jackdaw, or some other vermin, had evidently been at work, for there were signs of a peck on the stomach of one nestling. The parent birds were flying round in an excited state. Whatever had stolen the others I felt sure would return, consequently I took the remaining two; but they died before the day was over. This was on the 15th of June. On the 17th I discovered that the Virginians were not to be beaten, and had begun another nest close by the former spot, but this time in a holly bush, unfortunately equally bare of foliage and no larger than the yew tree. To add to these disadvantages, the nest is within a yard of the ground. It is curious that such spots should be chosen when there is such an abundance of thickly growing box-bushes and various other kinds of shrubs all round, places one would imagine any bird would infinitely prefer. However, I must hope for better luck this time. At any rate, this is a proof of what foreign birds will do, and how easily they might be naturalised in England, if people would but venture on such experiments, provided others could be persuaded not to shoot every uncommon bird that crosses their path.—H. D. ASTLEY (Chequers Court, Tring).

Little Gull in Guernsey.—On a recent visit to Guernsey I was shown a Little Gull, which had been picked up dead in a field in St. Martin's parish on the 17th of January last; it was a fully adult bird in winter plumage. The Little Gull does not occur very frequently; I could

only record one specimen in the 'Birds of Guernsey' from a note by Mr. Harvie Brown in 'The Zoologist,' and there is no mention of it in Professor Ansted's list. This bird was reported to me some time ago as a Tern, also as an Ivory Gull; so I thought it better not to record it till I had seen it myself. I saw little else on my visit worth mentioning; the Shags on the cliffs had all hatched some time when I saw them from the 1st to the 8th of June, but not one of the Herring Gulls, though all those I saw were sitting hard. Kentish Plovers seem to have decreased in numbers; we saw a few about the bay in the Vale and on the shell-beach at Herm, but found no eggs. There were a few Common Terns about Jettoo; and I picked up one Turnstone in full breeding plumage in Grand Havre dead and rather high. On the passage home we saw a large flock of Gannets fishing about seven or eight miles off Portland; they were mostly immature birds in different stages of plumage, though some were apparently adult birds, being all white, except the black primaries; others were in the dark plumage of the young birds, and others had only the head white, the rest of the body being in the dark plumage of the young bird, with apparently no white feathers mixed with the dark ones. — CÆCIL SMITH (Bishop's Lydeard, Taunton).

Sparrow attacking a Willow Wren.—When in my kitchen-garden this morning (June 16th), I saw two birds scuffling under a currant-bush about ten yards off, which proved to be a Sparrow and a Willow Wren, the latter crying out most pitifully. In a second or two the Sparrow got hold of it and flew about ten yards, when both came to the ground. The Sparrow then rose and carried the Wren about fifteen yards, falling into a thick hedge, where I dashed after them. I could hear the cries of the Willow Wren till I got quite near. On looking into the hedge the Sparrow (a male) flew up into a fir-tree, where he rubbed his bill on a branch in a most satisfied way, but I could not find the Wren. I then ran into the house and got my specimen-gun, and shot, I believe, the same Sparrow; and on the report of the gun the Wren flew out of the bottom of the hedge and away, not much hurt. If the Sparrow to his many other bad qualities is going to add these Shrike-like accomplishments, I for one shall give mine a good "thinning-down." During spring and autumn every bird is protected here, but I now strike *Passer domesticus* off the list.—J. WHITAKER (Rainworth Lodge, Notts).

Swans' Nests.—In March last two Swans came on the water here from the lake below the house, and in a day or two commenced to build on the island. When the nest was finished one began to lay, and on leaving the nest each morning the other performed the duty of the male. After laying eight eggs (which I took, not wanting them to breed, and having an idea they were both hens), the other bird took to the nest, and I found every other morning two eggs, both laid in one night, as I looked every day; they laid eight more, then stopped, and both were on and off the nest for a fort-

night, when one again took to it and laid seven more eggs. These I took, when they left the nest for about ten days, after which they made another nest on the other side of the island and laid one egg, then came back and laid three more in old nest, one of the birds acting the male again. In fact the one in the water was always very bold, and swam at anyone going near the side of the pond. I think the number of eggs laid is so unusual, and the conduct of the birds so strange, that I forward this account of their doings for publication.—J. WHITAKER (Rainworth Lodge, Notts).

Stock Dove appropriating a Song Thrush's Nest.—On May 28th, in a spruce fir, which was one of a plantation near a stream rather over a mile from here, two Stock Dove's eggs were taken out of a Song Thrush's nest. The bird flew off as my companion, C. Flight, ascended the tree; he brought down both nest and eggs. The nest, which was about ten feet from the ground, was that of a Song Thrush of the year, well lined with mud. The Stock Dove had filled the nest in with fine roots, so as to form a sort of concave platform. The eggs had been sat on some little time. The Stock Dove will, I know, sometimes appropriate an old nest of a Magpie, or even make no nest at all; but I have never either read or heard of an instance in which it has used the nest of the Song Thrush.—JOHN H. WILLMORE (Queenwood College, near Stockbridge, Hants).

Jackdaws breeding in a Magpie's Nest, and in Rabbit Holes.—Jackdaws are so very annoying in stopping up our chimneys with their nests, that I have been obliged to shoot three or four pairs every season during their nesting-time before the others are driven off. This spring they have been more pertinacious than ever, and as fast as one lot were shot down another replaced them, so that I was obliged to wage unceasing war. They then became so cunning that they attempted to build only in the early morning before any person was about, and never came near the chimneys during the rest of the day, but kept with the Rooks on the rookery trees, and roosted there at night. When they found that I kept such a close watch on their movements, they turned their attention elsewhere, and I thought I had got rid of them; but one day, about the middle of April, I was surprised at seeing several Jackdaws making a great noise, and playing about a Magpie's nest on an ash tree about sixty feet high, situated about twenty yards from the cottage. I had shot the hen Magpie, and the cock had deserted the nest some time before, so there was no owner to dispute possession with the Jackdaws, who took up their abode there, the hen laying and hatching out her young safely a few days ago. This proceeding of the Jackdaws appears to me so very unusual that I should be glad to know if any of your contributors are aware of any similar instance of Jackdaws breeding in Magpies' nests. For some years past large numbers of these birds have bred in the rabbit-holes on the island of Bartragh; in many cases the burrows are in level ground, with scarcely any bank or rising.—ROBERT WARREN (Moy View, Ballina, Co. Mayo).

Wrens' Nests.—Some time ago I described in 'The Zoologist' a Wren's nest which had been built in a straw-stack, and as the outside was entirely composed of straw, I remarked that these little birds assimilated their nests generally to the surrounding objects. Since then I have formed another opinion, namely, that they make their nests of the nearest available materials, which very often match the surroundings of the nest. I may mention the following nests which have come under my notice:—One in brown bracken, all outside of bracken; one in a wall over a bed of nettles, the outside being composed of pieces and leaves of nettles; one near a carpenter's shop, all outside of shavings; one in an arbour—here the nest was built in the side in some old heather, and was made of old grass which was used to stop up holes in the window of the arbour; the light brown grass was very conspicuous against the dark heather. One in a beech-tree on the lawn was formed of new-mown grass from a heap below the branch on which it was placed.—J. WHITAKER (Rainworth Lodge, Mansfield).

FISHES.

Flying Fish.—An excellent opportunity of observing the aerial means of propulsion in the Flying Fish was afforded me during a six day's calm lately, when crossing the Bay of Bengal. This must be my excuse for again touching this subject. I watched day by day some hundreds rise under the bows of the ship. The water-surface was a glassy calm. As each fish rose it spread its wings at once, apparently beating the surface with them two or three strokes before they steadied out. I say apparently, for it was not a definite beat so much as a struggle to rise. The tail, which of course under water was in rapid motion to escape from the ship, now gave ten or a dozen rapid beats, which could be counted by the ripples on the still surface, and the fish was off in aerial flight. As each fish lost the impetus of the first rise, which generally happened at about forty yards, the binoculars showed us the anal fins, which had till now been fully extended, drooping to feel the water. As soon as the surface was felt the tail was quickly introduced, and five or six smart strokes, also indicated by ripples, brought the impetus up again and carried the fish about another thirty yards, when another droop sent it on again, and so forth, some of the older fish travelling in this way four hundred or five hundred yards. The younger fish frequently fell awkwardly in this attempt to regain impetus. Where waves are running it requires a clever fish to gain impetus by a few judicious strokes on the crest of a wave, and many a fish tumbles over in the attempt. I once saw a fish rise close to the ship's quarter, and it flew parallel with the ship, pursued below by a Dolphin or Bonita. The latter followed every sway of the Flying Fish, keeping almost under it. At the first dip of the tail the pursuer made a dart forward, but missed it, and again dogged its prey by keeping just under it. On the second dip the

tail went into its pursuer's mouth, and there was an end of the flyer. It always struck me that it seemed a strain on the fish to keep the wings extended.—ALFRED CARPENTER, in 'Nature.'

Basking Sharks on the Coast of Cornwall.—Several Basking Sharks, *Selachus maximus*, have lately made their appearance on the Cornish coast. Just after having read the account given by Dr. Day, in the last number of 'The Zoologist' (p. 235), of the specimen sent to him by Mr. Dunn, of Mevagissey, I received a letter from my friend Mr. Stephen Clogg, of Looe (who identified the species), stating that a small but good specimen of the Basking Shark, about nine feet in length, was caught on June 3rd in a Polperro drifting mackerel-net, and brought into Looe for exhibition. This species is but rarely captured by the Plymouth fishermen. I have never had but one opportunity of examining a fresh specimen. This was rather a large one, sixteen feet long, caught many years since near the Eddystone, and exhibited in the town. Of this I made a drawing expressly for the late Mr. Couch, a copy of which may be found in the Appendix to his work on 'British Fishes,' where it is described under the name of "Broad-headed Gazer."—JOHN GATCOMBE (Durnford Street, Stonehouse).

Migration of Eels.—The eels of the ponds in the woods of Vincennes leave them every spring in large numbers, making their way to the Seine or the Marne, several kilometres distant. They take advantage of rainy weather, when the herbage is wet, and their instinct guides them directly to their destination. Fresh specimens have repeatedly been introduced into the lakes, but in vain; all seem to have this disposition to leave. Some have thought that the water of these ponds, having been brought by hydraulic engines, has undergone some change which drives the eels away. But the phenomenon of such migrations by eels and some other fishes is not uncommon. Thus, in the marshes of Picardy, eels are often found on the grass, going from one pond to another.

BATRACHIA.

On the Occurrence of the Palmated Newt in Oxfordshire.—My friend Mr. W. R. Ogilvie-Grant has recently ascertained the existence of the Palmated Newt, *Molge palmata*, in a small horse-pond on the border of a wood at Wormsley, near Stoken-Church. This is the first record of the occurrence of that species in Oxfordshire. In order to assist the readers of this Journal in completing our knowledge of the distribution of this local, though by no means rare, Batrachian, the following list of the counties whence it has hitherto been recorded—information at present scattered in various works, and volumes of 'The Zoologist'—is appended:—*Scotland.*—Sutherland, Edinburgh, Kirkcudbrightshire. *England.*—Herefordshire, Gloucestershire, Cornwall, Devonsire, Somersetsire, Dorsetshire,

Isle of Wight. I also take this opportunity to correct an error of locality made by the late Dr. Gray in the 'Catalogue of Batrachia Gradientia,' and which I have unfortunately reproduced in the recent issue of that Catalogue. Specimens of *M. palmata* are mentioned as having been obtained near Nottingham by Mr. Higginbottom. But, from the article on British Newts, published by the latter gentleman in the 'Annals and Magazine' for 1853, it is evident that the specimens presented by him to the British Museum were not from Nottingham, his place of residence, but from Bridgewater and Scotland, whence he obtained them through Messrs. Baker and Wolley, the original discoverers of the species in this country. To the well-known peculiarities which distinguish the Palmated Newt from the common species, but which apply to the males only, may be added the total absence in the former of pigment on the throat, this region being of a transparent flesh-colour—a character which affords an excellent criterion for the distinction of the two allied species in either sex.—G. A. BOULENGER (8, Courtfield Road, S.W.).

MOLLUSCA.

Segmentina lineata, Walker, a Thread-spinner.—My brother (L. M. C.), who has been keeping some of these interesting little *Planorbis* in a bell-jar, informs me that he has observed a specimen spinning a downward thread from the surface of the water to the bottom of the bell-jar. This is to me a very interesting fact, as I believe that this species has never before been recorded as a thread-spinner, and as it belongs to a different section of *Planorbis* to those species already known as thread-spinners (e. g., *P. carinatus*, *P. spinorbis*), it is well worth recording. The specimen in question was found in a ditch at Barnes, in company with *P. nitidus*, by my brother (D. B. C.), who, it may be well to remark, discovered a specimen of *Limnæa glabra* monst. *decollatum* in a pond close by. This last is a very rare species in the London district.—T. D. A. COCKERELL (51, Woodstock Road, Bedford Park).

Swiss Mollusca.—The following is a list of an interesting collection of land-shells made by Mr. G. F. Payn in the neighbourhood of Weggis during the last week of July, 1884:—*Clausilia parvula* (abundant), *C. laminata*, *Cochlicopa lubrica* var. *lubricoides*, *Pupa secale* (common), *Helix pomatia*, *H. pulchella* var. *costata*, *H. lapicida*, *H. rotundata*, *H. personata* (several), *H. obvoluta*, *H. incarnata*, *Succinea oblonga*, *Hyalina crystallina*, *H. nitidula* var. *nitens* (= *Helix nitens*, Michaud), and *Pomatias septemspirale*. Mr. Payn sent me some of the *P. septemspirale* alive, and I had an opportunity of examining the animal. It is very curious, light in colour, with a long snout, something like *Cyclostoma elegans*. The operculum is thin and light in colour.—T. D. A. COCKERELL (51, Woodstock Road, Bedford Park).

ARCHÆOLOGY.

Wolves in Ireland.—The following order, copied from the Commonwealth Records, shows that Wolves were troublesome in Ireland as late as the year 1659:—

Capt. Tomlins to take care yt ye Toyles for taking Wolves bee brought from Green- hill, &c., to Mr. Hunt.	}	WHEREAS some mony hath been issued upon Account to Coll. Daniell Abbott and others for providing of Toyles for taking of Wolves, which have been brought over for publique use, and understanding that part thereof is at present at Greenhill, near Kilcullen, Ordered that Capt. Tomlins, Comptroller of ye Trayne, do forthwith take care that ye sd Toyles and other materials thereto belonging bee brought from Greenhill or any other place, and layd in the publique stores, and there kept untill further directions shall be given concerning ye same. Dated at Dublin, 29 Augt. 1659.—THOS. HERBERT, Secretary.
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Extracts from 'The Ulster Journal of Archæology.'

About twenty years since a person from the County Tyrone, named John Russell, was employed here as a farm-labourer. This person repeatedly affirmed that the last Wolf seen in Ireland was killed at a place called Glenelly by a mare in defence of her foal! He could not, however, give the date. This fact might lead to an answer to the inquiry of your correspondent SENEX.—J. BELL, Prospect, Ballymoney.—Vol. ii. (1854), p. 281.

An ould Church made into a new Fort, Derry.—This conversion of the abbey church into a fort and magazine gave high offence. O'Sullivan tells the tale how a large and hairy Wolf caused the explosion which followed.—Vol. iii. (1855), p. 281.

In the first year of the reign of Queen Anne. . . . The colony was now in its infancy. . . . The Wolf* and the Wild Cat, the Martin (*sic*) and the Red-deer, were beating an orderly retreat; while the O'Dempseys had bequeathed to their successors, in the Irish names in the immediate district, . . . memorials significant of the wild animals, and indicative of the household of an Irish prince. Thus we have Kilbracken, the wood of wolves, &c. These translations are taken from Mason's 'Practical Survey of Ireland.'—Vol. iii. (1855), p. 215.

* We have seen an order of Cromwell's time "to send to Greenhills, near Kilcullen, for the toyles of the Wolves." J. Howel, alderman of Cork, in a letter dated 1698, writes thus:—"Wolves indeed we have, and Foxes, but these indeed are now rather game and diversion, than noxious or hateful." The wolf-hunting implied by Howel terminated in 1714, by the death of the last of the race [in that county].

SCIENTIFIC SOCIETIES.

ROYAL SOCIETY.

May 21, 1885.—Prof. HUXLEY, President, in the chair.

Prof. Boyd Dawkins, M.A., F.R.S., communicated a paper entitled "Contributions to the History of the Pleiocene and Pleistocene Deer. Part I. *Cervus verticornis*, *Cervus savini*." The numerous cervine remains which occur in the various collections in Britain and on the Continent have been studied by the author for the last twenty-five years, and in this communication two species, the one hitherto ill-defined, and the other new to science, have been described. The first, or *Cervus verticornis*, Dawkins, remarkable for the singular forward and downward curvature of the first tine, is represented by a large series of skulls and antlers, which enable the author to define the changes in antler-form from youth to old age, as well as to relegate it to the division of deer with palmated antlers, and to establish its geological age to be Pleiocene and early Pleistocene in Norfolk and Suffolk. The second, or *Cervus savini*, is represented by several skulls and many antlers, which present considerable modifications in form at varying ages. It also belongs to the section of deer with palmated antlers, and is probably the ancestral form of the extinct (*Cervus browni*, Dawkins) and living (*C. dama*) types of fallow deer. It has hitherto only been met with in the early Pleistocene forest-bed series of Norfolk and Suffolk.

ZOOLOGICAL SOCIETY OF LONDON.

June 2, 1885.—Prof. W. H. FLOWER, LL.D., V.-P.R.S., President, in the chair.

Mr. Sclater exhibited drawings of, and made remarks upon, the specimens of various species of *Coly* living in the Society's Collection.

Mr. Beddard, on behalf of himself and Mr. Treves, read a paper on the anatomy of the Sondaic Rhinoceros, *Rhinoceros sondaicus*, which had died in the Society's Gardens in January last.

A communication was read from Dr. Julius von Haast, on *Megalapteryx hectori*, an extinct gigantic representative of the *Apteryx*, of which the remains had recently been discovered in New Zealand.

Dr. Guillemard read the fourth and fifth parts of his report on the collection of birds formed during the voyage of the yacht 'Marchesa.' The present communication treated of the birds collected at Celebes and on the Molucca Islands.

Mr. J. Bland Sutton read a paper on the development and morphology

of the human sphenoid bone, in which he attempted to show that the basi-temporals of the bird are not homologous with the lingulæ sphenoidales, but with the so-called pterygoid bones of the Crocodile, and that the human lingulæ are homologous with the sphenotic of the bird.

Mr. Edgar A. Smith read a report on a collection of shells, chiefly land and freshwater, obtained by Mr. H. B. Guppy, R.N., Surgeon H.M.S. 'Lark' during a recent visit to Solomon Islands.

June 16, 1885.—Prof. W. H. FLOWER, LL.D., V.-P.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 May, and called attention to four Pucheran's Guinea-fowls, *Numida pucherani*, from Eastern Africa, presented by Commander C. E. Gissing, R.N., H.B.M. Vice-Consul at Zanzibar; and to examples of two species of Wild Cats of the genus *Felis*, presented by Mr. Frank Swettenham, acting British Resident of Perak, Malay Peninsula. Two of the cats appeared to be young examples of *Felis javanensis*; the third was a fine example of the rare *Felis marmorata*, remarkable for its long tail.

The Secretary read some extracts from a letter addressed to him by Mr. J. Buttikofer, of the Leyden Museum, calling attention to a paper published in 1857 by the late Dr. Bernstein, concerning the material of which the edible birds' nests of *Collocalia esculenta* are composed.

A letter was read from Major-General Sir Peter Lumsden, K.C.B., giving details of the place and time of capture of two young Snow-Leopards sent down from the Afghan frontier to Quettah, and intended for the Society's collection.

Mr. Oldfield Thomas exhibited and remarked on a specimen of a rare burrowing Rodent, *Heterocephalus glaber*, procured by Mr. E. Lort Phillips during his recent expedition in Somali-land, remarkable for having an almost completely naked skin and for its extraordinary habits.

Dr. Guillemard exhibited a series of eight skulls of the Kamtchatkan Wild Sheep, *Ovis nivicola*, pointing out the differences existing between it and *O. canadensis*.

Mr. W. T. Blanford exhibited the skull and an imperfect skin of a supposed new species of *Paradoxurus* from the Pulnai Hills, S. India.

A communication was read from Dr. G. Hartlaub, giving an account of a new species of Parrot of the genus *Psittacula*, recently received from Barranquilla, U.S. of Colombia, which he proposed to describe as *Psittacula spengeli*.

Dr. Guillemard read the sixth part of his report on the collection of birds formed during the voyage of the yacht 'Marchesa.' The present communication treated of the birds collected in New Guinea and the Papuan

Islands. Dr. Guillemard also exhibited a very fine series of *Paradiseidæ* obtained during the yacht's voyage.

Mr. G. A. Boulenger read a paper containing a description of the German River-Frog, *Rana esculenta*, var. *ridibunda*, Pallas.

Mr. P. L. Sclater read the description of a new species of *Icterus*, obtained by Mr. Hauxwell on the Upper Amazons, which he proposed to name *I. hauxwelli*.

A second paper by Mr. Sclater contained notes on the way in which *Lemur macaco* carries its young, as observed in a specimen living in the Society's Gardens.

Mr. A. D. Bartlett read some notes on the female Chimpanzee now living in the Society's Gardens, which he showed to be different from the ordinary Chimpanzee, and to be probably the *Troglodytes calvus* of Du Chaillu.

Dr. Gadow communicated a memoir by Miss Beatrice Lindsay, of Girton College, Cambridge, upon the avian sternum. The different theories held as to the origin of the sternum having been reviewed, the author proceeded, after an explanation of the various types of structure examined, to give an account of her own views. Miss Lindsay came to the conclusion that the keel is an apophysis of the two halves of the sternum, and is not produced by the clavicles or any other parts belonging to the shoulder-girdle; also that the part of the sternum whereof the keel is an outgrowth is itself of secondary origin, and that the various processes of the sternum are produced by addition and not by resorption of bony matter.

Col. J. Biddulph read a paper on the Rocky-Mountain Sheep, in reference to the new geographical race lately named by Mr. Nelson *Ovis montana dalli*, and confirming the view that there are two distinct types or races of this sheep in North America.

This meeting closes the present session. The next session (1885-86) will commence in November, 1885.—P. L. SCLATER, *Secretary*.

NOTICES OF NEW BOOKS.

Russian Central Asia, including Kuldja, Bokhara, Khiva, and Merv. By HENRY LANSDELL, D.D., F.R.G.S. 2 vols. 8vo. London: Sampson Low & Co., 1885.

THIS is a general book of travels, but there are many chapters in it which will be interesting to naturalists, especially those forming Appendix A to the second volume. For, although the

author does not profess any special knowledge of natural history, and in this respect has relied much on the observations of others, he has, nevertheless, brought together a good deal of information touching the zoology and botany of Russian Central Asia, which could only be gained by reference to a number of scattered volumes, some of which are in German and others in Russian. On the other hand, wherever he could collect any information on the subject elucidating the fauna and flora of the district through which he travelled, he did not fail to note it in his journal.

Briefly speaking, Dr. Lansdell travelled some 12,000 miles through Western Siberia to Kuldja; thence through Russian Turkistan and the Kirghese Steppes to Tashkend, Khokand, and Samarkand. Crossing into Bokhara, he travelled through the Khanate as guest of the Emir, floated 300 miles down the Oxus to Khiva, and then continued by a new route across the land of the Turcomans and north of Merv to Krasnovodsk, and so across the Caspian to Baku, and thence by rail to Tiflis, and so home.

The main object of this long journey was to distribute the Scriptures in prisons and hospitals, as well as generally *en route*, for which purpose he was furnished with translations in all the languages for which he was likely to find readers. In carrying out this object he naturally had both leisure and opportunity to enquire into the manners and customs of the various races met with, their mode of life, government, religion, and so forth, the description of which, with the geographical details of his route, occupies the greater part of the two bulky volumes before us, the remainder being taken up with Russian history, and incidentally, as we have said, with natural history, when opportunity has offered.

Journeying from Omsk to Semipolatsinsk, Dr. Lansdell thus describes the character of a Russian steppe (vol. i. p. 68):—

“ We were now well on the steppe, whose straight unbroken horizon so frequently reminds one of the ocean. The soil is yielding, stoneless, and sandy, thus making the smoothest of roads, on which our horses dashed along. The country is nearly treeless, and the ground almost without vegetation, so that one had only to picture the surface covered with snow to see the necessity for the roadside wickerwork erections to mark the route in winter. We were crossing, in the month of August, this steppe,

parched by the summer sun; but Dr. Finsch, who, in 1876, travelled over the same route in spring, speaks with more appreciation of its appearance. The steppe is not, indeed, a grass-covered flat, but the verdure is found only in patches, and then forms no turf, but grows, like the bunch or buffalo grass of the prairie, in separate clumps, although the steppe grass is longer. For great distances the steppe is covered with thickets of the *Spiræa*, or Meadowsweet.

Here and there, too, are gooseberry bushes, intermixed with feeble-looking birches, generally less than five feet high, whilst everywhere, when the road approaches the Irtish, we catch sight, on the opposite bank, of a more or less extensive vegetation of well-grown trees, such as willows, poplars, oaks, birches and pines. Alongside the river are frequently found hill-like chains of sand resembling downs, with wild oats and other grasses. Another characteristic of the steppe is seen in numerous ponds and lakes, unconnected by streams. They are, for the most part, isolated, and what is more remarkable, are in some cases filled with sweet, in others with salt, or brackish, water. Thus it happens in their neighbourhood that one meets now with sandy downs, and then with those deposits of salt that have been caused by evaporation, and frequently impart to the ground the appearance of hoarfrost or snow. In such quarters the appropriate salt flora is met with. It is not until the end of April that this steppe, near Omsk, begins to present a verdant appearance, and then, amongst the first harbingers of spring, are seen the beautiful blue Anemone, a yellow *Draba*, the universal Ranunculus, or buttercup, and members of the garlic family. With improved vegetation came a greater development of animal life, and I noticed the appearance of Hooded Crows, Magpies, various kinds of Hawks, and birds that I took to be Plovers. In crossing the Irtish steppe in spring, Dr. Finsch frequently met with Whooper Swans (*Cygnus musicus*) in flocks, sometimes of twenty or more, which he supposed to breed in the locality.

Both Winter and Black-headed Gulls (*Larus canus* and *ridibundus*) are frequently seen soaring above the deserted steppe, far, very far from water, looking, doubtless, for insects and worms as food. The Oystercatcher (*Hæmatopus ostralegus*) is also occasionally met with, and the Yellow-headed Wagtail (*Motacilla citreola*). In the sandy banks of the Irtish are found numerous nest-holes of Sand Martin (*Cotile riparia*), which nest here in common with the House Martin (*Chelidon urbica*). These last, however, do not excavate nest-tunnels, but only shallow holes."

Here we venture to think Dr. Lansdeil is mistaken. The birds, which he mistook for *Chelidon urbica* were doubtless

C. lagopoda, Pallas, which do not differ in their mode of nidification from our well-known House Martin.

“In April,” he continues, “White-winged Larks (*Alauda sibirica*) show themselves in large flights, and the sweet trill is heard of the Sky Lark (*Alauda arvensis*), notwithstanding the frequent showers of snow and hail. By erecting boxes on poles, the Cossacks provide nesting-places for House and Tree Sparrows, and sometimes Starlings; but Magpies, Crows, Jackdaws, and Ravens, have to make their own arrangements for nests on the bush-like dwarf birches. I noticed about the villages of the steppe, as I constantly did through Siberia in 1879, a variety of Hawks and Kites. Of the Brahminy Kite (*Milvus govinda*) several specimens are seen.

The charming Red-footed Falcon (*Falco vespertinus*) holds its quarters particularly along the telegraph line, that possesses, I have frequently noticed in treeless regions, so much attraction for all birds of prey, the wires and poles being so readily adapted by them for resting points. On the poles are often seen perched the Osprey (*Pandion haliaëtus*), and further south other Eagles. The Lesser Kestrel (*Falco cenchris*) is not rare. Now and again a Little Bustard (*Otis tetrax*) dashes by the traveller with heavy wing, soon, however, to settle again, as also does its larger congener (*Otis tarda*). On the downs of the Irtish is seen the Willow Ptarmigan (*Lagopus albus*), and keeping near and amongst the herds of cattle, as is their wont, are to be espied flocks of sociable Plovers (*Chettusia gregaria*).”

The two principal lakes of the province of Semipolatsinsk are the Balkhash, a portion of which was sighted by our traveller, and the Zaisan (meaning “noble”), some fifty-six miles long by thirteen miles wide, with an area of 700 square miles—a noble lake indeed. Its waters, which receive the drainage of ten rivers, are “transparent, fresh, soft, and good for cooking purposes, but of a reddish colour in deep pools.” Amongst the fish taken here are the Sturgeon, Sterlet, and Nelma Salmon, the *Taimen* (identified as *Salmo fluvialis*, and said to attain a weight of 144 lbs.), Trout (*Salmo lenæ*), Pike, Roach, Perch, Carp, and Burbot.

Except for fishing and hunting there is no navigation on Lake Zaisan, and there are few habitations on its banks. In the reeds around are numerous Wild Boars (which feed on the roots of *Arundo calamagrestis*), Otters, and Saiga Antelopes, whilst in the immediate neighbourhood of the lake are to be found Swans, Geese, Ducks, Cormorants, Pelicans, Snipe, Plovers, Bustards, and Pheasants.

Another grand lake most attractive to the naturalist is the Ala-Kul, or "variegated lake," the third largest in Central Asia. It is thought at one time to have been joined to the Balkhash, but is now an entirely distinct basin without effluent. Dr. Finsch, in his 'Reise nach West Siberien im Jahre 1876' (Berlin, 1879), has given a good account of the fauna of this lake district, of which Dr. Lansdell, not being a practised naturalist, has availed himself (pp. 146—150) at too great a length to be here quoted. The most remarkable bird noted there was the Black Lark (*Alda yeltoniensis*), whose uniform velvet-black plumage, pale yellow beak, and large size made it very conspicuous. It was observed sitting on stones by the roadside, or perching on bushes, with drooping wings and tail erect, singing there as well as in the air. When in flight it appeared even more remarkable. "Clapping together the points of its wings, and whipping about, now regularly, and then in an irregular manner, its flight may be likened to that of a bat."

In the shallow pools were observed Cranes, Stilts, Avocets, and Lapwings, and on the lake itself gulls (*Larus ridibundus* and *ichthyæetus*), and ducks of various species, including the Pintail and Gadwall, Common and Ruddy Sheldrakes, and Red-crested Pochard (*Fuligula rufina*).

With regard to fish, Dr. Finsch ascertained the presence of a large Perch (*Perca schrenckii*, Kessler), growing to the length of a foot or more, a Barbel (*Schizothorax orientalis*, Kessler), and two species of Loach.

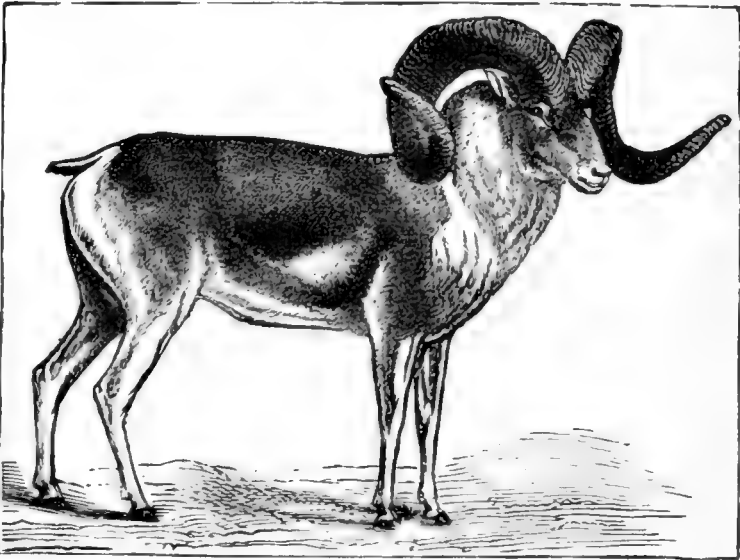
Amongst the Mollusca picked up along the sandy banks of the lake were specimens of *Limnæa*, *Planorbis*, *Bithynia*, and *Valvata*.

The more noticeable mammals of the Ala-kul district were the Arctic Hare, the Kura-biruk Antelope (*Antelope subgutturosa*), the Ibex (*Capra sibirica*), and the Wild Ass. The last named is found in several parts of the Central Asian steppes, and is probably the species described by Pallas as *Equus hemionus*, distinguishable from the Persian *Equus onager* by its sharp ears and by the absence of the black cross stripe on the shoulders. The Kiang (*Equus kiang*) of Upper Thibet, though nearly related, is a larger animal.

In the province of Semirechia numerous wild animals were met with, which are noticed on pages 160, 161 of vol. i., chiefly

by the light of Dr. Severtsoff's paper on the Mammals of Turkestan, translated in the 'Annals of Natural History' for 1876. Of three species of Marten as well as of a Lynx Dr. Lansdell was able to secure in Vernoe the skins and skeletons, all of which are now in the British Museum.

At p. 245 of vol. i. he gives a figure (here reproduced) of that fine Central Asian Sheep, *Ovis polii*, named after its discoverer, Marco Polo. Round the neck there is a pure white mane, and the light greyish brown of the back and sides shades off into white towards the belly, the legs being brown. It inhabits high hilly plains and runs with great speed. Severtsoff gives its length as 6 ft. 9 in. from nose to tail; height at shoulder, 3 ft.



THIAN-SHAN SHEEP.

10 in.; length of horn, 4 ft. 9 in.; distance between tips of horns, 3 ft. 6 in.; and length of skull, 1 ft. 2 in. Col. Prejevalsky, who shot some fine specimens on the Yuldus plateau, where he fell in with herds of thirty or forty, gives the measurements of the horns of the old males which he measured as 4 ft. 8 in., with a thickness of 18 in. at the base. Its weight is enormous. Severtsoff shot an old ram that proved too heavy for a camel to carry. This camel took four hours to go three miles, and was obliged to lie down several times on the way. At low elevations a camel can carry 600 lbs. with ease, and on lofty plains where the air is rarefied

400 or 450 lbs.; so that the weight of this particular specimen was estimated at about 600 lbs. At the Kuldja consulate, as also at Tashkend, Dr. Lansdell saw specimens of the skull and horns of this fine wild sheep.

The Dong, or Wild Yak (*Bos grunniens*), has till of late years only been known by rumour. It is a native of Thibet and high Asia, between the Altai and the Himalayas. Col. Prejavelsky shot one south of Koko Nor, six feet high and eleven feet in length, exclusive of tail, which was three feet more. The cow Yak is much inferior in size to the bull, and her horns are small. The animal is capable of domestication, and a variety of crosses with domestic cattle is produced.



A THIBETAN COW.

At page 143 of vol. ii. Dr. Lansdell gives a figure (here reproduced) of a Thibetan Cow of a supposed cross-breed introduced by the Russians into Turkestan. The Yaks pasture in the coldest parts of Thibet and the eastern portion of Bokhara, upon short herbage peculiar to mountain tops and bleak plains. It remains therefore to be seen whether this animal will thrive in the lowlands.

So far, we have been gleaning information touching the fauna of Central Asia from remarks scattered here and there throughout Dr. Lansdell's first volume. The most scientific portion of his

work, however, from a zoological point of view, will be found in an Appendix to the second volume (pp. 506—617), wherein, through the co-operation of certain well-known specialists whose aid he has been fortunate in obtaining, Dr. Lansdell has been enabled to give systematic lists of the animals, both vertebrate and invertebrate, which have been ascertained to occur in the country through which he travelled. Thus the lists of Mammalia, Aves, Reptilia, and Amphibia are vouched for by Messrs. Severtsoff, Fedchenko, and Sabanaeff; Herr Kessler supplies an account of the Fishes; the Mollusca are dealt with by Dr. von Martens, and the Crustacea by Dr. Ulianin; while the different orders of Insects are reviewed by such well-known entomologists as Messrs. Solsky, De Saussure, Gustav Mayr, Erschoff, and Alpheraky.

Thus it will be seen that Dr. Lansdell has spared no pains to make his work as complete as possible, even in regard to matters on which he does not profess to have any special knowledge; and should it be urged that in regard to Zoology he has not given us anything very original or very new, he must at least have the credit of having brought together within a comparatively limited space a good deal of useful information about a little-known part of the world, which could otherwise be only acquired by reference to a great many different works in different languages.

A History of British Birds. By WILLIAM YARRELL. Fourth Edition. By ALFRED NEWTON, M.A., F.R.S., and HOWARD SAUNDERS, F.L.S., F.Z.S. 4 vols. 8vo. London: Van Voorst, 1885.

THE Editors of the new edition of this standard work, as well as that portion of the reading public for whose use and benefit it is intended, are alike to be congratulated upon its recent completion. The last part (part xxx.) has at length appeared, with index, preface, and title-pages, and the four volumes may be now bound and put upon the book-shelf as the leading text-book on British Ornithology.

To attempt anything like a general criticism of the whole work would occupy many more pages than could be here afforded, and we must therefore abandon any such idea. Not that we

have any criticism to offer which could in any sense of the word be considered adverse, but it would have been a pleasure, did space permit, to review such portions of the work as deal with what ornithologists would call "moot points," and indicate perhaps here and there certain matters of interest upon which further particulars might have been desirable.

If we have one cause for regret, however, it is to see the way in which it has been thought necessary to alter the classification to which we have been so long accustomed, and which we have had, so to say, "at our fingers' ends." The result is that it is now, with four volumes, much more troublesome to find a given species, which we could formerly always turn to without any reference to the index. Obviously, perhaps necessarily, it has been thought desirable, where practicable, to indicate the relationship of groups by placing them in juxtaposition; hence one is not surprised to find in this new edition the Plovers placed near the Sandpipers in the order *Limicolæ*, and the Sandpipers near the *Gaviæ* or Gulls. But then arises a difficulty where to locate the *Herodiones*. It seems to us that the Herons and Storks are quite as much out of place in their new position, between the Divers and the Geese, as they were in former editions, between the Plovers and Sandpipers. They would appear more naturally, we think, between the *Rallidæ* and the *Gruidæ*, for in some respects there is as much resemblance between the Rails and Little Bitterns as there is between the Herons and the Cranes. This would not interfere with the Cranes being placed next to the Bustards, to which family they are more nearly allied than they are to the Herons. But it is much easier to find fault with the new classification than to propose a better, and it cannot be said that Mr. Saunders's view, as defended in his "Preface" (p. vii), is unreasonable.

A noteworthy feature in the present edition is the large number of species (many of them figured) which have been introduced as new to the British avifauna since the publication of the third edition in 1856. The omission of certain New World *Passeres*, which, as Mr. Saunders says (Preface, p. viii), "cannot reasonably be supposed to have reached our shores without human agency," is no doubt wise. The rejection of a few others which appear to us to have been admitted into the list of British Birds upon the very slenderest, not to say

unsatisfactory, evidence, might also have been sound policy ; but one is naturally unwilling to dismiss from view species which have been not only described but figured in former editions of the work.

We have been struck by the very few "errata" noted by the Editors, another instance of the care which has been exercised in the revision of the proof-sheets ; and, if we may say so without appearing egotistical, we are gratified to find from the frequent reference which is made to the pages of 'The Zoologist' how useful this Journal has been in the preparation of what must be regarded, at least for some time to come, as the best work of reference on British Birds.

Die Pilzthiere oder Schleimpilze. Von Dr. W. Zopf. Breslau, 1885. Extracted from the 'Encyclopædie de Naturwissenschaften.

THE title of this work, which, when translated into the language of the systematist, is the Mycetozoa or Myxomyctes, and the fact that a copy of it has been sent to this Journal for review, afford another proof that the best conception as to the prime classification of material things is becoming more widely adopted ; that classification, which was adopted by Linnæus in his earlier, but altered in his later, works, was the division of things into mineral or *Inorganisata*, and biological or *Organisata*. It has again come into fashion with the recent advances in our knowledge, and might, indeed, have been foreseen by the prophetic eye the moment that there was established the identity of the "protoplasm" of vegetable and the "sarcode" of animal cells.

Dr. Zopf is so well known as one of the most accurate of modern workers among the lowest *Organisata* that it is only necessary to mention the production of this carefully-compiled and well-illustrated handbook ; a detailed notice of its contents would, we think, be better found in a journal of Botany than of Zoology ; practical considerations as well as theoretic views, however just, must always be borne in mind by editors of periodicals.



THE ZOOLOGIST.

THIRD SERIES.

VOL. IX.]

AUGUST, 1885.

[No. 104.]

RECENT ADVANCES IN ZOOLOGY;

WITH ESPECIAL REFERENCE TO THE ORIGIN OF THE VERTEBRATA.

By PROF. F. JEFFREY BELL, M.A., Sec.R.M.S.*

WHEN I undertook to deliver a lecture with the title of "Recent Advances in Zoology," I hardly estimated how much of what is already well known would have to be told you, if you were to understand the value of our later progress. For this reason I shall have to confine myself to that group to which we belong ourselves, and which is, consequently, that which most powerfully interests us all. What I shall now deal with seem to be *real* advances, not forced or feigned marches, but deliberate attacks on what is unknown. These advances seem to be real, these attacks seem to be deliberate, because they are the result of guiding and directing philosophical principles.

A quarter of a century ago it would have been impossible to premise a lecture with a title such as that which has been chosen, with remarks such as those I have just made. Advances in knowledge there were; accumulations of facts were then overwhelming. But there was no co-ordination, there was no general leading, there were no forces animating men's minds to work together towards one great end.

Now, however, there is co-ordination, the spirit if not the person of the general is with us still, and well-ordered speculation has taken the place of scholastic generalities.

* A lecture delivered at the Zoological Society's Gardens in the course of "Davis Lectures," 2nd July, 1885.

I need not tell you how this has happened; how Charles Darwin "found a great truth trodden under foot . . . and ridiculed by all the world" (Huxley); but I may, perhaps, remind you that the outcome of the 'Origin of Species' was the conviction that, in Zoology, truth is only to be found when the doctrine of the blood-relationship of Animals is steadfastly borne in mind. And I hope to show you that this animating principle has not only excited investigators, but linked their results into coherence, if not into truth. I do not propose to weary you by taking you into details which are of interest only to the worker in a special field; I shall speak only of such discoveries, and of their apparently logical results, as will, I hope, prove to be of interest to zoologists generally.

And, firstly, as to the broadest classification of the Animal Kingdom; that which we are in the habit of using is the Lamarckian grouping of Vertebrata and Invertebrata; but it is one which to-day no competent zoologist would ever dream of teaching! I do not doubt that it will be continued to be used by Man, as a mark of the distinction between Man and his zoological allies, on the one hand, and "the rest" on the other. But it is, nevertheless, one which denies or neglects the greatest results of modern inquiry. It is one which expresses the beliefs of just half-a-century ago; for it was in 1835 that that great anatomist and physiologist, Johannes Müller, quoted with approval the words of Kant, "The cause of the particular mode of existence of a living body resides in the whole"; but it neglects a doctrine which is nearly fifty years old, too,—the doctrine of the great Belgian biologist, Theodor Schwann, that animal cells are independent in their mode of growth. This doctrine of Schwann's made steady progress, and the cellular composition of the higher animals was, long since, unreservedly accepted.

But the teachings of anatomists and microscopists remain limited to a narrow circle until they are used for the purposes of systematic classification, and it was not till 1866 that the logical result of our knowledge that some animals and some plants are composed of a number of cells which are united in a common organism, and subserve its different functions, led Prof. Haeckel to institute a third division of the Kingdom of Animated Nature, and to speak of Animals, Plants, and Protista, or first organisms, neither truly animal or vegetable.

Let me turn aside for one moment to point out two results, the one of practical, the other of philosophical interest, which flowed from this new classification. And I take them in the order of first practical, and next philosophical, because it is thus that they have affected men's minds.

The practical result is this, that teachers are not now satisfied with making their students either botanists or zoologists; they attempt to make them biologists; that is to say, they endeavour to make them acquainted first of all with the characteristic phenomena of Living Matter, and that it is in the second place only that they direct their attention to Animals, as such, or Plants, as such.—And the philosophical result, as has been so well pointed out by Mr. Geddes in his recent article on 'Morphology,' is this—we have returned to Linnæus' first conception of the classification of the material world; we think now of Organized things on the one hand, and of Non-organized on the other. The relation of Animals and Plants is recognised to be closer than it is supposed to be for the last century; and the formal reason has been to be found in the fact that both Animals and Plants have ancestors common to themselves, but not common also to Minerals; these ancestors are to be sought for among the Protista.

Prof. Haeckel has quite recently extended and formulated this view by uniting together into the group of Histiota all Animals and Plants that form tissues or cell-aggregates, urging that the difference between Protista and Histiota is greater than that between Animals and Plants. This is a view expressed too lately to come within the purview of acknowledged advances, but it is one that will, no doubt, be first of all hotly debated, and, later on, silently accepted.

So far, indeed, as Animals are concerned the principle of the matter was yielded ten years ago; for it is now but a few months more than a decade that Prof. Huxley read to the Linnean Society an essay on the classification of the Animal Kingdom. Allow me, before we go further, to remind you that Prof. Huxley is one of those generals who do not fight far in advance of their base; or, in other words, that the systematic generalizations which he proposes or accepts have always behind them a very solid array of well-matured facts. Ten years ago, then, Prof. Huxley distinguished between such animals as never formed tissues, and

those whose eggs, breaking up into cells, gave rise from those cells to distinct tissues. For the former he retained the old name of Protozoa, or first animals; for the latter he accepted and endorsed the Haeckelian term of Metozoa, or animals that came *after* the Protozoa. Using less objective terms, Maupas has recently suggested that we should speak of Cytozoa, or cell-animals, and Histoza, or tissue animals. The change, however, is not needed, and, as I hope to show you, we are on the eve of changes enough.

If you have gone with me so far you will have seen that the case against the Vertebrata and Invertebrata as representing the two prime divisions of the Animal Kingdom is now complete; allow me so far to comfort you as to assure that neither Cuvier, the father of comparative anatomy, nor von Baer, the father of embryology, ever accepted or endorsed this classification.

I must beg to offer you what consolation I have at my disposal, for I am now going to ask you to go a step further, and to give up altogether, on the pain of losing your characters as well-informed zoologists, the appellations of Vertebrata and Invertebrata!

I will first of all remind you of the history of the facts of the case, and will do so because you cannot hope to form a judgment on this subject, any more than on any which is of political interest, unless first of all you are led step by step through the processes by which opinion became formed.

In 1864 Prof. Huxley published a classification of animals, which he would now be the first to call antiquated; in this there was a division of Mollusca-like animals (Molluscoidea), one of the three groups of which was that of the Ascidians. In 1867 the distinguished Russian embryologist Kowalevsky published an account of his investigations into the early history of the mode of formation of the organs of the Ascidian body, which resulted in spanning the gulf between Vertebrates and Invertebrates in an altogether unexpected manner. Kowalevsky showed that in Ascidians, just as in 'Vertebrates,' the central nervous system arises by the formation of a dorsal groove, the sides of which gradually closed over, met and formed a dorsal neural tube, whereas in other high 'Invertebrates' the central nervous system arises as a solid thickening of the ventral middle line, which gradually sinks away from the surface, but is never hollow, and never folded

on itself. Nor is this all; the ventral system needs no support, the dorsal, lying above the cavity of the body, needs to be supported; in all 'Vertebrates' this support primarily consists of a solid unjointed rod—the dorsal rod or notochord; such a notochord was found by Kowalevsky to be developed also in the Ascidians.

Two results, then, were arrived at, and, as you do not all know the works of Kowalevsky, I may add—what would be quite unnecessary in a less general company—that the distinguished Russian's statements have been found by other naturalists to be exactly and perfectly correct. These results were—

1. That a notochord was not confined to 'Vertebrates'; and
2. That the central nervous system of Tunicates was formed in just the same way as in 'Vertebrates.'

You may be sure that these results of Kowalevsky were not at first accepted; to use the words of Prof. Kupffer, who wrote with the honest bluntness of Prince Bismarck's countrymen, they did not "seem to be generally taken as trustworthy"; the Professor owns that he himself was sceptical, but his scepticism was of the kind which a countryman greater still than Prince Bismarck had called an "active scepticism," or which, as Goethe explains, has for its sole object that of conquering itself. To this important and thoroughly scientific duty Kupffer devoted himself in 1869, and his testimony and the weight of Prof. Haeckel's opinion began to work a revolution in Systematic Zoology, which has not yet expended its influence.

The value of a discovery in science is not to be gauged merely by the additions which it makes to knowledge; science, as Plato long ago taught, consists not in the passive perception of facts, but in the reasoning upon them; or, to use the words of Berkely, with regard to that Greek philosopher, the man of science is the greater the more "fine hints sparkle and shine throughout his writings."

Now, what are the kind of considerations that arise when we reconsider the 'Vertebrata' by the light of Kowalevsky's discovery; first of all this, that among the 'Vertebrata' there is one remarkable form—the Lancelet (*Amphioxus*)—in which the central nervous system is a hollow tube, and in which this tube is supported by a notochord, but is never protected by cartilaginous or bony rings developed around it. In other words, the zoologist comes to the conclusion that he has outdone

even M. Jourdain, for while that immortal bourgeois had spoken prose for forty years without knowing it, the zoologist has for half a century called vertebrate an animal with no vertebræ at all.

This reconsideration of known facts has resulted in some, and in time, I doubt not, they will be followed by all, systematic zoologists, calling that great aggregation of forms to which belong Man, the Hawk, the Snake, and the Lancelet that of the Chordata, instead of that of the Vertebrata.

It was about this time (in 1868) that Prof. Huxley enunciated certain principles which are of very great importance in Systematic Zoology; and they are to be found in one of the volumes of 'The Ibis,' which was at that time under the editorship of Prof. Newton, and in a letter in which Prof. Huxley defends himself against the criticism of that accomplished ornithologist.

The part of the letter to which I wish you to pay attention runs thus:—

“Further, it must be recollected that the diagnosis of a group may rest not merely on a particular character confined to the group, but on a peculiar combination of characters.

“And it may happen that a well-defined group shall not have a single structural feature peculiar to itself, its peculiarity lying entirely in the mode of combination of those features.”

You will ask, perhaps, where is the combination of characters on which Prof. Huxley insisted; you will say that, the presence of a notochord being a necessity for a dorsal nerve-cord, the fact of the co-existence of these two organs is not a matter of much importance. I need not discuss this objection with you, for I am willing, at least, to pass it by; for this is yet another organ—that, namely of respiration—which is formed in just the same way in Vertebrates and Ascidiæ. In all the Vertebrata we find that there appear at the sides slits or clefts formed by the inpushing of the layer of cells on the outer surface of the body; these slits are met by outgrowths of the layer which lines some of the anterior portion of the digestive tract; the outgrowths and ingrowths meeting fuse, and give rise to a passage from the tract to the exterior. In fishes and in some—or for part of their lives all—Amphibians these slits serve as a means of passage for the water of respiration, which, entering by the mouth, bathes the slits, in the walls of which blood-vessels are well

developed, and makes its way to the exterior through their openings.

This view of the importance of a combination of characters has widely extended itself among zoologists, and has led to valuable results in other divisions of the Animal Kingdom than that of Vertebrata; but of these I shall hardly have time to speak to you to-day.

Startling as is the doctrine that the Vertebrates and some of Prof. Huxley's Molluscoids are intimate allies, I must now ask you to consider the possibility of your zoological affinities with members of the still lower group of what are ordinarily called Worms.

I will do my best to save your feelings of self-respect by introducing you first of all to a distant cousin, who has at least this regard for his more distinguished relatives, that he has quite cut himself off from all the rest of the mob which zoologists call 'Vermes' or Worms. More than this, he has a very high-sounding name indeed—it is *Balanoglossus*; and he has a thoroughly respectable name-father in the distinguished Italian naturalist Delle Chiaje.

It has long been known that this worm, which lives in sandy or muddy places, takes in water by its protusible proboscis, and passes it out through slits, which lie on either side of the anterior part of the body; and that these breathing-slits or gill-slits are, in all their essential morphological characters, justly comparable to the gill-slits of Fishes. This is a fact which is so thoroughly recognised that some time ago we had a diagram prepared for exhibition in the galleries of the new Natural History Museum at South Kensington. Curiously enough, on the very day on which I put into position that picture, and its appended label of "A Worm that breathes by gills, like a Fish," Mr. William Bateson, of St. John's College, Cambridge, read a paper before the Royal Society which gave a new aspect to the relationships of *Balanoglossus*.

Mr. Bateson has had exceptionally good opportunities for studying the history of this form,—we had better at once cease to call it worm,—owing to the excellent arrangements for marine laboratories which now obtain in the United States, and the hospitalities of their distinguished directors.

Mr. Bateson has been able to observe the development of

a dorsal rod, the microscopic structure of which is precisely comparable to that of young Lampreys, or young Sharks, and which he has no hesitation in calling a notochord; he finds that the central nervous system is dorsal and forms a hollow tube, and as to the gill-apparatus he tells us that it may be well compared to that of *Amphioxus*; just as in the Lancelet, the gill-slits increase in number from before backwards during life. There are other points of resemblance, but those which I have indicated are sufficient for our purpose to-day.

These observations appear to justify the inclusion of *Balanoglossus* in that great trunk of the animal tree which is called the Chordata, which will then, as Mr. Bateson suggests, consist of four groups:—

1. Hemichordata (Enteropneusti).
2. Urochordata (Ascidians).
3. Cephalochordata (*Amphioxus*).
4. Vertebrata.

Having now brought the origin of the vertebrate stock so far down in the ancestral tree, we may as well see if we cannot trace it yet a little further. If the views of Metschnikoff are just, *Balanoglossus* is most closely allied to the Echinodermata, or Starfishes and Sea-Urchins; this view, however, is too problematical for us to be able to regard it as an acquired fact in Zoology, and, so far as general audiences are concerned, it can only be mentioned as affording an opportunity for repeating the humorous remark of my friend and colleague Prof. Martin Duncan, that the highest Vertebrate is always an Urchin in his earlier days.

We can, however, trace the Vertebrate far and deep into the vermian mob. One division of the lowest groups of worms, the Nemertinea, are remarkable for the possession of a proboscis which can be protruded from an orifice in front of the mouth, and be withdrawn into a sheath which lies above the digestive canal; now this sheath lies in the dorsal middle line, or, in other words, occupies an exactly similar position to the notochord, and, so far as is known, in developmental history the notochord and the sheath appear to have much in common. Let this be the first point.

Nearly all the Vertebrata have on the lower surface of their brains a body which, in the highest group of all,—or that of the

Mammalia,—becomes actually fused with the brain itself; when thus fused it appears to be a downgrowth—or *hypophysis*—of the brain, and it has acquired the distinctive term of the *hypophysis cerebri*. But, although thus connected with the brain, the downgrowth in question has had a very different history to the great mass with which it has finally entered into relation. It was at first an upgrowth of the roof of the pit which goes to form the mouth, but its stalk becomes gradually nipped out, and the formation of the cartilaginous or bony palate separates it from the cavity from which it sprung.

In the lowest of Vertebrates—or in those in which there are no true jaws—the so-called Round-mouths, like the Lamprey and the Hag, the *hypophysis cerebri* does not arise directly from the roof of the pit which forms the mouth, but appears as an independent pit in the front of the mouth.

Now, as to the Nemertines: the proboscis, which is invested by the sheath, ordinarily arises as an ingrowth in front of, or independently of, the mouth, just as does the *hypophysis cerebri* in the Lampreys; but in two genera of Nemertines (*Akrostomum* and *Malacobdella*) it appears as an outgrowth of the roof of the mouth—or, in other words, is developed in just the same way as the *hypophysis cerebri* of most Vertebrates. Let these form our second sets of facts.

If we have found some plausibility in the appearance of resemblance between the proboscis-sheath and the notochord, it is clear that our case will be made very much stronger if we can see anything in the Nemertine which will correspond to gill-slits.

On either side of the anterior end of the body of a Nemer-tean worm we observe a structure which, varying somewhat in character, may be spoken of as a sac, a furrow, or a groove. The sides of this organ are ciliated, and are, therefore, able to set in movement any body, such as water, which may enter them; the groove is sometimes continued into a canal which passes into the substance of the nerve-cells of the brain. These cells are impregnated with a substance which gives them a reddish-yellow colour, and which has been found to be hæmoglobin—or that substance which gives the reddish-yellow colour to our blood-corpuscles, and which is known to be capable of storing up oxygen, or of acting as a respiratory pigment. Now the ciliated ducts bringing in water bring in a fresh supply of oxygen, and

thereby give a fresh store to the hæmoglobin. They are, therefore, respiratory ducts, just like the gills of *Balanoglossus*, of *Amphioxus*, or the Salmon.

Functionally, then, they are similar; but what about the structural resemblances? Gills, you will remind me, are made not only by inpushings from without, but by outpushings from within, which meet and fuse with the inpushings. Well, such a thing does obtain among the Nemertinea, too; the mass of cells into which the canals from without extend are derived primitively from the walls of the œsophagus.

Let these make our third point, or rather, the third point of Prof. Hubrecht. When we come to sum them up shortly we may state our points thus:—

(1). Nemertean worms have a hollow structure which in position, and possibly in developmental history, agrees with the notochord of the Chordata.

(2). The proboscis of most Nemertines has the same relations as the *hypophysis cerebri* of some Chordata, and that of a few Nemertines the same as that of most Chordata.

(3). Laterally placed respiratory grooves in some Nemertines come into relation with outgrowths from the wall of the œsophagus.

Before accepting the justice of the conclusions to which we seem to be led, let us repeat the scientific version of Danton's famous saying about the orator, "De la doute, encore de la doute, et toujours de la doute."

Are there no difficulties remaining? You will see one in a moment, I hardly doubt. You will say that while Chordates have the nerve-cords placed dorsally, all worms have them placed ventrally; and you would be almost correct, yet not quite.

Among all the remarkable discoveries which have been made in the quarter of a century that has elapsed since Mr. Darwin published his 'Origin of Species,' none are of greater value or significance than those which affect our knowledge of the evolution of the nervous system of animals.

The simplest forms, such as *Amœba*, have no nervous system at all, but the whole surface of their body shows itself able to respond to external stimuli; in the lowest group of the Metozoa, the Sponges, a nervous system is, also, said to be absent. But this is not correct; Prof. Charles Stewart has found that the

orifices by which the canals of our common Calcareous Sponge (*Grantia compressa*) communicate with the exterior are fringed with delicate hair-like processes which taper to a fine point; each hair appears to be in relation to an underlying cell, which sends out a delicate process which traverses the axis of the hair-like process. This apparatus is judged by Prof. Stewart to be one which is specially adapted for being impressed by varying conditions in the inrushing water; these changes possibly lead to the contraction of the surrounding cells, so that we have here a mechanism by means of which the extent of the incurrent canal may be increased or diminished.

In the next group of animals we have a number of stages in the development of sense-organs, and a number of jelly-fish are, without doubt, provided with means by which they can distinguish between light and darkness. But there are not only sense-organs situated on the surface; there is, also, just below the under surface of the disc or umbrella, a network of nerve-fibres which extends in an apparently irregular fashion through its whole extent. In other words, when a nervous system first appears it is superficial in position and scattered in arrangement.

As the nerve-fibres become more and more concentrated they become arranged in a smaller number of definite bundles, which we are in the habit of calling nerve-cords. Of these there may be, as Gaffron has lately found in one of the Flukes (*Distomum isostomum*), six cords, a pair of which are dorsal, a pair of which are lateral, and a pair of which are ventral in position. Now, of these, it is quite clear that future circumstances would alone determine which were to gain the supremacy, and become the dominant pair; to put it in another way, such a fluke might have three sets of descendants in which a dorsal, a lateral, or a ventral pair would alone be found.

The Nemertinea carry us a step further in our argument; while *Carinella* has its nerve-cord lying outside the muscular wall of the body and just beneath the integument, *Cerebratulus* has its nerve-cords lying in the midst of its muscular walls, and *Amphiporus* has them internal to the muscles; but in all these three cases the cords lie midway between the dorsal and the ventral surface of the body; they are lateral in position.

In most 'Invertebrates' the cords finally take up a ventral position; but this is not always altogether the case.

When we examine that remarkable form *Peripatus*,—the true position of which has been made clear by the discoveries of Prof. Moseley and of the late Francis Balfour, and of which I had hoped to have had time to speak to you to-day,—we find a nervous system which is in many remarkable points of an exceedingly primitive character. The single point to which I can now direct your attention is this: at the hinder end of the body the two nerve-cords, which lie on the ventral surface, are connected with one another by a band which lies above the intestine, or which is, in other words, dorsal and not ventral in position.

From all this it will be clear to you that the difference in the position of the nerve-cords in two highly developed animals is not a weighty argument against these two forms having had one common ancestor whose nerve-cords were like those of many of the Nemertinea, lateral in position.

If I have made myself clear in the exposition of the facts which I have brought before you I must have led you, first of all, to the conclusion that the Vertebrates are not sharply distinguished or separated from another great division of the Metazoa, and that what has often been regarded as an insoluble problem may before long be made much clearer.

Another result is this: the ancestors of Vertebrates are to be sought for in worm-like forms living on the sea-coasts, or, to use more technical language, in our littoral marine fauna. If this be true you will not wonder that many of us have during the last two or three years been giving a great deal of time and thought to try and get built a laboratory for investigation on our sea-shores; the ancient philosopher, such as Lucretius, found it pleasant to stand on the sea-shore and watch the mariners in distress; the modern philosophical naturalist wants to stand on the sea-shore that he may study the anatomy and the activities of those animals that seem to offer him the key to the structures of higher forms, that he may see the beginnings of that stock which has found one of its culminations in Man.

And, to conclude, I hope I have made it clear to you that, though these recent discoveries have effected a revolution in the ideas in which we were educated, they have been, after careful enquiry, generously accepted. If I have done this, I have done yet more; I have proved to you that the man of science does not

only profess truth, but seeks after it, and that he is willing to give up even cherished systems when they have been found to be out of accord with fact. Ten years hence, men may scoff at what I have been telling you to-day, for Science, and especially the science of organised Nature, is just now advancing with leaps and bounds, and the truths of to-day may be the fables of to-morrow. So long as we bear this in mind, so long as we are willing to incorporate new truths whencesoever they may come, so long shall we be able to speak of, and hope for, advances in Zoology.

THE FAUNA OF THE SEASHORE.*

THE marine fauna of the globe may be divided into the littoral, the deep-sea, and the pelagic faunas. Of the three regions inhabited by these faunas, the littoral is the one in which the conditions are most favourable for the development of new forms through the working of the principle of natural selection. As Prof. Lovén writes, "The littoral region comprises the favoured zones of the sea where light and shade, a genial temperature, currents changeable in power and direction, a rich vegetation spread over extensive areas, abundance of food, of prey to allure, of enemies to withstand or evade, represent an infinitude of agents competent to call into play the tendencies to vary which are embodied in each species, and always ready by modifying its parts to respond to the influences of external conditions." It is consequently in this littoral zone where the water is more than elsewhere favourable for respiration, and where constant variation of conditions is produced by the tides, that all the main groups of the animal kingdom first come into existence; and here also, probably, where the first attached and branching plants were developed, thus establishing a supply of food for the colonisation of the region by animals.

The animals inhabiting the littoral zone are most variously modified, to enable them to withstand the peculiar physical con-

* Abstract of lecture at the Royal Institution by Prof. H. N. Moseley, M.A., F.R.S.

ditions which they encounter there. Hence the origin of all hard shells and skeletons of marine Invertebrata, various adaptations for boring in sand, the adoption of the stationary fixed condition, and similar arrangements. Almost all the shore forms of animals, however inert in the adult condition, pass through in embryological development free-swimming larval stages which are closely alike in form for very widely different groups of animals. Thus the Oyster and most other Mollusca of all varieties and shapes when adult develop from a free-swimming pelagic trochosphere larva, and so do many annelids. Such larvæ cannot be of subsequent origin to the adults of which they are phases. If such were the case they would not have become so closely alike in structure. In reality they represent the common ancestors from which all the forms in which they occur were derived, and as all these larvæ are pelagic in habits and structure, it follows that the inhabitants of the shores were derived from pelagic ancestors. The earliest plants were also probably free-swimming.

In the case of the Cirripedia there can be no doubt, from the history of their development, that they were originally pelagic, and have become specially modified for coast life; and in the case of the echinoderms the only possible explanation of the remarkable similarity of the larval forms of the various groups of widely differing adults is that these pelagic larvæ represent a common ancestor of the group. The madreporarian corals all spring from a pelagic larvæ. The colonial forms probably owe their origin and that of their skeletons to the advantage gained by them in the formation of reefs, and the increase in facilities of respiration consequent on the production of surf. In the deep sea they are very scarce.

The Vertebrata are sprung from a very simple free-swimming ancestor, as shown by the ciliated gastrula stage of *Amphioxus*. The Ascidiæ afford another evident instance of the extreme modification of pelagic forms for littoral existence.

The pelagic mode of respiration of Vertebrata by means of gill-slits occurs in no other animal group except in *Balanoglossus*, which will probably shortly be included amongst Vertebrata. Possibly gill-slits as a respiratory apparatus first arose in a littoral form, such as *Balanoglossus*, and hence their presence at the anterior end of the body, that nearest to the surface in an animal buried in sand. The connection of *Balanoglossus* with

the Echinoderms through *Tornaria* is very remarkable. Possibly *Amphioxus* once had a *Tornaria* stage, and has lost it just as one species of *Balanoglossus* has lost it, as Mr. Bateson has lately discovered.

The littoral zone has given off colonists to the other three faunal regions. The entire terrestrial fauna has sprung from colonists contributed by the littoral zone. Every terrestrial Vertebrate bears in its early stages the gill-slits of its aquatic ancestor. All organs of aërial respiration are mere modifications of apparatus previously connected with aquatic respiration, excepting, perhaps, in the case of *Tracheata*, tracheæ being most likely modifications of skin-glands, as appears probable from their condition in *Peripatus*. The oldest known air-breathing animals are insects and scorpions, which have lately been found in Silurian strata. Prof. Ray Lancaster believes the lungs of scorpions to be homogeneous with the gill-plates of *Limulus*. Birds were possibly originally developed in connection with the seashore, and were fish-eaters like the tooth-bearing *Hesperornis*.

The fauna of the coast has not only given rise to the terrestrial and fresh-water fauna; it has from time to time given additions to the pelagic fauna in return for having thence derived its own starting-points. It has also received some of these pelagic forms back again, to assume a fresh littoral existence.

The deep-sea fauna has probably been formed almost entirely from the littoral, not in the remotest antiquity, but only after food derived from the *débris* of the littoral and terrestrial faunas and floras became abundant.

It is because all terrestrial and deep-sea animal forms have passed through a littoral phase of existence, and that the littoral animals retain far better than those of any other faunal region the recapitulative larval phases by means of which alone the true histories of their origins can be recovered, that marine zoological laboratories on the coast have made so many brilliant discoveries in Zoology during late years.

EDIBLE BIRDS' NESTS.

BY W. B. PRYER.

IN your number for August last year there are some remarks on the genus *Collocalia* (Three unpublished Papers by Blyth). I have lately noticed also several communications in 'Nature' and other publications on edible birds' nests and their makers; and as from these remarks it is apparent that there is still a good deal of uncertainty about the whole matter, the following observations may serve to clear up one or two doubtful points.

Is it true that the caves frequented by these Swiftlets are always near the sea? No; wherever these birds find caves adapted for their purpose, whether near the sea or far inland, they use them.

Are the nests ever spotted with blood? (Rev. J. Barbe). No; the cause of this theory is, no doubt, that some white nests, not of best quality, have a tendency to turn an unpleasant raw-flesh colour in their thick part—the stalk or part next the rock to which the nests are attached.

Are the birds particularly exhausted by the process of making the second nest, if their first is taken? (Rev. J. Barbe). I know nothing to favour such a supposition. I do not suppose they like having their nests taken, any more than a Thrush or a Sparrow does, but when their nests are taken before the young are hatched they simply go to work again and make another, even though it be for the third or fourth time, and the last made nest is just as good as the first, and is not spotted with blood.

Is it true that nests, clean at first, become when old deeply soiled and mixed with feathers (Blyth), and that "hence they are distinguished into white and black?" (Marsden). No; white nest is always white nest, and is distinguishable as such until it quite crumbles away; and black nest is always black nest, from the first commencement of its being made. Black nest always has a considerable number of feathers woven up in its composition; white nest none at all, or but one or two that are there by accident. I can show white nests that have been uncollected for four seasons, where the bird has made four successive nests, each on top of the remains of the last one; the oldest remnants, though crumbled away till there is but little left, are still almost as white

as when first made. If the above-mentioned theory were correct, of course the older nests ought to be black. On the other hand, I have seen thousands of black nests in all stages, from their first commencement up to their completion. Very lately I had under my observation a quantity of nests partly last season's make, partly this. The birds had returned to their old nests (which had not been collected), and utilized what remained of them, there being a rim of new (but black) material thrown round the old and partly decayed centre. Both rim and centre were unmistakably black.

The difference between the two classes of nest is at once to be seen. The quality—and consequently the price—of white nest varies considerably, from an almost pure white, crisp, thin nest,—which is valued as high as eighteen dollars, and even twenty dollars, a colley here,—down to thickish flabby nest, with the ugly raw flesh-stalk or foot, already mentioned, which is valued as low as two dollars a colley only, but is always to be recognised as “white” nest. Black nest varies, from the best quality,—known here as “manas,”—which is well shaped and crispish as a rule, but has feathers in quantities woven into their texture, and which is sometimes valued as high as one dollar and fifty cents a colley, down to the worst black, which may not be worth more than fifty or sixty cents a colley.

I know some caves in which the nest is always all white (of various qualities), others in which the nest is always all black (including manas), and others in which all qualities both of white and black occur. I am not prepared to advance any explanation for the reason of this at present, beyond mentioning that the natives say that there are two species of birds, the makers of black nests being chiefly distinguishable by their slightly larger heads from the makers of white. I have never noticed this distinction myself, however.

What is the truth of Marsden's statement as to the practice of beating down and destroying old nest in order that a greater proportion of white nest may be found next season? The fact is that if any nest is left uncollected, whether it be black or white, the birds next season will use as much as they can of the old foul and decayed nest, thus spoiling the new crop as well. If a new cave is found, though it can be seen at once if it is a white or a black nest one, the nest in it at the time of finding will not be of

much value, and it all has to be knocked down to ensure a crop of good quality next season, whether it be white or black.

Mr. Layard says that his experience is—if I understand him rightly—that the first gathering of a “crop” (*sic*) is white, the second black and feathery, and the third mixed with grass, &c. In this country, at all events, there is nothing of this sort; white nest is always white nest through all its seasons and gatherings, and black nest the same. The nests mixed with grass, &c., that Mr. Layard describes do exist, however. I have seen some that were brought from Palawan, which is so much mixed with grass and moss as to be valueless, but it is always the same, and though collectors were got over, and the caves thoroughly cleaned, with the hope of getting better quality at the next gathering, it was just the same, mixed with grass and moss as before. May not Mr. Layard have mistaken nest taken from different localities for successive collections from the same cave?

With regard to the material from which the nests are made, I regard the Algæ theory with great doubt. The natives say the birds skim up froth or scum from the water, and use it as the material. I myself think it is simply a natural secretion of the birds themselves. [But see Mr. G. Murray’s note, p. 147.—ED.]

There are still a great many points in connection with these Swiftlets that are very obscure, and which I have abstained from touching upon, but will endeavour to clear up as time goes on.

THE MOLLUSCA OF THE COUNTIES OF KENT, SURREY AND MIDDLESEX.

BY T. D. A. COCKERELL.

(Continued from p. 180.)

LIMNÆIDÆ.

Planorbis lineatus.—Very local, more common in East Kent than elsewhere. In Surrey it is found on Barnes Common; Middlesex and W. Kent (W. D. Roebuck). Knole Park (Smith).

Var. *albina*.—Near Deal (Mrs. Fitzgerald).

P. nitidus.—Ebbsfleet and Minster (S. C. C.); Chislehurst; Kew; Fulham; River Lea at Tottenham (C. Ashford).

P. nautilus.—Near Sevenoaks; Ealing; rejectamenta of River Stour at Richborough (S. C. C.); Mitcham Common (M'Kean).

Var. *crista*.—Near Sevenoaks, Acton, and other localities.

P. albus.—Rejectamenta of River Stour at Richborough; St. Mary Cray; near Dorking; Ealing.

[Var. *Draparnaldi*.—River Thames near Reading (W. Holland).]

P. parvus (= *P. glaber*).—Surrey, rejectamenta of Thames at Kew; Middlesex, in a private fishpond at Tottenham (C. Ashford); near Sevenoaks (Smith); Richmond (E. H. Rowe).

P. spirorbis.—Minster (S. C. C.); Beckenham; Bedford Park; Ealing; Surrey (M'Kean).

Var. *albida*.—Bedford Park (D. B. C.).

[Var. *ecarinata*.—Essex (Laver *vide* Rimmer).]

P. vortex.—Generally abundant. Canterbury (Miss L. Fenn); St. Mary Cray; Kew; Richmond Park (R. A. Freeman); Acton Green; Perivale.

P. carinatus.—Somewhat local. Rejectamenta of River Stour at Richborough; Crayford; Kew; Perivale.

Var. *disciformis*.—Guildford; Kew; Bushy Park (F. Fenn).

P. complanatus.—Common. Canterbury (Miss L. Fenn); St. Mary Cray; Kew; Guildford; Fulham.

Var. *rhombea*.—Stratford (Loydell and Rowe); Erith (Leslie).

Var. *albida*.—Eltham (Choules). Monst. *sinistrorsum*, Wye (Miss Hele). [Monst. *terebrum*, W. Sussex (Jeffery).]

P. corneus.—Common in Middlesex and East Kent, but otherwise somewhat rare. Minster; Canterbury (Miss L. Fenn); New Cross; Guildford; Kew; Ealing.

Var. *albinus*.—Minster; Kew; Fulham (Loydell and Rowe); Kingswood (McKean).

P. contortus.—Rejectamenta of River Stour at Richborough; Mottingham; Kew; Guildford; Acton Green; Ealing; Perivale.

Var. *albida*, Putney (Loydell and Rowe).

Physa hypnorum.—Bickley; Acton, scarce, usually found in ditches; Surrey (M'Kean).

P. acuta.—Tank in Kew Gardens.

P. fontinalis.—Herne Bay; St. Mary Cray; Richmond Park (R. A. Freeman); Perivale; Kew.

Var. *albina*.—Herne Bay; near London (Taylor).

[Var. *acuta* has been found in East Sussex.]

Limnæa glutinosa.—Rare. St. Nicholas Marsh; Minster

(S. C. C.). Sandwich and Deal (Mrs. Fitzgerald); Sittingbourne (A. Loydell); Barnes (Loydell and Rowe); Battersea, and on leaves of *Nuphar luteum* at Stanmore (Cooper).

L. peregra.—Very abundant. Minster; Canterbury (Miss L. Fenn); Bromley; Redhill; Acton Green, and many other places.

Var. *ovata*.—Minster; Perivale; Kew; Putney; &c.

Var. *acuminata*.—Putney; Ealing (S. C. C.)

Var. *intermedia*.—Shooter's Hill Road (Loydell and Rowe).

Var. *candida*.—Kent (Loydell and Rowe); Bushy Park, Middlesex (S. C. C.)

Var. *succinæformis*.—Kensal Green (Jeffreys).

Var. *labiosa*.—Bromley.

[Var. *lacustris*.—Brocket Hall Lake, Herts (W. Griffith).]

Monst. *decollatum*.—Chislehurst (D. B. C.); Barnes (S. C. C.).

Monst. *scalariforme*.—St. Mary Cray (L. M. C.).

L. auricularia.—River Lea at Tottenham (C. Ashford); Dover's Green, near Reigate (Saunders); Earlswood Common (M'Kean); Blackheath (W. Jenkins); Kingston; Bushy Park.

Var. *acuta*.—Kent (Jeffreys). Var. *magna*, Near London.

[Var. *ampla*.—W. Sussex (Jeffery).]

L. stagnalis.—Upper Deal; Chislehurst; Guildford; Kew; Chelsea; Perivale (S. C. C.).

Var. *roseolabiata*, Wolf.—Grove Park, Kent.

Var. *fragilis*.—Enfield (S. C. C.); Surrey and Croydon Canal (Jeffreys).

Var. *variegata*, East Kent (Fitzgerald). Monst. *decollatum*, Barnes. Monst. *scalariforme*, Chislehurst.

L. palustris.—Near Sarre; Canterbury (Miss L. Fenn); Witley Common; Kew; Ealing.

Var. *conica*.—Banks of the Thames from Hammersmith to Woolwich (Jeffreys).

Var. *albida*.—Sandwich; Minster (S. C. C.).

Var. *corvus*.—Folkestone (Mrs. Fitzgerald).

Var. *obesa*.—Faversham (Fairbrass).

Var. *disjuncta*.—Faversham (Fairbrass).

Var. *elongata*.—Kent (Loydell and Rowe).

Var. *tinctoria*.—St. Nicholas Marsh (S. C. C.). Var. *roseolabiata* is reported from Surrey and Middlesex. Monst. *globosum* (var. *globosa*, Taylor), Enfield (S. C. C.). Monst. *carinatum*, Bromley (S. C. C.). Monst. *decollatum*, Barnes.

L. truncatula.—Minster ; Chislehurst ; Croydon ; Kew ; Acton Green ; River Lea at Tottenham (C. Ashford).

Var. *albida*.—Battersea (Jeffreys).

Var. *major*.—Richmond (E. H. Rowe).

[Var. *elegans* and var. *microstoma*.—Hants (Jeffreys).]

L. glabra.—Near Hedgecourt Common (M'Kean) ; River Medway near Maidstone (Smith) ; Erith (Leslie) ; in a pond near Nine Elms, Battersea (Cooper).

[Var. *elongata*.—Near Colchester (Rimmer).]

Ancylus fluviatilis.—Enfield (S. C. C.) ; Barnes ; Redhill ; stream near Folkestone (Capt. Brown) ; River Cray near Erith (Leslie).

[Var. *albida*.—West Sussex (Jeffery). Var. *capuloides*, near Colchester (Rimmer).]

A. lacustris.—Bromley ; Lewisham (B. B. Woodward) ; Twyford, near Ealing (S. C. C.) ; Muddy lane, near Reigate (E. Saunders).

[Var. *albida*.—West Sussex (Jeffery) and Christchurch (Ashford). Var. *compressa*.—Colchester (Laver).]

TERRESTRIAL GASTROPODA.

Arion ater.—Type form (black). Near Wrotham ; Barnes (F. Fenn) ; Twickenham ; abundant on the banks of the Wandle at Waddon and the Wey at Shalford, also at Croydon Sewage Farm (K. M'Kean) ; near Southall ; Bedford Park (D. B. C.).

Var. *plumbea*.—Shiere and near Dorking.

Var. *nigrescens*.—Chislehurst and Bedford Park.

Var. *rufa*.—Chislehurst, Caterham, and Bedford Park ; north side of Copthorne Common, in immense numbers (K. M'Kean).

Var. *succinea*.—"Of frequent occurrence (in Surrey), I can always take it in a ruined limekiln below White Hill" (K. M'Kean) ; Bedford Park.

Var. *pallescens*.—Chislehurst.

[Var. *albida*.—E. Sussex (Jenner) ; Watford (J. Hopkinson).]

[Var. *albolateralis*.—Singleton, Sussex (W. Jeffery).]

A. flavus.—"A single specimen at the foot of a wall at Banstead. It measured three inches when extended ; in colour it was a dirty yellow, body and mantle, the sole of the foot being a little lighter ; no bands or markings" (K. M'Kean).

A. sp.?—Intermediate in size between *A. ater* and *A. hortensis* ; variable in colour, but usually orange-brown, with indistinct

lateral bands on body and mantle; tentacles dark grey. This form seems to be well distributed. I have found it at Haslemere, and quite recently at Chislehurst. I think that it will prove distinct from any of the other British Arions.

A. hortensis.—Near Reigate; Orpington; Chislehurst; Bedford Park.

Var. *grisea*.—Bedford Park and Chislehurst.

Amalia gagates var. *plumbea*.—Acton and Bedford Park. Mr. W. D. Roebuck informs me that this species has been recorded also for East Kent.

A. marginata.—Margate; Chislehurst; Bromley; Reigate Hill (E. Saunders); Sidcup; Battersea; Croydon (M'Kean); Bedford Park; Gunnersbury. There is a dark variety, almost black, which is not uncommon at Bedford Park and Acton, and I have taken one specimen at Kew. Curiously enough, all the Bedford Park examples I have examined have been without the usual internal shell, but the Kew specimen had the shell as in the type.

Limax lævis.—St. Mary Cray (S. C. C.); Barnes Common; Wray Common; Reigate Heath, &c. (E. Saunders); near Chipstead (K. M'Kean); Perivale; Ealing (F. Fenn); Twickenham. At Barnes there are two forms, one spotless and the other darker and mottled.

L. agrestis.—Very abundant throughout the district.

Var. *sylvatica*.—Perivale, Acton, Bromley, Croydon, Barnes.

Var. *tristis*.—Acton.

Var. *lilacina*.—Haslemere and Bedford Park.

L. flavus.—Margate; Chislehurst; Surrey (M'Kean); Acton; Bedford Park (S. C. C.).

Var. *grisea*.—Acton; Hampton Court; Bickley (S. C. C.).

Var. *virescens*.—Chislehurst.

Var.—Uniformly dark yellowish grey, without markings; mantle tinged with yellow anteriorly. Foot yellowish white. Ealing, May, 1885 (S. C. C.).

L. maximus.—Chislehurst; Haslemere; Croydon (M'Kean); East Kent (W. D. Roebuck).

Var. *maculata*.—Croydon (M'Kean).

Var. *obscura*.—Chislehurst; Willesden; Acton; Hampton Court; Bedford Park [Worthing.]

Var. *fasciata*.—Chislehurst and Bedford Park.

L. arborum.—Reported for West Kent, Surrey, and Middlesex.

Chislehurst (S. C. C.); Beech Woods at White Hill and Gatton (K. M'Kean); Wray Park (E. Saunders); Erith (H. Leslie). [South Essex (W. D. Roebuck).]

Testacella haliotidea.—Regent's Park, Hendon, and Hammersmith (J. E. Harting); Stoke Newington (E. R. Allen); St. John's Wood (B. B. Woodward); Bedford Park; Acton (S. C. C.); Lambeth (G. B. Sowerby); Kensington (Miss S. Marshall); Hampstead (J. E. Harting); Kew (Rolfe); Mitcham, also abundant in the grounds of Coombe House, near Croydon (K. M'Kean); Wray Park (E. Saunders); East Kent (W. D. Roebuck). [Lewes (Hillman); Crabbe Wood, near Winchester (W. H. Cobbe).] Most, if not all, of the specimens belong to the var. *scutulum*.

T. maugei.—Kensington Gardens (British Museum). [Fareham, Hants (J. W. Cundall).]

Succinea virescens.—Minster (S. C. C.); St. Mary Cray (S. C. C.); Mitcham (Groves); Twickenham (F. Fenn); West Drayton (R. W. Cheadle).

S. putris.—Minster; Bromley; Putney (Loydell and Rowe); Acton Green.

Var. *olivula*.—Charlton (Hazay).

Var. *Fitzgeraldiana*.—Folkestone (Hazay).

S. Pfeifferi.—Near Faversham (Miss Fairbrass).

Var. *propinqua*.—Hammersmith (Hazay).

Var. *parvula*.—Barnes Common.

Var. *ventricosa*.—Folkestone (Hazay).

S. elegans.—Minster, large specimens (S. C. C.); St. Mary Cray; Tottenham (C. Ashford); Deal (Hazay); Richmond (E. H. Rowe).

Var. *minor*.—Hammersmith (Jeffreys).

Var. *ochracea*.—Southend, Kent (Rimmer).

Var. *intermedia*.—Near London (Cooper).

Monst. *sinistrorsum*.—Eastbourne (R. Rimmer).]

Vitrina pellucida.—Ebbsfleet; Orpington; Beckenham; Perivale; Barnes; Brentford (F. Fenn).

Var. *depressiuscula*.—Hastings (J. H. A. Jenner).]

(To be continued.)

ERRATA.—P. 96, line 15 for "Kent, M'Kean" read "Kenneth M'Kean." P. 96, "*Pisidium roseum*, Croydon Club District." This, the only Surrey record for *P. roseum*, is erroneous. The specimens were *P. pusillum*.

NOTES AND QUERIES.

MAMMALIA.

Dormouse in Hampshire.—In Mr. Rope's article on "The Range of the Dormouse in England and Wales," he says, "Reports from Dorsetshire and Hampshire are very meagre; perhaps this may arise from the commonness of the species rather than its rarity." The Dormouse is, or was, very common in this part of Hampshire. I have known as many as seventy or eighty in the College at one time, the boys not unfrequently carrying them about in their pockets; the price paid for them at the cottages was threepence or fourpence. The last year or two they have not been so plentiful; in fact, they have been scarce. We have a number of hazel copses, and generally speaking considerable numbers of Dormice are found when the underwood is cut, there being a large extent of beech and oak wood in our neighbourhood. "Old-man's-beard" is very plentiful in our hedges. Some years since I lived at Leighton Buzzard in Bedfordshire, and the Dormouse was frequently found by the woodman in King's Wood and Baker's Wood, about three or four miles from that town. The variety, or rather example, with a white tip to its tail is by no means rare, but is thought a good deal of by the boys, it not being the "common" mouse. It is not an unfrequent occurrence to see one of these little animals with a "stump" tail—that is, with part of the tail gone; they are said to bite their own tails off when kept short of water. Occasionally they show carnivorous propensities; we once had half-a-dozen in a cage, and were surprised one morning to find one of them dead with half of his head eaten away. I have at different times sent several Dormice through the post to my friends, and in every instance they arrived safely. I have seen an instance in which this little animal was so tamed that when at liberty in a room it would come to its owner when called, and would run up his body into his hand or on to his shoulder.—JOHN A. WILLMORE (Queenwood College, near Stockbridge, Hants).

BIRDS.

Pied Flycatcher and other Birds at Bolton.—In the beginning of June I spent two delightful days at Bolton, in Yorkshire, attracted far more by the beautiful scenery of the River Wharfe than by the old Priory situated on its banks. Sketching by the river all one morning, I took up my position on a large boulder half-way out in the stream, where I was able to get an exquisite view and make myself comfortable, except for the numerous flies. Luckily there seemed an abundance of all sorts of birds,

a pair of Robins soon hopping inquisitively near me, who did their best to rid me of many of those small pests that buzzed about me. The male bird darted every minute at some large May-fly, flitted to the female, who received it with quivering wings, and then returned to his old place of "reconnaissance." The piping of a Water Ouzel attracted my attention at that moment. There he was coming down the stream towards me. A sudden cessation in his flight, and I had to look intently before I could discern his white breast, a few yards off me, as he took up his position on a moss-grown stone by the edge of the water, so closely did he resemble the surrounding mass of boulders and pebbles. The female in another minute put in an appearance. That these fascinating birds should be so destructive to the Trout is a thousand pities, for fishermen never hesitate to bring about their death in consequence. The Grey and Pied Wagtails were tippetting merrily about amongst the rocks, dabbling through the shallow pools and making fine meals. But I had no longer eyes for any of the above-mentioned, for at that moment a small black and white bird darted from a bough not eight yards from where I was sketching, seized a May-fly and returned to the tree. Without doubt I saw, for the first time in my life, a Pied Flycatcher at large; for I do remember seeing in an aviary at Wimbledon two pairs of these birds in perfect health and plumage, the property of a German, and brought over from Germany by him. However, my genuine wild Flycatcher at Bolton was more interesting, especially when his mate arrived also, and when, in a few more minutes, another male bird flew pugnaciously at him. They tussled for a second, and then the interloper took his departure a little way down the river, where I think he joined his lawful wife, for I fancied I saw her. The first pair stayed close to me the whole morning, appearing perfectly fearless, and once the cock bird flitted on to a rock, where he looked enquiringly at me, flirting his tail up and down all the time. Redstarts, Common Flycatchers, and a pair of Red-backed Shrikes also frequented what I may safely call one of the most lovely spots in England. Let us hope they will all, after safely rearing their young, return next year to add to the beauty and interest of Bolton.—HUBERT D. ASTLEY (Chequers Court, Tring).

Ornithological Notes from Breconshire.—On Whit-Monday (May 25th), when returning from fishing with one of my boys, I saw a Woodpecker which I cannot but think was the Great Black Woodpecker, *Picus martius*. I first heard the note of a bird, very loud indeed, in a tree, a large oak; it was exactly like the note of the Curlew when first disturbed, and quite as loud and totally unlike any Woodpecker's note I have ever heard before. A large black bird—certainly a Woodpecker—then flew out of the tree with a very quick flight. I only had just one glimpse of it, and could see it was larger than the Green Woodpecker, *Picus viridis*, and more

slender in shape; it flew with its tail forked. I heard its cry twice afterwards, but was unable to get another sight of it, and I saw it no more. Of its being a Woodpecker I have not the slightest doubt. Perhaps some of your readers who have heard the cry of the Black Woodpecker may be enabled to test the correctness of my surmise. It had a most resonant and startling cry, and I cannot do better than liken it to the note of alarm of the Curlew, omitting the "courlee" with which that bird always finishes. About a fortnight since a man picked up in a wood on a farm near Talgarth, in this county, a young Woodcock that was unable to fly; there were two others in the same spot. This confirms my idea that the Woodcock occasionally nests here, and I have found the same from the very early birds that are killed from time to time here, and which I have no doubt have been bred in this county. I had also last week the pleasurable opportunity of examining the Garganey, *Querquedula circia*, killed by Mr. Alfred Crawshay, and reported by him in 'The Field.' It is a female bird, and a nice specimen. It was killed on the old course of the River Usk, near Talybont, and was by itself. This old course of the river is now choked up with rushes and willows, and is an excellent place for all kinds of duck. The common Wild Duck breeds here every year. Mr. Crawshay tells me that he saw an Osprey, *Pandion haliaëtus*, last year at Llangorse Lake. It dashed down on the water several times, but he did not see it actually take a fish; this is the third occurrence of this bird, to my knowledge, in this county. While on this subject I may mention a most singular shot made right and left last winter by Mr. Crawshay at a flock of Goosanders, *Mergus merganser*; one barrel killed one and the other two old males in most splendid plumage. I saw the three stuffed. He tells me there were about eight in the flock, and finding he could not get near them he sent an attendant to drive them over his head, with the above result.—E. CAMBRIDGE PHILLIPS (Brecon, South Wales).

"Humming" of the Snipe.—When walking up the meadows on the 17th June last I heard a Snipe "humming." The sound was so peculiar that I stopped to discover, if possible, the cause. As the bird came round "humming" within twenty yards of me, I saw through my glasses that two or three feathers of one wing were wanting, and one or two also out of the other. The sound produced was quite a treble compared with the usual sound, which I fancy varies very little. In the afternoon I again heard the same bird, and as there was another with full wings "humming" at the same time, the difference was very marked. Several times both birds came within twenty yards, and I noticed that when the noise was made the tail was spread, the wings quivered, and the beak was closed. The very great difference between the sound produced by the bird with the whole wings and that of the one with several feathers wanting fully satisfied me that the

humming sound is produced by the wings. The tail being spread steadies the bird in its downward flight, and may in some degree add to the sound. I had a good opportunity of seeing a Snipe perch. The bird came flying towards me and settled on some posts and rails which run along the side of a hedge in a meadow. After sitting on the rail for a few seconds it walked along the top, using its wings to steady itself, and hopped upon a post, where I watched it for a minute or two. I then walked towards it till within thirty yards when it took flight. After passing the rails a little distance the bird flew back, and with legs down tried to settle on the fence, a low trimmed one, but finding no foothold again pitched on the post and rail. I crept back under the shelter of the hedge, and on looking over found myself within a few yards of the bird, which was standing most comfortably on the same post; he soon began to preen his feathers, taking hold of them with his bill close to the gape and running them between the mandibles. In this way he could get hold of the feathers on the wing-coverts, when a movement on my part disturbed him, and we both went our ways.—J. WHITAKER (Rainworth Lodge, Notts).

Curious Sites for Redbreasts' Nests.—In the studio of Miss Currey, of Lismore, which is situated in the garden, a pair of Redbreasts commenced a nest this season behind a brass salver on a shelf within the apartment. The owner not permitting them to build there, they constructed a nest outside within a small watering-can that hung on a hook beside the door. On the lady taking down this article one day the bird flew out and the eggs rattled against the can, but on being replaced the Redbreast hatched them out a few days later and reared her brood in the can. Last year a Redbreast built in a fishing-basket hanging up in the same place. The bird used to enter beneath the half-opened lid, and to quit the basket by the hole in the top. After the first brood was reared, the Robin built a fresh nest within the basket and laid a couple of eggs, when a marauding cat terminated her life.—R. J. USSHER (Cappagh, Co. Waterford).

Sparrows and the Crops.—The House Sparrow is a curious fellow—full of originality—as bold a bird for his size as is to be met with anywhere. His usual habitat is, as his name implies, in the neighbourhood of houses, chiefly towns or farms. In the towns there are always scraps to be thrown away, in the country the farmyards afford sustenance to the Sparrow; often in the former case, however, to the discomfiture of numerous half-starved cats that abound in urban districts. It seems odd, too, that although there are laws and what not for the protection of most of our birds and beasts, yet very little is thought about the thousands of cats that must die every year, in London alone, of starvation. Well, our present thoughts are not now with the cat, but that most republican of birds, the Sparrow. The Sparrow is a native of our isle, and he seems somehow to inherit the

independent spirit which, at one time at any rate, was the boast of Englishmen as peculiar to the British race. He is gregarious by habit, building his nest in colonies, his favourite place being either the eaves of buildings or thatch of barns; if numerous, however, they will build in evergreen trees and shrubs, such as the spruce-fir or Portugal-laurel. The nest, if built in the open, is circular-shaped, with an entrance at side, whilst it is often more or less rudimentary when built under the sheltering roof. The first sound that greets the dweller either in town or country in the early morning, and one of the last as evening draws on, is the endless chatter of the Sparrow, for he—unlike most of our sombre-coloured birds—possesses no pleasing song with which to beguile the hen during the days of incubation. What all their conversation can be about would tax the most imaginative of mortals to determine, for the ordinary listener the distinguishing feature of their parliamentary wrangles seems to be repetition. They remind me very much of a number of almshouse gossips, whose sole aim appears to be to hear their own voices, to attain which it is necessary for all to speak at once. The Sparrow, however, is not always chattering, for he is a good forager; a veritable gourmand is he—few things come amiss to him, from the corn in fields to the cherries on the wall; with his powerful beak he shells the peas with wonderful celerity, and when detected will fly to the nearest wall and chirrup a bold defiance, as if he delighted in a spice of danger. Watch him as he approaches the hens just fed with scraps from the table; in vain the cock—proud possessor of numerous wives—lets drive at him. No good, for he returns again and again until at last he seizes in his beak the object of his desire, perhaps a piece of turnip half as big as himself—quickly to be dropped, however, as some more palatable morsel is discovered. We have two or three cats here that feed regularly with the fowls; numerous Sparrows, of course, are there to pick and steal, as is their wont. It is a curious fact that the cats make no attempt to interfere with the Sparrows while feeding, the birds often feeding within springing distance. When Sparrows are numerous and food scarce their pugnacious nature asserts itself; if, however, two hen Sparrows should disagree, the general result is interference by some old male bird who has probably won his spurs in many a hard-fought tussle, in right of which he lays claim to decide upon the merits of the case, but if the cocks delight to fight and scratch, the hens will look on with indifference. I have seen Sparrows attack and drive away Starlings, even from the places where the latter had selected to nest. Around this house and buildings Swallows can get no place for their nests, owing to the fact that as soon as a nest is completed the Sparrows in the calmest way possible take possession. The Sparrow being a bird of social habits will, if encouraged, become tame, although, like most bipeds of bullying propensities, they are naturally suspicious, and will not as a rule, unless pressed by hunger, venture within

the window ; whereas there are many other kinds that will become very friendly by encouragement. I remember this last winter—by no means a severe one—a case of a Robin that used to sit on a stag's head in the dining-room here and sing whilst breakfast was going on, becoming so friendly at last that one morning he pounced from his "coign of vantage" and seized a pat of butter from my plate, which, however, soon slipped off his beak, much to his astonishment. Well, I must now draw my remarks on this best known of English birds to a conclusion. I much fear, however, that a hard time is coming for the country Sparrow, for he has increased so of late years, and the damage done by him to the cornfields is so great that the farmers, for the sake of their crops, will have to take steps to keep them within reasonable limits.—HERBERT GOW STEWART (Hole Park, Rolvenden, Ashford).

Jackdaws breeding in a Magpie's Nest.—In reply to Mr. Warren's enquiry (p. 264), I may state that I have got a clutch of Jackdaw's eggs taken on the 18th April, 1883, from an old Magpie's nest in a Scotch fir near a farmhouse of mine. The Jackdaw was said to have bred there before. For several years past a colony of these birds have bred in an old Rook's nest in the dense top of a tall spruce-fir near my house here, the Rooks having deserted this place. They seem to prefer this site to the chimneys.—R. J. USSHER (Cappagh, Co. Waterford).

Hybrid Wild Geese.—At p. 256 of 'The Zoologist' for 1883 is a notice of a supposed hybrid Wild Goose—a cross between a Bean and a White-fronted Goose, as I then considered it. The bird has now moulted into the ordinary plumage of a White-fronted Goose, though from the comparatively small amount of black on the under parts it seems to be not yet adult. It is evident therefore that my supposition was quite wrong, and it was only the immature plumage which misled me. Young White-fronted Geese may be constantly seen with the nail or "bean" on the mandible partly black, but in this example the whole beak was so very unlike what it ought to have been that I was led into the mistake of suspecting a hybrid origin. About the time that this goose was purchased in Leadenhall Market, Mr. Castang, of whom it was obtained, had another, which came from Holland, and was believed by him to have been bred in confinement. Judging from its appearance this bird, which was subsequently bought by my father, could be nothing else than a hybrid between a Grey-lag and a Bean Goose. The whole of the nail on the upper and lower mandible is black, the rest of the bill and the legs being a very pale flesh-colour. There is a certain amount of black on the under parts, but not much, and a good deal of white all round the base of the bill, or on the face, as I might term it. The lesser wing-coverts and region of the carpal joint are as grey as in any pure-bred Grey-lag. The bird died the other day, and this description was written down

from it while in the flesh. On dissection it proved to be a female.—J. H. GURNEY, jun. (Northrepps, Norwich).

Greater Shearwater on the Skye Coast.—While engaged in searching for *Puffinus anglorum*, on the west coast of Skye, on July 13th, I had the good fortune to discover a dead specimen of the Greater Shearwater, *P. major*, lying on a heap of torn sea-weed among the rocks. Probably it had been cast up by a N.W. gale on July 11th. The light was then too grey to admit of a thorough examination of the bird, and I have been walking ever since I found it until now; but even in the shade of the glen it was easy to decide its identity by a glance at the fairly powerful bill, the long toes, and the expanse of wing. The soft parts resemble those of *P. anglorum* (the irides have sunk); but the webs of the toes are paler than in our common Shearwater. It will make a nice skeleton.—H. A. MACPHERSON (Carlisle).

Swallows building in Caverns.—Since I was a boy, over thirty years ago, I have known a few Swallows, *Hirundo rustica*, to build against the roof of a large limestone cavern near this, where good light reaches them. I have recently seen instances of Swallows breeding both there and in another smaller cave. House Martins are rather local here, breeding chiefly in colonies under over-arching sea-cliffs.—R. J. USSHER (Cappagh, Co. Waterford).

Birds Breeding in Ants' Nests.—The Southern Chestnut Woodpecker, *Micropternus gularis*, always, as far as I have observed, uses an ants' nest to nest in; and Mr. Gammie, the Superintendent of the Government Cinchona Estates at Mongphoo, near Darjeeling, has noticed the same thing with regard to the allied northern species, *Micropternus phaeiceps*; and the peculiarity probably extends also to the allied species found in Burmah, Siam, &c. Mr. Gammie thinks that when an ants' nest has been taken possession of by the bird that the ants desert the nest. This is a point on which I cannot speak with certainty. Mr. Gammie has taken nests of the northern species in which, although the bird has laid, the ants remained, and he has taken other nests where not a single ant remained; but there is nothing to show that these nests were not deserted before the bird took possession. I myself have taken nests of the southern form, in which, though the eggs were partially incubated, the ants remained, showing that some considerable time must have elapsed since the bird took possession. This is a point that I hope to be able to elucidate within the next few months, when the birds will be breeding. When *Micropternus* is breeding, the feathers of the head, tail, and primaries of the wings get covered with a viscid matter, having a strong resinous smell, and this substance is usually rather thickly studded with dead ants (*vide* 'Stray

Feathers,' vol. vi., p. 145). Two species of Kingfishers also to my knowledge nidificate in ants' nests—viz., *Halcyon occipitalis* confined to the Nicobar Islands, and *H. chloris*, which ranges from India as far south as Sumatra. At Mergui, in South Tenasserim, I found a nest of *H. chloris* in a hornets' nest; and although I saw the birds repeatedly enter the hole they had made in the hornets' nest, the hornets did not seem to mind it, but they resented in a very decided manner my attempt to interfere with the nest.—WM. DAVISON, in 'Nature.'

Curious Nest of the Song Thrush.—On Whit Monday, May 25th, I found, in the Copgrove Woods, Boroughbridge, a Song Thrush's nest, which to me, and to other members of the Yorkshire Naturalist's Union (who were having an excursion there that day), seemed very curious. It was placed among a number of young shoots, covered with green leaves, springing from the bole of a tree, and was formed on the outside entirely of fresh green shoots and leaves of low-growing plants, the rim at the top being of perfectly fresh blades of grass. With the exception of the dung lining everything visible about it was green, and the contrast to the ordinary nest of this bird formed of dry withered material was most marked. No doubt it was done for greater concealment among the surrounding green leaves, the colour of which was exceedingly well matched, except for the dulness of the nest caused by the withering process, and which would, of course, increase every day. Whether the bird had itself plucked off the fresh shoots, or they had been thrown out of the gamekeeper's garden, which was some fifty yards away, I cannot say. The nest contained one egg.—G. T. PORRITT (Greenfield House, Huddersfield).

FISHES.

Spinous Shark in Galway Bay.—On June 26th a large Spinous Shark, *Echinorhynchus spinosus*, said to have measured nine feet, was captured in Galway Bay by some fishermen, who reported that another was, at the same time, seen accompanying it. This is the second known Irish example, and the first taken on the west coast, the former instance having occurred in September, 1882, when one of these rare Sharks was caught off Skerries, near Dublin (see Zool. 1882, p. 424). The head and portion of the tail of the present specimen have been secured for the Science and Art Museum. From Mr. Michael Alfred, of the 'Galway Express,' I learn that, on the 4th of July, a second specimen of this rare Shark was captured by some Claddagh fishermen outside the Aran Islands. It was about eight feet in length; and, like the latter, was taken on a handline used for conger eels, the bait being a gurnard without the head. Depth of water about thirty fathoms. Mr. Alfred adds that three have been caught within ten days.—A. G. MORE (Science and Art Museum, Dublin).

Rare Fishes off Aberdeen.—I recorded and figured in the 'Proceedings of the Zoological Society' for 1884 the first species of *Lumpenus lampetiformis* obtained in Great Britain. It was a male 10.7 inches long, captured trawling by Prof. M'Intosh, fifteen miles off St. Abb's Head. On June 20th I received a letter from Mr. Sim, of Aberdeen, inclosing a sketch of a fish which had become entangled in the net of a steam trawler, and which specimen he was good enough to forward for my inspection. It is a female of the same species 8.6 inches in length, in which the caudal fin differs from that of the male example in that its form is lanceolate. The second specimen, which I received at the same time from Mr. Sim, was that of a *Gadiculus argenteus*, Guichenot, which was cast up on the beach after a slight storm on the 13th April last. To this latter fish a considerable amount of interest attaches itself. Pertaining to a genus whose habitat is considered intermediate between the littoral and deep-sea zones, I have been in doubt whether it has or has not been previously obtained off our shores. Couch labelled a fish of this species from the 'Porcupine' Expedition as *Macrourus linearis*, and which is in the British Museum collection. Of it he wrote as follows:—"Much resembling a Whiting, but shorter in proportion to its depth and with a much larger eye. Caught from a depth of 183 fathoms, muddy ground, 54° 10' N. and 10° 59' W. Length about six inches; no barb; the head short, eye large, mouth capacious, teeth small, dorsal fins three, anal two, tail a little concave, colour in spirit pale yellow. If we can suppose that a Whiting can live at such a depth, we can suppose also that the eye might become larger and the body rather shorter, proportionally, but otherwise it is a distinct species and yet nearly alike; but from the latitude, and especially the longitude, it is scarcely a British fish." I should have deemed a fish from such a spot undoubtedly British, but as I was not quite sure whether Mr. Laughrin, who had been in charge of the fish collection in the 'Porcupine' Expedition, might not have inadvertently mixed up Mediterranean forms with those from higher latitudes, and as *Gadiculus argenteus* originally was obtained from the coast of Algiers, I wrote to him on the subject. However, he would only reply that "I do not think he [Mr. Couch] had any of the Mediterranean fish; I cannot remember, it is so long ago." It is very interesting being able, after so many years' interval, to adduce corroborative evidence as to this fish being entitled to a position in the British fish-fauna, the 'Porcupine' specimen having been obtained on the west coast of Ireland, Mr. Sim's on the east coast of Scotland. The specimen is 3.3 inches in length, D. 11/13/15, A. 16/16, L. 1. 56. There is a dark spot at the base of the anterior rays of the first and second dorsal fins.—FRANCIS DAY (Cheltenham).

Dentex vulgaris in Mount's Bay.—I received this morning (11th July), two hours after capture, a small but very good specimen of the

Four-toothed Sparus, *Dentex vulgaris*, taken in Mount's Bay. The most striking characteristic was the beautiful mother-of-pearl appearance of all the scales. Over the back above the lateral line they were rosy pink mottled with blue, on the sides pink, gradually becoming white on the belly. The distinctive teeth were present, recurved, and—what I do not observe noticed in the books—grooved throughout their length, thus giving an appearance of great strength. The jaws were so rigid that I had some difficulty in opening the mouth, suggesting great power in the muscles which worked them. The eye was high in the head, and, for one of the *Sparidæ*, small. The scales were large, and there were none on the nose, nor on the suborbital space. Its dimensions were:—Length over all, 1 ft. 6 in.; eye to fork, $11\frac{7}{8}$ in.; greatest depth at the base of dorsal, $5\frac{1}{2}$ in.; breadth, 2 in.; length of pectorals, $4\frac{1}{2}$ in. The lateral line started from the top of the operculum in a curious agglomeration of small scales,—not exactly a spot, because they were of the same colour as the other scales,—and was very conspicuous throughout its whole length, but was scarcely perceptible to the touch. In the dorsal fin the third ray was the longest of the spinous rays. Couch makes the fifth ray longest, but he is mistaken, and so is Yarrell in putting a small rudimentary ray in front of the dorsal. The caudal fin was a very powerful one. The specimen turned the scale at two pounds seven ounces. The fish had a remarkably strong smell, which communicated itself to one's hands on examining it. The specimen will be lodged in the museum at St. Michael's Mount.—T. CORNISH (Penzance).

ARCHÆOLOGY.

Folk-lore anent the Weasel.—In the 'Vicar of Wakefield,' Oliver Goldsmith puts into the mouth of Dr. Primrose the following curious expression, "My wife was usually fond of a weesel-skin purse, as being most lucky; but this by the bye." Can any correspondent explain the allusion? Why was the "weesel-skin" considered lucky? and is the notion still prevalent?—J. E. HARTING.

NOTICES OF NEW BOOKS.

A Naturalist's Wanderings in the Eastern Archipelago: a Narrative of Travel and Exploration from 1878 to 1883. By H. O. FORBES, F.R.G.S. 8vo, pp. 536. London: Sampson Low & Co., 1885.

ALTHOUGH the writings of Mr. A. R. Wallace have admirably paved the way in describing the characteristic fauna and flora of
 ZOOLOGIST.—AUGUST, 1885.

some of the islands in the Malay Archipelago, there is yet very much to be done in the way of exploring and collecting there before our knowledge on the subject can be considered as anything like complete. A valuable contribution thereto has been recently published by Mr. H. O. Forbes in the shape of a narrative of five years' wanderings in Java, Sumatra, the Cocos Keeling Islands, and Timor Laut; and, as might be expected, this narrative is full of interest for naturalists.

Proceeding first to Java he made Batavia his head-quarters, whence all necessary supplies could be procured, and his collections stored at the end of every expedition. After a brief stay here, which carried him over the worst part of the rainy season, he started early in 1879 for the Cocos Keeling Islands, in order, as he tells us, to form, by personal observation, more clear ideas of coral formation, and chiefly to note how the struggle between the reef-makers and the waves had been going on since the date of Darwin's visit there in 1836, when he made the observations subsequently published in his 'Coral Reefs.'

Returning thence to Batavia, he started soon after for Genteng, in the province of Bantam, where he spent some time in collecting; afterwards proceeding to Kosala, whence, after some months' absence, he returned to Batavia to pack up and send home his first collections. This accomplished, he began to look further afield, and in November, 1880, embarked for Telong Betong, the chief town of the Lampong Residency, which forms the most southerly province of Sumatra, steaming westward through the Thousand Islands into the Straits of Sunda, and so into Lampong Bay.

After a brief sojourn in the south-coast district of the Lampongs, once more he returned to Batavia to despatch collections, and again entered Southern Sumatra to explore the dense forests which clothe the great mountain chain extending through the Residency of Lampong, beyond that of Palembang. Here a year was adventurously and profitably spent, and it was not until the middle of April, 1882, that he once more left his head-quarters at Batavia, *viâ* Amboina, for Timor Laut, full of great expectations in regard to a group of islands of whose fauna and flora he was to give the first published account. The exploration of these islands, not unattended with danger and difficulty, occupied the remainder of the year 1882, when, after

an expedition to Buru and another to Timor, the traveller returned to England in August, 1883, after an absence of very nearly five years.

Such is a brief outline of the author's route, the full details of which he has described very pleasantly in the volume before us. We need scarcely say we have read it with a great deal of interest, and marked a good many passages for quotation, many more, indeed, than we here have space for.

During his sojourn on the Cocos Keeling Islands Mr. Forbes had good opportunities for observing the singular habits of the great Cocoa-nut Crab, *Birgus latro*, which is to a great extent nocturnal in its habits, making tunnels in the ground larger than rabbit-burrows, which it lines with cocoa-nut fibre. It feeds almost exclusively on fallen cocoa-nuts, using its great claw to denude the fruit of the husk surrounding it, and to get at the eye of the nut, which it has learned is the only easy gateway to the interior. Mr. Forbes thus describes the mode of operation :—

“Of the three eye-spots seen at the end of a cocoa-nut, only one permits an easy entrance. The *Birgus* does not waste its energies in denuding the whole nut, and it never denudes the wrong end. Having pierced the proper eye with one of its spindle ambulatory legs, it rotates the nut round till the orifice is large enough to permit the insertion of its great claw to break up the shell and triturate its contents, whose particles it then carries to its mouth by means of its other and smaller cheliferous foot. From this nutritious diet it accumulates beneath its tail a store of fat, which dissolves by heat into a rich yellow oil, of which a large specimen will often yield as much as two pints. Thickened in the sun it forms an excellent substitute for butter in all its uses.”

Mr. Forbes also discovered it to be a valuable preserving lubricant for guns, and steel instruments; and only when a small bottle of it which he had had for two years was finished did he fully realise what a precious anticorrosive in these humid regions he had lost.

The mammalian fauna of the Keelings appears to be entirely an introduced one. A herd of deer on Horsburgh Island is interesting, as being a cross between the Javan *Rusa*, *Cervus hippelaphus*, and the darker Sumatran species, *Cervus equinus*. Pigs run wild, and thrive remarkably well on the broken scraps of cocoa-nut everywhere lying about in the woods. Australian

sheep feed on the *Portulaca oleracea*, on a kind of grass, and on the tubers of an aroid which they scrape up, and seem none the worse for the maritime conditions under which they are forced to live. Rats are a perfect nuisance. Occasionally Flying-foxes (*Pteropus*) reach the atoll, but generally in too exhausted a state to survive.

Bird-life in the Keeling Islands is described as "limited, but very interesting." The Noddy Tern, *Anous stolidus*, and the Gannet, *Sula piscatrix*, were seen in thousands, and the author had many opportunities of noting how their industrious habits are taken advantage of by the Frigate-bird, *Tachypetes minor*, much in the same way as we see our British Gulls pursued by Skuas.

The Philippine Rail, *Rallus philippensis*, which is resident in the Keelings, becomes quite domesticated, and is employed by the colonists to hatch out their chickens, which it does with care.

While travelling in Java, one of the author's most interesting discoveries was a Spider, *Ornithoscatoides decipiens*, Cambridge, remarkable for its exact resemblance to the droppings of a bird, a resemblance which is increased by its spinning a thin white web on the surface of a leaf, by means of which it secures itself on its back to the leaf, leaving its legs free to enclose and seize any insect unwittingly resting upon or crossing the apparently harmless bird-dropping. This very curious spider was afterwards met with again in Sumatra.

In the forests on the southern slopes of the Malawar and the Wayang, the Banteng, *Bos banteng*, lives in considerable herds, but is very difficult to approach and dangerous when wounded. The baying of Wild Dogs often reached the traveller's ear, but they were so exceedingly shy and wary that he only succeeded in shooting one indifferent specimen. These Wild Dogs, it appeared, live chiefly on the Kantjil and Muntjac deer. Civet Cats were found to be abundant in Java, and the nocturnal Scaly Anteater, or Pangolin, was captured in the evening while clumsily climbing trees, licking up with amazing rapidity streams of ants, which form its sole food.

Amongst other interesting birds collected in the province of Bantam were a Flycatcher, *Siphia banjumas*, of a beautiful azure blue; a sea-green Magpie, *Cissa thalassina*, with brown wings,

coral beak and legs; and a handsome Shrike, *Laniellus leucogrammicus*, known only from Java.

In the forests of Sumatra Mr. Forbes added to his collection some of the fairest of the feathered tribes—a crested Bee-eater, *Nyctiornis amicta*, with rose-coloured head and vermilion throat; orange and scarlet-crested Woodpeckers; green Barbets, blue and bronze Doves, green and scarlet twittering Lories; and, on the dead snags of the lonely outliers, large hawks and falcons. Amongst the Mammalia his most interesting capture in Sumatra was a Flying Squirrel (*Sciuropterus*), with large gentle Lemur-like eyes, soft fur, and black-margined parachute expansions. Butterflies were numerous and beautiful, none perhaps more so than the lovely *Amblypodia eumolopus*, the upper sides of whose wings are of the most sparkling emerald.

Of the Natural History of Timor-laut previous to Mr. Forbes' visit hardly anything was known. If we except birds, animal-life seems to be but poorly represented. Besides a *Cuscus* (a genus of Marsupials common to the Moluccas and New Guinea) and a wild pig, Mr. Forbes found no large indigenous mammals, although, so far as native tradition goes, the herds of Buffaloes which live in a wild state on the mainland are believed to be indigenous. Mr. Forbes, however, considers it more likely that they have been brought there by the accident of shipwreck, or by design. No Deer were seen or heard of, no Kangaroo, and no Squirrels; a few small insectivorous Bats, one fruit-eating Bat, and a small mouse-like animal (*Perameles*) were all that were observed, although the Dugong, *Halicore australis*, frequents the shore, and is hunted by the natives for its ivory.

One species of Frog was collected, while Snakes and Lizards were found in considerable numbers, one species of each proving to be new to science. Out of sixty species of birds collected on Timor-laut no less than twenty were new; and of the butterflies and other insects brought home from here nearly one half were previously undescribed.

With this glance at its contents we must close Mr. Forbes' volume, though we should like to have quoted much more from it. It is extremely interesting from beginning to end, and is quite the best Natural-History book of the season.

The Birds of Lancashire. By F. S. MITCHELL. Post 8vo, pp. 224.
London: Van Voorst. 1885.

It has been for some time known to ornithologists that Mr. F. S. Mitchell has long had in preparation a volume on the birds of the county in which he resides; and it has just been published. Considering the vast increase of population in Lancashire, and the scientific farming which drains every marsh, and substitutes for every bosky nook a rigid bank and paling, it is astonishing how many different species of birds Mr. Mitchell has been able to enumerate as still resident in the county or occasionally visiting it.

He tells us that the present avifauna comprises 256 species, of which eighty-five are residents, thirty-one summer visitors, sixty-five winter visitors, and seventy-five occasional visitors. The residents are all annual breeders within the county limits, except the Lesser Black-backed and Herring Gulls, but as these nest within a very short distance of the border they may be fairly included in the class. The Peregrine Falcon, Common Buzzard, Hen Harrier, Nuthatch, Goldfinch, Raven, Rock Dove, Water Rail, and Spotted Crake, probably all still breed in Lancashire, though in much diminished numbers. The summer visitors also all breed annually, although the Pied Flycatcher, always local, is now considered rare.

“Among the winter visitors,” says Mr. Mitchell, in his Introduction, “is placed the Crossbill, which once bred regularly in the county, and possibly still does so occasionally, as also are those species like the Dotterel, Greenshank, and Turnstone, which appear on migration in spring and autumn, and those like the Guillemot, which occur the summer through, but never remain to breed.” Upon this paragraph we have to remark that when treating of the Crossbill further on (p. 69), Mr. Mitchell has omitted to furnish any evidence of its having “once bred regularly” in the county; nor do his remarks concerning the Dotterel, Greenshank, Turnstone, contain any allusion to their occurrence in winter. On the contrary, he shows that in Lancashire, as elsewhere in England, they are all of them spring and autumn migrants, going northward to breed in the spring, and returning southward with their young

in autumn. It must have been surely by inadvertence that Mr. Mitchell has included them amongst winter visitors in his Introduction.

Referring to the occasional visitors, amongst which we presume are to be included the rare and accidental stragglers, Mr. Mitchell notices the Roseate Tern, which not many years ago was a regular summer migrant, and which, though seemingly extinct, he has been "reluctant as yet to cut out altogether."

The two rarest birds which have occurred in Lancashire are those of which two excellent coloured plates are given, namely, the Black-throated Wheatear (*Saxicola stapazina*), and the Wall Creeper (*Tichodroma muraria*). The former was shot in May, 1875, near the reservoir at Bury; the latter was obtained in May, 1872, at Sabden, a village at the foot of Pendle Hill. The abundance of the Twite in Lancashire is noteworthy considering how scarce a bird it is considered in more southern counties. Mr. Mitchell describes it as "resident, occurring on open moorlands, and breeding as commonly on the South Lancashire mosses as in more elevated districts. It leaves the higher grounds in winter, and approaches the towns, feeding in company with its congeners, in considerable flocks, on the stubble fields and waste lands."

Referring to the marked decrease of the Wood Lark (p. 86), Mr. Mitchell states that, although once a common resident in many parts of Lancashire, it is now almost extinct. He adds that this appears to be the case generally throughout the north of England, and probably the incessant pursuit of this species by the professional birdcatcher has a good deal to do with its increasing scarcity.

We are surprised to notice the statement, on page 117, that the Hobby, a summer visitor to this country, has been procured in Lancashire *in winter*. This, probably, is a mistake, and, no particulars being given, it is not unlikely that the author's informant may have mistaken a young Merlin for a Hobby.

Amongst species which are absent from Lancashire are noticed the Nightingale, Dartford Warbler, Bearded Titmouse, and Thickknee, while some others, like the Nuthatch, though plentiful in other parts of England, are said to be "exceedingly rare and very seldom seen."

We have no faith whatever in the validity of the so-called species, *Parus britannicus* and *Acredula rosea*, both recognized by Mr. Mitchell. Between these and *Parus ater* on the one hand, and *Acredula caudata* on the other, no end of intermediate forms occur, which entirely destroy the importance of the characters relied on by those who are fond of persuading themselves that they have discovered a new British bird. It is true that the difference of coloration between *Acredula rosea* and *caudata* is much more marked than in the case of *Parus britannicus* and *ater*; so much so, indeed, that on a comparison of well-marked specimens of both forms, *rosea* would seem entitled to specific rank; but Herr von Tschusi zu Schmidhoffen, who has recently written upon the European Longtailed Tits (Mittheil. Orn. Verein, Wien, 1884, p. 103), states that in the district of Salzburg not only do both *rosea* and *caudata* appear, but also every possible form intermediate between the pure white-headed and the black-striped birds.

As an interesting example of the way in which changes in cultivation will affect the avifauna of a district, we may refer to the account which is given (p. 165) of the introduction of Black Game into Lancashire. This bird seems to have followed the larch plantations, and Mr. Pearson, in tracing its present distribution in the county, says, "It is remarkable that within the period of my memory the summit of Cartmel Fell, then a healthy waste, was tenanted by the Red Grouse; it is now a larch forest occupied by Black Grouse."

A very commendable feature in Mr. Mitchell's book is that the remarks made on the habits of the various species are the result of independent observation, and in all cases have a local bearing. It would, of course, have been easy to double the size of the volume by giving full descriptions of plumages, nests, and so forth, or by copying from the works of predecessors; but Mr. Mitchell assures us, in his Introduction, that his facts are all derived from original sources. His book forms a most acceptable addition to the steadily increasing series of county avifaunas.



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ORNITHOLOGICAL NOTES FROM NORFOLK.

BY HENRY STEVENSON, F.L.S.

IN continuation of my notes for 1882, contributed to 'The Zoologist' last year (pp. 370—374, 411—416), I now forward those for 1883, to be followed shortly by those for 1884.

On January 3rd an immature Red-necked Grebe was shot near Yarmouth; and on the 5th a young Slavonian Grebe at Potter Heigham. On the 3rd a Brent Goose was shot flying close to the houses next the beach at Yarmouth; and on the 4th a pair of Bean Geese at Winterton. On the 8th seven Wild Geese of some species were seen to cross Breydon, possibly Pink-footed, as one was shot at Fritton about the same time. On the 19th the Rev. E. T. Frere, of Burston, near Diss, informed me that three flocks of Wild Geese, the largest containing at least forty birds, passed over that parish, passing south-east. One flock came down low enough to be fired at, but without effect. An adult Bean Goose was also shot at Halvergate on the 19th; and two were sent up to Norwich from Yarmouth a few days later. A female Merlin was shot at Potter Heigham on the 5th; and on the 23rd another near Yarmouth. Three Shelducks were seen, and one shot, on Breydon, January 1st, and seven were seen on Breydon on the 10th; two immature were shot there on the 13th, and one on the 16th. Three Short-eared Owls were brought into Yarmouth on the 15th. Two Waxwings were killed at Gorleston on the 13th; two, also near Yarmouth, on the 19th, and one on the 20th; and one at Tivetshall on the 18th; probably part of the flock that reached us in December, 1882.

Snow Buntings were abundant on the Denes at Yarmouth early in the month; some two dozen were netted on the 1st. A single Grey Wagtail was seen by Mr. G. Smith on the Caistor road, near Yarmouth, on the 14th. Several Stock Doves were brought into the Yarmouth market during this month. A male Shoveller in change of plumage was sent to Yarmouth in the first week of the month; two female Golden-eyes were shot on Breydon on the 10th; and many Common Scoters appeared off the North Beach, and in the Roads on the 21st; but fowl and waders were alike scarce in January. Three Shore Larks were shot at Yarmouth on the 18th, nine on the 26th, and others were said to have been seen in a field more inland. On the 27th a Norwich birdstuffer had, also, seven from Wells. Mr. George Smith, of Yarmouth, considers the Rock Pipit to be a regular, and in some seasons abundant, visitor in autumn and winter to the Yarmouth coast, having shot large numbers at different times on the banks of the Bure, and on Breydon Walls. In December, 1869, he shot eleven and a Meadow Pipit in one day. On Jan. 22nd Mr. J. H. Gurney, jun., counted thirteen female Goosanders upon the lake at Gunton, near Cromer. He also observed on the same day at Gunton some three hundred Black-headed Gulls; a rather early date for their appearance thus far inland.

On February 3rd a Waxwing was seen on a fence at Lakenham, near Norwich; and another was shot near Yarmouth on the 5th. On the former date I saw three Kingfishers which had been recently trapped by the legs, and a few inquiries in the neighbourhood whence they came elicited that many more of these beautiful birds had been similarly sacrificed in the interests of trout preserving. On the 5th I saw five Shore Larks, brought to Norwich from Cley; one old male had the vinous tints on the shoulders, a rich black gorget, and yellow cheeks. On the 7th of this month, as Mr. J. H. Gurney informs me, a female Wild Duck died at Northrepps Cottage which had been hatched and brought up there in 1854. It had been blind for several months, and for about eight years had been in complete drake's plumage, except a few brown feathers mingled with the green on the sides of the head and neck, and a few normal feathers on the flanks. Mr. J. H. Gurney, jun., saw a Lesser Spotted Woodpecker on the 14th which had been sent to a Norwich birdstuffer from Easton; and two more were shot near Norwich. Another was seen about the

same time by a reliable authority running up the trunk of a tree at Brooke, also near Norwich. On the 1st two Grey Geese were seen flying at Horsey, and five on Breydon. On the 24th a White-fronted Goose was seen on Heigham Sounds. An immature Slavonian Grebe was shot at Flegg Burgh on the 9th, and another near Yarmouth on the 10th. This species was unusually numerous on our coast in the winter of 1882-83, but chiefly young birds. An immature Black-throated Diver was shot on the Yarmouth coast on the 14th. A great scarcity of both wildfowl and waders on Breydon was noticed this month. Two Shelducks, a few Wigeon, and one male Pintail Duck, on Breydon, on the 12th, and a few Grey Godwits are the only species worth notice, except the early appearance of Garganey at Potter Heigham on Feb. 24th. On the 19th an adult male Goosander was shot, one of sixteen which, varying in numbers, had frequented Gunton Lake and Antingham Ponds for some weeks, the flock comprising four adult males and twelve females. An immature Shag, probably storm-driven, was shot off the spire of Attleborough Church on the 22nd. On the 12th and 14th large flocks of small Gulls, no doubt of the Black-headed species, were observed at Northrepps, passing inland from the coast. One noticed on the 12th had a pure black head. An enormous flock of Lapwings, which extended a great distance when fairly on the wing, were seen to rise from the marshes by the river Yare, opposite Thorpe Asylum, on the 24th. The Rock Dove has never been included in the list of migrants to the Norfolk coast, from the obvious difficulty of deciding whether specimens obtained on the coast have not escaped from the trap-shooter, or strayed from the dovecote; but as Mr. Hancock includes it amongst the species nesting, to his knowledge, "occasionally in the cliffs of Marsden, and in other localities on the sea-coast, both in Northumberland and Durham, where the cliffs are high," there seems no reason why real wild Rock Doves from those counties, and still more northern localities, should not voluntarily visit Norfolk at times, and the species be added to our list, if they can be identified. I am led to make these remarks, since, in notes supplied to me from Yarmouth, Mr. G. Smith mentions examples of this species, one or two at a time (half a dozen or more in a bunch might suggest a shooting-match) as brought into Yarmouth from the neighbourhood, during January and February, 1883 (and on previous

occasions) with Stock Doves. Such occurrences, especially in autumn and winter, should be carefully noted, with particulars as to locality where met with, and under what circumstances, as well as the state of the weather, and direction of the wind at the time.

The marvellous change in the weather, after so mild a winter, which extended from the 6th to the 10th of March, when gales, most disastrous on the coast from north and north-east, were accompanied, day after day, with heavy storms of snow and sleet till, on the 10th, the snow laid five or six inches deep on my grass plot, and icicles hung from the windows at mid-day, after severe frost at night—it was a curious sight to see my “Charity Board,” thronged with feathered pensioners as in the sharpest winter. Tits, Chaffinches, Robins, and Hedgesparrows, with Thrushes, Blackbirds, and Starlings, all appeared, yet the latter, pinched as they were for food from this sudden deprivation of their diet, despite all cold and privation, sang merrily in the intervals of sunshine, and paid in melody for their “out-door relief.” Yet, strange to say, by the evening of the 10th, the large amount of snow so gradually accumulated, had, to a great extent, disappeared through a rapid ground thaw, without rain and the temperature still very low. Another young Shag, but in its second year’s plumage, now in my collection, was shot on the 1st of this month, on Yarmouth beach. A curious clustering of Wrens was observed at Northrepps about 5 p.m. on the 9th, when some six or eight, or more, were seen fluttering against the kitchen window of the keeper’s cottage, situated amongst the plantations, and not far from the sea, and may have been a small migratory flock; they flew off into a laurel-bush, but disappeared later. A red-plumaged male Crossbill was shot in a plantation at Mousehold, near Norwich, on the 5th. Like the Shag before recorded, at Attleborough, a young Cormorant, green only on the back, was shot off the tower of Necton Church, far inland, on the 8th. The bird fell wounded, and severely scratched a man who seized it on the ground. Hundreds of the smaller *Tringæ* appeared on Breydon in the first week of March, with some Ringed Plover, and during the severe weather a week later, more of these birds were seen than in all the winter months. Several Golden Plover, at this time, were well forward in summer plumage. Ruffs and Reeves appeared at Potter Heigham in

March, but are supposed not to have remained to breed. A Rough-legged Buzzard was shot at Potter Heigham on the 14th. Bramblings were plentiful about Yarmouth during the frosts, and a Grey Wagtail was shot at Yarmouth on the 10th. A large flock of Geese appeared on Breydon on the 14th, just after the storms of wind and snow; and three Grey-lag Geese on the 24th were killed out of a flock of seven. Mr. Edward Boulton, of Potter Heigham, informed Mr. Southwell that a fine Fork-tailed Kite flew over him, about thirty yards high, on the 21st.

On April 4th a specimen of the so-called "Hairy Water-hen" was shot near Norwich. (See paper on, and list of similar specimens, by Mr. J. H. Gurney, jun., Trans. Norfolk and Norwich Nat. Soc. vol. iii. p. 581.) Single Woodcocks were seen at Northrepps on the 10th and 15th; a Hobby at Northrepps on the 19th, and a pair of Shelducks shot on Breydon on the 12th. A Hoopoe was shot at Horstead on the 25th, and a pair of Twites were netted at Yarmouth on the 15th—rarely seen there in spring. An adult male Common Buzzard, just beginning to moult, was trapped at Northrepps on the 27th; and Mr. G. Smith informs me he saw an Osprey in the first week in April, flying over the Caister marshes from the sea. Lesser and Black Terns visited Breydon, April 30th.

A single Pied Flycatcher was seen at Northrepps on May 9th, on which day, as well as on the 12th, two Landrails were picked up dead under the telegraph-wires, one near Norwich, the other at Brandon, killed, most probably, on their migratory arrival, for on the 13th one was caught alive in the west porch of Cromer church, and about the same date Mr. J. H. Gurney, jun., saw one flying over a road at Northrepps. One appeared at Clipperby, near Yarmouth, on the 5th, and another at Winterton on the 9th. A Hoopoe was shot at Hanworth, near Cromer, on the 10th; and one at Lowestoft on April 25th. An adult Kentish Plover was shot on Breydon on the 3rd, and another on the 9th; and I saw a Black-tailed Godwit on the 12th, and one or two Bar-tailed, in change. Sanderling assuming summer plumage, 16th and 21st. Three fine Turnstones, and several good black-breasted Grey Plover, on the 21st. On the 20th I saw, on Cromer beach, a single Whimbrel, wonderfully tame, and two from Yarmouth on the 21st; one was shot at Yarmouth, April 12th—a very early date. A Land Dotterel was shot at Halvergate, on the 9th, in

immature plumage, and two adults seen. Six Knots, in good red plumage, were killed on Breydon on the 30th. Two Spoonbills were seen on Breydon on May 1st, but were not shot. Two Avocets also were seen on Breydon on the 9th, and one shot. The abundance of the Green Woodpecker, in certain favourable and wooded localities, is pretty well established by the fact, that a thoroughly reliable authority informs me, that in the middle of May, between Norwich and Thurning, where he went rook-shooting, and returning by Haverland and Swannington, he saw not less than a score of these birds. During the summer of 1883 a pair of Wood Pigeons and a pair of Turtle Doves nested in Mr. C. Barnard's garden, next Park Lane, on the Unthank's Road. I have never known the Wood Pigeon nest so near this city before; but, so far back as 1850, I remember Turtle Doves nesting in the Wilderness garden on Bracondale. For the first time, a pair of Twites nested and hatched young in my aviary; and a young Sky Lark was hatched on the same day. These were not reared, however, from the difficulty of supplying any suitable food for the nestlings that would not be devoured by all the other birds. Young Greenfinches seem to thrive on the seed softened in the crops of the old birds. An Osprey was seen on Breydon on May 14th. Mr. Smith informs me that a female Golden Oriole, in greenish yellow plumage, was shot at Chedgrave on May 19th. An immature Marsh Harrier, with the yellow head, was killed at Burgh, by Yarmouth, on the 29th, and a young male Montagu's Harrier at Horsey, earlier in the month.

On June 1st an Osprey was seen on a willow at Downham, near Brandon, by Mr. F. Norgate; and an adult female Short-eared Owl was shot at Drayton on the 12th, but from its worn plumage and poor condition it had most likely been previously wounded, and unable to migrate. Several pairs of Garganey were known to have nested and had young broods in the Broad district of the Bure this month. Mr. B. C. Silcock informed me that, when sailing on Barton Broad on May 8th, he had the pleasure of watching a pair of White-winged Black Terns hovering over the water, and occasionally settling on a post. On the 10th a male of this species, no doubt one of the pair, was shot from a post on Hickling Broad. It was alone at the time. When fresh-killed the bill is said to have been brown with a tinge of lake-red at the gape of the mandibles; irides hair-brown; feet and legs bright

orange-red. On the 22nd a male Montagu's Harrier, one of a pair which had a nest this season in the marshes about Hickling, was shot and sent up to Norwich. It had still some brownish tints upon the back and shoulders, though otherwise in adult plumage, and some of the tail-feathers, unmoulted, were worn to mere stumps. The female was subsequently shot at, but missed, as she rose from the nest, and four eggs were taken, but not all at the same time. The hen bird still frequented the neighbourhood till the beginning of July. An eye-witness thus described to me the actions of these birds. The female sits as soon as the first egg is laid. The male attends upon her, and seeks for prey, with which he flies round her, giving a sharp cry, and drops it a little distance from the nest. The female then takes wing, picks up the prey from the ground, and, alighting with it still further from the nest, makes her meal, when she again settles on her eggs.

Two Grey Crows were seen at Scratby, near the shore, on July 15th. On Breydon, Common Sandpipers, Greenshanks, and Dunlins appeared on the 18th; six Whimbrel on the 22nd; a Little Stint on the 27th; a flock of twenty Whimbrel, two Pigmy Curlews, and Common Sandpiper on the 29th; and on the 31st six Curlews, Ring Plovers, and Whimbrel. On the 8th a young Sanderling; 9th, four immature Spotted Redshanks shot out of six, four Greenshanks shot out of six, and two Whimbrels; on the 11th, Knots, and a Wood Sandpiper, and Turnstone; 13th, a Green Sandpiper, and an immature Wood Sandpiper; on the 17th two Spotted Redshanks, dark birds, and one Reeve seen; one Common Sandpiper on the 21st. On the 10th and 11th a young Black Tern appeared on Breydon, and immature Common, Arctic and Lesser Terns. Several Garganey were shot at Ranworth on the 1st, and three Pochards were killed on Breydon out of seven on the 17th. Two adult and one young Great Crested Grebes on the 18th.

On the night of August 6th, at 10 o'clock, I heard Plover over the city, very dark at the time. At Cambridge, the night before, I heard the same notes over the town. On the 8th, about 10 p.m., after a heavy rain, with dark clouds about, heard mingled notes of birds passing over my garden, Plover and small *Tringa* apparently amongst them, and one Curlew very noisy, going north-east to south-west. On August 24th, at 8 p.m., a single

Curlew passed in the same direction, calling incessantly. In Yarmouth market, on August 1st, Whimbrel and Curlew, an immature Ruff and two Reeves. On the 5th, from Breydon, two Oystercatchers, Knot, Pigmy Curlew, and a Turnstone. A male Crossbill, in red plumage, was shot at Braconash, near Norwich, on the 31st. Water Rails must have been exceptionally plentiful this year in Norfolk, as Mr. Edward Bidwell was informed by one dealer he had received over two hundred eggs from Yarmouth, and others had been supplied with them as well.

On September 4th a Manx Shearwater was shot on Breydon, and a Red-necked Phalarope on the banks of the Bure, near Yarmouth, on the 7th. An adult Little Gull was shot on Breydon on the 13th. An immature specimen of the red-spotted race of Blue-throated Warbler was shot on the 15th, on the south side of Breydon Wall, and on the previous day another was shot at Blakeney by Mr. F. D. Power. As will be seen by Mr. Gurney's paper (Trans. Norfolk and Norwich Nat. Soc. vol. iii. p. 597) on the occurrence of this species in some numbers this autumn upon the Cley and Blakeney sand-hills, between the 14th and 22nd of September, Mr. Power secured nine specimens, all in more or less immature dress, which, with many others seen, consorted with various other common summer migrants, amongst the Warblers. An immature Pied Flycatcher was shot on the Denes at Yarmouth on the 15th. Two Honey Buzzards were seen by Mr. Cremer during this month at Beeston, near Cromer. Strange as it may seem, that a species so common across the Channel should be unrecognised here, we certainly owe to Mr. H. M. Upcher's observation the addition of the White Wagtail to our Norfolk list. In his address as President of the Norfolk and Norwich Naturalists' Society, he stated that for three or four days in September, 1883, he watched a pair of these birds on his lawn at Feltwell. These two were adult, and he thinks some immature birds were with them. Fortunately, to make identification more sure, by comparison, several Pied Wagtails were in company with them at the time, so that the difference was most marked. Mr. Smith's notes from Breydon and Yarmouth beach comprise a Little Stint on the 8th, and Pigmy Curlew; another Little Stint on the 14th; and three next day, and one on the 16th, with two Greenshanks, a Sanderling, Ruff and Reeve, and a Land Dotterel (immature) and two red Knots; a Spotted Redshank on the 8th; one

Woodcock seen in a garden on the 18th; another Little Stint on the 24th; a Solitary Snipe with four Jack Snipes was shot on the 29th at Potter Heigham. I am informed that at least fifty Kingfishers were shot this autumn in the Yarmouth district, and though many of these were no doubt autumnal visitants to our coast, some would also be home-bred, and such a wholesale destruction is much to be regretted, if it cannot be prevented. An immature Eared Grebe was shot on Breydon on the 15th; and a male and female at Somerton about the same date. A Merlin, taken on a vessel at sea, was brought into Yarmouth on September 24th. Two Goosanders, early arrivals, were seen on Breydon on the 25th. In 'The Zoologist' for 1884 (p. 13), Mr. Gunn mentions four or five young Cormorants seen in Yarmouth Roads early in September, and he saw one on the 11th about one hundred yards off the beach.

On Breydon and in its vicinity two or three Solitary Snipe were shot early in October, and a Purple Sandpiper on the 5th; about forty Golden Plover seen on the 9th; on the 12th a Woodcock brought into Yarmouth alive, taken on board a fishing-boat, another was shot on the shore on the 16th, and on the 22nd one created great excitement in Yarmouth market-place as it flitted over the stalls; a Spotted Redshank shot on Breydon, on the 22nd, ten were shot the same day, mostly on the north Denes, a numerous flight of these birds appeared on the North Norfolk coast on the 31st; four Spotted Redshanks out of a flock of seven were shot in Terrington marsh, near Lynn, on the 27th, by Mr. W. D. Ward. A young specimen of the Little Gull was shot at Hickling or Potter Heigham on October 7th, and a Great Grey Shrike was killed at Horsey on the 9th. A Stormy Petrel was brought into Yarmouth, alive, on the 12th, caught on a vessel off the coast. A dark immature Richardson's Skua was killed near Yarmouth about the 9th; and a good adult Red-throated Diver shot on Breydon on the 16th. A Rough-legged Buzzard was shot on Yarmouth Denes on the 20th; and another at St. Olaves, in the adjoining county, on the 13th. A male Shore Lark was shot at Winterton on the 4th; and others were seen at Yarmouth on the 24th and 28th: of four shot on the latter date three were immature males. A pied variety of the Ring Ouzel was obtained near Yarmouth on the 24th. An adult Red-necked Grebe, in change of plumage, was shot on Breydon on the 24th; and a young

Red-necked Phalarope on the beach at Yarmouth the same day. About the 8th of this month the Yarmouth birdcatchers were netting Siskins, Linnets, and Goldfinches; on the 13th hundreds of Sky Larks and numbers of Greenfinches made their appearance. Grey Crows and some Jackdaws appeared on the coast at North-repps on the 6th and 8th; and Grey Crows in large numbers, and some Black Crows, appeared at Yarmouth on the 14th. On the 20th, at the same place, Missel Thrushes arrived in considerable flocks. At Cromer lighthouse on the 13th, between 3 and 5 a.m., seven Sky Larks and one Starling struck the light; and at Happisburgh, between 4 and twenty minutes past 5 a.m., seventy-two Larks, eight Starlings, and a male and female Brambling struck the lighthouse—the first big flight of the season. In 'The Field,' about the 11th, a passenger by a steamer from Aberdeen to London, reported the appearance on board of six Chaffinches, a Rook, and a Woodcock when off Cromer. The wings of the following species, killed at Lynn Well lightship were sent to Mr. J. H. Gurney, jun., on the 17th:—Kestrel, Snow Bunting, Chaffinch, Robin (two), Wren, Goldcrest. The presence of the Common Wren amongst these migrants is very interesting.

Two Pink-footed Geese were shot in South Breydon marshes on November 1st, and one Grey-lag, shot out of three seen on Breydon on the 4th; another was shot in the neighbourhood on the 17th. A Spotted Rail was shot near Yarmouth on the 6th, and one or two in the neighbourhood in the previous month. On the 8th a Grey Shrike was killed near Yarmouth. An adult Red-throated Diver was shot on Scratby beach on the 10th. Two Shore Larks were shot on Breydon Wall on the 13th; and one shot, and three more seen, on Yarmouth Denes on the 22nd. Mr. Smith thinks that this species, and Snow Buntings also, passed further inland this season, instead of frequenting the Denes and shore line. A solitary Slavonian Grebe was shot on Breydon on the 14th. Mr. Smith informs me that he saw a Ring Dove on the 22nd, that had just died, which had been taken and brought up as a nestling, and had lived in a cage for nineteen years. The only fowl of any note on Breydon in November were a few Scaups, Pochard (immature), and a male Shoveller in change of plumage; and five Golden-eyes at Hickling. Mr. E. Boulton informed Mr. Southwell that Scaups appeared with Pochards and

Wigeon on the Broad waters at Potter Heigham early in October. A Gadwall and some Pintails were taken in Westwick decoy about the 30th. A Great Spotted Woodpecker was shot at Somerton on the 10th. Hundreds of Golden Plover and Lapwings were seen in the South Breydon marshes on Nov. 1st, when a flight of Woodcocks occurred, and several were shot on the Denes, and another flight seems to have come about the 24th; a single bird was found dead at Northrepps on the 26th, having flown against a building in the night. Several Short-eared Owls appeared in Yarmouth market during this month; Snipe not plentiful. A few Dunlins on Breydon on the 12th, and a Purple Sandpiper was shot there on the 13th. A Water Rail was taken alive on board a boat off Yarmouth on the 13th. On the 24th a flock of about fifty Golden Plover passed inland at Northrepps, going west. Hooded and Carrion Crows were still arriving at Yarmouth between Nov. 1st and 6th. A Grey Crow shot on the 25th had the mandibles twisted like a Crossbill. Two Swallows were seen at Northrepps as late as the 16th. A good many Cole Tits were seen in plantations on the Caistor road, near Yarmouth, on the 4th, and both these and Long-tailed Tits appeared in the same locality in the previous month. A good number of Rock Pipits arrived about the 22nd on the walls of Breydon and the Denes. The following species were also identified by Mr. J. H. Gurney, jun., by wings sent of specimens killed at Lynn Well lightship, between the 4th and 9th of this month:—Thrushes (twelve), Redwing, Chaffinches (ten), Blackbird, Snow Bunting (four), Wheatear, Brambling, Tree Sparrow, Fieldfares (four), Knot Sandpipers (four), Storm Petrels (six), Jack Snipe, Dunlin Sandpipers (three).

The chief ornithological event of the winter was the appearance of some half-dozen, probably more, Eider Ducks, all, so far as I could learn, either adult females or immature birds. It was not till the 2nd of December that I learnt from Mr. G. Smith, of Yarmouth, a female Eider had been seen, but not shot, on Flegg Burgh Broad on Nov. 22nd, and this probably marks the period of arrival of these birds on our coast. A part, evidently, when shot at and dispersed on Breydon, passed inland, and frequented fresh waters for a time. This seems apparent from the fact that an adult female, said to have been seen with others, in the same locality, was killed with a stone on December 11th, upon a small

stream near Hellesdon Mills, near Norwich, and, like the one to be next mentioned, was said to have been strangely tame. This bird was presented by Mr. J. H. Walter to the Norwich Museum. On the 12th Mr. G. Smith informed me that a supposed immature female, seen in company with six more, was shot on Breydon, and that this bird was so tame that it came to the boat-yards, where boys threw stones at it. On the 14th, another, described as a young male, was also killed on Breydon, and the plumage of both was described as very dark. It is quite probable that four large diving ducks seen by Mr. J. Barwell on Bridge Broad, Wroxham, ten days later, may have been the remnant of this flock, judging from his account of their size, form, and actions. An adult female Peregrine was shot at Haverland on the 10th. Woodcocks were decidedly numerous during the autumn and winter, as shown in the Yarmouth district, and bags made at Westwick and Sheringham; but the noted Swanton Wood did not make the return expected this year. A Bittern was shot on Barton Broad on the 23rd. At Yarmouth, on the 8th, Knots and Sanderlings were shot on the beach. A little frost and snow in the first and second weeks of December brought a good sprinkling of fowl to Yarmouth, mostly Duck and Mallard, Wigeon and Teal; and on the 12th three Pintails, two males and one female, on Breydon. Some notice was taken in the local papers, both at the end of November and during December, of flocks of Geese, on one occasion numbering over eighty birds, passing over the city at midday. Mr. Gunn, who recorded their occurrence in 'The Zoologist' for 1885 (p. 57), was no doubt correct in supposing them to be the half-wild Canada Geese, bred in large numbers on various estates in this county, and which, in sharp weather, being unpinioned, take long flights from their home quarters.

NOTES ON THE VERTEBRATE ANIMALS OF
LEICESTERSHIRE.

BY MONTAGU BROWNE, F. Z. S.

(Continued from p. 253).

Class AVES.—Order PASSERES.—Family TURDIDÆ.

Turdus viscivorus, Linn. Missel Thrush ("Thrice-cock," "Thistle-cock.")—Resident, commonly distributed, and breeding

even in gardens close to or within the town of Leicester. A nest, which I found in May, 1884, built in the fork of a spruce-fir close to the high road in the village of Aylestone, contained birds fully fledged. Both parents came from a distance on hearing the cries of the young as they endeavoured to escape, and for several minutes dashed around our heads and settled at our feet, trying to entice the young birds to a place of security. The Missel Thrush is semi-gregarious in winter, feeding with others of the *Turdidæ*, though, as Mr. Ingram writes, this bird is "not gregarious like Fieldfares, but consorting in families." Harley says it commences its song towards the early part of December, yet I think it is most frequently heard towards the end of January and in February. This year I heard it singing early in the morning of February 3rd. In 1883 Macaulay reported it singing on Feb. 19th. Mr. H. S. Davenport gave me the following interesting note:—"Two Missel Thrushes—call them A and B—built nests at the same time in low trees within six yards of each other, opposite the hall-door at Ashlands, in May, 1883, and successfully reared their broods. A few days later both birds returned to B's nest, in which they deposited nine eggs (I took four away), and on these A commenced to sit; meanwhile B constructed another nest a short distance off, and both birds reared their second broods in safety. In the first instance the eggs in both nests presented distinctive features." The following year he wrote on March 25th:—"Yesterday morning I found a Missel Thrush's nest close to the same spot, containing seven eggs, all fresh, the old bird on the nest. Of the seven, four were of one size and shape, and three another, and both lots corresponded exactly with the eggs taken last year. Do you suppose that there is one cock and two hens? I compared the eggs found yesterday with those (one of each) I took last year, and they are fac-similes."

Turdus musicus, Linn. Song Thrush.—Resident and common; breeding in gardens on the verge of the town. During the mild winter of 1884 I heard a Thrush singing at Aylestone on Jan. 2nd; Mr. Macaulay heard one in full song at Kibworth on Jan. 5th, 1882, and also on Christmas-day, 1883; he also heard Thrushes singing during the night of Feb. 27th, 1885,—a circumstance which I myself remarked on February 20th, 1867. Mr. Macaulay has found a nest containing the abnormal number of seven eggs.

Mr. Davenport found young birds in 1883 as early as April 8th. The earliest egg as yet noted was laid on March 18th, 1885. The most singular site for a nest which I have seen was one selected in April, 1885, in the garden of Mr. William Squires, on the Aylestone road. This nest was built on an ornamental wooden, semicircular projection, like a little bracket, above the door of the "summer-house," about six feet from the ground, perfectly exposed, and liable to be disturbed by anyone passing in or out; while not two feet distant was a growth of ivy covering the roof and sides of the house, in which the nest might have been well concealed. Notwithstanding the exposed situation selected the bird successfully brought off her brood. Varieties of this species occasionally occur, and Harley has recorded three albino birds taken out of a nest in the lordship of Aylestone.

Turdus iliacus, Linn. Redwing.—A winter migrant, generally distributed in woodland districts throughout Leicestershire, arriving about the middle of October, and remaining sometimes until late in the spring. Harley observed it "even after the month of June had come in," which suggests the possibility of the Redwing sometimes remaining to breed with us; and I find a note by Mr. J. H. Ellis (*Zool.* 1864, p. 9242), which, assuming no mistake to have been made, would settle the matter. He writes:—"Mr. H. R. Hurst, of The Oaks, near Kirby Muxloe, states that a Redwing built in his grounds this spring. He is a keen observer, and not likely to be mistaken. One bird only was hatched, and he has kindly sent me one of the addled eggs. It is a trifle smaller than a Thrush's egg, more rounded at the ends; the ground colour is a greenish white, spotted with reddish brown of various shades. I am not competent to form an opinion from the egg, but it certainly is none of our resident Thrushes." This circumstance is also noticed in Mr. Harting's edition of White's 'Selborne,' p. 159, note. In some years the Redwing appears in greater abundance than in others, and I imagine it to be more plentiful in Leicestershire than the Fieldfare. On Dec. 26th, 1884, I was shooting at Knighton, and towards evening was in a "spinney," when a vast number of Redwings flew in to seek shelter for the night. Flock after flock arrived, uttering their harsh cries, deepening to notes of alarm as they observed me. I shot several to be sure of the species, and this without frightening others, which kept on flying into the thicket until

quite dark. Although some of them alighted in the tall ivy-clad trees overhead, they flew down to the ground at the first opportunity, where they rested in thick bushes close to the ground. I had previously, in the daytime, observed the ground covered thickly under these bushes with their droppings, and conclude that (as White and Harley state of the Fieldfare) this species roosts close to the ground.

Turdus pilaris, Linn. Fieldfare (local name, "Felt," "Felt-y-fare," or "Pigeon-Felt.")—A winter migrant, generally distributed in Leicestershire, appearing about the middle of October, and usually leaving at the end of March or beginning of April, or even later should the weather be severe. Mr. Macaulay has observed it as late as May 10th, and Mr. H. S. Davenport once saw five near Skeffington Vale on May 12th, 1879. Contrary to the well-known habits of its congeners, as remarked by Harley, quoting White, it roosts at night-time on the ground in such places as holms and scaurs, where tall grass and rushes prevail. Although there is no evidence of this bird nesting in the county, Mr. J. H. Ellis, writing in 'The Zoologist' for 1864 (p. 9248), states that "On the 29th of July, 1864, a Fieldfare, *Turdus pilaris*, was shot in the garden of Mr. H. R. Hurst, The Oaks, near Kirby Muxloe, Leicestershire. The bird had been about the garden during the summer."

Turdus merula, Linn. Blackbird.—Resident and commonly distributed, breeding even in gardens close to or within the town of Leicester. In 1884 I heard Blackbirds singing, together with Thrushes, on Jan. 2nd. Harley occasionally met with its nest on the ground, and once saw a nest containing five eggs which had been found on the crest and within the flower-stalks of a turnip, several yards from any fence or hedge. Mr. H. S. Davenport reports that in May, 1879, a Blackbird built its nest in some thick ivy on the wall adjoining the stable-yard at Skeffington Rectory, in which she laid six eggs, all of which were hatched, and the young fled. Shortly afterwards five more eggs were deposited in the same nest, and were also successfully hatched off. In July, 1885, a cock and hen Blackbird continued to feed their young in a cage after their removal in a nest from one side of a summer-house to the other. Two pied varieties are in the Leicester Museum.

Turdus torquatus, Linn. Ring Ouzel.—Rarely observed, but is said to breed in the county. In Potter's 'History of

Charnwood Forest,' Mr. Babington says:—"On Strawberry Hill, near Sharpley, in the summer of 1840, I observed three or four flying about among the rocks, and had a specimen brought me from the same place a few years previously." Harley states that this bird is sparingly met with in the Forest of Charnwood, and affects the uncultivated waste lands, intersected by rough stone walls, lying over against the village of Whitwick, where it breeds. "As autumn draws on, the old birds with their young leave the bleak hills, and retire to the enclosures abutting thereon, where they feed on the fruit of the wild brier, elder, &c., shortly afterwards disappearing for the winter." Mr. Macaulay has recorded one shot in May, 1871, in Gumley Wood, and now in the collection of the Rev. A. Matthews, and another at Noseley, 1880. I saw one which was shot between Syston and Queniborough towards the end of 1882, and Mr. H. S. Davenport shot a fine male at Cold Overton on October 2nd, 1884.

Saxicola œnanthe, Naum. Wheatear, "Fallow-chat." — A summer migrant, generally distributed, and breeding. I have seen the bird at Aylestone more than once, and Mr. A. W. Evans shot two in autumnal plumage in the Abbey meadow in the autumn of 1883. Harley remarks that "the first to arrive are males, which haunt the plough-lands for a few days, and then apparently betake themselves to the desolate hills of Bradgate and the rocky summits of Bardon and Markfield. There they are to be found the summer through." He adds:—"We once met with the nest in the vicinity of Bardon. In turning aside suddenly to examine the fronds of some plants that were growing in great luxuriance on a ditch-bank, surmounted by an irregular stone fence, composed of boulders and large blocks of loose granite, or porphyry, we disturbed a female Wheatear, whose nest we found had been snugly built between the chinks of two large stones, guarded on all sides by large masses of the same materials. The structure of the nest was bulky and loosely made. It was mainly composed of fibrous twigs, green moss, tender leaves of dry grass, and lined with hair, wool, and some small feathers, and contained six eggs." The female Wheatear endeavoured, by feigning lameness, to draw his attention from the nest. Mr. H. S. Davenport writes:—"In May, 1875, I found a Wheatear's nest with five eggs down a drain-pipe on the turnpike road at Skeffington."

Pratincola rubetra, Gray. Whinchat (locally "Utick," as also the following species, from its sharp note).—A summer migrant, generally distributed, and common. Mr. Davenport reports the first egg of this species in 1883 on May 31st, but in 1884 on April 30th. Respecting this unusual date for the nesting of a bird, which is always a late-comer, I must say that, despite Macaulay's contention as to its being a proof of the wintering of the Whinchat in Leicestershire, I consider that Mr. Davenport must have mistaken it for the Stonechat, upon the nesting of which he is silent.

Pratincola rubicola, Gray. Stonechat (local name, "Utick.").—Resident and generally distributed, but I consider it a much rarer bird than the Whinchat; nor have I any record of its nesting save that furnished by Harley in his MS. list of Leicestershire birds, so often quoted.

Ruticilla phœnicurus, Macg. Redstart, "Firetail."—A summer migrant, generally distributed, but not common, breeding. Harley notes the arrival of the males several days before the females, and adds:—"With us it affects pollard willows and ashes, nesting on the crown of such unsightly trees. It will, moreover, take possession of the deserted hole of the Woodpecker and Nuthatch, and such crevices in our forest trees as are produced by natural decay and wet." Browne, Davenport, Ingram, and Macaulay have found the nests of this species built in other situations than those noted by Harley.

Erithacus rubecula, Gray. Redbreast.—Resident, generally distributed, and breeding in all sorts of situations, usually very early, and, being double or even treble-brooded, very late. The end of February and March, 1883, was very severe, during which time a Robin was sitting on four eggs in ivy growing beside the greenhouse in the garden of Mr. T. Lawrence, of Stoneygate, Leicester. A nest containing two fresh eggs was sent to the Museum on Oct. 22nd, 1884, taken from a shed in the grounds of Messrs. Harrison & Sons at Westcotes. In May, 1883, a nest containing three young birds (now in the Leicester Museum) was built in a broken bottle, surrounded with other bottles, in a tool-house in Mr. C. S. Robinson's garden at Stoneygate. Another one, also in the Museum, containing four young ones and the parents, was found, on the 4th April, 1884, in the bank of a small ditch by the side of the road at Aylestone, only a few

yards from the tram terminus. Another nest and four eggs, built in a flower-pot lying on the ground, was presented by the owner, Mr. Boyes, a nurseryman at Aylestone, in May, 1885. The 'Leicester Daily Post' for May 28th, 1885, states that the occupier of one of the Sparkenhoe allotment gardens discovered a Robin's nest and brood in a disused meat-tin, which, having been emptied of its original contents, he had used for tar, and had thrown away. The eggs of the Robin vary considerably both in shape and tone, Mr. Davenport reporting a nest of six eggs, pure white, found near Ashlands in May, 1880.

Daulias lusciniæ, Newton. Nightingale.—A summer migrant, sparingly distributed, and occasionally breeding. The latest date on which it was heard by Mr. Macaulay, who finds it every year in the vicinity of Kibworth (where it appears to be more common than in any other part of the county), was on June 24th, 1879. Mr. Babington has noted its occurrence about Leicester, Rothley, Wanlip, &c. Harley found it at Whetstone Gorse, Buddon Wood, The Outwoods Loughborough, Stoneygate plantations, Birstal plantations, covers, and thick belts of plantations in other parts of the county. Mr. Ingram writes me that it arrives at Belvoir "in April, and frequents Barkstone, the Kennel Woods, and Calcraft's Bushes, breeding in each of these woods." Although I have been frequently told of its occurrence around Leicester, I never heard it until this year (1885), on the 9th of May, in a spinney by the canal-side at Wistow. I have reason to believe that it nested this year at "Leicester Frith," the seat of Mr. T. Swift Taylor.

(To be continued.)

THE MOLLUSCA OF THE COUNTIES OF KENT, SURREY AND MIDDLESEX.

BY T. D. A. COCKERELL.

(Continued from p. 303.)

Hyalina cellaria.—Minster; Orpington; Ealing; Bedford Park; Kenley. *Var.*, opaque white, Minster and Kenley. *Var.*, greenish white and semitransparent, near Wrotham; Folkestone Warren (A. H. Shepherd); [Maidenhead].

Var. compacta.—Surrey (M'Kean).

H. alliaria.—Chislehurst; Barnes Common; banks of River Lea (Loydell and Rowe).

Var. *viridula*.—Kent (Smith).

H. glabra.—W. Drayton (R. W. Cheadle); Acton (L. M. C.); Hanwell (S. C. C.); Chiswick (F. Fenn); Reigate; Leatherhead (J. H. Ponsonby); Hendon (A. H. Shepherd); Orpington; Canterbury (Miss L. Fenn). This species is commonest in Surrey and West Kent. This and the last are without doubt identical with Jeffrey's species bearing the same names, but there seems to be some difference of opinion among continental authors as to the naming of these forms.

H. nitidula.—Generally common. Minster; Canterbury (Miss L. Fenn); Orpington; Haslemere; Bedford Park; Wembly; Perivale.

Var. *nitens*.—West Northdown, Thanet; Boxhill (Loydell and Rowe); banks of Thames near London (Harting).

Var. *Helmi*.—Sevenoaks (Smith); Bickley; Orpington, under blocks of chalk in company with *H. rotundata* var. *alba*; Godstone quarries (K. M'Kean).

H. pura.—Shooter's Hill and Eltham (Loydell and Rowe); Erith (Leslie); near Oxted.

Var. *margaritacea*.—Shooter's Hill (Loydell and Rowe); Farnborough; Chislehurst; Orpington; near Dorking; Leatherhead (J. H. Ponsonby).

H. radiatula.—Chislehurst; Orpington; Barnes; Bedford Park, &c.

Var. *viridescenti-alba*.—One at Chislehurst (D. B. C.); Mill Hill Park (F. Fenn).

H. nitida.—Minster; St. Mary Cray; Barnes; Perivale.

Var. *albida*.—Richmond, in rejectamenta of River Thames (Choules).

H. excavata.—Recorded for West Kent, Surrey, West Sussex, and Hants. Near Tunbridge Wells (Jeffreys); near Copthorne Common, Surrey (E. Saunders).

H. crystallina.—Orpington; Haslemere; Bedford Park, &c.

H. fulva.—Chislehurst; St. Mary's Cray (L. M. C.); Haslemere; Barnes. "Very common in beech copses, far under dead leaves, about Woldingham, and especially Gatton" (K. M'Kean).

[Var. *Mortoni*.—N. Hants (Jeffreys); Maidenhead (L. E. Adams).]

Helix aculeata.—Warlingham; Sevenoaks; Gatton, Croham Hurst, Woodmansterne, &c. (K. M'Kean); Orpington, on a bank with *H. pygmæa*; Erith, with *Hyalina fulva* in oak woods (H. Leslie); Twickenham (S. C. C.); Fulham (Harting).

H. pomatia.—East Kent (W. D. Roebuck); Eynsford, Warlingham, &c., abundant on the chalk.

Var. *albida*.—Near Reigate (Brewer); Dorking (J. W. Williams).

H. aspersa.—Very abundant in all three counties.

Var. *exalbida*.—Warlingham, Dartford, Chislehurst (L. M. C.); Dorking (C. Ashford); near Faversham (Fairbrass); Kemsing (A. H. Shepherd); Folkestone (Fitzgerald); Orpington (L. M. C.).

Var. *zonata*.—Folkestone (C. Ashford).

[Var. *virescens*.—Cowfold, Sussex (J. W. Taylor from description by J. E. Harting).

Var. *unicolor*.—Horndean, Hants (Madison).]

Var. *grisea*.—Folkestone (Fitzgerald); Dorking (Ashford).

Var. *albescens*.—Minster (S. C. C.); Godstone.

Var. *albofasciata*.—Godalming (H. W. Kidd). [Carisbrook Castle, Isle of Wight (Ashford).]

Monst. *scalariforme*, Chislehurst (L. M. C.). Monst. *sinistrorsum*, Epsom (Daniel); Hanover Villas, Notting Hill (E. A. Smith); Dartford (Latham).

H. nemoralis.—Abundant in Kent, but less common in Surrey. Generally distributed in Middlesex.

Var. *castanea*.—Minster, St. Mary Cray, Perivale.

Var. *studeria*.—Crayford.

Var. *olivacea*.—Near Faversham (Miss Fairbrass).

Var. *albescens*.—Wrotham.

Var. *rubella* 00000.—Near Canterbury (Miss L. Fenn); Chislehurst; Orpington.

Var. *libellula* 00000.—Orpington, Minster.

Vars. *albolabiata* and *hyalozonata*.—Folkestone (Fitzgerald).

H. hortensis.—Generally abundant. It does not seem to occur in Thanet, however, the only evidence of its existence there being a few dead shells found on the shore a little to the west of Ramsgate by my brother (S. C. C.), but these had probably been washed from elsewhere.

Var. *lilacina*.—Chislehurst; near Faversham (Miss Fairbrass); near Putney (S. C. C.); Gunnersbury.

Var. *albina*.—Acton; near Putney (F. Fenn); Sidcup.

Var. *lutea* 00000.—Chislehurst, Hampstead (C. Fryer), Acton Green, Dorking, &c.

Var. *incarnata*.—Acton Green; Dorking; near Chislehurst, &c.

Var. *hybrida*, Jeff. (= *roseolabiata*).—Kent and Surrey, but not so well marked as some I have seen from other districts (*e.g.*, Bristol, Miss Hele). Faversham (Taylor).

Var. *fuscolabiata*.—Folkestone (Mrs. Fitzgerald); Canterbury (Miss L. Fenn). The specimens which I have seen from both these localities have been pink and bandless.

Var. *arenicola*.—Canterbury (L. Fenn); Bickley; Warlingham, one having a formula (123)(45); and other localities.

Var. *minor*.—Bickley (L. M. C.).

[Var. *castanea*.—Preston Candover (H. P. Fitzgerald).]

H. arbustorum.—Local. West Drayton (R. W. Cheadle), Shiere, Charlton (Harting), Deal, Battersea, Fulham, and Hammersmith (Harting).

Var. *alpestris*.—One at St. Mary Cray (S. C. C.).

Var. *marmorata*.—Deal, amongst nettles.

Var. *flavescens*.—Folkestone (Mrs. Fitzgerald); St. Mary Cray.

Var. *cincta*.—Folkestone (Mrs. Fitzgerald).

H. cantiana.—Very abundant, Ramsgate; Upton; near Sandwich; Canterbury (L. Fenn); Orpington, Shiere, Acton Green, Ealing, &c.

Var. *rubescens*.—Near Faversham (Fairbrass); near Chislehurst.

Var. *galloprovincialis*.—Minster and Sarre.

Var. *minor*.—Farnborough.

Var. *albida*.—Near Faversham (Fairbrass); Chislehurst, amongst *Tussilago*, with the type (L. M. C.); Orpington, Epsom Downs (Loydell and Rowe), Hampton Court.

(*H. limbata*.—Hampstead, G. B. Sowerby. Probably introduced).

H. cartusiana.—Sandwich; Deal (Leslie); Folkestone, "The largest ones were highest up the hill, on bents of long grass during the hottest weather. Not one found on a windy day (wind S.W.), nor could I find them at roots of grass. Nearly all full grown at the end of August" (C. Ashford). This species is also said to have been found on Banstead Downs, in Surrey (Cooper).

NOTES AND QUERIES.

Death of Professor Milne-Edwards.—Since the appearance of our last number our readers will have become aware of the death of Prof. Henri Milne-Edwards, which took place in Paris on the 29th July last. The announcement, we feel sure, will have been received with a universal expression of regret amongst naturalists to whom he was known, either personally or through the medium of the many valuable works published by him during a long lifetime. Of English parentage, he was born in Bruges in 1800, and at an early age repaired to Paris, his adopted home, to study for the medical profession. This was in the days of Lamarck, Latreille, Cuvier, Dumeril, and Audouin, all famous naturalists, with whom it was his privilege to become acquainted, and through whose friendship and assistance he may be said to have risen to fame. His energy and talents were soon recognised, and in 1838 he was selected to succeed F. Cuvier in the Académie des Sciences. In 1841 he was appointed to the Professorship of Natural History in the Collège Royale de Henri Quatre, and afterwards to the chair of Zoology and Comparative Physiology at the Faculty of Sciences. From 1834, in collaboration with his friend Audouin, he acted as joint editor of the zoological portion of that useful periodical the 'Annales des Sciences Naturelles,' to which they both contributed many valuable memoirs. On the death of Audouin, Milne-Edwards was elected to the Professorship of Entomology at the Jardin des Plantes, where some years later, namely in 1862, he succeeded Isidore Geoffroy St. Hilaire as Professor of Zoology. Of his numerous published works it is difficult to speak too highly and yet briefly. To the majority of students his name will be, of course, associated with his popular 'Elémens de Zoologie,' first published in 1834, and afterwards (in 1851) reissued as a 'Cours élémentaire de Zoologie,' which not only had a large circulation in French, but was translated into several other languages. Of his more important works may be mentioned his 'Histoire Naturelle des Crustacés' (1834-40); his 'Histoire Naturelle des Corallières' (1857-60); and his 'Leçons sur la Physiologie et l'Anatomie Comparée de l'Homme et des Animaux' (1857-81)—any one of which works would have sufficed to make the reputation of its author. Those who, like the writer of these lines, have enjoyed the privilege of visiting him in Paris, and have sought his aid while studying at the Museum of the Jardin des Plantes, will ever remember with gratitude how freely that aid was extended, how courteous a reception was given! He will be much missed at the Museum, but we rejoice to think that he has left behind him so worthy a successor as his son, M. Alphonse Milne-Edwards, to fill the chair of Zoology.

The British Association. — The Fifty-fifth Annual Meeting of the British Association will commence on Wednesday, September 9th, 1885 at Aberdeen. The President-Elect is the Right Hon. Sir Lyon Playfair, K.C.B., M.P., Ph.D., LL.D., F.R.S., who will take the place of Lord Rayleigh. The Vice-Presidents are His Grace the Duke of Richmond and Gordon, K.G., Chancellor of the University of Aberdeen, the Right Hon. the Earl of Aberdeen, LL.D., Lord-Lieutenant of Aberdeenshire, the Right Hon. the Earl of Crawford and Balcarres, F.R.S., James Matthews, Lord Provost of the City of Aberdeen, Prof. Sir William Thomson, F.R.S., Alexander Bain, M.A., LL.D., Rector of the University of Aberdeen, the Very Rev. Principal Pirie, D.D., Vice-Chancellor of the University of Aberdeen, Prof. W. H. Flower, F.R.S., Pres.Z.S., Director of the Natural History Museum. General Treasurer: Prof. A. W. Williamson, F.R.S., University College, London, W.C. General Secretaries: Capt. Douglas Galton, C.B., F.R.S., A. G. Vernon Harcourt, F.R.S. Secretary: Prof. T. G. Bonney, F.R.S. Local Secretaries for the Meeting at Aberdeen: J. W. Crombie, M.A., Angus Fraser, M.A., M.D., Prof. G. Pirie, M.A. Local Treasurers for the Meeting at Aberdeen: John Findlater, Robert Lumsden. The Officers for Section D, *Biology*, are—President: Prof. W. C. McIntosh, F.R.S. Vice-Presidents: Prof. I. Bayley Balfour, F.R.S., Prof. J. S. Burdon Sanderson, F.R.S. Secretaries: W. Heape, J. Duncan Matthews, F.R.S.E., Howard Saunders, F.L.S., F.Z.S. (Recorder), H. Marshall Ward, M.A.

The Hume Collection in the British Museum.—The fine collection of Natural History specimens so generously presented to the British Museum by Mr. Allan Hume, C.B., has arrived from India, and has been deposited in the Natural History Museum at South Kensington. It is by far the largest private collection yet seen in any country, and illustrates in the fullest possible manner the avifauna of the British Asian Empire, commencing with Baluchistan on the west, and comprising the whole of the Indian peninsula and Ceylon, the Burmese Countries and Tenasserim, extending down the Malayan peninsula to Singapore. The collection comprises about 63,000 bird-skins in excellent condition, and all labelled with particulars of locality, date, &c., 18,500 eggs, and about 500 nests. In addition to these there are some 400 skins of mammals, including several undescribed species, and many of great interest from their rarity or local distribution. Great credit is due to Mr. R. B. Sharpe for the energy which he has displayed in proceeding to India during the hot season, and the expedition with which he packed and sent home this enormous collection, thus saving it from exposure to another rainy season at Simla, which in all probability would have destroyed a great number of skins. The Trustees of the British Museum may well be congratulated upon the acquisition of so

important a collection, which, when unpacked and properly arranged and catalogued, will prove the most valuable addition which has yet been made to the galleries of the Zoological Department.

MAMMALIA.

Period of activity of the Noctule and Pipistrelle.—Referring to the statement in the second edition of Bell's 'British Quadrupeds,' p. 19, that "the 18th of September is the latest date we have on record of its appearance," I may mention that I have frequently observed the Great Bat, *Scotophilus noctula*, to continue in activity up to a considerably later date. In 1879, particularly, I noticed this species on the wing on many evenings in October, and observed two or three examples hawking up and down in an exact line over the village street of Bodicote during a cold foggy week ending on the 13th of that month, on the evening of which day one of them was shot for me by a farmer. On the 16th we had a white frost, and it was very cold, nevertheless the Noctules continued on the wing, and a second example was shot and sent to me on the 28th October. This species becomes very fat previous to retiring for its winter sleep; the specimen shot on the 13th had a thick layer of yellow fat under the skin and weighed one ounce and a quarter, a great increase of weight as compared with two examples shot on the 25th July in the same year, sent to me from Nottinghamshire by Mr. C. M. Prior, which each weighed slightly under an ounce. It should, however, be stated that the Bodicote example was a male, and measured 14·6 inches in extent of wings, while the Nottinghamshire specimens were both females, measuring only 14·5 and 14·0 inches respectively. It is, I think, not very unusual to see the Pipistrelle on the wing in the daytime in winter, when the thermometer rises above 50° F. Under such conditions I have seen it about mid-day on January 2nd.—OLIVER V. APLIN (Great Bourton, Oxon).

BIRDS.

Discovery of the Eggs of the Knot, *Tringa canutus*.—Dr. Hart Merriam, writing on this subject in the July number of 'The Auk,' says:—"Lieut. A. W. Greely, U.S.A. Commander of the Late Expedition to Lady Franklin Sound, succeeded in obtaining the long sought-for egg of this species, and has had the extreme kindness to ask me to publish the first account of it. Lieut. Greely writes:—"The specimen of bird and egg were obtained in the vicinity of Fort Conger, lat. 81° 44' N. The egg was 1·10 in. [28 mm.] in the longer axis, and 1 in. [25·40 mm.] in the shorter. Colour light pea-green, closely spotted with brown in small specks about the size of a pin's head.'" Dr Hart Merriam is somewhat in error in supposing that the egg which he describes is the *first* which has been obtained; for during Parry's first voyage in 1820, Sabine found the Knot breeding in abundance on Melville Island; and during Parry's second voyage, in 1823,

Capt. Lyons found it breeding near Quilliam Creek, Melville Peninsula. He described it as laying four eggs in a tuft of withered grass, without any nest. Sir John Richardson reported the Knot as breeding in Hudson's Bay, and down to the 55th parallel (Faun. Bor. Amer. Birds, p. 387); and, according to Mr. Hutchins, the egg is of a dun-colour, fully marked with reddish spots. It will be recollected that Major H. W. Feilden, naturalist on board H.M.S. 'Alert' in the English Arctic Expedition of 1875-76, brought home the young in down of this bird from Knot Harbour, Grinnell Land, lat. 82° 33' N. They were found on July 30th, 1876, a previous careful search for the eggs having proved unsuccessful. — J. E. HARTING.

The Siskin in Co. Sligo in Summer.—While riding to Ballina, on July 1st, I observed a male Siskin at Moyfort, flitting about the tops of the long grass on the side of the road, and afterwards in an adjoining field, where it pursued the same career, evidently searching for insects of some kind. From the fact of its hunting for insects, I infer that it must have had a nest with young somewhere near, probably in the extensive larch plantations of Belleek Manor, just across the river. This is the first instance I have known of the occurrence in summer of the Siskin in the West of Ireland; moreover, in winter it is of very rare occurrence in this district. Many years ago, however, I met with a large flock during winter feeding on the alders in the glen at Raffern, Co. Cork; and, shooting some specimens for identification, a female bird was slightly wounded in the wing. On bringing her home I put her into a cage, where she became so tame that she paired with a canary the following spring; and built a nest, but unfortunately died in laying her first egg. — ROBERT WARREN (Moy View, Ballina).

[In Ireland the Siskin occurs chiefly as a winter visitor, but we learn from Mr. A. G. More that the nest has been found in the counties of Antrim, Wicklow, and Waterford.—ED.]

The Note of the Great Black Woodpecker.—With reference to the note of a supposed Great Black Woodpecker, described by Mr. E. Cambridge Phillips (*antea*, p. 305, 306), it may perhaps be useful to remark that the cry of this bird is described in Meyer's 'British Birds' (8vo ed. vol. iii. p. 227), and in Dresser's 'Birds of Europe' (vol. v. pp. 6 and 8), with sufficient precision to afford a basis for comparison with that heard by Mr. Phillips.—J. H. GURNEY (Northrepps Hall, Norwich).

White Wood Pigeons.—I have lately received a handsome variety of the Wood Pigeon. It has the flight-feathers and tail of the normal colour, except the three central feathers in the latter, which are pure white. On the breast are a few feathers, very faint, of the normal colour; otherwise the bird is quite white. It was shot in Fifeshire last December, and

I believe has not yet been recorded. Besides having another exactly like it, I have a third in my collection, a perfect albino.—JOHN MARSHALL (Belmont, Taunton).

[Another instance of a pure white Wood Pigeon is reported in 'The Field' of 1st August last.—ED.]

Ring Ouzel feeding on Cherries.—It may interest some of your readers to hear of the capture of a Ring Ouzel alive in a cultivated part of Lincolnshire, nineteen miles south of Lincoln. It was taken by one of our gardeners in a cherry-net, feeding, I suppose, on the cherries. It is, I believe, a female of this year; but being put into my aviary with Black-birds, &c., it died, and was thrown away unfortunately, as I intended to have preserved its skin, and to have examined it. Is not this bird of rare occurrence in this county?—T. G. REEVE (Leadenham House, Grantham).

[Mr. Cordeaux, in his 'Birds of the Humber District,' tells us that the Ring Ouzel is occasionally met with in Lincolnshire during the spring and autumn, and that during the latter season he has observed it in company with Fieldfares. It evidently does not breed in his county, or he would have remarked it; and its appearance in gardens and cultivated grounds is, we should imagine, unusual. We have seldom observed it except in the wildest parts of the country, generally on hilly ground amongst heath and juniper, and far removed from all human habitations.—ED.]

Variety of the Brambling.—Three black-chinned Bramblings were killed at Yarmouth last autumn. I never saw but one example of this variety obtained in Norfolk before, and this was picked out from among some poisoned birds at Florden, before that method of destruction was made illegal. The black patch on the chin measured about one-fourth of an inch, but in one of my Yarmouth examples it is over half an inch. In Herr Gätke's collection is a very fine specimen, obtained in the little island of Heligoland, in which the black measures half an inch. This variation in the colour of the chin, I believe, has never been noticed in the hen bird. It is well represented in a figure of this species given in Rowley's 'Ornithological Miscellany' (vol. i. p. 90).—J. H. GURNEY, jun. (Northrepps, Norwich).

Breeding of the Lesser Black-backed Gull on the Yorkshire Coast.—Referring to the correspondence which has already appeared on this subject, I wrote last June to one of the "climbers" on the Yorkshire coast, asking him to send me "a clutch" of Kittiwake's eggs, and with them he sent two eggs of the Lesser Black-backed Gull, which he thought I should like as they are so seldom to be found. He assures me they are genuine, and that he distinctly saw the old bird sitting on them before he took them. The nest was on the cliffs between Filey and Scarborough, where the eggs were also taken which I recorded in 'The Zoologist' for

November, 1884. The man who sent me this clutch of eggs is one of the climbers on the Flamborough cliffs, and is well acquainted with the various birds occurring along the coast, and has no connection with the man from Filey who had gathered the eggs I saw in 1884. I think myself there is no doubt the eggs are authentic, but it is a great pity the idea did not occur to the sender of shooting the old bird off them, though it was hardly likely he would consider the identification of the bird of so much importance.—
THOMAS CARTER (Burton House, Masham).

[Perhaps the sender remembered what our correspondent appears to have forgotten—namely, the existence of a Wild Birds Protection Act, in force between the 1st March and the 1st August.—ED.]

Curious death of a Partridge.—My brother, T. H. Becher, brought home the head, which I now forward, of a young Partridge which he found dead. It seems to me that the stiff clay at the end of the bill has most effectually sealed up the beak, and eventually caused death. When found there was more clay upon it, but having been brought home in the pocket some of it got accidentally rubbed off. I send the head, as I think a personal inspection may be interesting.—W. BECHER (Hill House, Southwell, Notts).

[The head in question certainly presents a singular appearance, both mandibles being enveloped in clay. This must have been of a very adhesive nature, accumulating as the bird picked up its food until, in an interval of repose, it became dried and hardened by the sun or wind, eventually preventing the beak from opening. It is curious that the bird did not get rid of it by wiping the beak at once after feeding, a process which most birds are very careful to perform.—ED.]

Breeding of *Charadrius hiaticula*.—Mr. Stevenson, writing in 1870 ('Birds of Norfolk,' vol. ii., p. 85), informs us that—"At the present time, in the long range of coast between Yarmouth and Salthouse, I know of no regular nesting-place of this Plover, although a few scattered pairs may possibly be met with." I was therefore very much pleased this spring, 1885, to find no less than three pairs breeding on the South Denes, Yarmouth, and I am glad to say one pair at least hatched out their young safely, as I saw the downy nestlings crouching amongst the gravel on June 29th. It is wonderful with what persistency birds return to old breeding-haunts, and under what difficulties they incubate. These South Denes of Yarmouth are the constant resort of hundreds of pedestrians. Fishermen are continually employed spreading out and drying their nets thereon, and yet a pair of Ring Plovers made their nest and hatched out within fifty yards of the carriage-drive. On June 28th (Sunday) several "Arrys" with a dog, were employed in pelting this pair of birds with stones as they flew round and round, or, settling on the ground, endeavoured to

lead the terrier from their young; in this they were successful, as the next day I found the young all right. That the old birds should have been permitted to live through the spring in such a locality is owing to the close season being respected.—H. W. FEILDEN.

Breeding of the Red-throated Diver in Ireland.—Writing of this species in the new edition of 'Yarrell's British Birds' (vol. iv., p. 113), Mr. Howard Saunders remarks:—"To the coasts of Ireland this Diver is a regular visitant from autumn to spring, and it appears possible that a few pairs breed on some of the numerous lakes of the remote districts of Donegal." Since this observation was published, in September, 1884, confirmatory evidence on the subject has come to hand. Mr. R. Lloyd Patterson, of Holywood, Co. Down, writes word that on May 26th last a nest with two eggs of the Red-throated Diver was found on a small lake near Dungloe, in North-western Donegal. The discovery was made by the keeper of Mr. John Hudman, who forwarded the eggs to Mr. Patterson, by whom they were compared with the coloured plates in Hewitson's and Seebohm's works, and with authenticated eggs of the Red-throated Diver in the Belfast Museum. There is no doubt, therefore, that the eggs taken at Dungloe have been correctly identified, and an interesting fact has been established which previously rested merely on surmise.—J. E. HARTING.

Ornithological Notes from Oxfordshire.—On April 11th I saw a pair of Grey Wagtails near a spring in a railway-cutting at Adderbury; I only know of one instance of this species breeding in North Oxfordshire. Both the House Martin and Swift arrived earlier than I have ever known them to do before, the former on the 17th and the latter on the 27th April. The water at Clattercutt Reservoir, which was let down last July, was very low all the winter and spring, and over a considerable extent of mud left exposed a luxuriant marsh vegetation has come up. Among this a Whimbrel was feeding on May 9th and 10th; it was fairly tame, and I got a good view of it with the glasses. It seems probable that Goldfinches are increasing slightly, as I have seen three pairs this season (one of which was feeding "branchers" on June 18th), whereas for several years past I have rarely seen a bird of this kind all the summer. A Common Tern was caught by a dog on the canal near Banbury early in June. On the 20th I waded out to a very pretty Coot's nest, moored in water about two and a half feet deep; the upper portion of the nest was formed almost exclusively of the fresh flowering plants of *Nasturtium amphibium*, together with a few of *Ranunculus sceleratus*. Mr. Bartlett informs me that about the end of May he saw two pairs of the Cirl Bunting near South Newington. He knows the bird, and particularly noticed the black throats of the males. About the end of December, 1870, eight of these birds were shot from a small party feeding on hay seeds close to Banbury; I saw two of them, a

male and female, last year in a collection at Warwick. A Quail frequented a clover-field near this house in May; I heard it calling on several evenings, but do not know that any nest was found when the field was mown. From its curious note, this bird takes in Oxfordshire the name of "Twit-me-dick," but perhaps "Twit-middick" would express the sound better. The fact of their having a local name shows that Quails must at one time have been tolerably common in this county, but they are now very rarely met with. I have seen no eggs taken in the north of the county within the last ten years, and Mr. Wyatt has not stuffed a specimen for some years past. A Black-headed Gull in immature dress was shot in the Cherwell meadows, near King's Sutton, on July 11th. On the 19th a Green Sandpiper had put in an appearance at the Reservoir; this is the earliest date in autumn at which I have met with it.—OLIVER V. APLIN (Great Bourton, Oxon).

Varieties of the Carrion Crow.—Mr. W. K. Petherick, of Taunton, has recently shown me a curious variety of the Crow, shot by Gen. Kepple Taylor, of Staplegrove. It may be described as of a rich umber-brown: the back of the head and nape-feathers are of a somewhat paler tint, inclining to ashy brown; the breast is almost entirely ashy brown, the feathers getting richer in colour towards the vent. The wings are a pale brown, the flights being a rich umber-brown. The beak and legs approach the normal colour, but are slightly brown. Altogether the bird is of a very warm umber-brown colour. A white specimen of the Carrion Crow was shot the last week in June at Hawkridge, near Dulverton, by Mr. James Bawden, of East Hollowcombe. This also has been preserved by Mr. W. K. Petherick, and Mr. Bawden has kindly allowed me to add it to my collection.—JOHN MARSHALL (Belmont, Taunton).

Little Owl in Yorkshire.—In November of last year (1884) one of these pretty little Owls was taken on board a fishing boat just off Scarborough, and brought alive to a birdstuffer in the town, Mr. A. Roberts, who preserved it for my collection. About six weeks later another of these birds was taken in a trap at Leamore, about four miles from Scarborough, inland. This also was brought alive to Mr. Roberts. Probably both birds came over together from the Continent, and one was fortunate enough to escape capture for a few weeks longer than the other.—J. WHITAKER (Rainworth Lodge, Notts).

Variety of the Magpie.—I have recently examined a curious variety of the Magpie. It is a young bird just out of the nest, fully feathered, but with the tail-quills only four or five inches long. The head, neck, and upper breast are of a smoky dun-colour; the back wings and tail silver-grey, the colour being particularly silvery on the tertials; primaries marked with white, as usual; the white of the scapulars strongly tinged with buff, and that of the under parts with the same tint in a less degree. Bill and

legs normal or perhaps a shade paler than in the adult, which may be the case with young birds generally. It was one of a brood hatched at Shotswell, Warwickshire, and was caught, soon after leaving the nest, on or about Midsummer-day. Varieties of the Magpie seem to be decidedly rare. I have only seen three others, besides this one, *viz.*, (1) the normal black everywhere replaced by cinnamon-brown; (2) somewhat similar, but with the brown much paler; and (3) a white bird sold by auction at Stevens's Sale Rooms in March last.—OLIVER V. APLIN (Great Bourton, Oxon).

Hybrid Wildfowl. — Calling on my correspondent, Mr. Verrall, of Lewes, on July 31st, he showed me three fine well-feathered hybrids, bred this summer from a drake Pintail and female Wild Duck. In shape and colour they bore a strong resemblance to the Pintail, which was of course in "eclipse"; but the warmth of tint about the breast suggested the Mallard cross. Other fine hybrids were there also, bred from a female Canada Goose and a Chinese gander; these in plumage bore a close resemblance to the Canada Goose, but their cravats were broader than hers and less pure in tint. In their legs and feet the mixed blood showed itself; these parts should probably be termed flesh-coloured. Upon the same water we observed a charming group of three Tufted Ducklings in dark brown down. The trio were resting indolently on the broad leaves of a water-lily, at no great distance from the old duck. A pair of Pochards were there also, but had lost their young. Mr. Verrall, whose experience in hybridising is very remarkable, reared a number of hybrids on these small waters, between the Pochard and Tufted Duck, some years ago.—H. A. MACPHERSON (Carlisle).

Late Stay in Spring of the Shore Lark.—In April last I received, as an unknown bird, a male Shore Lark (*Otocorys alpestris*) in the flesh. It was shot, on the 22nd of the month, on the Sussex coast, east of Hastings. Its stomach contained the remains of numerous small white worms and small green coleopterous larva, also a quantity of grit. — OLIVER V. APLIN (Gt. Bourton, Oxon).

Redstart and Great Titmouse using the same Nest. — In May last, Mr. John Gurney was kind enough to show me one of his nesting-boxes at Sproston Hall, near Norwich, which at that time contained four eggs of the Great Tit and two of the Redstart, on which the Tit was then sitting. Both the Redstart and the Great Tit were seen to visit the nest, but after laying two eggs the Redstart appears to have vacated in favour of the Tit, which in due course hatched and reared the mixed brood, the young Redstarts leaving the nesting-box one day before the Tits. There were also two pure white eggs in the nest, but by what bird they were laid it is now impossible to say with certainty; unfortunately they were taken, instead of being allowed to hatch off.—T. SOUTHWELL (Norwich).

Hybrid Finches.—I have lately had the pleasure of examining two hybrids, bred in the aviary of Mr. J. H. Verrall, of Lewes, between a male Goldfinch and female Linnet. I had not seen this cross before in nestling plumage; the upper parts, wings, and tail closely resembled the young grey-pated Goldfinch, though the golden wing-bars were of course much narrower and less vivid than in *Carduelis elegans*. The head and breast were of a Linnet-brown, and the shape was more that of the Linnet than Goldfinch. These nestlings were reared in an outdoor aviary (in which Mr. Verrall has bred hybrids between the Twite and Greenfinch, Linnet and Greenfinch, &c.). The old Linnet has nested three times this summer.—H. A. MACPHERSON (Carlisle).

BATRACHIA.

The distribution of British Batrachians.—I can add a few links to the chain of counties mentioned by Mr. Boulenger (p. 267) as inhabited by the Palmate Newt—namely, Berkshire, Hampshire, and Surrey; it is also reported from Yorkshire, Norfolk, and Ireland. The Berkshire localities I forget; those in Surrey include Tooting and Woking ('Science Gossip,' 1866); while in Hants it must be generally distributed, as the late Prof. Bell found it at Selborne, and I have myself seen it on the sand at Bournemouth, on the Dorsetshire border, and here, in the south-east of the county, where it occurs with both common species in clay-pits, but most abundantly, with a very small proportion of *punctatus*, in a warm pond in a chalk-pit. The absence of the Common Smooth Newt from Bournemouth seems remarkable. Has it been met with on other dry soils? Are the Toad and the Rough Newt (both rough-skinned) alike in preferring such localities? I saw in 'The Field' that the Zoological Society had received a Smooth Snake from Essex, last year, I think. Is not that a new locality?—J. E. KELSALL (Fareham).

FISHES.

Basking Shark in Mount's Bay.—A specimen of Pennant's Basking Shark (the Rashleigh Shark and Broad-headed Gazer of Couch) was taken in Mount's Bay, in a set-net, within twelve fathoms of the base of the cliff between Newlyn and Mousehole, on July 26th, measuring ten feet one inch in length. I inspected it and had it photographed the following day, but the extreme heat of the weather prevented my making any attempt to preserve it. I have, however, nothing to add to my description of a smaller specimen of the same fish given in 'The Zoologist' for 1870, p. 2253. Mr. Clogg, of Looe, writes me that a precisely similar fish was taken at Polperro in the first week in June last, and Mr. Gatcombe, of Stonehouse, informs me that another was taken at Plymouth some years ago. He sends drawings of its peculiar head, which leave no doubt on the subject. I do not find that this fish has any specially distinctive name,

and I accordingly suggest for it *Selachus Pennantii*. I do not understand that its habits are at all those of the true Basking Shark. I have never heard that it has been seen on the surface of the water; and it differs from the Basking Shark proper, *Selachus maximus*, as much as it is possible for one Shark to differ from another.—THOMAS CORNISH (Penzance).

[On turning to the 8th vol. of Dr. Günther's 'Catalogue of Fishes,' we find (p. 394) that the author regards both the fish described by Pennant and that described by Couch as identical with the Common Basking Shark, *Selache maxima*. The weight of this large and gelatinous fish would cause it to be much distorted when cast ashore, and one might be easily led to suppose that a specimen thus misshapen was something different from the common species. Having regard to the synonymy given by Dr. Günther, it seems to us unnecessary to propose a new specific name.—ED.]

Food of the Basking Shark and Herring.—Couch, no mean authority, says "the food of this fish is not known." Dr. Day has lately expressed an opinion on the subject (*antea*, p. 235). After examining the stomach of a large Basking Shark stranded on a rocky ledge off Shanklin, in February, 1875, I remarked (*Zool.* 1875, p. 4415) that in the stomach "nothing but a glutinous substance was found, which was submitted to a microscopic inspection. The analyst who examined it failed to ascertain of what it was composed; sea-weed was suggested, and he seemed to think it might be that. The matter contained in the sporules of the genus *Fucus* is of a glutinous nature, somewhat resembling the substance in question." When residing on the east coast of Scotland I endeavoured to find out on what the Herring feeds, opening and examining several recently netted, but nothing but a little pulpy glutinous matter, in a semi-liquid state,—possibly digested spawn,—was found in the cloacum. The smallness of the intestine—less than one-fifth of an inch in diameter—seems to offer an effectual bar to any but the merest fry being swallowed. The recently published remarks, however, of Mr. Matthias Dunn (*antea*, p. 236) suggest that the pulpy glutinous matter which I found in the Herrings which I examined consisted not of digested spawn, as I supposed, but of the spores of sea-weeds.—HENRY HADFIELD (High Cliff, Ventnor).

Thrasher or Fox Shark at Rye.—On July 14th a Thrasher or Fox Shark, *Squalus vulpes*, was caught in some mackerel-nets at Rye Bay, Sussex, and was brought into Hastings for exhibition. It measured eleven feet in length. The colour of the body and fins was dark dull blue, and the belly white and mottled. Its weight was 250 lbs.—F. V. THEOBALD (Kingston).

Fox Sharks on the Coast of Devon.—On the 6th of August two Thrashers or Fox Sharks, *Squalus vulpes*, were caught in Torbay by a Paignton fisherman named Lewis, one of which measured nine and the other

five feet in length. Sharks of different kinds have been rather plentiful on the coasts of Devon and Cornwall during the prevailing hot weather.—J. GATCOMBE (Durnford Street, Stonehouse, Devon).

Torpedo marmorata at Mevagissey.—On the 25th June last a female specimen of *Torpedo marmorata* was caught in a trawl-net in Mevagissey Bay. It measured about eighteen inches in length by eleven inches in width, and weighed about six pounds. The general colour of the back was light brown, with a shade of yellow in it, and mottled with white spots over the entire surface, except that directly over the electrical organs the spots coalesced so as to form an extensive white patch. The spiracles behind the eyes were large and oblong, with seven or eight protuberances attached along the inner edge. A strange circumstance in connection with this creature is its being affected by parasites, some of which, very much like leeches, were attached to its back, and presumably must be proof against an electrical shock.—MATTHIAS DUNN (Mevagissey).

Habits of the Lesser Weever.—The Lesser Weever, *Trachinus vipera*, has a habit of taking shelter at night under the sand of the seabottom. I had this information from two friends who went to Portmelon beach here to dig Launces out of the sand with a shovel, one using the implement, the other holding a light and gripping hold of the fish on their being turned up. The light-holder made a rush at what he thought was a large Lance, but found to his cost he had got hold of a “Viper Weever,” for the spines of the creature instantly entered his hand. The usual length of this fish is four or five inches, the colour yellowish brown, and the body relatively deeper than that of the Greater Weever, *Trachinus draco*.—MATTHIAS DUNN (Mevagissey, Cornwall).

MOLLUSCA.

Pisidium roseum at Fulham.—It may interest some of your readers to know that *Pisidium roseum*, Schlotz., occurs in great profusion at Fulham, Middlesex. It is associated with *Sphærium corneum*, *Pisidium pusillum*, *Bythinia tentaculata*, *Valvata piscinalis*, *V. cristata*, *Planorbis nitidus*, *P. albus*, *P. vortex*, *P. complanatus*, *P. corneus* and var., *P. contortus*, *Physa fontinalis*, and *Linnæa peregra*.—SYDNEY C. COCKERELL (Bedford Park).

CEPHALOPODA.

Octopus at Mevagissey, Cornwall.—About the end of June last a large *Octopus vulgaris* was landed here; the stretch of its arms covered five feet four inches, and the number of its sucking discs was about 1500, some of which were an inch in diameter.—MATTHIAS DUNN (Mevagissey).

SCIENTIFIC SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

At a meeting of this Society, held 5th August, 1885, Mr. J. Jenner Weir, Vice-President, in the chair.

Mr. J. W. Dunning, at the invitation of the Vice-President, announced that the Society's application for a Royal Charter had been successful. He held in his hand the Charter which had been granted by Her Most Gracious Majesty, and begged leave to present it, and formally place it in the custody of the Society.

The document was then read by the Secretary.

The Vice-President congratulated the Fellows, as he might now call them, on the position which the Society had attained, and on the privileges which had been granted.

Mr. Dunning said that when, in 1883, it was decided to take action in the matter, he had invoked the assistance of a member, Mr. Frank Crisp, and left the conduct of the affair entirely in his hands. He thought the result which had been announced was a sufficient justification of the step. Now that the object had been obtained, Mr. Crisp had, with characteristic generosity, written to say that he had no charges whatever against the Society. He therefore moved that the hearty thanks of the Society be given to Mr. Crisp for his valuable and gratuitous services. This was seconded by Mr. Stainton, and carried unanimously. The Secretary was instructed to communicate the vote to Mr. Crisp, who was not present at the meeting.

Jonkherr May, while gladly acknowledging Mr. Crisp's kindness, thought that it was only Mr. Dunning's modesty which induced him to take this means of diverting attention from his own share in obtaining the Charter. It was to Mr. Dunning also that the Society was indebted, and he moved that the hearty thanks of the Society were due, and should be given to him. Mr. Meldola seconded the motion, and it was carried unanimously.

Mr. Dunning, in acknowledging the vote, said that when temporarily occupying the chair, some six years ago, he had said, "Incorporation by Royal Charter is not beyond our hopes." It was only a passing thought, and he had little expectation that the hope would so soon be realised. To himself, it was an unmixed pleasure to have been instrumental in obtaining that which alone was wanting to complete the fabric of the Society, and give it that status to which its history of fifty years afforded a claim, the justice of which has now received such graceful recognition.

NOTICES OF NEW BOOKS.

Catalogue of the Birds in the British Museum. Vol. X. The Passeriformes or Perching Birds. By R. BOWDLER SHARPE. 8vo, pp. 682, with 12 coloured plates. London: printed by order of the Trustees. 1885.

THE publication of this important Catalogue proceeds steadily at the rate of a volume a year, ten having appeared since its commencement in 1874. With the exception of Vol. V., which was prepared by Mr. Seebohm, and Vols. VIII. and IX. by Dr. Gadow, all have been written by Mr. Sharpe, who must be congratulated on the energy which has enabled him in the midst of other official duties to execute so large a share of the general work.

In Vol. X., now before us, 448 species are described, represented by no less than 4590 specimens in the National collection. This portion of the general collection has received important additions by the amalgamation of the valuable private collections of neotropical birds belonging to Messrs. Salvin and Godman, and Dr. Sclater, which, since the publication of Vol. X., have been presented to the Trustees of the British Museum, and which, so far as the present volume extends, have been incorporated in the Catalogue; while numerous valuable North American birds have been added through the co-operation of Professor Baird on behalf of the United States National Museum.

As regards the Old World species the British Museum collection would seem to be tolerably complete; and many of the migratory species are represented by long series of specimens satisfactorily illustrating their geographical distribution.

Mr. Sharpe tells us in his Introduction that in working out his descriptions of the changes of plumage which a great many species undergo, he has not relied solely on the series in the British Museum, but has examined numerous specimens in several private collections. The various changes of plumage which the Wagtails, for example, undergo, are extremely puzzling, even when a large series is available for examination; and looking at the nicely executed coloured figures of the heads

of Pied and Yellow Wagtails given on Plates IV.—VIII., it needs a nice discrimination to separate *Motacilla lugens* from *M. ocularis*, *hodgsoni* from *personata*, or *borealis* from *cinereicapilla*. Many authors separate generically the Yellow Wagtails from the Pied ones, bestowing upon the former the generic term *Budytes*: but Mr. Sharpe, we observe, calls them all *Motacilla*. At p. 457 he says:—"I have united the Field Wagtails (*Budytes*) with the Water Wagtails (*Motacilla*), as their separation does not appear to me to depend upon any structural character. A study of the whole of the Wagtails teaches us that although European forms might be divided under the above headings, there are certain intermediate species, such as *M. flaviventris*, which unite these two supposed genera."

Again, the generic differences between *Motacilla* and *Anthus* are so slight, that Mr. Sharpe would place them in the family *Motacillidæ*, instead of adopting, as Dr. Coues does, two sub-families, *Motacillinæ* and *Anthinæ*, a subdivision which Mr. Sharpe thinks strictly applicable only to the American species. His "keys" to the genera and species are ingeniously constructed, and although here and there one may detect a slight inconsistency or slip of the pen, on the whole they must be said to furnish useful aids to identification, and obviously represent a considerable amount of labour, and the handling of an enormous number of specimens. If Mr. Sharpe's views are not always acceptable to ornithologists, they are at least deserving of attentive consideration as the outcome of the study of an unrivalled collection.

Comparative Anatomy and Physiology. By F. JEFFERY BELL, M.A., Professor of Comparative Anatomy at King's College. Post 8vo, pp. 550, with 229 engravings. London: Cassell & Co. 1885.

In this useful volume, one of a series of Manuals for Students published by Messrs. Cassell & Co., we have a guide to Comparative Anatomy and Physiology written on somewhat new lines. The author points out that as there has been an evolution of organs as well as of animals, if we desire to understand the most complicated organs, we must first know the structure of such as are more simply constituted. With this object he has

written about organs rather than about groups of animals ; but he has added an Index, in which the various parts of an animal are collected under its name ; so that the student who desires to use the volume as a zoological text-book will have no difficulty in selecting the portions of the chapters which bear on a particular form or set of forms.

A noticeable feature in the book is that all important biological terms which precede the definitions given of them are printed in bolder (Clarendon) type. These, in point of fact, are the material words which would be certain to be underlined by the student, were he not by this device saved the trouble of doing so. Another commendable feature is that the author gives the names of his authorities for important statements, a practice which we should like to see more generally adopted, especially when such statements embody the latest results of biological research. It too often happens that the writers of text-books, for the sake of brevity, condense in a few lines an allusion to some recently ascertained fact, and by omitting a reference to the authority for the statement, disappoint the reader, who would like to satisfy himself on the point in greater detail.

The woodcuts in this volume, although of unequal merit, seem to have been selected judiciously, and sufficiently illustrate the author's remarks.

The Collected Scientific Papers of the late William Alexander Forbes, M.A. Edited by F. E. BEDDARD, M.A. With a Preface by P. L. SCLATER, M.A., Ph.D., F.R.S. Royal 8vo, pp. 496, with 25 plates. London: R. H. Porter. 1885.

THE late Mr. W. A. Forbes, as many of our readers will recollect, was for three years Prosector to the Zoological Society, during which period he brought before the scientific meetings many interesting and valuable communications, mainly derived from his studies of the animals that came under his examination at the Zoological Gardens. These were published at intervals in the Society's 'Proceedings.' In addition to these, he contributed several papers to 'The Ibis,' and 'The Entomologist's Monthly Magazine,' and an important Report on the Anatomy of the Petrels collected during the voyage of H.M.S. 'Challenger,' printed in the Scientific Reports of the Voyage,

Volume IV., Part XI., and occupying 64 quarto pages with seven plates.

When, to the grief of all who knew him, Forbes fell a victim to dysentery while travelling up the Niger in January, 1883, it was resolved, at a meeting of the Zoological Club (of which he was a member), to reprint his scientific papers in a memorial volume similar to that containing Garrod's Scientific Papers, which Forbes himself had edited. The volume thus agreed upon has been ably edited by Mr. F. E. Beddard, the present Prosector to the Zoological Society, and has been recently issued to subscribers. We understand that a few copies are available for sale to the public, and those of our readers who do not possess sets of the periodicals to which Forbes's papers were originally contributed will do well to obtain a copy of this valuable collection.

Amongst the more interesting and useful papers in the volume may be mentioned the Reports on the Collections of Birds made during the Voyage of H.M.S. 'Challenger,' "On the Anatomy of the African Elephant," "On the Shedding of the Horns of the American Prongbuck," "Contributions to the Anatomy of Passerine Birds," "On the Anatomy of the Koala," "On Garrod's Contributions to Bird-Anatomy and Classification," "On the Incubation of the Indian Python," "On the Anatomy of the Great Anteater," "On the Californian Sealion," and "On the Petrels collected during the Voyage of the 'Challenger,'" already referred to; while the out-door naturalist will fully appreciate the papers reprinted from 'The Ibis' "On the Nesting of the Spoonbill in Holland," "Eleven weeks in North-Eastern Brazil," and the author's "Last Journal," with which the volume closes. The book is admirably printed, and is illustrated with all the plates (25 in number) which accompanied the original memoirs.

Elementary Text-Book of Entomology. By W. F. KIRBY. 8vo, pp. 240, with 87 Plates containing 650 figures. London: Sonnenschein & Co. 1885.

WE are always glad to welcome new aids to Science, especially when such publications emanate from specialists, or from those who have the reputation of possessing a knowledge of the subjects

on which they write. But it is one thing to possess the necessary information and another to be able to impart it to others. The art of teaching is not given to every writer of books, and in this instance Mr. Kirby does not show that he possesses it. We will not say that his book does not contain a good deal of information of one sort or another, but, as it seems to us, it is not of a kind to satisfy the readers of an "Elementary Text-Book." It so happened that while we were turning over the pages of this volume we received from a friend in Yorkshire a packet containing a number of Bees (*Bombus pratorum*) in the pupa stage, looking, in their tough, coriaceous envelopes, like so many broad beans which had been planted and dug up again before sprouting. It naturally occurred to us to turn to the Order Hymenoptera, Family *Apidæ*, to see what information was afforded concerning the transformations of Bees, the point we specially wished to investigate being the mode in which the pupa-case is formed, since it differs altogether in appearance from the white silky film or cocoon which the larva spins round itself in the cell. We were also curious to discover how long a period is passed in this curious pupa stage; but to our surprise Mr. Kirby's pages afforded no information on the subject, the reader being merely informed that "as long accounts of the economy of Bees are to be found in almost every book on Natural History, we may perhaps be allowed to pass the subject over in the present work." This statement reads to us very oddly in an "Elementary Text-Book," where one naturally expects to find such instruction as we have indicated. A similar dearth of information respecting the *Ephemeridæ*, and the *Phryganeidæ*, to which we turned only to be disappointed, forced upon us the conviction that 'the title of the book is a misnomer, while the absence of an index is a serious drawback to a beginner who may be expected to be ignorant of classification, and who may not know where to find the species he is looking for if not in the index. A better title for the book would have been "Illustrations of Entomology," for the most striking feature about it is the number of plates at the end, which contain more than 650 figures, nicely printed, though not original. Unfortunately no details of structure are figured, nor do we find any representations of larvæ or pupæ, which again seems to us a mistake in a so-called "Elementary Text-Book."

It is evident that a great deal of labour has been bestowed on the preparation of the letter-press, but from the way in which the subject-matter is treated we can hardly think that it will prove of much utility to those for whom it purports to be designed.

The Irish Wolf-hound. By Captain G. A. GRAHAM, of Rednock, Dursley. Printed for the Irish Wolf-hound Club. 8vo, pp. 47, with two photographs. Dursley: Whitmore & Son. 1885.

It has often been asserted that the old race of dog known as the Irish Wolf-hound is extinct, but the writer of the present essay, who has for years been interested in preserving and perpetuating it, confidently believes that there are strains now existing which may be traced back more or less clearly to the original breed. It also appears tolerably certain that our modern Deer-hound is descended from that noble animal, and gives a fair idea of his appearance, though inferior to him in size and strength.

A Club has recently been organised, having for its object "to promote the more complete recovery of the Irish Wolf-hound, and to firmly establish the race by endeavouring to make the qualities and type of the breed better known." With this object in view Captain Graham, the Honorary Secretary and Treasurer of the Club, has, in the Essay now before us, described the points and measurements of a typical dog of this breed, and has given some historical notices of it collected from a variety of sources. There can be no doubt that, having once fixed upon a type or standard to breed up to, based upon an accurate knowledge of the characteristic points of the old Wolf-hound, with energy and perseverance the race may be entirely recovered, an event which we feel certain will meet with the approval of all good sportsmen and naturalists. Those of our readers who may be disposed to aid the object in view by becoming members of the Club should communicate direct with the Hon. Sec., whose address is given above.



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BIRD-LIFE IN POMERANIA.

BY DR. THEODORE HOLLAND, OF STOLP.

As we traverse the forest in the last days of February the dark firs are still clad in wintry garb, the bare oak and beech trees stretch out their naked arms imploringly to the spring, no longer able to hide from the eye of the ornithologist the eyries which they embrace so protectingly. The huge nest of the Osprey is still there waiting for its light-winged occupants; the wild storms have already much shaken its foundation, a long dry branch of the beech tree. Snow covers everything as far as the eye can reach; trees and bushes are still in the icy fetters of winter. All life seems to have forsaken the forest. Thus the Pomeranian woods seem empty and forlorn; no gay Finch (*Fink*) is twittering, no Willow Wren (*Laubvogel*) chatters in the foliage, through the trees at night no touching melody is warbled by the Nightingale (*Nachtigall*): all these delicate inhabitants of the forest have gone to the south to escape the rough caresses of winter.

And yet all life has not disappeared. Our carpenter, the Pied Woodpecker (*Specht*), with his black and white coat, is still with us, and, seated on the trunk of an oak, breaks, with his busy knocking, the monotonous silence of the forest. He looks up in astonishment as he hears the scrunching of the snow at our approach, then flies off, angrily screaming because we have dared to disturb him at his work. With him have remained his two cousins, the "Greencoat" (*Grünrockige*), who, according to the popular belief, has the gift of finding the "spring-root," and the

Great Black Woodpecker, with his little red cap of liberty. Various superstitions are connected with the Woodpecker, as, for instance, that he who carries its beak in his pocket will not be stung by the bees when depriving them of their honey. But these traditions are too critically opposed in our time; naturalists have spied very closely into the life-history of Woodpeckers, and have discovered habits of much more interest and importance to the foresters. Dr. Altum has given us some very accurate information of these habits in his 'Forst-Zoologie.'

From a fir tree in front of us we suddenly hear a soft twitter; a troop of quaint little Titmice (*Meisen*) have invaded it, and, ruffling their plain grey feathers, climb the dark branches looking for food. Their perpetual cry is translated by witty folks into "*flitig, flitig, flitig*" (busy, busy, busy), and sounds to the lazy workman as a mocking incentive to labour. From branch to branch, in great zest and hurry, now on the top of the bough, now beneath it, never resting, they run round the tree, or hang on the under side of it, picking out the insect-egg and chrysalids which are hidden in the crevices of the bark. Such an occupation, in spite of their insignificance, makes these active and useful little birds favourites with everyone; they cannot be too much encouraged and protected.

And now we come upon a couple of lovers in this wintry place. Two Crossbills (*Kreuzschnabel*), in gay-coloured nuptial dress, unmindful of the cold, are having a playful game amongst those great fir-branches, at the root of which the little Wrens (*Zaunkönig*) are hopping and singing their bridal song, in spite of ice and snow. A Raven (*Rabe*), who still claims an important position among birds,—because his ancestors were the constant companions of Odin, and sat on the shoulders of the god as his chief counsellors and messengers,—looks down from above, scolding and croaking. The Crossbill displays a very peculiar form of bill, the point of the mandibles being crossed sideways. The pretended origin of this abnormal form of beak has been made the subject of a poem by the Magistrats-rath, Jacob Schnerr, who lived at Nuremberg in the beginning of the century, as well as by the great American poet Longfellow. In Pomerania it is believed that the Crossbill carries a blessing with it, and that a house in which one of these birds is kept will never be struck by lightning.

Continuing our walk, we come to a clearing. At the entrance

of the wood some Buntings (*Ammern*) are twittering hungrily, "*Bur lot mi in din Schön*" ("please let me into your barn"), while close by, in the branches of an alder tree, a flock of Siskins (*Zeisige*) are chattering gaily and feeding on the alder seeds. A Crested Lark (*Haubenlerche*) runs about in company with Greenfinches (*Grünfincken*) and Yellow Buntings (*Gelbgünschen*), busily pecking about in the cart-ruts, heedless of a Rough-legged Buzzard (*Rauhfußbussard*), clumsily flying over the field, looking for prey. But at this time of year this northern visitor can be as little trusted as his cousin the Common Buzzard (*Mäusebussard*). If opportunity serves neither of them will refuse a hare or a partridge, and thereby incur the anger of Sportsmen, though, on the other hand, they carry on a praiseworthy warfare against rats and mice, those enemies of cultivation.

Near the forester's house, which we see at a little distance, a Skylark (*Feldlerche*), but recently returned from his travels, and welcomed as the first harbinger of spring, rises in the clear wintry air, warbling his greetings to the sun. From the roof of the barn a thievish Magpie (*Elster*) is teasing the dog, the guardian of the house. Bullfinches (*Dompfaffen*), whose red breasts contrast prettily with the white snow, Linnets (*Hänflinge*), and impudent Sparrows (*Sperlinge*) amuse themselves on the trees of the little garden, each in its own way, while a Starling (*Staar*) sits on a branch, staring at the sun, and pipes and twitters his varied notes, beating time with his wings.

Our path leads us along the hedge of the forester's garden, and suddenly a Blackbird (*Amsel*) dashes out from his winter shelter, and with a loud far-sounding note warns every animal in the forest of approaching danger, and urges them to flee without delay to their hiding-places. This unluckily deprives us of a rare sight in this country—a Golden Eagle (*Steinadler*), which, to the great regret of the ornithologist has probably now disappeared from our list of resident birds (and whose habits therefore we should much like to have observed), rises at a great distance, startled by the cry of the Blackbird, and soars away with dignity into the dense forest. We hasten to the place whence he rose, and find a hare, recently slaughtered. Dr. Ekhard gives an instance of the extraordinary strength of this bird. He once saw an Eagle break the neck of a three-year-old goat with one wrench of his beak.

Beyond the field the wood again stretches onward. Here a lively troop of wandering Fieldfares (*Krammetsvögel*) have settled in some firs, and cannot tell enough of the northern home they have so recently left, and of the adventures of the journey. There is no end of chattering; merry and light-hearted are they, like all travellers.

Through the happy chatter of the Fieldfares sounds the angry scolding of a quarrelsome Jay (*Holzschreier*). "Herr Markwart," as the country people call him, flies from tree to tree with crest erect and blue-banded wing. This crafty marauding bird—this declared enemy to all singing birds, whose eggs and young he is always ready to devour—thus tries to attract the attention of the noisy travellers. As none of them, however, regard his scolding, he flies off through the wood with loud mocking cries.

On the branches of yonder old gnarled oak tree, which seems to mourn for its giant companions of former days, a Nuthatch (*Blauspecht*) runs up and down to the twitter of a Tree Creeper (*Baumläufer*), at work lower down on the trunk. A little further on the forester has spread his nets. An unfortunate Robin (*Rothkehlchen*) has been caught in them, its taste for berries having caused it to be punished with the persecuted Thrushes (*Drosseln*). The poor Thrushes themselves, which rejoice us the whole summer with their songs, and for whose destruction these nets are spread, fall into undeserved condemnation. In a district much damaged by larvæ I have seen Thrushes collected in great numbers searching busily for them in the moss. At least the resident and breeding birds ought to be spared, and the nets should be set a little later in the year, when our woodland birds are gone to the south; arrivals from the north are then coming in sufficient numbers to satisfy the epicure, and to enable the foresters to gain enough by catching them.

In the depths of the dark forest, on a mighty fir tree, a pair of our largest Eagles (*Seeadler*) have taken up their abode. The male bird has flown to the lake to fish; his mate is busily engaged in repairing their gigantic nest. The remains of prey, which lie strewn about, show that the pair have made quite a raid amongst both warm- and cold-blooded animals of wood and water. There we find the bones of young roes, hares, wild ducks, and good-sized fishes. While we are still occupied in looking at the remnants of the feast, the male bird returns. Slowly, and with

measured flight, he approaches the nest, but his sharp eyes have already discovered us. With a mighty flapping of his wings he falls back, and soars higher and higher, until he reaches his mate, who has already left the tree, and together, in safe regions, they sail in wide circles, without any perceptible movement of their pinions. A pair of Ravens (*Raben*), which have their abode close by, try with vain presumption to vie with the flight of the Eagles, and to disturb, with their hoarse croaking, the tranquillity of the noble pair. But they will not condescend to notice such common fellows; and, if the Ravens dare to approach too near, a sharp peck from one of their strong beaks repels the cowards to a respectful distance.

Strangers from still further north have also arrived, and, in spite of their Arctic home, in almost tropical splendour of plumage, Waxen Chatterers (*Seidenschwänze*) are flying about in troops. The hard winter of the north and the lack of food have sent them to feed on the berries of our forests. But they need not expect undisturbed hospitality in our midst; nets and traps are already set for their reception, not because (as in olden times) they are regarded as birds of misfortune,—foretellers of approaching war,—but because, like the Thrushes, they are an appreciated delicacy. Natural appearances, not uncommon in themselves, but which pass unobserved by many, frequently give rise, through misinterpretation, to legends and superstitions. Thus it was with the appearance of the Waxen Chatterers. These brilliant birds, from unknown lands, were received as messengers of evil and so-called birds of war, plague, or misfortune; while it was said by others that they only appeared every seven years. In reality they visit us annually in larger or smaller flocks, making, with their variegated plumage, a pretty feature in a winter landscape. Until the year 1856 even ornithologists were ignorant of their birth-place and mode of breeding. To throw light on the subject several excursions were made to Lapland, Finland, and North Russia; whole winters were passed there in the search. The birds were kept in aviaries, in the hope that they would breed. Fifty roubles were offered by the ornithologists of the capital of Finland for a single nest. But all in vain, till at length an Englishman, John Wolley, who had spared neither expense nor trouble in the matter, after a long search at length discovered a breeding-place of this bird, Lapland; and, as is

often the case, after the first discovery, other nests were found every year. These charming visitors do not come alone; other northern beauties, in company with them, seek our protection. Snowy Owls (*Schnee-eulen*), with beautiful white feathers, which, unlike our Owls (*Eulen*), do not shun the sun, but hunt also in daylight.

But now we have crossed the forest, and before us extends the coast of the Baltic and the broad shining sea, with its northern sea-visitors, which have already arrived in numbers. Quite a differently feathered world is here represented in various shapes and colours. Flocks of water birds float on the ice-cold waves, or fly singly or in flocks through the air. Close to the ice swim a flock of Long-tailed Ducks (*Eisenten*), called by the fishermen *Klashanik*, the coloured drakes with long tail-feathers. As soon as our boat approaches them they rise hastily, to return after a short flight to their native element. These sea-ducks, which breed in the north, are shot and caught in great numbers and sold at a very cheap rate for food; but, though prepared after the most approved rules of cookery, they always taste strong and unsavoury. Further on several snow-white Swans, so celebrated in poetry and song, float silently and gracefully in majestic beauty on the water at a safe distance from our guns; while towards the coast fly a skein of clamorous Bean Geese (*Saatgänze*), which have been feeding on the green winter corn.

Ahead of our boat swim some slender-throated birds, which prove to be Red-throated Divers (*Rothkehlige Eistaucher*). Our guns click, and all disappear below the surface; one alone cannot follow, for his fate has overtaken him. These birds find their lonely breeding-places in Iceland, and other Arctic regions, in company with their two congeners, the Great Northern and Black-throated Divers. Some of these last-named birds, strangely enough, at one time did not quit the Pomeranian coast for the summer, but chose some lakes in the neighbourhood, which perhaps bore some resemblance to those in their more northern home. They breed there now every year, and are considered a great curiosity. But the report of our guns have made a stir amongst the other sea-fowl. Large and small flocks of different species of Ducks cross the water in all directions. Wild Ducks (*Stokenten*), Scaups (*Bergtauchenten*), Sheldrakes (*Schellenten*), Long-tailed Ducks (*Eisenten*), Pochards (*Tafelente*), with

their large brown heads, whistling Wigeon (*Pfeifenten*), White-eyed Pochards (*Moorenten*), Velvet Ducks (*Sammetenten*), Scoters (*Trauenten*), and Eider Ducks (*Eider-enten*), which provide such luxurious down, cross the water in all directions; while numerous Gulls (*Möven*), of the Common (*Sturm*), Herring (*Silber*), and Black-backed (*Mantel*) species, sail at various altitudes through the air.

But now "Helios" is directing his fiery steeds homewards, warning us also to return to our homesteads. On the way we meet with a solitary Merganser (*Sägetaucher*), called "Norh" by the people on the coast. A poor fishing-boat, heavily laden with spoil, follows in our wake. The nets have gathered a rich harvest among the Scaup Ducks (*Bergtauchenten*), which were seeking for crustacea and mollusca at the bottom of the sea.

(To be continued.)

ORIGIN OF THE AMERICAN VARIETIES OF THE DOG.

BY PROFESSOR A. S. PACKARD.*

THE impression that the Domestic Dog of the Old World has descended from wild species distinct from the Wolf may be well founded;† but in America the evidence tends to prove that the Eskimo and other domestic varieties of dogs were domesticated by the Aborigines, and used by them long anterior to the discovery of the Continent by the Europeans, the varieties in question originating from the Gray Wolf or Prairie Wolf.

First, as to the Eskimo Dog. From the following extract, from Frobisher, it appears evident that the Eskimo had the present breed of domestic dogs long anterior to the year 1577. Frobisher's account of the Eskimo themselves is, so far as we know, the first extant, and is full and characteristic. After describing the natives, he goes on to say:—"They frank or keepe certaine dogs not much unlike wolves, which they yoke together, as we do oxen and horses, to a sled or traile: and so carry their necessaries over the yce and snow from place to place: as the captive whom we have made perfect signes. And when these

* From 'The American Naturalist,' September, 1885, pp. 896—901.

† See 'The Zoologist,' 1884, p. 393.

dogs are not apt for the same use; or when with hunger they are constrained for lack of other vituals, they eate them, so that they are as needful for them in respect of their bignesse as our oxen are for us.”*

Regarding the Eskimo Dog, Richardson remarks in his ‘Fauna Boreali-Americana’ (p. 75):—“The great resemblance which the domestic dogs of the Aboriginal tribes of America bear to the wolves of the same country was remarked by the earliest settlers from Europe (Smith’s ‘Virginia’), and has induced some naturalists of much observation to consider them to be nearly half-tamed wolves (Kalm.).

“Without entering at all into the question of the origin of the domestic dog, I may state that the resemblance between the wolves and the dogs of those Indian nations who still preserve their ancient mode of life continues to be very remarkable, and it is nowhere more so than at the very northern extremity of the Continent, the Esquimo dogs being not only extremely like the gray wolves of the Arctic circle in form and colour, but also nearly equalling them in size. The dog has generally a shorter tail than the wolf, and carries it more frequently curled over the hip, but the latter practice is not totally unknown to the wolf. . . . I have, however, seen a family of wolves, playing together, occasionally carry their tail curled upwards.”

The Hare Indian Dog is also supposed to be a domesticated race of the Prairie Dog, as shown by the following extract from Richardson’s ‘Fauna Boreali-Americana’:—

“*Canis familiaris* var. *C. lagopus*. Hare Indian Dog.—This variety of dog is cultivated at present, so far as I know, only by the Hare Indians and other tribes that frequent the border of Great Bear Lake and the banks of the Mackenzie. It is used by them solely in the chase, being too small to be useful as a beast of burden or draught.” It is smaller than the Prairie Wolf. “On comparing live specimens I could detect no marked difference in form (except the smallness of its cranium), nor in fineness of the fur and arrangement of its spots of colour. . . . It in fact bears the same relation to the prairie wolf that the Esquimo dog does to the great gray wolf.”

* The second voyage of Master Martin Frobisher, 1577. Written by Master Dionice Settle, ‘Hakluyt’s Voyages,’ vol. iii., p. 62 (1810).

Another variety of Indian Dog is Richardson's *Canis familiaris* var. *novæcaledoniæ*, Carrier Indian Dog. The Attuah, or Carrier Indians of New Caledonia, possess a variety of Dog which differs from the northern races,—“It was the size of a large Turnspit dog, and had somewhat the same form of body; but it had straight legs, and its erect ears gave it a different physiognomy.”

The Spitz Dog, Mr. J. A. Allen informs us, is, with little doubt, a domesticated subarctic variety of the Prairie Wolf.

Sir John Richardson, in the Appendix to Back's 'Narrative, 1836 (p. 256), remarks:—“Indeed the wolves and the domesticated dogs of the fur countries are so like each other that it is not easy to distinguish them at a small distance; the want of strength and courage of the former being the principal difference. The offspring of the wolf and Indian dog are prolific, and are prized by the voyagers as beasts of draught, being stronger than the ordinary dog.”

The origin of the ordinary Indian Dog of North America is obscure; but Richardson, who names it *Canis familiaris* var. *Canadensis*, North American Dog, throws much light on its origin:—“By the above title I wish to designate the kind of dog which is most generally cultivated by the native tribes of Canada and the Hudson Bay countries. It is intermediate in size and form between the two preceding varieties; and by those who consider the domestic races of the dog to be derived from wild animals, this might be termed the offspring of a cross between the prairie and gray wolves. . . . The fur of the North American dog is similar to that of the Esquimo dog breed, and of the wolves. The prevailing colours are black and gray, mixed with white. Some of them are entirely black. . . .” He quotes from Theodat's 'Canada,' written in 1630, to show that at the early period, and “perhaps even before the arrival of the Europeans, they formed an esteemed article of food of the natives.” Confirmatory of the theory of the Re-Columbian origin of the Indian Dog may be cited the following extract, from Hakluyt's 'Voyages,' regarding the Indian dogs seen on Cape Breton Island, 1593:—“Here divers of our men went on land upon the very Cape, where at their arrival they found the spittes of oke of the savages which had roasted meate a little before. And as they viewed the countrey, they sawe divers beastes and

foules, as blacke foxes, deere, otters, greate foules with red legges, pengwyns, and certaine others." . . . "Thereupon nine or tenne of his fellowes, running right up over the bushes with greate agilitie and swiftnes, came towards us with white staves in their handes like halfe pikes, and their dogges of colour blacke, not so bigge as a grayhounde, followed them at their heeles; but wee retired unto our boate without any hurt at all received."*

It is probably this variety, the bones of which have been found by Dr. J. Wyman in the shell-heaps of Casco Bay, Maine.

"The presence of the bones of the dog might be accounted for on the score of its being a domesticated animal, but the fact that they were not only found mingled with the edible kinds, but, like them, were broken up, suggests the probability of their having been used as food."

We have not seen it mentioned, however, by any of the earlier writers that such was the case along the coast, though it appears to have been otherwise with regard to some of the interior tribes, as the Hurons. With them, game being scarce, "venison was a luxury found only at feasts, and dog-flesh was in high esteem." . . .

A whole left-half of a lower jaw of a *Wolf* was found at Mount Desert, measuring 7·5 inches in length, making a strong contrast in size with a similar half from a dog found at Crouch's Cove. This was more curved, and had a length of a little less than 5 inches.†

It is possible that the Newfoundland Dog was indigenous on that island, and also an offshoot of the Gray Wolf allied to the Eskimo. In their 'Newfoundland,' Messrs. Hatton & Harvey say (pp. 194, 195), that "There are few fine specimens of the world-renowned Newfoundland dog to be met with now in the island, from which it derived its name. The origin of this fine breed is now lost in obscurity. It is doubtful whether the Aborigines possessed the dog at all; and it is highly improbable that the Newfoundland dog is indigenous. Some happy crossing of breeds may have produced it here. The old settlers say that

* "The voyage of the ship called the 'Marigold,' of M. Hill, of Redrise, unto Cape Breton and beyond, to the latitude of 44 degrees and a half, 1593. Written by Richard Fisher, Master Hilles man, of Redrise."—Hakluyt, 'Voyages,' iii., p. 239.

† 'The American Naturalist,' January, 1868, p. 576.

the ancient genuine breed consisted of a dog about 26 inches high, with black-ticked body, gray muzzle, and gray or white stockinged legs, with dew-claws behind." Judicious treatment has greatly improved the breed. "Their colour is white with black patches, curly coats, noble heads, and powerful frames. The favourite Newfoundland dog at present is entirely black, of large size, from 26 to 30 inches in height, remarkable for his majestic appearance. It is now generally admitted that there are two distinct types of the Newfoundland, one considerably larger than the other, and reckoned as the true breed; the other being named the Labrador, or St. John's, or Lesser Newfoundland. The latter is chiefly found in Labrador, and specimens are also to be met with in Newfoundland."

Regarding the dogs of the Mexican Indians, Nadaillac says, in his 'Prehistoric America':—"The European dog, our faithful companion, also appears to have been a stranger to them."* His place was very inadequately filled by the Coyote or Prairie Wolf,† which they kept in captivity, and had succeeded in taming to a certain extent.

In a recent visit to Mexico, not only along the railroads, but in the course of a stage ride of about 500 miles through provincial Mexico, from Saltillo to San Miguel, we were struck by the resemblance of the dogs to the Coyote; there can be little doubt but that they are the descendants of a race which sprang from the partly-tamed Coyote of the ancient Mexican Indians. At one village, Montezuma, we saw a hairless or Carib Dog, as we supposed it to be; similar dogs are sometimes seen in the United States.

Finally, that the domestic dog, and the Gray as well as the Prairie Wolf, will hybridize has been well established. Dr. Coues has observed hybrids between the Coyote and domestic dog on

* Certain kinds of dogs were, however, domesticated in America. They were called *Xulos* in Nicaragua, *Tzomes* in Yucatan, and *Techichis* in Mexico. These were considered to afford very delicate food after having been fattened.

† *Canis latrans*, Baird. In a description of Virginia, published in 1649, we read:—"The wolf of Carolina is the dog of the woods. The Indians had no other curs before the Christians came amongst them. They are made domestic. They go in great droves in the night to hunt deer, which they do as well as the best pack of hounds."

the Upper Missouri.* To this we may add our own observations made at Fort Claggett, on the Upper Missouri, in June, 1877. We then were much struck by the wolf-like appearance of the dogs about an encampment of Crow Indians, as well as the fort. They were of the size and colour of the Coyote, but less hairy, and with a less bushy tail. They were much like those lately observed in Mexico, and I have never seen such dogs elsewhere. Their colour was a whitish tawny, like that of the Eskimo Dog.

Confirmatory of these observations is the following note, by J. L. Wortman, in the 'Report of the Geological Survey of Indiana for 1884':—"During extended travel in Western U.S., my experience has been the same as that recorded by Dr. Coues. It is by no means uncommon to find mongrel dogs among many of the Western Indian tribes, notably among Umatillas, Bannocks, Shoshones, Arrapahoes, Crows, Sioux, which to one familiar with the colour, physiognomy, and habits of the Coyote have every appearance of blood-relationship, if not in many cases this animal itself in a state of semi-domestication. The free interbreeding of these animals, with a perfectly fertile product, has been so often repeated to me by thoroughly reliable authorities, and whose opportunities for observation were ample, that I feel perfectly willing to accept Dr. Coues's statement."

To these statements may be added that of Mr. Milton P. Pierce, published in 'Forest and Stream,' for June 25th, 1885, as follows:—"Hybrid wolves have always been very common along our western frontiers. I have seen several of them sired both by dogs and wolves, and all I have seen have resembled wolves rather than dogs."

It is to be hoped that our mammalogists may collect, and examine this subject, particularly the skulls and skins of numerous specimens, both of dogs and wolves, and of the hybrids between them. Further observations are also needed as to the fertility of the hybrids.

* 'The American Naturalist,' 1873, p. 385.

REMARKS ON THE COMMON VIPER, *VIPERA BERUS*, AND
ON ITS SUBSPECIES *V. SEOANEI*.

BY G. A. BOULENGER.

It is frequently believed that existing species can only be separated by the presence of gaps in the series of variations, or, in other words, that "good species" ought always to be sharply distinguishable without the interposition of any connecting forms; that if two or more species are completely linked together they should be united, save to be distinguished as subspecies. However recommendable this principle may be when naturalists have to deal with forms of which they possess little material and information, it cannot always be carried out when knowledge attains a nearer approach to perfection, as in the case of certain groups of European reptiles. Since proper attention is being paid to the variations of the commoner forms, several species, on the distinctness of which no one has ever ventured to cast a doubt, have been found so linked together as to be in some cases utterly inseparable by the means of investigation at our command. One of the most striking examples of this kind of difficulty is presented by the Vipers of Europe, a subject which has already been discussed by Boscá, Lataste, and Tourneville, but on which there still remains a good deal to say.

Until a few years ago only three forms of European Vipers were distinguished, one forming the genus *Pelias* (Merrem, 1820), viz., *P. berus*, L., the two others the genus *Vipera* (Laurenti, 1768), viz., *V. aspis*, L., and *ammodytes*, L. The former genus was characterised by the presence of three large sincipital shields; the latter by the absence of these shields, the head being entirely covered with small scales. The two species of *Vipera* proper were distinguished by the presence in *V. ammodytes* and the absence in *V. aspis* of a large horn-like protuberance on the end of the snout. A strict examination of a large number of specimens from various localities shows, however, that the distinction of species is by no means so simple. I should not even allude to the rejection of the genus *Pelias*, as I go so far as to doubt the possibility of surely distinguishing in all cases *V. berus* from *V. aspis*, were it not that, in spite of the objections of recent

authorities,* the authors of faunistic lists and popular works in this country still adhere to the generic separation of *V. berus* and *aspis*. An example of this inconsistency is to be found in the article "Reptiles" in Cassell's 'Natural History,' which contains a figure of *V. aspis*, with the lettering "Common Viper," which latter species is regarded, in the text, as generically distinct from the former!

The first blow to the old conception of the species of Vipers was dealt by Boscá, who described a new form from Spain, intermediate between *V. aspis* and *V. ammodytes*, which he named *V. latastei*.† He was shortly followed by Lataste, with a new subspecies, also from Spain, *V. berus seoanei*,‡ intermediate between *V. berus* and *V. aspis*. That these forms are not to be regarded as hybrids between their allies is proved by the fact that the latter do not co-exist in the Spanish Peninsula.

The chief object of this note is to show that, although *V. berus* and *V. aspis* must continue to be admitted as species, in spite of the complete transition from one to the other, there is no reason to maintain the form *V. seoanei* even as a subspecies, the characters upon which it was founded not being sufficiently constant. The following is the diagnosis published by Lataste:—" *Vipera seoanei* rostrum leviter (sed scutellorum prominenti ex oculo ad oculum margine) excavatum, *aspidis* et *beri* intermedium, habet; frontalia parietaliaque scuta omnino desunt, vix majusculis, minoribus tamen quam illa quæ *aspidium* girundicarum notavi, scutellis irregulariter in vertice nonnunquam conspicuis; unica scutellorum serie inter oculos et supra labialia; cephalæis demum scutellis *beri* quam *aspidis* affinioribus. Præterea, cum *beri* et *aspidis* quartæ et quintæ supra, quintæ et sextæ subtus, *seoanei* vero quartæ supra, quintæ subtus labialibus oculus superponitur." The Natural History Museum received in 1880, from M. V. L. Seoane, a specimen which, except in the total absence of frontal and parietal shields, agrees with the above diagnosis; but it has recently received from the same generous correspondent five more specimens, three of which likewise entirely lack the sincipital shields, the two others, on the contrary, agreeing, in the presence

* Cf. Lataste, Actes Soc. Linn. Bordeaux, (3) x. 1875, p. xxi.

† Bull. Soc. Zool. France, 1878, p. 116.

‡ *Op. cit.*, 1879, p. 132.

and size of these shields, with the typical *V. berus*. In two specimens the eye is situated above the fourth and fifth upper labials, and not above the fourth alone;* another specimen is, in this respect, intermediate between the two extremes. The character of the more prominent rostral canthus is not constant.

The best character for distinguishing *V. berus* from *V. aspis* still remains in the shape of the end of the snout, which is blunt in the former and more or less distinctly turned up in the latter, although not of absolute value, as already pointed out by Tourneville† and F. Müller.‡ Next comes the number of series of scales between the labials and the eye, *viz.*, one series in *V. berus*, two in *V. aspis*, which character has been regarded as the most constant by Jan, Lataste, and Tourneville; however, there is, in the Natural History Museum, a specimen of *V. berus*, a pregnant female from France, which shows two series; and I must also refer the reader to a passage in Strauch's 'Schlangen des Russischen Reiches,' p. 210, which shows that specimens with two series are not infrequent in some parts of Russia.

Lastly comes the character of the development of the sincipital shields, which, if taken by itself, will frequently mislead. As to characters taken from the proportions and scaling of the body and the coloration, I need say nothing, for they are well known to vary to such an extent as to be useless as specific distinctions. Leydig§ has, it is true, pointed out a microscopical difference in the structure of the scales of the two species, but its value as a distinctive character requires to be confirmed by the investigation of a larger series of specimens.

ORNITHOLOGICAL NOTES FROM DEVON AND CORNWALL.

BY JOHN GATCOMBE.

My last notes having ended on September 29th, 1884, and having been from home until the end of December following, I commence those for the present year from January 15th, at which

* Leydig, "Einheim. Schlangen," Abh. Senckenb. Ges. xiii. 1883, pl. 1, fig. 8, figures a German specimen with the eye above the fourth labial only.

† Bull. Soc. Zool. France, 1881, p. 41.

‡ Verh. Nat. Ges. Basel, vii. 1885, p. 694.

§ Arch. f. Mikr. Anat. 1873, pl. xxxii.

date I examined a Green Sandpiper, shot by Mr. Dayrell Stephens near Wadebridge, Cornwall, and some Stock Doves, killed at Pamphlete, near Plymouth. I mention the latter as they are so rarely met with in our neighbourhood. Two or three Dippers were also obtained; one of them a slight variety, the white on the breast continuing in a narrow line towards the vent. About the 20th two Hawfinches were killed near Saltash, Cornwall, their stomachs containing fragments of the kernels of some stone-fruit. Fieldfares were also to be found in our markets, but the scarcity of Missel Thrushes for the past few years in this neighbourhood has been remarkable. Indeed, I have hardly seen one since we experienced two unusually severe winters following each other; but they are now, I am glad to say, increasing. The usual number of Black Redstarts made their appearance, and during the late severe weather between thirty and forty Kingfishers, with several Herons, were received by one Stonehouse birdstuffer alone. A Kingfisher was also brought to him which had been taken on board ship, an account of which I afterwards received from a friend, who was a passenger:—"The Kingfisher was first seen on board 'The Sheila' off the Western Isles, about a week before arriving in port, but it only lived a few days in England. It must have fed on very little whilst on board, as it was only seen in the vicinity of the engine-room, where it was caught." Another Kingfisher was captured near Plymouth with bird-lime.

On February 2nd a fine male Scaup and a Shoveller were obtained, and up to this date, after some severe gales, Kittiwakes were plentiful in the Sound. On the 5th I examined a Common Guillemot, which had thus early assumed its full breeding plumage.

On March 1st *Larus ridibundus*, with full black head, and Lesser Black-backed and Herring Gulls in breeding-dress, appeared. The stomach of a Green Woodpecker I examined was crammed with the white larvæ of a wood-boring beetle about an inch in length. On the 13th I observed the first Wheatear, and, at the same time, the last Black Redstart for the season, at the Devil's Point, Stonehouse. A male Peregrine Falcon was killed two days since at Sheviock, near St. Germans, Cornwall; its plumage was immature, but there were a few new barred slate-coloured feathers appearing on the back; its stomach contained the feathers and legs of a Blackbird and Green Linnet.

This reminds me of the extraordinary number of Greenfinches which made their appearance in this neighbourhood at the beginning of the winter, remaining until the end of March. Indeed, places in the Docks, where ships discharged their cargoes of grain, actually swarmed with them, and when on the ground, although mingled with the usual vast flocks of Sparrows frequenting the locality, their plumage gave a strong green tint to the assembled flock. Hundreds were caught by the birdcatchers, who, I was informed, sent the wings or skins to London to be used as ornaments for ladies' hats; but for the truth of this statement I cannot vouch. At the beginning of the close season I took steps to put a stop to such wholesale destruction. About the same time Mr. J. H. Gurney, jun., remarked the appearance of a similar multitude of Green Linnets in the neighbourhood of Norwich (Zool. 1885, p. 150). By April 23rd Razorbills were in full breeding plumage.

On May 9th observed the first Swifts. The stomach of a Cuckoo examined was filled with the larvæ of the fox-moth. Several Tawny Owls and a Great Spotted Woodpecker were brought to our birdstuffer within the last few days, and I saw at his shop a large and very old tame Duck, which had assumed the plumage of the drake, even to the curled feathers in the tail. He had also a singular variety of the male Blackbird, the whole plumage of which was pure white, with the exception of the tail, which was of a deep black, although, strange to say, the upper tail-coverts were as white as the rest of the body.

For the month of June there is little to record, except that the birdstuffer received several Tawny and Barn Owls.

On July 4th I visited the breeding-place of the Herring Gulls at Wembury, and found about the usual number of old and young, some of the latter having grown to a large size, although not yet able to fly. On a shelf close to a nest and two young birds lay a large piece of conger eel, which appeared not to have been touched.

At the beginning of August, whilst fishing in the Cattewater, Plymouth, I observed some Kittiwakes, which seemed to fly in a most extraordinary and unusual manner, with very quick beats of the wings. I afterwards ascertained (on examining one killed) that this was owing to the quill-feathers of both wing and tail being so worn and abraded by picking and exposure to the

weather during the breeding-season as to appear like those of a dried skin badly attacked by moth. On the 7th I saw, at the birdstuffer's, a young Greenshank and an adult female Pochard, the tail- and wing-feathers of the latter being much worn and faded in colour; also a very young Black-headed Gull in its first plumage, showing the brown crescent-shaped mark on the back of the neck, a state of plumage in which it is rarely met with on our part of the coast. It was shot at Warleigh, on the River Tavy. On August 15th examined a young Green Sandpiper, and, on the 19th, another; both were killed at Ivybridge, near Plymouth. A Quail was obtained on the 23rd, a bird seldom met with in this part of the country. Many Choughs, I am told, have been seen on the Cornish coast this summer.

THE MOLLUSCA OF THE COUNTIES OF KENT, SURREY
AND MIDDLESEX.

BY T. D. A. COCKERELL.

(Concluded from p. 341).

Helix cartusiana var. *leucoloma*.—Beechborough, near Folkestone (Mrs. Fitzgerald).

[Var. *rufilabris*.—Lewes (T. S. Hillman).]

H. rufescens.—Very common. Kingsgate, Monkton, Canterbury (L. Fenn), St. Mary Cray, Dorking, Bedford Park.

Var. *rubens*.—Folkestone (A. H. Shepherd); near Caterham; Bedford Park.

Var. *albida*.—St. Mary Cray; near Putney; Hampton Court.

H. concinna.—Minster, Orpington, Godalming, Ealing.

Var. *albida*.—Ebbsfleet; near Oxted.

Var. *minor*.—Dover (Jeffreys).

H. hispida.—Reculvers, Orpington, Redhill, Ealing.

Var. *albida*.—Chislehurst; Walton Heath, near to Tadworth Court, with *H. rotundata* v. *Turtoni* (K. M'Kean).

Var. *subglobosa*.—Hammersmith (Jeffreys).

Var. *subrufa*.—Headley Lane (Loydell and Rowe).

Var. *nana*.—Walmer (A. H. Shepherd).

H. sericea (= *granulata*, Ald.).—West Drayton (R. W. Cheadle); near Sevenoaks (Smith); one dead shell at Reigate (E. Saunders); also reported from Hants, East Kent, and Herts.

[Var. *cornea*.—North Hants (Fitzgerald).]

H. fusca.—Morden College fields (Cooper). [Recorded for East Sussex and Bucks.]

H. virgata.—Abundant on the chalk. Walmer, Birchington, Orpington, Croydon, &c. Middlesex (W. D. Roebuck).

Var. *albicans*.—Near Faversham (Fairbrass), and Surrey.

Var. *subalbida*.—Near Faversham (Fairbrass).

Var. *subaperta*.—Epsom Downs (Loydell and Rowe).

Var. *submaritima*.—Pegwell Bay. [Isle of Wight (Pickering).]

Var. *alba*.—Surrey. [Near Yarmouth, I. of Wight (C. Ashford).]

[Var. *major*.—Eastbourne (J. W. Taylor). Var. *minor*, Afton Down, Isle of Wight (C. Ashford), where also are found var. *nigrescens* and var. *leucozona*. Monst. *sinistrorsum*, near Afton toll-gate (C. Ashford).]

H. caperata.—Westgate; Orpington; near Shiere; Acton.

Var. *major*.—Surrey (Choules); also said to occur in West Kent, at Erith, and East Sussex.

Var. *ornata*.—Near Orpington; Box Hill (Loydell and Rowe); Willesden.

Var. *Gigaxii*.—Sandwich (Jeffreys).

[Var. *alba*.—Isle of Wight (Jeffreys); var. *obliterata* and var. *fulva*, Yarmouth, Isle of Wight (C. Ashford).]

H. ericetorum.—Local. Kingsdown, near Deal; Margate; Chislehurst; Orpington (S. C. C.); Warlingham.

Var. *alba*.—Kingsdown (A. H. Shepherd); Selsdon, Woldingham Downs, and many other places, almost as common as the type (K. M'Kean).

Var. *major*.—Kent (Loydell and Rowe).

Var. *minor*.—Riddlesdown (A. H. Shepherd).

H. rotundata.—Abundant. Minster, Orpington, Shiere, Perivale, Ealing.

Var. *alba*.—Eynsford; Otford; Folkestone (A. H. Shepherd); Headley Lane (Loydell and Rowe); Addington; Orpington; Leatherhead (J. H. Ponsonby); Chislehurst (S. C. C.).

[Var. *rufula*.—Herts.]

Var. *Turtoni*.—Haling Park, in a chalk quarry (K. M'Kean).

[*H. rupestris**.—Lewes (Hillman); Singleton (W. Jeffery).]

* *H. rupestris* has been recorded from Mickleham by Cooper, but I think this requires confirmation. In the Census of Mollusca in the July 'Journal of Conchology' this species is down for East Kent and Herts, but I am not aware of the precise localities. It has also been found in Oxfordshire.

H. pygmæa.—Margate, one specimen near Foreness Point; Gatton Park (E. Saunders); Orpington; Barnes; under fragments of chalk or stones lying among the grass on the southern slopes of the Surrey Downs (K. M'Kean). [Near Winchester (B. Tomlin), and in East Sussex.]

H. pulchella.—Margate, Chislehurst, Shiere, Twickenham.

Var. *costata*.—Margate, Ebbsfleet, Chislehurst, Reigate, Kew; Grove Park, Chiswick.

H. lapicida.—Fairly common in West Kent and Surrey, but in East Kent I have never taken it living, although dead shells are not rare at Minster and near Deal. Bickley; near Shiere, &c. [South Essex (W. D. Roebuck).]

Var. *albina*.—Reigate (E. Saunders). [Reading (Col. Wilmer).]

Var. *minor* has been found at Epsom (Daniel).

[*H. obvoluta*.—Up Park, Sussex (J. E. Harting); near Winchester (B. Tomlin); Buriton, Hants, and all along the hill-side from Buriton to the dell, Treyford. Common at Treyford, in beech woods chiefly, and specially near water (J. Gordon).] [Add to localities named Ashford Wood and Stonor Hill (Rev. W. Hawkes); Kingley Vale, near Chichester (W. Jeffery); Crabbe Wood, near Winchester (W. A. Forbes); amongst moss at the roots of hazel, and on beech trees at some height from the ground.—ED.]

[*Cochlicella acuta* (= *Bulimus acutus*).—Eastbourne (Langdon, *vide* Jenner); Isle of Wight. Var. *elongata*, Needles (E. Westlake, *vide* Taylor). Var. *bizona*, Highdown, near Freshwater (C. Ashford). Var. *alba*, var. *strigata*, and var. *inflata*, Afton Down (C. Ashford).]

Bulimus montanus.—Near Godalming (H. W. Kidd); beech wood skirting the grounds of Waverly Abbey, Farnham (K. M'Kean); rejeamenta of Thames near London (Cooper). [Near Buriton (Rimmer).]

B. obscurus.—Foreness Point; Orpington; Reigate.

Var. *albinos*.—Bickley; Bromley; Sevenoaks (Smith); near Croydon (Rimmer). [Hants, Essex, and East Sussex.]

B. goodallii.—Kensington Palace Garden (Miss Donald); Nursery-ground, Tottenham (C. Ashford); Weybridge (Daniel). This is not an indigenous species, but has been introduced among cultivated plants.

B. ellipticus.—Fossil in Woolwich beds.

Pupa umbilicata.—Minster; Bickley; Shortlands; near Reigate; Middlesex (W. D. Roebuck).

Var. *edentula*.—Upper Gatton, near the Suspension Bridge, and at Chipstead (K. M'Kean).

Var. *albina*.—One thrown up by the sea at Margate (S. C. C.).

Pupa marginata.—Birchington; Chislehurst, but apparently confined to an area a few yards in extent; Blackheath (Loydell and Rowe); Epsom Downs (M'Kean); rejectamenta of Thames at Twickenham (S. C. C.).

Var. *edentula*.—Rejectamenta of River Stour near Richborough; Chislehurst; Epsom Downs (M'Kean).

[Var. *bigranata*.—Lewes and Beachy Head (Rimmer).]

[*P. secale*.—Recorded for Sussex, Herts, and Bucks. Lewes (C. H. Morris). Var. *minor*, Sussex.)]

Vertigo antivertigo.—Barnes; margin of Basingstoke Canal near Brentwood (M'Kean); Redhill (E. Saunders).

[*V. moulinsiana*.—Hants and Herts.]

V. pygmaea.—Near Oxted; rejectamenta of River Stour at Richborough; Box Hill, Wray Park, and Reigate (E. Saunders); rejectamenta of Thames at Twickenham (S. C. C.).

[*V. alpestris*.—Fossil at Coptford, Essex (British Museum).]

V. substriata.—Redhill (Daniel *vide* E. Saunders).

V. pusilla.—Near Reigate (E. Saunders).

V. angustior.—Battersea Fields (Stephens).

V. edentula.—Surrey (M'Kean); Beechwoods, near Reigate (E. Saunders).

V. minutissima.—Thrown up by the sea at Margate (S. C. C.). [Isle of Wight.]

Balea perversa.—Kingsdown (A. H. Shepherd); Bickley; Wray Park (E. Saunders); Coombe Lane (M'Kean); Perivale (R. W. Cheadle); Grove Park, Chiswick, two very young ones (D. B. C.). [Near Winchester (Tomlin).]

Clausilia rugosa.—Very common on trees, &c. At Ebbsfleet I found over 100 at the roots of one small willow tree. Minster; Canterbury (Miss L. Fenn); Orpington; near Dorking; Bedford Park; Kensal Green.

Var. *gracilior*.—Near Ramsgate (Sclater); Battersea Marshes (Jeffreys); Headley Lane (Loydell and Rowe). [E. Sussex.]

[Var. *dubia*.—"New Forest." Var. *albinos*, Dinton Hall, Bucks Goodall); Colchester (Rimmer); Christchurch (Ashford).]

Monst. *dextrorsum*.—Sevenoaks (Smith).

C. Rolphii.—Very local. Plentiful in Belvedere Park under chestnut trees, and also on Plumstead Common (H. Leslie); near Dorking; Shooter's Hill Road (Loydell and Rowe); Leatherhead (J. H. Ponsonby). [Robertsbridge, Sussex; Up Park, Sussex (J. E. Harting); near Winchester (Tomlin).] This species is very frequently found in company with *Azeca tridens*; this was the case with the Dorking, Leatherhead, and Robertsbridge localities, and Mr. C. Ashford reports it as occurring with *A. tridens* var. *crystallina* at Petersfield. [The following localities for this species may be added:—Charlton, Ashford, Sevenoaks, Southborough, Tunbridge Wells, and Mickleham, near Dorking. It is generally found in damp situations in woods, amongst dead leaves and moss, and under nettles and dog's mercury, as well as on the trunks of trees.—ED.]

Var. *Mortilleti*.—This is said to have been found in Kent, and also, according to R. Tate, at Hastings.

C. biplicata.—Near Putney; near Hammersmith; Fulham; two in rejectamenta of Thames at Dartford Creek (H. Leslie).

Var. *Nelsoni*.—Near Hammersmith (J. W. Taylor).

C. laminata.—Canterbury (Miss L. Fenn; Orpington (S. C. C.); Bickley; Warlingham; Epsom and Ranmer (Loydell and Rowe); Dartford (H. Leslie).

Var. *albida*.—Eynsford; Ranmer Common (Loydell & Rowe); Darnwood, Kent (Stephens); White Hill, Surrey (M'Kean).

Var. *pellucida*.—Dartford, on the chalk (H. Leslie).

Cochlicopa (Azeca) tridens.—Near Dorking; Leatherhead (J. H. Ponsonby).

Var. *crystallina*.—Near Reigate; Stanstead, Kent (Smith); Leatherhead (J. H. Ponsonby). [Lewes (Hillman); Well Wood, Sandridge, Herts (Griffith).]

[Var. *nouletiana*.—Lewes (Hillman).]

C. (Zua) lubrica.—Reculvers; Orpington; near Godalming; near Willesden; Bedford Park.

Var. *minor*, Fischer.—Elmstead, Chislehurst, one under an oak tree.

Var. *minima*, Siem.—Barnes Common.

Var. *nitens*, Kokeil.—Redhill (J. Daniel).

Var. *hyalina*.—Fetcham Common, near Leatherhead (K. M'Kean). Var. approaching *lubricoides*, Farnborough, Kent.

Achatina acicula.—Washed up in immense numbers by the

sea at Birchington; one at Ebbsfleet; one in the rejectamenta of the Stour at Richborough; one at Chislehurst (S. C. C.); Barnes (S. C. C.); rejectamenta of Thames at Kew; Ealing (Brown); Croydon (M'Kean); near Reigate Heath (E. Saunders). [Essex, Herts, Sussex. Afton Down, Isle of Wight (C. Ashford).]

Carychium minimum.—Rejectamenta of River Stour at Richborough (S. C. C.); Chislehurst; Barnes Common; Perivale, near the canal.

Cyclostoma elegans.—Orpington; Epsom (Loydell and Rowe); near Godalming, &c.; East Kent (W. D. Roebuck).

Var. *marmorea*.—Croydon (C. Ashford).

Var. *fasciata*.—Chatham (C. T. Musson, *vide* J. W. Taylor); near Shiere.

Acme lineata.—Folkestone (Mrs. Fitzgerald); also recorded for Gatton, Surrey (E. Saunders); under moss on old posts at Battersea (Cooper). [Bucks.]

Var. *alba*.—Folkestone (Mrs. Fitzgerald).

CEPHALOPODA.

Octopus vulgaris.—Ramsgate (J. T. Hillier).

Sepia officinalis.—Pegwell Bay (S. C. C.)

Sepiola Rondeleti.—Ramsgate (J. T. Hillier).

Loligo vulgaris.—Margate.

L. media.—Ramsgate (J. T. Hillier).

Ommatostrephes sagittatus.—Kent and Sussex. Folkestone (Forbes and Hanley).

[*Rossia macrosoma*.—Isle of Wight (Forbes and Hanley).]

ADDENDA.

Kellia suborbicularis.—Margate (S. C. C.).

Syndosmya nitida.—Margate (S. C. C.).

Astarte triangularis.—A single valve at Margate (S. C. C.).

Pisidium nitidum.—Acton Green, in a stream.

P. fontinale.—Bushy Park, Middlesex.

P. fontinale var. *pulchella*.—Ditch between Lee and Charlwood (K. M'Kean).

Anodonta anatina var. *radiata*.—In the little stream between Pendell Court and Redhill, but only at one spot where the bottom is sandy; they are associated with *A. cygnæa* (K. M'Kean).

Unio tumidus var. *radiata*.—Near Twickenham (E. H. Rowe).

Anodonta anatina, var. approaching *complanata*.—Near Twickenham (E. H. Rowe).

Valvata piscinalis monst. *sinistrorsum*.—Sunbury (Groves).

[Mr. H. P. Fitzgerald sends me the following list of Mollusca recently taken by himself in the neighbourhood of Preston Candover, North Hants:—*Valvata piscinalis* var. *depressa*, *Ancylus lacustris* var. *albida*, *Amalia marginata*, and the dark variety before mentioned, *Limax flavus*, *L. arborum*, *Helix aspersa* var. *tenuior*, *H. lapicida* var. *albina*, and *Vertigo edentula*.]

[*Neretina fluviatilis* var. *cerina*.—Christchurch (Ashford).]

NOTES AND QUERIES.

The British Association.—The accounts received from Aberdeen concur in representing the meeting recently held there to have been a most successful one. A great number of papers were read in the different sections, some of which, owing to pressure of time, had to be divided into sub-sections. In Section D, *Biology*, the chief feature was the address of the President of the Section, Prof. W. C. McIntosh, on the Phosphorescence of Marine Animals, a full report of which will be found in 'Nature' for ~~Nov.~~ *Sept.* 17th. Sir John Lubbock contributed an interesting paper on Ants, in continuation of former researches on the same subject; and a Report was read from the Committee appointed to collect evidence on the subject of the Migration of Birds. To this Report we hope to refer more particularly in our next number.

MAMMALIA.

Habits of the Squirrel.—As the Sparrow is becoming a source of trouble to the agriculturist, so is this well-known rodent a cause of anxiety to the forester in those districts north of the Tweed where the *Coniferae* flourish. The Squirrel has also another peculiarity in common with the Sparrow, *i. e.*, that it is well known both in town and country; in the former case he may be seen whisking round seemingly in endless rotation in his cage,—the delight of every small girl or boy that passes,—whilst he perhaps imagines each turn will bring him nearer to those pine-woods far away, where he was born. Whilst on the subject of cages, I recollect having long ago had a Squirrel in a cage, which, like most wild animals taken young, became very tame with kindness; one day he escaped, taking up his abode in some fir-trees at some distance from the house; whenever my old nurse went near his new abode, on rattling her keys down he would come, for these selfsame keys opened the box in which his nuts were kept; at length

however, a day arrived when he did not appear to the well-known signal—his love of nuts had brought him within reach of the gardener's long-muzzled gun. To those living in the country, on the other hand, especially in well-wooded districts, from the first leaf of summer to the last of autumn the Squirrel is constantly to be seen, whether chattering in the pine-tops, taking those flying leaps from tree to tree with such rapid movement as to bring to mind his American congener, or watching with the brightest of eyes from the sheltering foliage of a nut-bush the approach of his sworn enemy the irate gardener. In the early morning, too, in summer he may be seen wending his way across the lawn, with tail uplifted to avoid the dew. The Squirrel, like all rodents, is very prolific, but is unlike most of the order, however, in building its nest in a tree, placed generally near the top of some evergreen, which serves the double purpose of concealment and protection from the winter gales. The exterior of the nest, although not unlike that of the Magpie, is far more comfortable within, for as the Squirrel generally passes the colder winter months in a state of partial hybernation warm materials are required to keep up the animal heat so necessary to healthy vitality; in the nest, too, the provident animal has a store of its favourite food, nuts and different kinds of cones, Squirrels delighting in the seeds they contain. This county being celebrated for its nuts, either in the hedges or cultivation, is consequently a land of plenty to them; they have no difficulty in laying in their winter stores. I recollect an old oak-tree in the garden of a house I lived in once, the rugged bark of which was filled with nut-shells, the *débris* of a Squirrel's feast, for the ingenious animal to save itself the trouble of holding the nuts placed them firmly in the deep furrows of the bark whilst the process of gnawing was going on. The Squirrel is very destructive to most kinds of conifer, gnawing off the young shoots; they will also in dry weather attack the shoots of other trees, particularly the horse-chestnut. This predilection of theirs for the pine-shrubs imparts a turpentinous flavour to the flesh, for although the Squirrel is not eaten with us, to the inhabitants of other European countries it is looked upon as a delicacy. I remember once, whilst shooting Woodcocks in the forests of the Morbihan, Lower Brittany, one evening on returning from "la chasse," meeting my host in a state of suppressed excitement; on enquiring the cause of so much feeling, he told me that he had made "grande chasse," desiring me at the same time to inspect the "*gibier*," so in we went to the "salon" of Monsieur. "There," cried Monsieur de F., pointing to the ceiling; looking up I saw hanging from two nails an old Crow and a Squirrel; a feeble grin was my only reply. So pleased, however, was he that I was asked as a great treat to dine with him that evening "pour manger l'écureuil." In declining the proffered hospitality I thought it might have been worse if it had been the aged specimen of *Corvus corone*. The tail of the Squirrel undergoes a curious change in colour as age

advances, the luxuriant brown making way for a creamy colour, the hair at the same time becoming scanty; the teeth, strange to say, except for great discoloration, do not as a rule exhibit much change as the Squirrel gets older. If Squirrels become too numerous, they will degenerate not only in size, but in general appearance; as this is caused by too much interbreeding there is nothing strange in it. It is to be hoped that the Squirrel will not, like many other interesting animals, be improved off the land; it is consoling to think that his depredations are mostly confined to the property of what I may call the non-speculative classes, who can regard his pretty ways as a fair recompense for the damage done by his sharp teeth.—HERBERT GOW STEWART (Hole Park, Rolvenden, Kent).

BIRDS.

An Albino Nightjar.—Mr. Pratt, the taxidermist of Brighton, has just now in his shop an albino Nightjar, which was shot at Northease, near Lewes, on or about August 20th. Seen in an ordinary light the bird appears perfectly white; but, with a strong light, faint bars can be seen on the tail, and also a faint line on the scapulars. Mr. Pratt tells me that the eyes were pink.—HERBERT LANGTON (115, Queen's Road, Brighton).

Notes from Hunstanton, Norfolk.—The cold dull weather and N.E. winds seem to have brought down the birds on their autumn migration earlier than usual this year. Adult Sanderlings were pretty plentiful by August 1st; on the 12th I shot the first Knot (young bird), and on the 13th a beautiful mature Turnstone. On the 22nd I shot an adult Richardson's Skua, like the central figure in 'Yarrell,' and saw one or two more of the same species. An immature Cormorant passed me within easy shot near the bathing-machines, and was soon after shot from the pier-end by a boatman. On the 25th I got an immature Purple Sandpiper, and had just picked it up when a large flock of Golden Plover passed high overhead, flying due south. Wild Geese have been seen on one or two occasions this month (August), but, as none were shot, the species cannot be identified.—JULIAN G. TUCK (St. Mary's, Bucknall, Stoke-on-Trent).

Ring Ouzels in Gardens. — With reference to the note, "Ring Ouzel feeding on Cherries," and editorial remarks thereon in 'The Zoologist' for September (p. 346), I find recorded in my diary that Ring Ouzels are constant visitors to the garden at Skelpick Shooting-lodge, in Strathnave, Sutherlandshire, when the fruit is ripe. They are even more numerous and troublesome there than the Blackbirds and Thrushes, paying especial attention to the raspberries. I was in the garden on two occasions in August last and saw a good many of these birds, finding it by no means easy to dislodge them from the raspberry-bushes. The tenant of the Lodge informed me that they did considerable damage to his fruit. — S. G. REID (Capt., late R.E.).

Ring Ouzel feeding on Cherries (p. 346).—I have lived nearly forty years in a district in which the Ring Ouzel breeds almost as abundantly as the Blackbird. They are only too pertinacious and too destructive in my garden, and the gardens of my parishioners and others throughout this district. They come in by dozens if left undisturbed for a day or two, and they are distinctly bolder than the Blackbird. Cherries, strawberries, currants (black and red), raspberries, gooseberries, and plums, all are attacked by them, and I have to wage a perpetual war on them and the Blackbirds to prevent the plunder of my garden to the extent of one-half or more. The Blackbirds generally make a precipitate retreat on being disturbed after having been shot at a few times; the Ring Ouzel or (as he is called here) Moor Blackbird retreats only to the nearest wall or a fruit-tree, where he keeps up a frequent cry of disapprobation. The bilberries ripened late this year, and the Moor Blackbirds were in the garden as early as towards the latter part of July; then, after the bilberries were exhausted, they came in again in numbers, as usual. As to their breeding-places here, I should say that the majority breed near the edge of the moor, and very few in proportion on its more remote parts. I have frequently seen these birds on the open moor about the last week in August, when they, to all appearance, are preparing for their southward migration. I was, however, over a large area of moorland on August 31st without seeing a single bird of this species, the edges of that area having to my knowledge furnished breeding-places for, I dare say, nearer a hundred couples than half that number, and food during the bilberry season for any reasonable number. In my walks to and from a distant chapel-of-ease along a customary track or rough road, I used, three or four weeks since, to disturb half-a-dozen to half-a-score within a space of 100 yards, and all the stones and tracks near testified to the aggregate number feeding about by the countless deep purple stains occasioned by their droppings. — J. C. ATKINSON (Danby, near Cleveland).

Discovery of the Eggs of the Knot.—I beg to enclose an extract of a letter to me from Lieut. A. W. Greely, U.S.A., referring to this subject, which extends into rather more detail than the note by Dr. Hart Merriam in the July number of 'The Auk,' reprinted with comments in 'The Zoologist' for September:—"Washington, D.C., May 25th, 1885. My dear Major Feilden,—I have had it in mind many a day to tell you how a Knot's egg looks, but my strength is not equal to all demands, and I have been silent. In the egg-sac of a Knot were found twenty-one eggs, all sizes, including one completely-formed egg with hard shell. Its longer axis was 1·10 in., and the shorter about 1·0 in. The ground-colour was light pea-green, closely spotted with small brown specks about the size of a pin's head.—A. W. GREELY." It would therefore appear that the members of the Greely Expedition had no better luck in finding the actual

nest of *Tringa canutus* in Grinnell Land than the British Expedition of 1875-76. Both expeditions seem to have been singularly unfortunate in this respect, for the Knot during the breeding-season was tolerably common in the neighbourhood of Discovery Bay (Fort Conger station of the Americans), as well as around Floeberg Beach, the winter-quarters of H.M.S. 'Alert,' still further north. Our Arctic voyagers to the Parry Archipelago in the first half of this century seem to have found the Knot breeding there in great abundance, and its nest and eggs do not appear to have been considered difficult to find. I fancy that the Knot must be far more numerous there than in Grinnell Land. — H. W. FEILDEN (West House, Wells, Norfolk).

Gathering of Swallows and House Martins. — There is no surer sign of the waning year—no better or more interesting indication of the advent of autumn days—than the congregation of many migratory birds ere taking their departure to the oases of Northern Africa. Swallows and Martins perhaps congregate, previous to migration, as much as, or even more than, any other birds. One of the prettiest of these "autumn manœuvres" it has ever been my lot to witness came under my notice on August 22nd last. I was travelling up to London by the South Western Railway from Exeter, and when about four miles from Salisbury we stopped for a few minutes at the little country station of Wilton. Close to the station is a large field crossed by two telegraph-wires, the posts being perhaps 150 yards apart. From end to end these wires were covered with Swallows (*Hirundo rustica*) and House Martins (*H. urbica*), the latter species preponderating. So thickly did they cluster that from a distance the wires resembled two large cables; and every now and then fresh arrivals would strive to alight by pushing off their companions, when the chain seemed broken for a moment ere every bit of room was again taken up. The air was one dense throng of fluttering "Swallows," and their merry notes could be heard above the noise of the engine as it fretted and fumed, all impatient to be off again. It was indeed a pretty sight, just in the sunset hour, when the air seemed flooded with a soft almost unnatural golden light, and all Nature filled with repose. Hope beat high in each little Swallow-breast; the resistless impulse to migrate was dawning in each youthful bird; whilst dim recollections of distant Africa filled the old ones with desire to leave their northern home once more to sport and gambol over the palm-groves of the south. Yet how many of this fluttering throng will never reach the distant goal, but quietly succumb to the perils of the long journey before them!—CHARLES DIXON (London).

Lesser Black-backed Gull breeding on the Yorkshire Coast. — Mr. Carter's interesting note (p. 346) has quite satisfied me that the Lesser Black-backed Gull nests on the coast of Yorkshire. The comparatively low cliffs between Scarborough and Filey, with their grass-covered ledges, would

be much more congenial to this species than the almost perpendicular chalk precipices at Buckton and Speeton. Mr. Carter may well be congratulated on having added this fine species to the list of Yorkshire breeding-birds.—
JULIAN G. TUCK (St. Mary's, Bucknall, Stoke-on-Trent).

Black-chinned Bramblings. — Mr. J. H. Gurney's interesting remarks (p. 346) on Black-chinned Bramblings induce me to add a few words to his note. The first male Brambling, with a black chin only a quarter of an inch in extent, which I came across was given to me by an East London birdcatcher, but I have forgotten where he netted it. Referring to my annotated 'Yarrell,' I find that on March 25th, 1884, I closely examined about fifteen dozen Bramblings at once in the Spitalfields shops, all being fresh-caught birds from Cambridgeshire. Out of all the number I only counted five females, and only one male showed a tendency to variation. The black feathers irregularly besprinkling the throat of this bird show, to my mind, that the presence of the black feathers on the chin or throat is due to an extension of the black face over the surface of the throat. It is not "melanism" any more than the presence of a white chin in a "cheverel" Goldfinch could be strictly termed "albinism"; nor does it arise, I imagine, from unhealthy condition; I regard it rather as a mark of vigour than otherwise. But if, as I am disposed to think, it is only an extension of the black colour of the head, it is obvious we could not expect to find it in the brown or grey-headed female. A third example exhibits an entire black throat to perfection, and from its general brightness is probably an old bird. It was shot near Carlisle, November, 1882. — H. A. MACPHERSON (Carlisle).

FISHES.

The Fish Gallery at the Natural History Museum. — Since the publication of our last number the new Fish Gallery at the Natural History Museum, South Kensington, has been opened to the public. This fine gallery, 140 feet in length by 50 feet in width, is approached from the central hall through the Bird Gallery, out of which it opens at right angles. The greater portion of this collection, which has been arranged by Dr. Günther, F.R.S., the Keeper of the Zoological Department, is exhibited in a series of wall-cases round the room; while the larger specimens, such as the Sharks, Dolphins' Sword-fishes, Wolf-fish, Sun-fish, &c., are arranged on stands and table-cases in the centre of the gallery. A Guide to this collection, we understand, is in course of preparation, and will shortly be printed.

MOLLUSCA.

Uncommon Varieties of Arion and Limax. — Conchologists will be glad to hear of fresh English localities for two uncommon varieties of slugs. I recently found *Arion ater* var. *bicolor* fairly abundant at Chideock, near Bridport, and at New Quay, in Cornwall. At the latter place I also found

a very fine specimen of *Limax maximus* var. *Ferussaci* — ANTHONY BELT (Ealing).

[We do not find these varieties noticed in Gwyn Jeffreys' well-known Text-book. *Arion ater* var. *bicolor* is described by Moquin Tandon (Hist. Nat. des Mollusques, ii., p. 11) as of a dull brown colour, yellowish or orange at the sides; and two coloured figures of a young specimen, one elongated, the other contracted, are given on Plate i. of the Atlas to Ferussac's grand work, 'Hist. Nat. Gen. et Part. des Mollusques Terrestres et Fluviatiles.' *Limax maxima* var. *Ferussaci* is described by Moquin Tandon (*tom. cit.*, p. 29) as of a whitish hue, the mantle covered with round black specks and four rows of larger spots of the same colour. A segment is figured (Plate iv, fig. 5) for comparison with segments of other varieties placed side by side on the same plate, from which it appears that var. *Ferussaci* resembles most nearly var. *cellurius*. It may be well perhaps to point out that the slugs of the genus *Arion* differ from the *Limacidae* or common slugs in having the respiratory orifice placed in front instead of near the hinder part of the shield, in having a slime-gland at the tail, and also in the arrangement of the teeth.—ED.]

CRUSTACEA.

Pisa tetraodon at Penzance.—I have to record the capture in my own nets of a specimen of the very rare Crab (off our shores), the Four-horned Spider Crab, *Pisa tetraodon*. Its correspondence with Bell's description is perfect. My specimen is a female, in fully berry, which will make its preservation somewhat difficult, but my friend Mr. E. Maynard means to attempt it. Bell remarks of this Crab that it frequently occurs in large numbers in given localities, and I have trustworthy information that a Crab of this description (said by the local fishermen to be seen nowhere else) occurs off Port Isaac, on the north coast of Cornwall. I obtained a specimen of this Port Isaac Crab some weeks ago, and put it down as *Pisa Gibbsii*; but, looking at my present capture, I think the Port Isaac Crab is more probably *Pisa tetraodon*.—THOS. CORNISH (Penzance).

NOTICES OF NEW BOOKS.

The Great Auk or Garefowl: its History, Archæology, and Remains.

By SYMINGTON GRIEVE. 4to. London: T. C. Jack. 1885.

As there can be no doubt that the Great Auk, or Garefowl, is now to be numbered amongst birds which are extinct, no living example having been met with for more than forty years, the time seems to have arrived for publishing as complete a history as can be compiled of this very remarkable species. Such a

history has been attempted by Mr. Symington Grieve in the handsomely-printed volume before us.

To a considerable extent, no doubt, the labours of the author have been lightened by the previously-published researches of John Wolley, Prof. Newton, Prof. Steenstrup, M. Victor Fatio, Prof. Blasius, and Sir Richard Owen, all of whom have printed important contributions to the literature of this subject. But, as Mr. Grieve points out in his Introduction, these memoirs are scattered in different volumes and publications of Scientific Societies, and his own work, he says, has been undertaken "not with the impression that he has much to relate that is new to British ornithologists, but more with the desire to bring within the reach of all materials that are at present difficult of access."

In order to determine the area in the northern hemisphere in which the Great Auk existed, Mr. Grieve very properly begins by tracing out the localities in which it is known to have bred, the records of its occurrence or capture, and the places where its remains have been discovered. The following haunts seem to be historically well attested, namely, St. Kilda, Orkney, possibly Shetland, Farøe, the three Garefowl rocks off the coast of Iceland, Danells or Graahs Islands, situated in latitude $65^{\circ} 20' N.$, at one time called Gunnbjornsskjoerne; then, proceeding westward to the East Coast of North America, we find abundant evidence of its former occurrence on Funk Island, off the coast of Newfoundland, as well as on some of the islands in the Bay of St. Lawrence, and at Cape Breton; while another station on the same coast at which it probably occurred was Cape Cod, apparently the southern limit of the region in which the bird lived.

In European seas the Garefowl in historic times is not known to have been ever so plentiful as it was in American waters. There at one time, as we learn from the narratives of early voyagers (Carthier, André Thévet, Hore, Parkinson, and others), the fishermen visiting Newfoundland were wont to kill numbers of them for food during the time the birds were assembled on the islands for the purpose of breeding, and whole boat-loads of them used to be carried away to be salted down for provisions. It is easy to understand what a disastrous effect such wholesale destruction must have had upon a bird which could never have been very numerous as a species, which, even if unmolested, could not have increased very rapidly (since it laid but a single

egg), and which, from its incapacity for flight, must always have been more or less at the mercy of its enemies, especially those who, having discovered a breeding-colony (as on Funk Island), ruthlessly slaughtered all they could.

These no doubt have been the chief causes of its extinction. Prof. Steenstrup is of opinion that we should also take into consideration the fact that some of the nesting-places of this bird have been liable to violent natural disturbances, in which circumstance he sees at least a subsidiary cause of the Garefowl's decrease in, and disappearance from, a few places, as, for instance, the Gerfugl Rocks off Iceland.

The result of Mr. Grieve's labours (as embodied in the present volume) to collect and arrange all the materials available for a history of this remarkable sea-fowl will be most acceptable to ornithologists, although we cannot say that the arrangement of matter is so good as it might have been, or that it is altogether free from inaccuracies. We could point out a few errors, typographical and otherwise, and perhaps supply a few references to passages in other works which Mr. Grieve apparently has not consulted, as, for example, a passage in Wallis's 'History of Northumberland,' 1769 (vol. i., p. 340), and a paper, by the late Dr. Charlton, published in the 'Transactions of the Tyneside Natural History Society,' and afterwards reprinted in 'The Zoologist' for 1860.

The paper on the Great Auk, by Prof. James Orton, to which Mr. Grieve refers as being "cut out of some scientific Magazine or the Proceedings of a Society," adding that he "does not know its source," may be found in the 'American Naturalist,' vol. iii., pp. 539—542. The footnote to this paper (p. 540), very briefly alluded to by Mr. Grieve, was not penned, as he supposes, by Prof. Orton, but by Mr. F. W. Putnam, one of the editors of the journal in question. It is worth quoting in full:—

"That the Great Auk was once very abundant on our New England shores is proved beyond a doubt by the large number of its bones that have been found in the ancient 'shell-heaps' scattered along the coast from British America to Massachusetts. The 'old hunter' who told Audubon of its having been found at Nahant was undoubtedly correct in his statement, as we have bones of the species taken from the shell-heaps of Marblehead, Eaglehill in Ipswich, and Plumb Island; and Mr. Elliot Cabot has informed me that an old fisherman living in Ipswich

described a bird to him that was captured by his father in Ipswich many years ago, which, from the description, Mr. Cabot was convinced was a specimen of the Great Auk."

At. p. 85 of Mr. Grieve's volume he remarks, with reference to the remains from the shell-heaps near Ipswich, Mass., above alluded to, that he has been unable to ascertain where these bones are at present preserved. If we mistake not, they are to be found in the Peabody Museum at Cambridge, Massachusetts, of which Museum Mr. F. W. Putnam, above mentioned, is the Curator.

The following lines by an accomplished friend, Mr. H. W. Freeland, M.A. (late M.P. for Chichester), and never before published, may be appropriately printed here as a contribution to the poetic literature of the subject:—

THE GAREFOWL.

They seek thee far and near, from shore to shore,
Through creeks and rocks and Outer Hebrides,
As wandering Science fondly sought of yore
The missing Sister of the Pleiades.

'Mid Faroe Islands, where the Gulf Stream flows,
Diffusing warmth and plenty on its way,
They seek thee, while with beauty twilight glows,
And bright Auroras lengthen out the day.

The Orkneys know thee not, though once their boast;
Volcanic Iceland lash'd by wave and storm,
Seeks fruitlessly along her rock-bound coast
The outline of thy once familiar form.

They seek thee where Norwegian Fjords abound,
And bold adventurers every creek explore;
Where feather'd tribes securer haunts have found
'Neath sheltering crags on Scania's rugged shore.

They find thee not! strange mystery that Man
Hath oft his great Creator's works displac'd,
Thou, once a wonder in Creation's plan,
Art now a lingering shade on Memory's waste.

In addition to other illustrations (including those of bones of this bird found in Caithness, and a sheath of an upper mandible from a cave near Whitburn Lizards, Co. Durham), Mr. Grieve's work contains two excellent coloured figures, of the natural size,

of two Great Auks' eggs which are preserved in the Museum of Science and Art, Edinburgh, and a coloured chart purporting to show the supposed distribution of *Alca impennis* (so far as can now be ascertained), its breeding-stations, and localities where specimens of the bird have been procured.

There are, unfortunately, several errors in this chart, owing to its having been prepared before the letterpress was printed, and of which the author himself became aware when too late to make any alterations. The necessary corrections, however, are pointed out in a few pages of "Remarks" following the Index, so that the reader may with a little trouble inform himself of the true state of the case.

European Butterflies. By W. F. DE VISMES KANE, M.A., M.R.I.A.
Post 8vo, pp. xxxiii. 184, pls. 20. London: Macmillan & Co.
1885.

THIS work is intended to meet the requirements of tourists more fully than any previous English publication on the same subject; and the author even ventures to hope that it may attract new disciples to the study of Entomology. Mr. Kane has had considerable experience in collecting in Switzerland, but whether he has succeeded in producing a book which will really be so useful as he hopes is another question.

The volume commences with a rather long Introduction, in which the author expatiates on the delights of collecting; and adds some practical hints for the capture and preparation of specimens, explanations of technical terms, and remarks on localities, variation, &c. On p. xxv. he speaks of the latent tendency of certain butterflies to occasionally recur to a blanched Arctic type, as seems to be the case with such of the *Coliidæ* as inhabit temperate or northern latitudes, and the females of which frequently present an albino form. But as the white form of the female is more abundant in the South African *C. electra* than in many species which inhabit colder countries, and even the *Helice* form of *C. edusa* is commoner in Southern than in Northern Europe, it seems very doubtful whether the white form of *Colias* can be regarded as having any connection with the Arctic Regions.

Next to the Introduction we find the plates, which are entitled

to favourable consideration as being reproduced from photographs, and to a certain extent experimental. But, except in the case of butterflies, in which the colours are very strongly contrasted, photography is rarely very successful. Any defect in the setting or condition is faithfully reproduced, and one side of the same figure is frequently much more distinct than the other. Further experiments are necessary before photographic representations of butterflies can be regarded as preferable to good woodcuts; while coloured figures, unless so inaccurate as to convey a totally false idea of the insect, are, in the reviewer's opinion, far preferable to plain ones, and are almost necessary for beginners. Mr. Kane, however (p. xxvi.), takes an opposite view, observing—"Coloured plates, though attractive to the eye, are (unless of rare merit) too frequently useless, if not misleading, to the student."

On turning to the body of the work we at once encounter its most serious defects. Mr. Kane has unfortunately adopted a plan so imperfect as to render his book useless to beginners, unless they use it in conjunction with others; and it is to be regretted that no attempt has been made to make it complete in itself within its own limits. No characters are given for the families, except for the *Hesperiidæ*; while the observations prefixed to some only of the genera are of the most general character, and rarely give any idea of the appearance of the species which they include. Mr. Kane remarks (p. xxi.), "The niceties of arbitrary classification, many of which will become obsolete with a wider study of this order of insects, are out of place in a work of such small compass." But, as a rule, the families and genera of European butterflies are well-defined and natural, and are capable of being explained in a few words. Whether a group is a family or subfamily, and its position in a natural system; and whether a genus admits of subdivision or not, are questions which would be out of place in a popular work; but this is no reason why all information on the characters of families and genera should be withheld, nor why everyone who does not happen to know the genus to which a butterfly belongs should be obliged to work through the entire book to find it, for want of a few words which would point out its approximate position. Under *Papilio machaon* the author writes, "A description of the British swallow-tail is unnecessary. The bright primrose gro. col. f. w. [ground-colour of fore wings] is in this

species and *P. hospiton* broken into patches by the black rays, &c.” The other European species of *Papilio* are all described in comparison with *P. machaon*, of which no full description is given. A less serious omission is that of descriptions of larvæ, though it may be conceded that few tourists have time or opportunity to rear them. It is true that the food-plants are generally noticed; but it is a pity that the characters of the larvæ of the various genera were not given, for if this information had been supplied, tourists, and especially residents abroad, might chance occasionally to discover the metamorphoses of many species of which the earlier stages are still unknown. The larvæ of a large number of Alpine butterflies in particular still remain undescribed.

Mr. Kane has been careful to notice all the varieties of each species, and this portion of his work will be useful to those who have already some acquaintance with the normal type, and who have not larger works at hand for reference. The tables of species prefixed to large genera will also be found useful.

Much space has been given to the localities for each species, and, if these had been carefully collected and arranged, the list might have formed one of the most useful portions of the book. Unfortunately it is both incomplete and misleading. A good many localities are given in France and Switzerland; but beyond these two countries the information given is usually vague and general. Thus, although *Apatura iris* is common over a great part of Europe, the localities enumerated are (with the exception of Piedmont) all in France and Switzerland, though its occurrence in Russia is incidentally mentioned. Alsace is enumerated as a locality for *A. ilia*, both under France and Germany. Owing probably to defective punctuation, we find Dresden among the Austrian localities for *Lycæna meleager*; and we have noted other similar slips.

We have never heard of *Danaïs chrysippus* having been taken in England, as stated at p. 83; but the N. American *D. archippus* has been met with several times within the last few years, and we imagine that Mr. Kane has confused the two insects.

The design of Mr. Kane's book is good, and we regret that we have not been able to speak of it more favourably. The defects to which we have referred are not fundamental, and with due care may be remedied in a second edition.

Lord Malmesbury's Reminiscences of Sport and Natural History.

In 'Memoirs of an Ex-Minister.' 2 vols. 8vo. London: Longmans & Co. 1885.

In the two entertaining volumes which Lord Malmesbury has published, entitled 'Memoirs of an Ex-Minister,' in which the author's experiences of men and manners are set down in diary-form, we find occasional entries relating to sport with gun and rod, and to the habits of wild animals, which possess an interest for sportsmen and naturalists, but which are likely to be overlooked by readers who might perhaps suppose that an Ex-Minister could have nothing to write about but subjects of political or social import. Lord Malmesbury, though a busy man, who from the exigencies of his position was obliged to be much in London during the earlier and middle part of his political career, had yet a keen appreciation of country life, and enjoyed a good day's shooting or fishing as much as any man. His methodical habits induced him to note these "good days" in his diary, and it is to be regretted that the few scattered entries which are to be found in his book do not supply fuller details which from a sportsman of his experience would have been both interesting and valuable. His experience of stag-hunting in France, to which country he was a frequent visitor, often as the guest of the Emperor Napoleon III., is thus alluded to:—

"1837, *June 15th.*—The Duke of Orleans is extremely kind and civil to me, and asked me to hunt at Chantilly. The Stag broke away from the forest, and took us nearly to Beauvais. His Royal Highness presented me with the foot, which the artist Susse has turned into a pen-rack. The Duke also gave me the buttons of his hunt. The costume is dark blue, with a red collar; his crown and initials on silver buttons" (vol. i., p. 81).

It is perhaps not generally known that deer when brought to bay have a habit of defending themselves by striking vigorously with their fore-feet as well as with their horns. Gilbert White, in one of his letters to Pennant (Letter VII.), thus relates how a dog was killed in this way by a hind in the forest of Wolmer:—
"Some fellows suspecting that a new-fallen 'calf' was deposited in a certain spot of thick fern, went with a lurcher to surprise it, when the parent hind rushed out of the brake and, taking a vast spring with all her feet close together, pitched upon the neck of the dog and broke it short in two."

Lord Malmesbury relates that he was once attacked by a deer in this way himself:—

“1849, *Sept. 22nd.* — I had been out deer-stalking; and as I was returning home alone, and by bright moonlight, I saw a hind on the hill a little above the road and shot her; but just as I was stooping over her with a knife, she sprung up and struck at me with one of her fore-feet, hitting me in the forehead just between the eyes. The blow was so violent that it knocked me down and stunned me for a short time, and on recovering my senses I found I was quite blind, but this was only from the blood. Her hoof had cut a deep gash in my forehead and along my nose. The animal was lying quite dead by my side. I walked to the house, which was not far off, and the maid who opened the door was so frightened at my appearance that she fainted forthwith. This laid me up for a week, but with no further consequences” (vol. i., p. 253).

At his hospitable country seat, Heron Court, near Christchurch, Hants, he used to enjoy some of the best wildfowl-shooting to be had in this country, and fortunate were the guests who were invited to participate in it:—

“1850, *Nov. 15th.*—Heron Court. Lord Clanwilliam and Lord Stanley arrived. The two being the quickest men I know, amused us much by chaffing one another, and I think on the whole Lord Clanwilliam had the best of it. They both of them enjoyed the wildfowl-shooting very much, and were as eager as two boys” (vol. i., p. 266).

It would have been interesting to know what the “bag” was on this occasion, as also on other occasions when the diary refers to the noble author’s having enjoyed several days’ covert shooting at Knowsley:—

“1851, *Nov. 10th.*—Arrived at Knowsley. Lord Stanley (now Earl of Derby) looks very ill. Great *battue* shooting for next three days.”

His own success in shooting he rarely chronicled, although in his best days he must have been no mean performer with a gun. Here is the result of one shot, however, of which he was justly proud:—

“1854, *Jan. 6th.*—I stalked a flock of Wild Geese behind my pony and got within thirty yards of them, killing five. Very severe weather, with a gale from the S.W., and snow” (vol. i., p. 421).

Occasionally Lord Malmesbury was the guest of the late Prince Consort at Balmoral, where, as might be expected, he enjoyed both good and varied sport. He relates the following amusing incident during a deer-drive in which he took part:—

“1852, *Sept. 4th.*—The Prince had a wood driven not far from the house. After we had posted in line, two fine stags passed me, which I missed; Colonel Phipps fired next, and lastly the Prince, without any effect. The Queen had come out to see the sport, lying down in the heather by the Prince, and witnessed all these *fiascos*, to our humiliation!” (vol. i. p. 347).

Amongst the wildfowl killed at Heron Court there were usually a very large number of Teal, and sometimes extraordinary bags were made by good shots. Thus:—

“1853, *Jan. 31st.*—Lord Anson and Mr. Bentinck arrived; we three went out duck-shooting on the moor’s river, and killed 166 Teal. I record this feat, because I believe it to be unequalled with three ordinary guns. They were in thousands after a long flood throughout November and December” (vol. i. p. 383).

In October of the same year we find the noble author back again in Scotland, at Achnacary, where, on the 20th of that month, he was joined by the Hon. Grantley Berkeley, who, as we learn from the diary, “was as agreeable as he always is; but, considering his great reputation as a sportsman, he did nothing in deer-stalking, being past the age for walking over Lochiel’s mountains.” (Vol. i. p. 407). The author himself a few days later—

“Killed a good Stag at 168 yards—a running shot through the head (luck, of course)—yet he recovered by the time the dogs and men got up to him, and made a good fight, shaking off the hounds several times, charging one of the gillies, and tearing his clothes with his antlers. Berkeley killed a *Salmo ferox*, weighing 18 lbs., in Loch Arkaig” (vol. i. p. 407).

He himself in this same loch killed a bull-trout of 18 lbs., and Lord Edward Thynne a Salmon of 13 lbs. (Vol. i. p. 439).

On the next page we read:—

“1853, *Nov. 5th.*—Went to the Forest of Gerran (a primæval wood stretching along the shores of Loch Arkaig), and killed a magnificent Stag with twelve points, a cup on each horn, and double brow-antlers. This wood and that of Gusach, lining the shore of Loch Arkaig, are certainly primæval. The hill is clothed with immense pines, and with almost impenetrable heather. Among the *débris* of centuries and in an older stratum lie many gigantic oaks; one I measured was sixty feet long, and perfectly sound. They were evidently the ancient possessors of the mountain before the younger generation of the red pine usurped their place” (vol. i. p. 408).

In the following month (November, 1853) he was again the guest of the late Emperor of the French, and shooting at Chantilly:—

“1853, *Nov. 26th.*—A grand shooting party in an enclosed space of ground. A squadron of Hussars marched up when we arrived, and dismounted to act as beaters. Sky-blue uniform and red trousers. As they wore spurs they were constantly tripping up! There were a great number of Pheasants and some Roe-deer; the latter unable to escape, being fenced in. The guns were the Emperor, Chaumont, Soulageon, Edgar Ney, Col. Henry, Prince Napoleon, Marshal Magnan, Lord Cowley, and myself. We bagged 210 head. More than one Hussar was peppered, upon which his comrades cried out, ‘*Tiens, tu as de la chance, toi! tu seras décoré!*’ The Emperor shot very well, and was most civil to Lord Cowley and me” (vol. i, p. 412).

But of all the entries in the diary, the following will perhaps possess the greatest interest for sportsmen of all classes, since it points to the existence of another journal still in MS., which relates exclusively to sport, and which, we doubt not, a good many of our readers would give much to peruse:—

“1853, *Dec. 26th.*—Mr. and Mrs. Disraeli, Mr. and Lady Augusta Sturt, and Lord Anson arrived at Heron Court. Disraeli very low at Palmerston’s resuming office, as he thinks the Government are now safe. He is very much occupied and pleased with my library, which was compiled by three generations of men of totally different tastes. The first, my great-grandfather, usually called ‘Hermes,’ was a great Grecian and classical scholar, and collected all the most perfect editions of the ancient writers. The second, my grandfather, a diplomatist and politician, added all the best specimens of European authors of the last two centuries; and my father, all the most modern literature of his time. What seemed, however, to strike Disraeli more than anything was an autograph journal by my father, recording his sporting pursuits daily for forty years, in which is noted every shot he fired, killed, or missed, with a careful memorandum of the weather day by day” (vol. i. p. 418).

Is it too much to hope that this autograph journal may some day be published? The results of forty years’ experience related in his own words by an ardent sportsman would be eagerly perused by those of similar tastes, and are surely too valuable to remain hidden from public gaze in the library at Heron Court.



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BIRD-LIFE IN POMERANIA.

BY DR. THEODORE HOLLAND, OF STOLP.

(Concluded from p. 367.)

So much for the Pomeranian woods and coasts in winter; how different are they when we return to the same places in spring! Snow and ice have melted away, "Frühlingslüfte sind erwocht, sie säuseln im wehen bei tag und bei nacht." Nature rises in renewed youth; Earth has laid aside her mourning for departed autumn, and has put on a fresh green robe, so as to receive her blooming son Spring in full state. All creatures follow the example of Mother Earth, and everywhere is joy and gladness. From bush and bough it sounds, Rejoice! spring has come with music and singing, bringing from the south our dear old friends whom we believed to be dead. The merry aërial hosts have again returned, and celebrate their arrival with a grand concert. Fresh comers present themselves, and mutually greet one another.

The Wood Lark (*Heidelerche*), which in the forest takes the place of its cousin, the Sky Lark (*Feldlerche*), as messenger of spring, soars into the air, and warbles in sweet full notes its gratitude to the friendly sun. But the Thrush (*Drossel*) will not be outdone, the whole wood resounds with its jubilant song; and the Hoopoe (*Wiedekopf*), "Kukuksküster," as the country folk call him, with his coloured plumage and crested head, reiterates the greeting no less loudly, though his entire song consists only of one note repeated over and over again.

The Titmice (*Meisen*), Buntings (*Ammern*), and especially the many coloured, loud-voiced flocks of Finches (*Finken*), having

recovered from the privations of winter, welcome one another with new songs from vigorous throats. A pretty Blue-throated Warbler (*Blaukehlchen*) peeps from the erl-bushes near the ditch, twitting his joyous ditty; and Turtle Doves (*Turteltauben*) coo tenderly in the dark secrecy of the fir-trees. Flycatchers (*Fliegenfängen*) and Willow Wrens (*Laubvögel*) are also there, and softly twitter their short strains without intermission, as if their songs were the best of all. And through the spring air, and amid all this joyous life, the mournful song of the Redbreast (*Rothkehlchen*) trembles complainingly, although, in truth, he himself is anything but sad. It is almost as if a sigh of melancholy were heard through the joyous spring voices. But the Golden Oriole (*Goldamsel*) will not suffer it; his mellow whistle drives away every gloomy thought: he is strongly assisted by friend Cuckoo (*Kukuk*), who, according to the popular belief, has again laid aside his hawk-like form and character, and loudly announces his arrival to everyone, especially warning the small songsters to be once more ready to nurse and feed his greedy young ones. He is also supposed to possess the gift of prophecy. He not only informs those who will listen to him how many years they have yet to live, but also whispers to curious maidens how long they will remain unmarried. But the Cuckoo is a rogue, and deceives his listeners so often that at last they no longer believe in his prophecies. If the Cuckoo is heard after St. John's-day it is said there will be a bad year, but it is supposed he brings good luck to those who hear him for the first time, with money in their pockets.

Whilst we are thus engaged in listening to this varied concert, we are suddenly startled by a loud knocking; instinctively we look round, and perceive a Spotted Woodpecker (*Buntspecht*) sitting on a dry branch, and hammering it with his beak. The reason of this bird's appearance, neither ornithologists nor foresters have yet discovered.

Thus joy and gladness, peace and harmony, seem to meet us at every turn; but alas! not so in reality. "Struggle for existence," is the primary motto of Nature, and strife and destruction follow as necessary consequences. The birds of prey have returned from their winter-quarters in far-off Africa, and are beginning to disturb the peaceful life of the inhabitants of wood, meadow, and water. There, circling in the blue ether,

soars the Osprey (*Fischadler*), the enemy of all fresh-water fish; ever higher and higher he rises, the white feathers of the under parts shining brightly in the clear sunlight. Now he darts forward like a Gull, suddenly turns over, and then descends with quieter flight. Poised for a minute above the water he spies his prey below him, and, swift as an arrow, drops into the water, which almost closes over him; then, shaking the spray from his feathers, he rises with a struggling fish in his feet, and flies off with it. The eyrie is as remarkable as the owner of it. Whilst other birds take pains to conceal their nests amongst thick branches and foliage, the Osprey makes his home in the most exposed situation he can find, choosing the most lofty, and, if possible, the driest point, of the highest tree in the neighbourhood; so that the eyrie, overlooking all, is visible from afar. The dry twigs and branches, of which the nest (from three to five feet high) is built, are bound closely together with mud and earth.

A sharp cry now announces that another Eagle is soaring above us, the shy Spotted Eagle, *Aquila nœvia* (*Schreiadler*), who circles round and round while keeping a sharp look-out below for food. Suddenly every bird becomes silent, and slips away into the bushes, or crouches on the ground, as a Peregrine Falcon (*Wanderfalke*) dashes by—the terror of all birds from Duck and Plover to the smallest of the feathered tribe.

A timid Buzzard, which, through hunger, has been trying to catch mice in the field, hastens back, with heavy wings, to the forest, pursued by importunate Crows (*Krähen*), and, screaming, seeks shelter among the trees.

Our way leads us past the eyrie of another feathered robber. By knocking hard on the tree, we disturb a brooding Goshawk (*Hühnerhabichte*), whose mate is paying a visit to a neighbouring farmyard in search of his daily tribute of hens and pigeons. With the greatest dexterity and courage he pursues his prey, and seldom misses his stoop; in his blind haste he even follows his victim into houses. I once saw a Goshawk thus entrap himself in a pigeon-house while in pursuit of a pigeon. The female of this species, like that of all other birds of prey, surpasses the male in size and strength, as well as in cruelty and recklessness; cases have been known of a female Goshawk killing her mate and young ones.

Farther on, in a high beech-tree, is a broad flat nest, which, by the fluttering rags we recognise as that of the Kite (*Königs-gabelweihe*), and, indeed, a couple of these scavengers are now approaching, carrying rags, with which to line their nest. More of a thief than a robber, the Kite is little feared by other birds; and in the dry branches of an oak-tree close by we hear a Wood Pigeon (*Holztaube*) cooing softly to his mate, whose long absence has made her anxious; while "Master Carpenter" (Woodpecker) is busy in the same tree building for himself and his family. The same duties are being performed in a very artistic manner by the kindred families of Finches (*Finken*) and Titmice (*Meisen*). A Great Titmouse (*Kohlmeise*) already sits assiduously on twelve eggs; one can hardly comprehend how a pair of such small birds are afterwards able to feed so many hungry bills.

From a neighbouring brook a little party of Green Sandpipers (*Schwalbenschneppen*) announce their arrival with sharp notes. Quick as lightning they circle through the trees, searching for the last year's nests of Thrushes (*Drosseln*), and Jays (*Heher*), as a foundation for their own.

Storks, both black and white, and all the Heron family (*Reiher*), have arrived, and with renewed strength recommence their struggle with every living thing that they can subdue. Screened by the trees we quietly watch a couple of Cranes (*Kranich*). With half-open wings, and curious springs and turns, the male bird dances round his mate, calling tenderly to her the while.

The marsh leads into a large meadow, which in turn stretches down to a lake. Scarcely have we entered the marsh when a watchful Plover rises from the grass and warns the sitting birds of the approach of danger. The hen Plover (*Kiebitz*) runs quickly through the grass, then rising at some distance endeavours with her mate to allure the intruder from the neighbourhood of the nest by anxious cries and odd manœuvres; now they dart towards us as if they were going to attack us with their beaks, or tumble sideways as if with broken wing; then they run on some distance, and rise again to recommence their play until we have safely passed their nest. From this curious behaviour those who look for Plover's eggs can tell with exactitude where the nests are, and whether they contain newly-laid eggs or young birds. Not less loudly than the cry of the Plover sounds the clear whistling

of the Curlew (*Brachvogel*), whose nest is also somewhere in the marsh. Crows (*Krahen*) are swarming everywhere, pursued by the pair of Curlews with sharp bills and anxious whistling. There is a perpetual animosity between these birds, for the Crows have a *penchant* for the savoury eggs of the Curlew, and watch every opportunity to steal and eat them. Besides these, numerous small Dunlins? (*Strandläufer*) enliven the marsh; and from the grass the note of the Common Sandpiper (*Rothscheckel*) and the monotonous cry of the Corncrake or Landrail (*Wiesenknarrer*, *Wachtelkönig*) greet the ear.

A loud humming sound makes us look up, where a Snipe (*Bekassin*) is flying here and there with amusing playfulness, making that curious noise in descending which has suggested the name of "Sky-goat" (*Himmelsziege*). At a short distance from us are several curious-looking birds, each one differently coloured, but all with a high long-feathered ruffle round the neck, giving them a remarkably quaint appearance. These are Ruffs (*Kampfhähne*, *Burrhähne*), which hold their tournaments here in the pairing season. They fight so vehemently with one another, that we can approach within forty paces without being observed, and can plainly see how they have trodden down the grass on the spot selected for their tournaments. Suddenly they perceive us, and are off. In front of us a little Titlark (*Wiesenpieper*) flies twittering from stem to stem in the grass; and a slender Yellow Wagtail (*Bachstelze*), with quick up and down movement of the tail, runs about gravely in front of us. Hundreds of Black-headed Gulls (*Lachmöven*) and Terns (*Seeschwalben*) whirl through the air with their peculiar cry, looking like large snow-flakes in the bright sunshine, an effective contrast to the green marsh in its fresh spring dress. Further away some Hen Harriers (*Wiesenweihen*) appear; and a lovely Hobby (*Baumfalke*), flying towards the forest, stoops on his way at a small screaming bird with graceful dexterity.

In the shallow water, near the shore of the lake, stands a motionless row of larger birds; with one leg drawn up close to the body, the long thin neck bent back, and the strong-pointed beak half hidden in the puffed feathers,—the Heron (*Fischreiher*) stands in philosophical tranquillity and stoical indifference, regardless of the noisy ways of other birds, amongst which the Reed Thrush (*Rohrsperrlinge*) takes care to make himself

conspicuous. But such apathy is only feigned. The cruel greedy eye is immovably fixed on the surface of the water: presently an unsuspecting fish approaches; like lightning the long neck is raised, one sharp sure thrust of the powerful beak in the water, and the fish is caught. As if in sport it is then tossed in the air, only to fall head foremost into the insatiable maw of its captor. On the smooth surface of the lake swims the Common Coot (*Blässhuhn*), and the Crested Grebe (*Haubentaucher*) has also its nest here. Although not visible to our eyes, they give notice of their presence by monotonous hoarse cries. Between the water-plants green-legged Spotted Crakes (*Rohrhühner*) are bustling about; and further on there are some Ducks (*Enten*) on the water, amongst which we recognise the Common Duck and Mallard (*Stockente*), the smaller Teal (*Kräkente*), and the Pintail (*Schiessente*) with their slender necks. Slowly over the lake, without any perceptible motion of his wings, soars a Black Kite (*Schwarzer milan*), watching eagerly for prey. The Ducks care little for him, and continue to float carelessly on the water; but suddenly a Peregrine Falcon (*Wanderfalke*) appears, also looking for prey. A panic seizes the whole feathered flock; even the impudent Crows (*Krähe*) fly away terror-stricken; the Ducks swim as low as possible in the water, or if on shore, crouch upon the ground, for only thus are they safe from the dreaded Falcon; and woe to the bird who, trusting to the swiftness of his wings for safety, is overtaken and struck down.

On the other side of the lake a deep ditch winds through the fir wood, and extends as far as the coast, in the steep banks of which we may find the nesting-holes of the bright blue-backed Kingfisher (*Eisvögel*). Miners as well as fishermen, they have dug out a horizontal tunnel, at the bottom of which the young ones are couched upon a layer of fish-bones.

Continuing our walk through the forest we reach the broad shining sea. Birds are scarce here at present. A few Black-headed and Common Gulls (*Lachmöven* and *Sturmöven*) are looking for food on the beach; and here and there a Tern (*Seeschwalben*), wiser than the Plover (*Kiebitze*), has not yet begun nidification, because, according to law (in Pomerania), all eggs laid before the 1st of May can be taken to supply the kitchens of those who are partial to Plover's eggs and Gull's eggs. Further on some Ducks are on the moor; Mallards (*Stockenten*), whose

iridescent green heads shine like emeralds in the evening sun; many-coloured Sheldrakes (*Brandenten*) perpetually moving; Common Teal (*Krükenten*); Shovellers (*Löffelenten*), whose beauty is spoilt by their unshapely bill; and still further on some Red-breasted Mergansers (*Sägetaucher*). All the numerous winter visitors to our sea-shore have returned to the undisturbed breeding-places of their northern home, to visit us next autumn in increased numbers.

In the meantime the sun has sunk below the horizon into the sea, dyeing the firmament and water with brilliant purple tints as a last farewell. Twilight falls upon the earth, and warns us to turn our steps homeward. We wend our way back through the old forest, through which the dark shadows are already creeping. Tired and silent we wander on, now and then roused from our reverie by stumbling over some projecting root of a tree. Every object melted into vague indistinct outlines; and the profound silence of the forest—interrupted only by the crackling of the dry twigs on which we tread, or the movement of the branches lightly stirred by the wind, and the croaking of the frogs heard afar off through the lovely May night—excites the fancy, and makes the mind susceptible to the influence of things apparently supernatural, whose origin cannot be accounted for. Suddenly the stillness of the wood is broken by sounds which fall on the ear like ghostly voices from the air and branches above us: “komm mit, komm mit” (come with us), these invisible spirits of the wood seem mockingly to say. While still listening in wonderment, another curious noise comes from a tree near us; a loud “whirr,” as if a spinning-wheel was being turned quickly; and as soon as it ceases on one side of us, it is heard again on the other. Have we lost our way in the domains of some angry forest fairy, who has banished a party of spinning maidens to the place to disturb the silence of the night with their humming?

To our relief, we learn from wiser mouths that the first voice we heard was that of the Little Owl (*Steinkauze*), whose cry is interpreted by the common people as an announcement of death; and it in consequence receives the name of the “Death-bird” (*Todtenvogel*). The whirring noise we heard is made by the Nightjar, or Goat-sucker (*Nachtschwalbe*), which acts as the night-police of the wood, keeping a sharp look-out for insects which prowl about in the dark, and punishing them summarily.

But these sounds appear to be only the introduction of the usual nightly concert. A Long-eared Owl (*Waldshreule*) begins *piano*, with a long protracted scream, which sinks into hollow deep notes; a Tawny Owl (*Waldkauz*) joins in *crescendo*, with disagreeable hoarse tones; and then all the Long-eared and Tawny Owls of the neighbourhood fall in one after another until they reach a protracted *fortissimo*; a loud frightfully discordant chorus, with a burst of hideous laughter as a *finale*. This unearthly music does not drown the hollow disagreeable hooting of the great Eagle Owl (*Uhu*), which approaches nearer and nearer, and is not unlike the baying and yelping of a hound; now it changes to jeering laughter, shouts of joy, sharp screams, or hollow deep cries, echoing the bird's own name (*Uhu*), accompanied by quick movements and snapping of its beak. This is the terrible concert which Owls and Goatsuckers keep up during the night; and is well calculated to create alarm in anxious and superstitious minds, inducing them to ascribe these noises to supernatural powers; so that the story of the wild huntsman and other fairy tales seem almost entitled to be regarded as true. But having listened long enough to this discordant music, we hasten on our way, rejoiced to think that, hungry and tired as we are, we shall soon reach home.

ON SOME VARIATIONS IN *HELIX ARBUSTORUM*, LINN.

By B. B. WOODWARD, F.G.S., F.R.M.S.

SOME months ago my attention was called to a paragraph, by Mr. J. W. Taylor, in the 'Scottish Naturalist,' recording the discovery of *Helix arbustorum* var. *Baylei*, Lecoq., near Loch Brora, in Scotland. I at once wrote to Mr. W. Baillie, of Brora, who was said to have found it, and he very kindly placed at my disposal all his duplicate specimens of *H. arbustorum* from that northern neighbourhood.

The cursory examination made at the time of its arrival showed that the little collection afforded some very interesting peculiarities regarding the variations in colour, markings, &c., to which this species is liable; but until quite lately no opportunity occurred for working them out.

The amount of variation exhibited in specimens coming from the same spot is very striking, and led to my enquiring into the value of the named varieties (so-called) of this species. The conclusion was irresistible that, however useful such distinctions may have been in the past, they are totally inadequate to present requirements, not to say unscientific, whilst their retention is even mischievous in encouraging too close an insistence on trivial and valueless minutiae to the overlooking of the broader generalisations that underlie them; and this is true of other species equally with the one at present under consideration.

In the first place, of course, I sought for the var. *Baylei*, Lecoq., which was said to be new to Britain. The description given by Moquin Tandon* as follows:—"v. *Baylei* (Lecoq. ! in litt.). Coq. plus petite, plus conoïde, extrêmement mince, fort transparente, d'un jaune verdâtre clair, unicolore."

What may be implied by the ! after Lecoque's name I cannot ascertain; but it is evident that he never published a description of it, and it is at best a MS. name.

Many of the immature specimens in the collection answer very well to this description. They are perfectly transparent, extremely thin, and destitute of any markings whatsoever (reminding one strongly in these respects of *Vitrina pellucida*, Müll.† (a likeness enforced by the presence of a dent in one specimen, showing that the shell was quite soft when the animal was extracted); the colour, too, is greenish yellow. These specimens, however, are matched in every respect, save that of colour, by other examples, also immature, from the same locality, the tint in these cases being a pale red-brown. Moreover, amongst the adult specimens, both fulvous and rufous, it is by no means uncommon to find examples in which the upper $3\frac{1}{2}$, or even 4, whorls are manifestly free from markings of any kind, thus showing that in their youth they, too, resembled the specimens just described, till at a given period of their growth, and immediately after an evident pause in the same, they acquired (sometimes quite suddenly) the full markings of the typical form.

* Hist. Nat. Moll. France, ii. p. 124.

† Mr. J. W. Taylor also notes this similarity of texture (Journ. Conchol iii. p. 253.

“The young shells,” says Gray, when speaking of this species,* “have a thin lip, with a slight white internal rib,” a fact which is apparently unnoted by any other observer, save Mr. J. W. Taylor,† who reproduces Gray’s words, though by some oversight, unusual with him, he has omitted to name his authority. This white internal rib is not, however, of universal occurrence in the immature specimens, as evinced by the examples before me, and seemingly it is coincident with a check in the growth of the mollusk; but when once formed it is permanent, and adult specimens will frequently exhibit one or two such internal ribs, marking stages of growth, the only external indication of their presence being a lighter band of colour across the whorl, interrupting the markings when such are present, and coinciding with the lines of growth. Strange to say that, common as this phenomenon is in the adult forms, and almost typical of the species, it does not appear as yet to have been recorded. In *H. rufescens*, Penn., *H. Pisana*, Müll., and *H. virgata*, Montf., the same thing occurs, and, as far as I can judge from a cursory examination, all the *Helices*, which in the adult stage have a thickening or rib within the usually unreflected lip, are liable to form two or even three such ribs in the course of their growth. In those *Helices*, however, which, like *H. aspersa*, have a more or less reflected lip when adult, the pauses in growth are indicated only by an interruption in the markings on the exterior of the shell.

The amount of variation in the ground colour of the shell shown in these Scotch specimens, even in those from one spot, is somewhat remarkable. Out of twenty-four specimens collected at Rock, near Loch Brora, six adult and ten young ones are of the red-brown or rufous type; one adult is nearer the normal colour; one adult and five young belong to the yellow or fulvous type; and one adult individual is olive-green speckled with yellow, the band corresponding in colour with the ground tint, whilst the interior is purplish brown. One of those belonging to the fulvous group appears to the naked eye to be of a uniform yellowish tinge, the spiral band being pale brown; when

* Turton’s Manual of Land and Fresh Water Shells of the Brit. Is., ed. Gray, 1840, p. 138.

† Journ. Conchol. iii. p. 244.

examined with a lens, however, the seemingly uniform tint resolves itself, in the last half whorl, into a series of excessively fine, parallel, wavy, spiral bands alternately opaque and clear. To take another example, out of twenty-seven specimens from Golspie Burn (just south of Brora), two adult and two young individuals belong to the rufous type, one of them being the darkest coffee-brown coloured example I have seen; two adult and eight immature specimens are near the normal hue; three adult and ten young belong to the fulvous group, of which some have a decided greenish tinge, whilst one is straw-coloured.

In size they also vary greatly, as the following figures giving the dimensions in millimetres of some of the adult specimens will show. To save repetition the numbers are arranged so as to give, (1) altitude, (2) maximum and minimum diameter, (3) height and width of the aperture, (4) the number of whorls; then follows the type of colour, and lastly the locality:—

20.	22 × 19.	11 × 11.	6.	Olive-green.	Rock.
18.	20 × 19.	11 × 11.	5½.	Rufous.	,,
17.	20 × 17.	11 × 10.	5½.	,,	,,
17.	19 × 17.	11 × 10.	5½.	Normal.	,,
16.	19 × 17.	10 × 9.	5½.	Rufous.	Golspie Burn.
17.	20 × 17.	10 × 5.	5½.	Normal.	,,
16.	19 × 17.	10 × 10.	5½.	,,	,,
19.	22 × 19.	12 × 11.	5½.	Fulvous.	,,
17.	19 × 17.	10 × 10.	5½.	,,	,,
20.	22 × 20.	12 × 12.	5½.	Rufous.	Loch Brora.
16.	20 × 17.	10 × 11.	5¼.	,,	,,
19.	21 × 19.	11 × 12.	5½.	Normal.	,,
15.	18 × 15.	10 × 10.	4¾.	,,	,,
18.	20 × 17.	11 × 11.	5½.	Fulvous.	,,
14.	19 × 17.	10 × 10.	4½.	Normal.	Tongue.

The last example quoted is a most remarkable one; the spire is not more elevated than in *H. cantiana*, Montag., and has a rather knocked-about appearance, as though it had had a hard time of it, which is not unlikely, seeing that it was taken by Mr. Baillie in the extreme north of Scotland at Tongue, near the sea, and, I am informed, associated with *H. ericetorum*, Lister, though to this companionship its depressed state is not

attributed.* The severity of the climate in that northern latitude and the hard living must, doubtless, be held responsible for its distorted aspect, and to the same causes, acting possibly a little less harshly, but still rendering the struggle for existence a severe one, must be attributed the abundant variation evident throughout the collection.

To attempt to relegate the variations just chronicled to any of the two and twenty named varieties (so-called), which have been established for this species,† though quite in harmony with the views of a certain school of conchologists in this country and abroad, would be, to my thinking, not only absurd but impossible. For, supposing we do agree that the fulvous specimens, transparent through poverty of lime, and devoid of the customary markings, are the "var. *Baylei*, Lecoq.;" and that the rufous examples, which for the same causes in all save colour are identical with them, are to be estranged from them, and concealed under another varietal name, var. *fusca*, Férus: granted all this, what is to be done with the adult individuals, both fulvous and rufous, that with middle age changed their condition of spotless and transparent youth for the blotched markings and opaque state of the normal shell? Are two brand-new varietal names to be invented for their special benefit? Is it not rather time that these useless distinctions were consigned to the oblivion of the (unscientific) past, more especially as so many of them were founded at a time when fixity of species was a current creed, and varietal names were established on such insufficient grounds as mere differences of colour or divergence in size from a purely arbitrary but supposedly fixed type?

Surely the state of our knowledge is sufficiently advanced to allow of certain variations being admitted as normal, so to speak, to every species, *e. g.*, unusually fine specimens,‡ dwarfed forms, reversed examples, scalariform individuals, and albinos,

* A yet more depressed form from Twickenham is also in my possession. The dimensions are:—13, 20 × 17, 10 × 12, 4 $\frac{3}{4}$, colouring normal. It is, of course, a distorted specimen.

† For a good summary of these see Mr. J. W. Taylor's paper, Journ. Conchol. iii. pp. 246—51.

‡ Generally called "var. *major*": fancy christening the late lamented Jumbo *Elephas africanus* var. *major*!

without its being necessary to distinguish each one by a different varietal or "monstral" name.* It should be enough to record their existence, and that of such variations as are more or less specific, *i. e.*, those of colour, markings, &c. In short, I would advocate the adoption of the method followed by Gray, whose description† of the variations of this species when emended and brought up to date would read as follows:—

The shell of *Helix arbustorum* varies—1. In colour: (a) The ground tint ranges from pale yellowish white through a brownish tawny to red-brown and almost brown-black; whilst a greenish tinge at times prevails over these. More rarely it is olive-green. One specimen has been recorded of a violet colour. Albinism is not uncommon. (b) The frecklings are sometimes partially, sometimes altogether, white.

2. In markings: Sometimes the spiral band, at others the frecklings, and sometimes both, are wanting. The band varies also in strength of colour and a little in width.

3. In thickness: Some specimens being exceptionally solid; whilst examples from elevated situations, where lime is scarce, are exceedingly thin and transparent. (These "starved" forms are frequently devoid of all markings.)

4. In size: According, as the surroundings of its locality are exceptionally favourable, or the reverse, to its development.

5. In shape: According as the whorls are a little more or a little less tightly coiled.

6. Variations due to combinations of the foregoing.

It is sometimes distorted—(1), the spire is more or less elevated or depressed; (2), reversed examples are met with at times; and (3), very rarely it is scalariform (*i. e.*, the spire is elevated and the whorls separated).

Such a summary, when properly annotated and supplemented by more detailed mention of remarkable examples, especially those forms which have at any time been described and regarded as distinct species, would, I contend, be amply sufficient for all purposes, save that perhaps of the amateur conchologist, who wants to expand the catalogue of a scanty collection into a formidable list of names.

* I am glad to see that this is in part admitted by Mr. T. D. A. Cockerell, even whilst coining fresh ones (see *Sci. Goss.* 1885, pp. 179—80).

† *Op. cit.*, p. 138.

In conclusion, I should like to point out that some of the colour modifications, which have been already alluded to as more or less specific in contradistinction to such variations as are universal, seem to be more widely diffused than has hitherto been generally recognised. These colours, of course, are due to the organic pigments in the periostracum and shell, deposited from the pigment-glands in the mantle of the animal, and consequently their modifications are dependent on certain physiological changes in the latter, the cause and nature of which are as yet unknown. Certain it is, however, that many other mollusks besides the subject of this note are liable to the same or closely similar variations in coloration. Thus *Helix aspersa* varies from a pale yellow through tawny to dark red-brown and almost brown-black. *Helix nemoralis* and *H. hortensis*, as every one knows, are both yellow and pink and olive-brown, whilst more rarely lilac examples are met with. *H. (Nanina) citrina*, Linn., has also a range of colour from yellow to red-brown, and slate-coloured examples are known. Amongst the gaudy-coloured Helices from the Philippines, *H. mirabilis*, Sow., varies from pale to dark yellow-brown; and *H. polychroa*, Sow., from a pale brown tinged with streaks of green, to green and to dark coffee-brown. Many other instances might be adduced, but enough has, I think, been said to show there exists some general law at present imperfectly, if at all understood, which it would be well to bear in mind when treating of colour variations; and this it was which prompted me in the foregoing note to confine myself to general terms when dealing with the colour modifications of *H. arbustorum*, and to speak of the "fulvous type" and the "rufous type."

NOTES ON THE VERTEBRATE ANIMALS OF
LEICESTERSHIRE.

BY MONTAGU BROWNE, F.Z.S.

Curator, Town Museum, Leicester.

(Continued from p. 338).

Sylvia cinerea, Bechstein. Whitethroat. "Peggy."—Summer migrant, arriving in April and leaving in September. Generally distributed, and breeding. Harley says, "The young, before they are fully fledged, not unfrequently leave the nest, and creep

about the bushes and thickets in which they have been fostered, but especially so on being disturbed." He also states that this species is double-brooded, which I have no doubt is the case, as the Leicester Museum possesses a nest and young taken by me in the month of August, 1883, at Aylestone.

Sylvia curruca, Naum. Lesser Whitethroat. — A summer migrant, but not quite so common as the last-named. Harley says it is very local. I have not yet received the nest, and have but few notes of its breeding from Mr. Davenport, who considers it, as I do, less common or more local than *S. cinerea*. He gives the dates of the first eggs taken by him as follows:—In 1882, May 8th; 1883, May 30th; 1884, May 17th; and in 1885, May 12th. Mr. Macaulay states that this species arrives earlier than the preceding one.

Sylvia atricapilla, Naum. Blackcap. — Summer migrant. Generally distributed, breeding, but not so common as the last named species. Harley writes:—"It nestles in thick bushes and shrubs, but I have met with its nest on the ground among tall matted grass, composed mainly of cleavers, soft grass, and other vegetable substances, matted and woven together with cobweb. It is lined with hair. The nest, by a careless observer, may be mistaken very easily for that of the Whitethroat." Davenport has found the nest and eggs from 1882 to 1885 between May 8th and 18th.

Sylvia hortensis, Bechstein. Garden Warbler. — Summer migrant. Generally distributed; breeding and more common than the Blackcap. Harley says:—"Nidification commences in May, if the spring be favourable and mild. The nest is rather slovenly and loosely put together, which, when completed, may easily be mistaken for that of the Whitethroat. The fabric is slenderly built, and composed of goose-grass mainly, lined with horse-hair. It is placed generally among nettles, long grass, and tall plants; but more frequently we have met with it fixed to the dwarfed branches of the sloe, or rough twigs of the wild raspberry." The eggs are rather difficult to distinguish from those of the preceding species.

Melizophilus undatus, Newton. Dartford Warbler.—This bird does not occur in the county, and is only now mentioned because it has by error been included in local lists on the authority of Yarrell and Morris, as having occurred at "Melton Mowbray, in

Leicestershire." The individual bird mentioned by Yarrell came from Cambridgeshire.

Regulus cristatus, Koch. Goldcrest.—Resident; generally distributed; breeding. The nest is sometimes suspended from a branch of the spruce fir and other coniferous trees; but not invariably so, for Harley met with a nest fixed laterally on a branch of the yew, after the manner of a Chaffinch. A nest containing eggs was built on the branch of a spruce-fir in the garden of Mr. C. S. Robinson at Eastfield, Stonegate, Leicester. Mr. Davenport has found the nest and eggs in 1882 on April 16th; 1883, May 3rd; 1884, May 1st. Mr. Ingram says, "Often found in our large yew trees."

Regulus ignicapillus, Naum. Firecrest.—Mr. Macaulay states ('Midland Naturalist,' 1882, p. 63) that a pair of these birds were seen at Skeffington in 1880. I doubt whether this species could be distinguished from the preceding if only seen on the wing.

Phylloscopus rufus (Bechstein). Chiffchaff.—Summer migrant. Generally distributed, common, and breeding. It arrives about April 7th, and "two broods are reared during the season. The first has been seen abroad on the wing early in June; the second in August." The earliest record I have of its arrival is March 18th; the average date would be March 25th. Said by Macaulay (at pp. 85-6 of 'Midland Naturalist,' April, 1883) to have been seen at Langton on February 21st, 1882, and also at Gumley, Nov. 11th, 1882. The winter of 1881-2 was the mildest ever known in the Midlands. I heard a Chiffchaff several times in a small spinney at Aylestone, in 1883, as late as September 21st.

Phylloscopus trochilus, Newton. Willow Warbler.—Summer migrant; generally distributed and breeding. I have received nests and eggs of this bird from Aylestone, Belvoir, Bradgate, Knighton, and other places, much more frequently than those of the Chiffchaff. Apparently it is equally common with that bird, and its nest is just as skilfully concealed. Davenport writes:—"In June, 1882, I found a nest of this species in the plantation hedge at Skeffington Rectory, quite five feet from the ground; it contained eggs."

Phylloscopus sibilatrix, Newton. Wood Warbler.—Summer migrant; sparingly distributed. It makes an oval nest on the ground constructed of dry grass, decayed leaves, sprigs of moss, internally lined with finer bents, fibrous grass, and a few hairs.

Mr. Macaulay writes:—"Rare. In 1879 it was seen in Gumley Wood by the Rev. A. Matthews, whose intimate acquaintance with birds, both in this county, and for many years previously in Oxfordshire, is a sufficient guarantee for the correctness of the note."

Acrocephalus streperus (Vieillot). Reed Warbler.—Summer migrant. Locally distributed, and breeding in some situations. Harley met with a nest fixed to three stalks of the nettle, some four feet from the ground. It was composed of fibrous roots, fine grass, and cleavers (*Galium aparine*, L.). This bird abounds on the banks of the Soar, haunting most osier-beds and willow-holts skirting that dull running stream. It is "met with also in the reed-beds on the banks of Groby Pool, at Dishley Reservoir, at Garendon, and elsewhere in the county." Macaulay, though living near Saddington Reservoir (where it undoubtedly breeds in small numbers every year) had no knowledge of its existence, save on the authority of the Rev. A. Matthews (who said that it occurred in the northern division of the county), until I came to Leicester, when in September, 1880, I took a few short walks for purposes of observation, and during one of them came to a spot close to Leicester, in which one would expect to find nesting the Sedge and possibly the Reed Warbler, and where the following May and June I found both. In fact, so abundant were both species that, had we been so minded, we might have taken twenty or more nests. This year (1885) I visited the same locality, which (being a reed-bed just under the Castle—actually in Leicester itself) will soon be swept away by projected improvements, and there found the nests and eggs of this bird in numbers, several being secured for the Museum. Most of them were difficult of approach, but one was built in an elder-bush. Another which I chanced on at Aylestone, containing eggs, was built—like a Whitethroat's—in a blackthorn bush in a hedge fringing the river; another one, also at Aylestone, was built in a privet-bush in a garden close to the water. In addition to the localities mentioned, I find it nests also at Bosworth and at Thornton. This bird and the Sedge Warbler, singing at all hours of the night, are often mistaken for the Nightingale.

Acrocephalus aquaticus (Bechstein). Aquatic Warbler.—This bird is noted as occurring in Leicestershire on the authority of Mr. Harting, who received a single specimen from the neigh-

bourhood of Loughborough during the summer of 1864, as recorded at length in 'The Ibis' for 1867 (p. 469), and also in 'Our Summer Migrants' (p. 91).

Acrocephalus phragmitis (Bechstein). Sedge Warbler.—Summer migrant. Generally distributed, and breeding. I have found it, at the Castle reed-bed, built both in reeds and in forks of osiers, and also, as in July, 1885, in the middle of a small whitethorn-bush by a ditch at Aylestone. This nest was extremely well constructed, and lined with the seed-tufts of the reed. Davenport says:—"In June, 1883, I found a nest of this species built at the top of a "bullfinch hedge," quite ten feet from the ground, near Shangton Holt. It contained four eggs."

Locustella naevia (Boddaert). Grasshopper Warbler.—Summer migrant. Sparingly distributed, and breeding. Macaulay records that a pair built under a bush in the garden at Gumley Rectory, 1876, and when the young were hatched a good view was obtained, by him, of the old bird while engaged in feeding them. Mr. Davenport found a nest in May, 1879, in Skeffington Wood, with five eggs; another in May, 1883, in a spinney near Ashlands, containing six eggs, and a third on May 21st, 1884. I have not met with this bird around Leicester, though Mr. Macaulay notes it near Kibworth every year.

Accentor modularis, Linn. Hedgesparrow.—Resident; generally distributed, and breeding. Harley remarks that it is liable to a tubercular disease, and has seen the eyelids, base of the bill, and a great part of the occiput covered with small tubercles and warts; a peculiarity which I have myself noticed.

Cinclus aquaticus, Bechstein. Dipper.—Resident, but rare. It occurred on the brook which flows down from the forest of Charnwood by way of Gracedieu Priory, and was observed by Harley on the brook which rises near Copt Oak and flows onward by the villages of Belton and Sheepshed, and thence into the Soar. Adams shot an example (in Harley's time) on the stream which passes through Bradgate Park. Another was shot some years ago out of a brook near Noseley, and is now in Sir A. Hazelrigge's collection. I purchased for the Leicester Museum a specimen said to have been shot near Syston or Queniborough three years ago, and the keeper of Thornton Reservoir told me that he had procured specimens there more than once during the past few years.

Fam. PANURIDÆ.

Panurus biarmicus, Gray. Bearded Tit ("Reedling").—Formerly occurring; rare. Being at Elkington's, a taxidermist, of Churchgate, Leicester, on the 3rd October, I found a pair of these birds, which he assured me were shot by Greer, of Aylestone Park, some ten or twelve years ago, at the "backwater," Bede House Meadows, Leicester. Mentioning these to Turner, of Harcourt Street, another taxidermist, he said it was no doubt the case, as he had received several some eight or nine years ago, shot at the reed-beds under the Castle, Leicester, and that he always imagined they bred there.

Fam. PARIDÆ.

Acredula caudata rosea (Blyth). British Long-tailed Titmouse.—Resident, and generally diffused, especially in thickly-wooded tracts, as, for example, the vicinity of Newtown Linford, Groby, and Ansty. I have received the nest from Belvoir, Braunstone, and Bradgate.

Parus major, Linn. Great Titmouse.—Resident. Generally distributed, and breeding. In June, 1883, I found in an apple tree at Aylestone Hall a nest of this species in juxtaposition with a nest of the Blue Tit, both containing young.

Parus ater, Linn. Coal Titmouse.—Resident. Generally distributed, and commoner than the following species.

Parus palustris, Linn. Marsh Titmouse.—Resident, but sparingly distributed. It is partial to the willow and alder, in the decayed boles and branches of which it nests. It also affects the Scotch fir, and other coniferous trees when decayed. I myself have no record of its nesting in the county, nor does Davenport appear to have as yet discovered it.

Parus cæruleus, Linn. Blue Titmouse.—Resident, and generally distributed. On June 5th, 1883, Davenport found a nest of the Blue Titmouse built inside an old nest of the Song Thrush in a thorn-bush at Loddington Redditch, containing nine eggs, on which the old bird was sitting hard. The Leicester Museum possesses a group of nine young ones and the mother bird, taken out of a hole in an apple tree at Aylestone in 1883. Mr. Ingram showed me a nest built in the mouth of a faun's head which formed a decoration on the base of an urn in the gardens at

Belvoir Castle. Another nest was formed in an ancient howitzer in the same grounds.

Fam. SITTIDÆ.

Sitta cæsia, Wolf. Nuthatch.—Resident, locally distributed, and breeding; occurring, however, in well wooded districts, as, for example, at Garendon, Bradgate, Bosworth, Donington, and Croxton. I have found it as near Leicester as Knighton, and at Wistow and Kibworth it is fairly common.

Fam. TROGLODYTIDÆ.

Troglodytes parvulus, Koch. Wren.—Resident, and generally distributed. Building in all situations; holes in walls, in ivy, in banks; and the Leicester Museum possesses one built in an old hat found in a garden on the Hinckley Road in May, 1884.

Fam. MOTACILLIDÆ.

Motacilla alba, Linn. White Wagtail.—No authentic note of the occurrence of this species in the county is extant, although Macaulay states ('Midland Naturalist,' 1881, p. 256) that "it comes and departs with *Motacilla raii*, and has been more abundant of late years." I wish now to correct the error made by him of confusing this bird with the Pied Wagtail in spring plumage. Mr. Harting, at p. 110 of 'Our Summer Migrants,' describes in a few words the specific differences between the common form and the rarer *M. alba*, a species common enough on the Continent, and which I have repeatedly observed and shot in Spain and Greece.

Motacilla lugubris, Temm. Pied Wagtail. — Resident, and commonly distributed. Its nest is commonly found on a stump of osier, and not unfrequently on the ground below at its base; also in piles of wood, stacks of coal, and large heaps of slate and stones. A pair of these birds nested this year in a stack of coal on Mr. Gulson's wharf, Mill Lane, Leicester, and made determined attacks on the family cat, which was sometimes anxious to inspect the brood.

Motacilla melanope, Pallas. Grey Wagtail ("Winter Wagtail.") —A winter migrant, sparingly distributed, seldom making its appearance much before October. The Leicester Museum possesses one shot by Dr. W. M. Squires at Aylestone. Mr. G. H.

Storer procured one at Hinckley Road, September 22nd, 1884 and I shot one at Knighton, November 22nd, 1884. In the winter of 1884-5 it was comparatively abundant. Mr. W. A. Evans shot a fine male on October 7th, 1885, close to the "North End," Leicester.

Motacilla raii, Bonap. Ray's Wagtail. — Summer migrant, commonly distributed and breeding. Common in the meadows of the Soar around Leicester. The nest, placed on the ground among grass, young corn, and tall plants, is composed of dry bents, fibrous roots, and small twigs, mixed with green moss, and lined with hair.

Anthus pratensis, Linn. Meadow Pipit. — Resident, and commonly distributed, and breeding.

Anthus trivialis, Linn. Tree Pipit. — Summer migrant, Generally distributed, and breeding.

(To be continued.)

NOTES ON NEW ZEALAND BIRDS.

By THOMAS H. POTTS, F.L.S.

Falco novæ-zealandiæ, Gmelin. Quail-hawk. — Eggs taken from an eyrie near the Teremakau River are ovoid in shape, of a rich yellowish red, suffused profusely with reddish brown. In one specimen the upper portion of the surface is blotched with dark reddish brown; a second specimen has the entire surface generally mottled over with irregular marks of dark reddish brown.

Circus assimilis, Jardine and Selby. Harrier. — In November, 1884, in one of the large swamps in the Hind District, on the Canterbury Plains, a nest of this Harrier, built on a large tuft of coarse growing rushes (*Juncus*), was knocked over by a "mob" of cattle. The nest, being set up again and the eggs put back, the hawk returned and resumed incubation. The nest contained five eggs; another nest in the Hororatu District also contained five eggs.

Prothemadera novæ-zealandiæ, Gmelin. Tui or Parson-bird. — In January last I saw two nests with five eggs each, built on tall manukatras (*Leptospermum ericoides*).

Anthornis melanura, Sparrman. Bell-bird, Korimako.—Last season I saw two instances of the nest of this bird on foreign trees, one in a plum (*Prunus*), the second in a thorn (*Cratægus*).

Anthornis melanocephala, Gray. Chatham Island Bell-bird.—This bird is deserting the neighbourhood of the settlements and homesteads, and retiring to the southern part of the island.

Orthonyx ochrocephala, Gmelin. Canary, Popokatea.—For several weeks past (July, 1885) a few of these birds have appeared in the garden and shrubberies.

Rhipidura fuliginosa, Sparrman. Black Flycatcher or Fantail, Ti-waka-waka.—Remarkably tame and confident. During many weeks of autumn one of these birds entered the rooms freely, and often alighted on persons, or on a newspaper whilst being read, sometimes perching on a low fender in front of the fire. It would also perch on persons out of doors in a most confident manner.

Platycercus novæ-zealandiæ, Sparrman; *P. auriceps*, Kuhl.—Appeared in great numbers last spring and summer, living on currants, strawberries, cherries, plums, pears, apples, &c.; in the autumn and winter feeding on sowthistle, cocksfoot, acacia seeds, cones of *Cupressus funebris*, *Pinus pinea*, acorns, &c.

Charadrius bicinctus, Jardine and Selby. Dotterel.—Last season bred on farms not far from homesteads in the Westerfield District, Canterbury Plains.

Thinornis novæ-zealandiæ, Gmelin. Shore Plover.—On October 3rd this species was found breeding on a small rocky islet, about five acres in extent; it is one of the Chatham Island group, called the Sisters, or Rangitutahi. This very exposed and unsheltered site apparently is shared only by the huge Albatross (*D. exulans*), and the Giant Petrel (*O. gigantea*), which also breed there, and rest awhile from almost ceaseless wanderings over the surrounding ocean. Exposed to gales that sweep over a vast unbroken expanse of sea, and break against this little speck of rock, the only screen that may shelter the wild home of the Shore Plover is the tussock of wiry grass or saw-edged *Carex*, for no tree is there to lend a friendly shelter. The eggs, three in number, just fit the slight nest of a few grass-leaves twisted into a circular form. They are ovoido-conical, ovoid with the smaller end blunt, or somewhat pyriform, smooth, and somewhat shining. They vary in colour, being (a) pale or warm

stone-colour, freely sprinkled with blackish brown (or almost black) irregular marks, angular lines, or dots; (*b*) pale greenish white, very much scrubbed over with irregularly-shaped marks and minute dots, which become more conspicuous towards the larger end, round which they form an unevenly-defined zone; (*c*) stone-colour, more or less covered with irregularly-shaped marks of umber-brown; (*d*) pale stone-colour, with a faint greenish tint, sparingly sprinkled below the bilge with very small blackish-brown freckles, none of which seem sunk into the surface, the upper portion splashed with bolder marks of umber and deep chestnut-brown; (*e*) rich warm stone-colour, abundantly covered with blotches of chestnut and umber-brown, interspersed with minute dots, freckles, and fine linear scribbling marks of dark brown. Length, 1 in. $4\frac{1}{2}$ lines; breadth, 1 in.

(Ohinitahi, July 27, 1885).

NOTES ON LAND MOLLUSCA OCCURRING IN THE NEIGHBOURHOOD OF PONTEFRACT.

BY GEORGE ROBERTS.

THE neighbourhood of Pontefract has long been a favourite hunting-ground for conchologists and botanists. The town stands partly upon the outcropping edge of the Magnesian Limestone which runs across Yorkshire, partly upon the Carboniferous Sandstone, and partly upon a bed of sand, the latter being mined and quarried in various places for moulding purposes. The soil is in some places six to nine feet deep, and, on the east side of the town, produces fine crops of liquorice and other vegetables. The visitor on alighting from the railway finds himself surrounded by liquorice grounds, and market gardens filled with cabbages, French beans, peas, and potatoes. Besides the diversity in the strata, in the soil, and in the vegetation, there are many old disused quarries, marl-pits, sand-pits, ivy-covered walls, high grassy banks, and cliffs; hence we find suitable habitats within a small area for a great variety of plants, insects, and mollusks.

Most of the under-mentioned *Helices*, with varieties, have been collected within the last three years; the others have been noticed in previous years.

I.—TERRESTRIAL MOLLUSCA.

UNIVALVES (*GASTEROPODA*).

Fam. LIMACIDÆ.

Arion ater. The Black Slug.—Abundant.

A. hortensis. The Garden Slug.—Typical form. Monkhill.

Var. *fasciata* (Orange-foot), Monkhill. The young of this species are sometimes white.

Limax agrestis. The Field Slug.—Type, and a yellowish variety on nettles. In August I caught a *Limax agrestis* mounted on the top of a *Sparganium* leaf, coiled round, and feeding on, a young *Succinea putris*.

L. maximus. The Great Slug.—Abundant everywhere.

L. lævis. The Smooth Slug. Near Ackworth.

Fam. HELICIDÆ.

Zonites cellarius. The Cellar Snail.—Common.

Z. alliarius. The Garlic Snail.—A few specimens on St. Thomas's Hill (the hill on which Thomas Duke of Lancaster was executed in 1322).

Z. nitidulus. The Shining Snail.—A few specimens very glossy, and much like *Z. glaber*, on a bank at St. Thomas's Hill.

Z. purus. The Clear-shelled Snail.—One or two examples with the last-named. Frequent among dead leaves in woods.

Z. crystallinus. The Crystalline Snail.—Common.

Helix aculeata. The Prickly Snail.—Two dead shells with *Z. nitidulus*. Occurs sparingly in various other places.

H. aspersa. The Garden Snail.—Abundant in the hedge-banks, of all sizes and colours. On May 27th, 1885, many were still hibernating in crevices in the rocks, congregated in large clusters one upon another. Gwyn Jeffreys states that *Helix aspersa* is destructive in kitchen gardens, and also feeds on wall-fruit. I have observed its habits for many years, and have never seen it in the act of eating any kind of fruit. I placed a canister full of these snails in a bed of strawberries, but I never once saw any of them touch the fruit, and have seldom observed them eating living garden vegetables. I believe *Limax agrestis* and *L. maximus* are the real delinquents. Although this species is exceedingly abundant in the neighbourhood of Pontefract,—more

abundant than in any other district that I know,—they are not very numerous in gardens. They are mostly to be found amongst the rocks, at the foot of walls, and on hedge-banks. Roadsides, where the vegetation is covered with lime-dust, are generally prolific in *H. aspersa* as well as other snails. In many places near Pontefract a score species of land-shells may be picked up within as many yards on the lime-covered road-banks, but if the conchologist should turn a few yards into the fields he will not find a single shell. I was surprised to hear that *H. aspersa* is now collected and eaten by the working people in the vicinity of Pontefract and Knottingley, where it is plentiful, in the same way that *H. pomatia* is used in the South of England and in France and Italy. The varieties from Pontefract district are as follows:—

Var. *minor*, Moquin Tandon.—Bands obsolete.

Var. *conoidea*, Picard.

Var.—Shell very thin, nearly transparent; mouth circular; ground cream-colour; bands five, reddish brown; transverse marks of the same colour as the ground.

Var.—Shell small, dark reddish brown; no bands observable outside; transverse marks consist of rows of small oblong, yellow streaks, apart from each other.

Var.—Shell small, a prominent yellowish band in the middle of the last whorl; transverse marks straight, not zigzag.

Var.—Shell very small, being only about one inch in diameter and six-eighths in altitude. A white band in the middle of the last whorl; transverse streaks white.

Var.—Shell small; ground colour dark reddish brown; transverse streaks yellowish and zigzag; a yellow-white band in the middle of the last whorl.

Var.—Shell bandless, of a dark purplish colour; a narrow whitish line on the periphery; transverse zigzag marks remote.

Although the Pontefract district apparently offers all the conditions for a full and mature development of shells, the specimens of *H. aspersa*, so far as I have observed, do not exceed the average size, and very many are small. I have not seen one that comes up to the measurements given by Mr. Taylor for the var. *major*. I have looked over Mr. Taylor's "Life-History" of this species in the 'Journal of Conchology,' but I find that he does not touch at all on its feeding habits, or on the nature of its food.

H. nemoralis. The Wood Snail.—This species occurs in the Pontefract district in considerable abundance. Neither Gwyn Jeffreys nor Tate gives any account of its feeding habits. Although I have seen it hundreds of times on nettles and other plants, I have never actually observed it feeding on the plants. I suspect that it feeds on decayed vegetable matter, and, like others of the genus, may be much more carnivorous than is supposed. The varieties from Pontefract are as follows:—

Var. *major*, Fer.—Bands 1 2 3 4 5 and others.

Var. *minor*, Moq.—Greatest diameter three-fourths of an inch, altitude seven-sixteenths. Shell red, with one black band on the periphery and a white line beneath it.

Var. *roseo-labiata*, Taylor.—Shell pink, with a broad red band on the periphery, and a white line beneath it.

Var. *albolabiata*, Von Martius.—Two specimens; yellow, with translucent bands. Rare.

Var. *bimarginata*, Moq.—Common; variously banded.

Var. *libellula*, Risso.—Common; some nearly white.

Var. *rubella*, Moq.—Many of a light cherry-red colour, finely polished. The bandings are mostly 1 2 3 4 5 and 0 0 3 0 0. I have one with 0 0 3 0 5. Some are exceedingly thin, with conical spire.

Var. *castanea*, Moq., and var. *olivacea*, Gassies. — Various intermediate colours of these occur. Most that I have seen are inclined to olive, and bandless. I have one specimen which is very glossy and thin, of a greenish purple colour, with a white line in the suture of all the whorls. A dark brown band encircles the periphery, with a faint white line beneath it. Lip dark brown; inside of the shell purple.

Var. *hyalozonata*, Taylor.—Not yet recognised.

The band-varieties 0 0 3 0 0 and 0 2 3 4 5 are frequent. Others I have found with interrupted bands. The animal of one of the chestnut-coloured specimens was creamy-white, with a subcutaneous bluish tinge. Another (with chestnut shell) was slaty-blue, with a white median line. Another (shell yellow) was greenish brown, with a yellowish white, narrow dorsal median line. Another was a uniform light straw-colour. The animals seem to vary in colour nearly as much as the shell. Mr. Hudson tells me that the animal varies in nearly all shades from black to white. It is scarcely necessary to point out that the bands do

not commence on the first whorl, but appear sometimes on the second and sometimes on the third, and gradually increase in number. Whatever colour the shell may be, the bands are nearly always brown of different shades. Sometimes a white band occurs where the brown bands are all fused into one, and sometimes translucent bands appear on yellow shells. Mr. Wilcock, of Wakefield, has two examples of *nemoralis* which have a tooth-like projection on the pillar-lip. One of this kind might have resulted from accident, but it is singular that two should be found alike.

H. hortensis. The Wood Snail.—I have not yet observed this form on the eastern side of Pontefract, though it occurs on the western side.

H. arbustorum. The Shrub Snail.—Occurs in numbers on banks in Bondgate, within two minutes' walk of the ruined church at Pontefract; also at Monkhill, a little to the north. I have never seen this species in gardens, and seldom in woods about here.

Var. *alpestris*, Ziegl.—Forms agreeing with the description of *alpestris* occur; but if this variety inhabits low lands as well as high lands the name *alpestris* is misleading.

Var. *conoidea*, Westerl.—Conoid forms occur numerously, both large and small. I do not know what difference there is between *alpestris* and the smaller examples of *conoidea*.

Var. *marmorata*, Taylor.—In Ferrybridge Lane, but rare.

Var. *cincta*, Taylor.—A few in a nettle-bed about two miles from Pontefract; more numerous at the same place in 1884. Occurs also at Ferrybridge.

Var. *flavescens*, Moq.—Is said to occur, but I have not seen it.

H. cantiana. The Kentish Snail.—Occurs in thousands in Ferrybridge Lane, about two miles to the east of Pontefract. The shell is white when young, but some of the adults may be safely classed under the variety *albida*, Taylor. The animal here is finely tuberculated, of a light slaty-blue colour, with the sole of the foot yellowish white. Large numbers of eggs of this species and of *H. nemoralis* were deposited in a collecting canister on September 11th, 1884. I have noticed depressed and conical forms, but this species seems to vary very little. Scalariform examples are very rare. About Pontefract *H. cantiana* is to be found in ditches in great numbers, mostly hanging in the day-

time beneath the leaves of nettles and other large plants. Gwyn Jeffreys tells us nothing about its feeding habits.

H. rufescens. The Rufescent Snail.—Occurs on both limestone and sandstone, but not very numerously. I have made several journeys lately below Pontefract, and never seen a specimen. Vars. *minor* and *alba* are not rare. This species is subject to much variation and distortion. Some of the specimens are very flat, sometimes the first whorl is intorted; some have a raised spire, and some have an exceedingly deep suture with rounded whorls. The conical forms have a whorl more than the flat forms. Scalariform examples with a flat apex are frequent.

H. hispida. The Bristly Snail.—Common. The young are grey, and may easily be mistaken for *H. sericea*.

Vars. *subrufa* and *conica*.—Frequent.

H. virgata. The Zoned Snail.—Abundant in Ferrybridge Lane, and occurs both on the ground and high up in the hedgerows. The banded forms and the yellow ones are about equally distributed.

Var. *minor*, Taylor —In 1884 I observed large numbers of this variety on the lawn at Pontefract Station.

Var. *carinata*, Jeff. —Carinated adult specimens are rare. Many of the young of the type form are carinated, but some are not.

Var. *submaritima*, Des Moul.—Occurs amongst the variety *minor*.

Var. *subalbida*, Poiret. Rare.

Band variations are almost infinite. Pontefract is the headquarters in the inland parts of Yorkshire for this species.

H. caperata. The Wrinkled Snail.—Said to be less common about Pontefract than it was formerly.

Var. *ornata*, Picard.—Not unfrequent.

Var. *gigaxii*, Charp.—Found with the type.

Monst. *subscalaris*.—Rare.

H. ericetorum. The Heath Snail.—I found two or three sub-fossil shells in a bank in Ferrybridge Lane on May 26th, 1885.

H. rotundata. The Rounded Snail.—Common.

Vars. *pyramidalis* and *minor*.—Rare.

H. pygmæa. The Pygmy Snail.—Frequent in woods amongst leaves and moss.

H. pulchella. The White Snail.—Gwyn Jeffreys says the shell of this species is transparent, but Tate describes it as opaque. Judging from specimens found here the ridged form should be considered the type, and the smooth white form a subspecies or variety. On July 14th last I found several specimens of the glossy, smooth form amongst water-weeds which had been dragged from a canal. I have always found the ridged ones in dry situations on the tops of walls. The latter are frequent on walls and rocks in the vicinity of Pontefract. I have occasionally found the shell of this species covered with minute grains of sand.

Bulimus obscurus. The Dull Twist Shell.—Frequent. Generally smooth, not covered with particles of sand, or in any other way concealed.

Pupa umbilicata. The Umbilicated Chrysalis Shell.—Common.

P. marginata. The Margined Chrysalis Shell.—Abundant.

Vertigo minutissima. The Least Whorl Shell.—Frequent.

Clausilia rugosa. The Dark Close Shell.—Plentiful.

Var. *tumidula*. If this is sufficiently marked to be a variety, the short tumid form of *C. laminata* should be regarded as a variety. I have seen adult specimens of this tumid form of *laminata* with two whorls less than the type, and much more ventricose near the mouth.

Cochlicopa lubrica. The Common Varnished Shell.—Abundant.

Var. *lubricoides*.—Common as the type.

Achatina acicula. The Needle Agate Shell.—Local; gregarious. Numerous in certain places.

Fam. CARYCHIIDÆ.

Carychium minimum. The Little Sedge Shell.—Common in woods and plantations.

All the above-named snails and slugs may be found within two miles of Pontefract, and very many of them within the boundaries of the town itself. The under-mentioned species have been found at Wentbridge, about four miles to the south-east:—*Helix lapicida*, *Vertigo antivertigo*, *V. pygmæa*, *V. substriata*, *V. pusilla*, *V. edentula*, and *V. minutissima*. All these species of *Vertigo*, may be found within a limited area, where the River Went has cut a deep passage through the limestone rocks.

NOTES AND QUERIES.

The British Association.—A typographical error occurred in our last number under this heading. The address of the President of Section D. *Biology* (Prof. M'Intosh), on the Phosphorescence of Marine Animals, will be found printed in 'Nature' for Sept. 17th (obviously not Nov. 17th, as previously stated). Amongst other papers read at the meeting were the following:—On the causes of dissimilarity in the Faunas of the Red Sea and Mediterranean, by Prof. E. Hull; on *Megaptera longimana* and other Whales obtained in the Tay (1), and on the Cervical Vertebrae of the Greenland Right Whale (2), by Prof. Struthers; on the Anatomy of a second specimen of Sowerby's Whale from Shetland, by Prof. Turner; since published *in extenso* (Journ. Anat. and Phys., October, 1885, pp 144–188); on the development of the Vertebrae of the Elephant (1), and the foot of the Horse (2), by Prof. Struthers; on the Viscera of *Gymnotus electricus*, by Prof. Cleland; on the Spiracle of Fishes in its relation to the head as developed in the higher Vertebrates, by Prof. Cleland; a new Theory of the Sense of Pain, by Prof. Hayward; on the Hybridization of *Salmonidæ*, by Dr. F. Day (*vide infra*); on Chinese Insect White Wax, by A. Hosie; on the size of the Brain in Extinct Animals, by Prof. O. C. Marsh; on the systematic position of the Chamæleon, and its affinities with the Dinosauria, by D'Arcy W. Thompson: on the origin of the Fishes of Galilee, by Prof. Hull; and on the Marine Laboratory at St. Andrews, by Prof. M'Intosh. A *précis* of each of these and some other papers which were also read will be found printed in 'Nature' for October 8th.

Haggerston Entomological Society.—We hear that a pocket-box exhibition of entomological specimens is to be held on Thursday, Nov. 12th, at 8.30 p.m., at No. 10, Brownlow Street, Dalston, when the kind co-operation of entomologists is invited. Communications may be made to the Secretary, Mr. Ernest Anderson, at the above address.

MAMMALIA.

Deer striking with their fore feet.—On reading the extract from Lord Malmesbury's "Memoirs," and the reviewer's remark thereon (p. 397), I have been reminded of two instances of a somewhat similar nature. Some years ago a friend of mine was waiting for a train at one of the forest stations (Lyndhurst, I believe), when he saw a deer, hard pressed by the hounds, make for the line, not far from the point where he was standing; but a previous long run prevented it from leaping the fence, and it was brought to bay, when it turned its back to the fence and fought the hounds desperately with its fore feet. So intent was it in defending itself that a

rope was passed around it from behind, and the hounds, having been whipped off, the deer was taken upon the platform, where it was viewed with considerable interest by the passengers. The other instance referred to is of more recent date, and caused some amusement in the locality where it happened. A young gentleman farmer, fond of "riding to hounds" and of relating his wonderful exploits in the hunting-field, found himself in close proximity to a "stag at bay," when, being anxious, I suppose, "to take the game alive," he dismounted. On approaching the deer, it immediately struck out with its fore feet most vigorously and felled him to the ground, cutting his face severely, and stunning him for a short time.—G. B. CORBIN Ringwood).

Habits of the Squirrel.—In the note under this head (p. 384) I had almost hoped to see some reference to a previous communication (p. 229) touching the destruction of the eggs of *Picus major* by the Squirrel; for I am decidedly one of the "tender-hearted people who hesitate to believe in the egg-stealing propensity of the Squirrel." And, certainly, if the evidence to be adduced on the side of the prosecution be no more really evidence than what is alleged by Capt. S. G. Reid, no man in the possession of ordinary common sense will ever believe it. The facts alleged are (1), that a single fresh egg was found in a certain nest; (2), that a week after the nest was empty; (3), that at the same date, wedged into a crack in the wood of another tree thirty yards distant, and near its top, an egg of *Picus major* was found, "perfectly sound, except for a small tooth-mark in the side." Literally there is nothing else in the statement relevant to the charge made against the Squirrel as an egg-stealer. No Squirrel is mentioned as having been seen near the tree, no proof is alleged that the small mark on the egg was a tooth-mark at all; but the writer states that he had "known Squirrels to remove the eggs from the nest of the Long-eared Owl,"—one wonders if on equally conclusive evidence,—and that there is "no doubt Squirrels were the delinquents on this occasion." One day this summer I found three Starlings' eggs and two Sparrows' eggs on my lawn, not twenty yards distant from the site of a colony of Starlings and House Sparrows breeding in the ivy, and ivy-sheltered partitioned boxes placed for their use, within a few feet of my dining-room window. If I chose to write "Notes on Natural History" on the same lines as this charge against the Squirrel is laid down, I might have written as follows:—"Egg-stealing by the Cuckoo.—This bird has this year once and again seated itself on the ridge of a gable above my bed-room window, and there repeated its well-known notes many times in succession [a fact]. In the ivy, within three to five yards of its station, were five nests of Starlings, and any number of Sparrows' nests. 'There is no doubt,' allowing for the Cuckoo's recorded predilection for eggs of other birds (whether for the alleged purpose of 'sweetening his voice' or no, does not signify), that the

Cuckoo in question removed all the aforesaid eggs and dropped them where I found them." Only this case would be the stronger of the two, because the Cuckoo could not put in an *alibi*. In reality, I am quite aware, from continual observation, that the deposit or dropping of these eggs of the Starling and the Sparrow, each "sound, except for a small *bill*-mark on the side," is the natural result of the fierce squabbles that are of perpetual occurrence between, I am sorry to say, different pairs of the Starlings themselves, as well as between some of the Sparrows and some of the Starlings. More than once I have seen the combatant Starlings fall to the ground hampered by their mutual clutch. Once the clutch was so tenacious that, after the birds had fallen, and had been on the ground for perhaps two or three minutes, I went out, passed round the end of my house and along one side, and was all but touching the struggling pair with my fingers, before they consented to loose their grasp of each other. Possibly, during the past season, I have picked up twenty eggs under the circumstances named, besides noticing several others that had either been dropped or chucked out of the nest, and had fallen within a foot of the wall. A bird's bill will make a single mark on the egg carried on its point, a feat I have seen performed more than once in my time. I very much doubt if a Squirrel—supposing one bent on such a practical joke as taking a Woodpecker's egg out of its deep nest in a tree, and carrying it to near the top of another tree, twenty feet above the ground—could perform the feat with no other cost to the egg besides a "small tooth-mark in its side." On the whole, as regards any evidence that is alleged, Capt. Reid's note seems very like "giving the poor Squirrel an ill name," and acting, as regards his "vow," on the principle declared in the case of a dog in the same category.—J. C. ATKINSON (Danby in Cleveland).

Habits of the Squirrel.—On reading the interesting notes upon this lively little rodent (p. 384), I am sorry to find that the old accusation against it of destroying the young shoots of pine and other *Coniferae* has been pretty well "proven." The destruction of pine-shoots, however, is not the only depredation for which it has to answer, if we may believe the observations that have from time to time been made of its carnivorous propensities in egg-sucking (p. 229), as well as killing young birds. Strange to say, although I have spent many hours, at different times, watching Squirrels, I never in a single instance saw one touch either eggs or young birds. I did once see an encounter between a Squirrel and Missel Thrush, but, as this bird is naturally pugnacious, and will attack any intruder who approaches its nest, I thought perhaps the Squirrel had wandered rather too closely, and was buffeted away by the over-anxious Thrush. The late Canon Kingsley informed me that, much as he loved the Squirrel, he had given orders that all seen on his grounds should be destroyed, as they undoubtedly had this carnivorous habit, and he preferred the birds to the

Squirrels. Some time since I was informed that the authorities of the New Forest had also given orders for the destruction of Squirrels, on account of the damage done by them to the young plantations of fir; but whether this order is still in force, or not, I am not aware.—G. B. CORBIN (Ringwood).

Note on the Squirrel.—With regard to the edible qualities of this little rodent, I believe there are many dwellers in the forest who have tasted its flesh, not so much perhaps from an epicurean point of view, as from a desire to talk about it afterwards; and yet I am told that if the creature is killed at a time when, and in a locality where, chestnuts, acorns, and “beech-mast” are easily obtained, the flesh, when cooked, so closely resembles that of the rabbit both in smell, taste, and appearance, that it might be mistaken for it by any person who did not suspect its origin. I was not aware that the buff or “creamy colour” of the tail in some specimens is caused by age. At various times I have seen and handled such specimens, but always supposed it to be an individual peculiarity at the time of changing the coat, for I always noticed in such cases that these yellowish hairs were much looser and more easily removed than their brown neighbours. A boy once brought me a Squirrel, the tail of which was entirely denuded of hair; and his statement was, “I caught this beautiful silver-tailed Squirrel for your collection, but when I took hold of it, its tail skinned, and all the fur came off in my hand.” I have also noticed that in most, if not in all, cases, where the tail is of a lighter hue, the long hairs decorating the ears, at certain seasons of the year, are of the same tint, and of a scanty appearance, which seems to indicate that the change affects both ears and tail; and yet it may be sometimes observed, in normally-coloured individuals, that whilst the whole of the body, including the tail, is covered with abundance of hair, the ears are comparatively bare; so that after all the lighter colour may be indicative of age.—G. B. CORBIN (Ringwood).

[On this point, see Bell's ‘British Quadrupeds,’ 2nd ed., p. 279.—ED.]

Albino Bank Vole in Essex.—During the last week of August my cat caught in the orchard, and brought into the house uninjured, an adult albino specimen of the Bank Vole (*Arvicola pratensis*). I forwarded it to the Zoological Society's Gardens, where it may be seen. It is a genuine albino, having pink eyes, although there is a slight sandy tint on the back. Mr. Bartlett has identified it as the Bank Vole. — EWARD ROSLING (Chelmsford).

[Donovan has figured an albino example of *A. agrestis* in ‘British Quadrupeds,’ pl. 48; and another albino specimen was caught alive at East Bergholt, near Colchester, in November, 1872, as recorded in ‘The Field’ of Nov. 30th, 1872.—ED.]

BIRDS.

Pied Flycatcher and Night Heron in Clackmananshire.—Early last spring a Pied Flycatcher was shot by a gamekeeper in this county on the banks of a small stream running into the Forth, not far from the town of Alloa. I expect to have the specimen in my possession shortly. Not far from the same place a fine specimen of the Night Heron was obtained in May, 1879, which, I think, has not hitherto been recorded.—W. ERSKINE (Alloa House, Alloa, N.B.).

[The Pied Flycatcher is doubtless an annual summer visitor to Scotland, but the Night Heron is rare there. It is rather curious that one of the latter birds was shot off a tree on the banks of the Black Devon, adjoining Alloa Park Policies, by one of Lord Mar's keepers, 23rd May, 1879.—ED.]

Food of the Hobby.—Through the kindness of Mr. Schumach I examined the contents of the stomach of a Hobby (*Falco subbuteo*), which was shot at Caunton, Nottinghamshire, early in September last. The food consisted principally of coleopterous insects. I noticed particularly that the head of each was invariably wanting, and, so far as I could determine from the wing-cases, some of them belonged to the weevil family. There were no remains of either birds or mice. In addition, however, I discovered the bodies of five or six large moths, more or less injured by the process of digestion, but all evidently of the same species, and swallowed whole. A careful inspection enabled me to identify them as the Yellow Underwing (*Triphana pronuba*).—W. BECHER (Hill House, Southwell, Notts).

Short-eared Owl in the South of England.—During the winter months this species is of somewhat frequent occurrence in this part of Hampshire, in some winters being more abundant than in others; but has it ever been known to nest so far south? The reason of my asking is this: in May last a gamekeeper trapped and brought me an owl of this species. He had previously informed me that there was at least one pair, if not more, of a dark-coloured owl, which frequented the extensive heaths over which his "beat" lay, and that they were seldom seen in the woods like the other owls; and he had seen them on one or two occasions in the day-time. So I asked him to shoot one for identification, with the result above recorded. When he brought me the bird in question I naturally suggested that he should keep a look-out for any nest that might be built, at the same time telling him its probable situation, upon the ground. At different times during the summer he has seen the birds—on one occasion a pair flying together—but not in any particular locality indicative of nesting; in fact, he says that sometimes he did not see them for a week or more, and then he would come across them in quite a different spot. As I suggested a possibility of his having been deceived about the species he saw flying in

July, he offered to secure me another specimen as he had done in May, but I declined. On looking through my diary I find that the majority of cases in which this bird has come under my observation have been between November and March, so that the occurrence of the species in May was unusual, though I did not think it worth recording at the time. I have on more than one occasion seen the Long-eared Owl flying over the heaths, but always in the evening (Zool. 1877, p. 20), and, as this species occasionally nests in the neighbourhood, it is just possible that from their comparatively erratic appearance, the owls seen by my friend the game-keeper were referable to this and not to the Short-eared species. Nevertheless, it would be interesting (to me) to know whether the latter has ever been known to nest in the southern counties of England.—G. B. CORBIN (Ringwood).

Winter Visitors in Northumberland.—On Sept. 27th, while on the Town Moor, Newcastle, I observed five Wild Swans at a great height, flying from south to north. Taken in conjunction with the fact that during the previous week, in North Northumberland, particularly near the sea-coast, the Redwing (*Turdus iliacus*) had already arrived, a month before its wonted time, may not this portend an early and severe winter? Snow has, in fact, already fallen on the Cheviots; and near Wooler, on Sept. 25th, I noted several flocks of Wild Ducks and Wild Geese, but all flying northwards.—R. DUNCOMBE JEWELL (Newcastle-on-Tyne).

Redwing nesting in Yorkshire.—In 'The Zoologist' for September I notice that Mr. Browne, in his "Notes on the Vertebrate of Leicestershire" (p. 334), mentions the Redwing as breeding in that county. In the year 1879 I found what must have been the nest of a Redwing at Harrogate, in Yorkshire. This nest was built in the forked branch of a small oak, in a small wooded coppice, called Barber's Coppice; it was placed about six feet from the ground, and contained four eggs of a greenish white ground colour, the green shade very faint, speckled with a light shade of reddish brown, and about the same size as a Song Thrush's egg.—RILEY FORTUNE (61, Grainger Street, Newcastle-on-Tyne).

[The description given of the eggs certainly applies to those of the Redwing, which are not unlike small varieties of the Blackbird.—ED.]

Note on the Great Crested Grebe.—Mr. T. E. Gunn tells me that he has noticed the eye of the Great Crested Grebe (*Podiceps cristatus*) to vary greatly in colour, being sometimes lemon-colour, sometimes red, and sometimes brown. A most singular instance of this sort, which could not be accounted for by age or season, occurred last Christmas in an example shot on Ranworth Broad on Dec. 30th. Ten minutes after death I held it up by its legs, and its eyes were then a delicate buff with a tinge of yellow, but the next morning they had changed to a bright clear currant-red. Mr.

Booth has some remarks on the point in his 'Descriptive Catalogue of Birds' (p. 194), which are taken from practical observation. He says:—"While in the down the eye of this species is a bright grey. During their first autumn and winter I have observed the iris both a dull orange and a bright lemon-yellow; this gradually changes until it assumes the brilliant red which is seen in the adult in summer." In an example shot at Hempstead some years ago in November, the eye was noted down at the time as red, and no doubt correctly so; but I have had no recent opportunity of handling any Grebes in the flesh. A sudden change in the eye from one colour to another in the space of a few hours is incomprehensible, and very misleading to any one who is in the habit of noting down the colours of the soft parts. On June 15th a Great Crested Grebe quitted her eggs on Fritton Lake without covering them. On the 25th I saw her again quit the eggs, and saw her cover up the eggs in doing so. The action was almost momentary,—a couple of tugs with the beak, and that was all. Mr. Seebohm considers that the eggs are not covered by the Grebe until she begins to sit ('British Birds,' pt. iv., p. 457). Certainly her object must be to hide them from view, and it is singular if she does not hide them when they are freshly laid. In Mr. Seebohm's vignette (p. 464) the nest is represented as more cup-shaped than any I have seen on our Broads.—J. H. GURNEY, jun. (Northrepps, Norwich).

[We have observed a similar change in the colour of the iris of the Pochard, *Fuligula ferina*, and have remarked that it is yellow in immature birds, orange as they grow older, and red in the adult.—ED.]

Birds at Sea.—On August 23rd, while homeward bound between Gibraltar and Plymouth, in lat. $42^{\circ} 45' N.$, long. $11^{\circ} 07' W.$, a number of Grey Phalaropes (*Phalaropus fulicarius*) were seen, some sitting upon the water, and others flying past the ship. They were first noticed about 9 o'clock in the forenoon, and in the course of an hour I counted more than a hundred of them. They were all in winter dress. The next day, about noon, when in lat. $44^{\circ} 50' N.$, long. $9^{\circ} 45' W.$, seven Cranes (*Grus cinerea*) approached the ship, wheeled round her several times, and then flew off, low over the sea, in a south-easterly direction. The same afternoon we were visited by a Titlark, and the following day, in lat. $46^{\circ} 33' N.$, long. $7^{\circ} 28' W.$, two Chaffinches and a Humming-bird Hawk Moth (*Macroglossa stellatarum*) enlivened us by their presence.—GERVASE F. MATHEW (Instow, N. Devon).

Ring Ouzel feeding on Cherries.—The fact (as related at pp. 346, 386-7) of the Ring Ouzel's partiality for cherries is no new one. In Hutchinson's 'History of Cumberland,' 1794, p. 457, parish of Ulswater, speaking of this species he says:—"It is commonly called the Fell Throstle. When perched on the edge of a rock, it makes the hills echo with its loud note. It delights in black cherries, of which there is a great

abundance in Martindale: here they breed, but disappear in winter." Macgillivray also ('British Birds,' vol. ii., p. 103), quoting from the Rev. Nathaniel Paterson, in the statistical account of the parish of Galashiels, in Selkirkshire, observes:—"The Moor Blackbird, too, has of late years become a troublesome spoiler of the garden—a daring thief that comes before the windows and carries off a plum nearly as large as itself, showing by its chatter more of anger than of fear when it is disturbed in the work of depredation. Currants, gooseberries, cherries, plums, and the finest wall-fruit are its prey." In the autumn the Ring Ouzel regularly visits the gardens attached to the shepherds' houses in Cheviot, and is more pertinacious and determined in its attacks on the fruit than any of its congeners.—JOHN CORDEAUX (Great Cotes, Ulceby).

Varieties of Wood Pigeon and Magpie.—It may interest Mr. Marshall to know that I have a pure white Wood Pigeon in my possession, belonging to Mr. Alfred Beaumont; but I know nothing of its history. I have also one with the upper parts mottled with various shades of drab, killed, I believe, in Lancashire. Besides the varieties enumerated by Mr. Aplin, two of which, I perceive, are those in Mr. Whitaker's collection, I recently sketched a third from the same collection, which has the head, breast, and back sooty brown, primaries and tail grey, scapulars and under parts dull white, bill inclined to yellowish, legs normal. I have also in my possession another having all the parts usually black, of a very pale grey.—S. L. MOSLEY (Huddersfield).

Albino Birds.—During the past year I have observed an unusually large proportion of albino and mottled birds. Recently at Richmond Park I saw a white Pheasant, and at Kingston a Rook with a white wing regaling itself with walnuts; also two black-and-white Blackbirds, and a pure white bird supposed to be a Swallow have lately been seen there. In addition, I saw and captured a pure albino Sparrow last year.—F. V. THEOBALD (Kingston, Surrey).

A remarkably tame Wryneck.—I have or some time been thinking of writing to you about a bird, which I have called my odd Wryneck: odd because it is a single bird, and also because its ways have been, to my mind, so very odd. For the last three years a young Wryneck has come to my garden by itself. It is so tame that it has let my gardener and his boy take it up in their hands and pet it, and when they have let it fly it has gone to the nearest tree; and two Chimney Swallows have made swoops upon it, but have not hurt it. I have myself handled it. I have never seen any old Wryneck with it. I have heard Wrynecks when they have come at their usual time, but have never seen one with the young one I am writing of. This is the third year in which it has appeared in my garden. I send this account without attempting to explain it, but I

thought if any readers of 'The Zoologist' have met with anything like it they would kindly mention it. — EDWARD JAMES MOOR (Great Bealings Rectory, Woodbridge, Suffolk).

Curious Place for a Wren's Nest.—In the picture gallery of Charlton Park, near Malmesbury, the seat of Lord Suffolk, is a glass case containing the skin and feathers of a crow. It had been caught and nailed to a tree with other vermin, and between the wings a Wren built a neat little nest. With wonderful dexterity the tiny bird contrived to fasten together the wings, the entrance to the nest being where the crow's breast had been, and here the family of little Wrens was reared. The nest was observed, and, when its occupants had flown away, Lord Suffolk had it carefully removed and placed in his picture gallery.

Wood Sandpiper in the County of Wicklow.—Hitherto the Wood Sandpiper has only been included in the Irish avifauna on very slight and unsatisfactory evidence, and I felt obliged to exclude it from my recently published 'List of Irish Birds.' But I am now enabled, through the kindness of my friend Dr. Benson, to announce the occurrence of the first well-authenticated example, which I have just examined, and which was shot by Mr. Smith Cregan (of the Royal Engineering Department) on the 23rd of last August at Calary Bog, near the Sugar Loaf Mountain, Wicklow. It was alone, and its flight was thought to resemble that of a Snipe.—A. G. MORE (Science and Art Museum, Dublin).

FISHES.

Hybridization of the Salmonidæ.—At the recent meeting of the British Association Dr. Francis Day read a paper on this subject, based upon the results of experiments made at Howietown, near Stirling. From these experiments it would appear that the following conclusions may be drawn:—(1) Salmon and Trout, Trout and Char, and different species of Char may interbreed and give rise to fertile hybrids; (2) Hybrids reared from Lochleven Trout eggs fertilized by Salmon breed in their fourth year, like young female Salmon kept under similar conditions; (3) The anodromous instinct is not lost in these Trout and Salmon hybrids; (4) Judging from the period of breeding in the above-mentioned hybrids, the male element is prepotent; (5) In hybrids reared from Lochleven Trout eggs, fertilized by American Char, the male is prepotent, judging by the colour of the offspring; (6) In hybrids reared from American Char eggs, fertilized by Lochleven Trout, the female element is prepotent, judging by the colour of the offspring; (7) In hybrids reared from American Char eggs, fertilized by British Char, the male element is prepotent; (8) In all cases of hybridization numerous instances of malformation occur amongst the offspring, and great mortality; (9) The age of the parent fish has an important bearing on the vitality of the offspring.

The young of the Garfish.—Early in September last, Mr. M. Dunn, of Mevagissey, was kind enough to send me several specimens of a very small fish from shoals abounding in Mevagissey Bay, and which he identified as the young Garfish, *Belone vulgaris*, Yarrell ("Gerrick" in West Cornwall). The specimens sent varied from half an inch, to an inch and a half in length, over lower jaw and all. The first point which attracted my attention was that the mandible of the upper jaw was normal, ending just in front of the maxillaries, whilst the mandible of the lower jaw was projected to about one half of the length of the fish. This peculiarity precisely coincides with that on which Couch persuaded Yarrell to declare a specimen to be the European *Hemiramphus* (*H. longirostris*), but Mr. Dunn, in 1880 ('Land and Water,' Sept.), pointed out the probable error. I am now able to confirm Mr. Dunn's opinion, by saying that in all the larger specimens which he sent me I detected the green back-bone, which is characteristic of the Garfish. I think our joint observations may have disposed of the "Half-beak" Fish, in which Yarrell apparently had no faith, but the plentiful occurrence during the last summer of large shoals of very small fish (locally known as "bait" or "fry") of all sorts, including shoals of this immature Garfish, may account for an unusual incidence of Sharks which feed on very small prey.—THOMAS CORNISH (Penzance).

MOLLUSCA.

The Mollusca of Kent, Surrey, and Middlesex.—The following important localities were accidentally omitted on pp. 381—383:—*Pupa secale*, Sudbury, near Harrow (J. E. Harting), Mickleham (Cooper); *Vertigo pusilla*, Sandwich (Montagu); *Azeca tridens*, one near Fulham (A. F. Sheppard); *Acme lineata*, quarry near Wildernesse, Kent (Smith); and on p. 302 may be added *Limax maximus* var. *Ferussaci*, Sutton, Surrey (T. G. Fenn). This and New Quay (p. 389) appear to be the only ascertained South of England localities for this very striking variety.—T. D. A. COCKERELL (Bedford Park).

Notes on some Calvados Mollusca.—My friend Mr. G. F. Payn, who last year visited Switzerland (p. 267), has this year been collecting for me in the North of France, and has sent me twenty-seven species from the neighbourhood of Cabourg-sur-Mer, Calvados. The list includes the following species:—*Cardium norvegicum*, *Macra solida*, *Pholas candidus*, *Solen pellucidus*, *Cardium tuberculatum*, *Pecten maximus*, *P. varius* var. (dark brown mottled with reddish), *Cardium edule*, *Donax vittatus*, *Trochus magus*, *Natica catena*, *Scalaria communis*, and *Sepia* sp.? (a fragment). It is very interesting to compare this list with those of the opposite shores of England. All the above, except three, are found all along the south coast in suitable localities, and are included in the Kentish fauna. But *Trochus magus* does not venture through the straits of Dover; *Cardium tuberculatum*

does not seem to occur in Sussex, but is common in Devonshire; and *Solen pellucidus* is found in the Scilly Islands, but is either absent or very rare further east. The fresh-water species are *Bythinia tentaculata*, *B. Leachii*, *Planorbis complanatus*, *P. vortex*, *Limnæa auricularia*, *L. peregra* var. *ovata*, and *L. stagnalis*. All these species are more or less common in the South of England. The Terrestrial species are more interesting:—*Hyalina Draparnaldi*, *Arion ater* var. *rufa* (dark olive-brown), *Helix aspersa*, *H. nemoralis*, *H. virgata* (and bandless variety), *H. pulchella* (type form), *Cochlicopa lubrica* var. *minor*, *Cochlicella acuta* vars. *strigata* and *alba*, and *Pupa marginata*. All these species are found on the south coast of England; but *C. acuta* probably does not occur east of the Isle of Wight ('Naturalist,' 1885, p. 181), and *Hyalina Draparnaldi* has not been found nearer than South Devon. The varieties of *H. nemoralis* and *C. acuta* were very interesting. Mr. Payn sent sixty-one examples of the former, of which twenty-one were *rubella* 12345, ten *castanea* 00000—some with linear abrasion very well marked (*antea*, p. 115), nine *libellula* 12345, six *rubella* 00300, and there were two each of *libellula* 00000 and 10345, three of *libellula* 00300—one of these appeared pale greyish when it contained the animal, but light yellow without it, resembling some shells I took at Crayford, in Kent (Sci. Gos. 1884, p. 236), and one each of *libellula* 123(45), *rubella* 00000, 123(45), and (12)3(45), *olivacea* 00000, and *castanea* 0₂3₄0, 00₃40, and 00₃00. Several of these are not mentioned in Moquin-Tandon's list of French varieties. The three last mentioned are instructive, as showing the gradual disappearance of the bands, 1 and 5 being the first to go, then 2, 4, and lastly 3. This rule does not hold good in all cases, however. Seventy-five examples of *C. acuta* were sent, and it is very remarkable that not one is of the typical (banded) form, most being *strigata*, but many altogether without markings.—T. D. A. COCKERELL (51, Woodstock Road, Bedford Park).

INSECTS.

The Industry of Bees.—Few people have any idea of the labour expended by bees in the gathering of honey. Here is a calculation which will show how industrious the "busy" bee really is. Let us suppose the insects confine their attention to clover fields. Each head of clover contains about sixty separate flower-tubes, in each of which is a portion of sugar not exceeding the five-hundredth part of a grain. Therefore, before one grain of sugar can be got, the bee must insert its proboscis in 500 clover-tubes. Now there are 7000 grains in a pound, so that it follows that 3,500,000 clover-tubes must be sucked in order to obtain but one pound of honey.



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THE RABBIT-PEST IN NEW ZEALAND.

BY ROBERT S. HAWKINS.

A GREAT deal of uncertainty has existed in the Wairarapa, Wellington Province, as to the possibility of keeping down Rabbits by Ferrets only. The uncertainty has largely been caused by writers who, professing a knowledge of the country in which Ferrets have been tried, assert that the result has been unsatisfactory. The question is one of such vast importance, no less to myself than to the whole of the settlers in the Wairarapa, that I resolved to go over to Marlborough and ascertain the facts by personal inquiry and sight. I propose to state as concisely as possible the result of my visit.*

It is well known that Messrs. F. and F. G. Bullen took the lead in the introduction of Ferrets into the Kaikoura, Marlborough Province, and that it is the fact of their success that is so persistently denied. I went at the end of May last to their house, and during a stay of ten days received the most cordial hospitality. Messrs. Bullen's house is on the sea-coast, about five miles from Kaikoura. There are about 2000 acres occupied with the house and homestead lying between the rivers Kohai

* The colony of New Zealand was previous to 1876 divided into nine Provinces, and in that year the county system was adopted, the former division being retained as "Provincial Districts." The writer resides in the southernmost Provincial District (Wellington) of the North Island, and the journey which he describes was made to the northernmost Provincial District of the South Island.

and Kuhautara, of which 500 acres are flat land under cultivation, or laid down in pasture, and the rest is chiefly round hills, some of which have been ploughed and others are being ploughed. This land has been for the most part fenced with Rabbit-netting. Poison has been and is used, and, though there are Ferrets on it, they are as far as possible caught and taken on to the run. Mr. F. Bullen occasionally shoots over this land, and takes care that Rabbits do not establish themselves there. Besides this Messrs. Bullen have 300 acres of fine limestone hill on the Point, and running down to the Quay at Kaikoura. This was acquired over two years ago, and was then swarming with Rabbits. It was fenced with wire-netting and thoroughly poisoned. Messrs. Bullen ploughed it, and it was, when I saw it, covered with fine crops of swedes and turnips. Nowhere could I see any sign of a Rabbit.

I have dealt with these two farms in order to avoid any confusion. I now come to the main run, which contains 90,000 acres, and lies between the rivers Kahautara on the north, Conway on the south, and is bounded on the east and south-east partly by the sea and partly by other properties. The run consists of land of various formations and qualities, from rock and clay to shingle-beds and limestone, though the last is of comparatively small extent. The upper hills for the most part are covered with tussock, but the sides and gullies have considerable areas of fern, small bush, and scrub. The homestead and country known as the Green Hills, which forms part of the run, is at an altitude of 1600 feet above the sea, and in part lies close under ranges, which, when I was there, were covered with snow. Some 9000 acres are flat and low downs, ploughable, and of this about 4000 acres have been ploughed, and were partly in grass and partly in root-crops. Beyond this 9000 acres the run is of such a character that all mustering must be done on foot. The Rabbits (which are the silver-grey) began to show themselves in serious numbers in 1870, and continued to increase rapidly in the following years. In 1872 Messrs. Bullen turned out a dozen Ferrets, and from that time continued to turn out Ferrets in small numbers, as they could get them, up to 1878, when they began breeding Ferrets; and since then they have turned out from 100 to 200 Ferrets yearly. In 1875, 1876, and 1877, Messrs. Bullen had from ten to twelve rabbiters in

constant employ. At the end of the year 1877, finding that the Rabbits were still increasing, and having reason to believe that the Ferrets were being destroyed, they dismissed all rabbiters; but in March, April, and May, 1878, they employed again two men on a part where the Rabbits were especially thick, and the result being unsatisfactory they dismissed them. From that date they have not employed rabbiters. The only men employed in connection with Rabbits are two. These were necessary for the protection of the Ferrets. (This was prior to the Act making it penal to take or destroy Ferrets.) One is, with his son, a boundary keeper on the Conway, and it is his duty to kill Pigs and any Rabbits he may see. The other is in the position of a small settler, who occupies a homestead of Messrs. Bullens' at the Kahautara, milks from twenty-four to forty cows, and employs two labourers. He breeds Ferrets for Messrs. Bullen on a capitation fee, and kills Pigs and Rabbits. His chief duty as to Rabbits is to keep a bit of river boundary, and shoot Rabbits as they come on from the adjoining property. These two men are at opposite sides of the run, thirty miles apart. They only have two or three dogs, each carefully trained to Ferrets. The rabbit-skins tallied over by the man at the Kahautara boundary were in June, 1883 (representing five months' killing), 93 dozen; in August, 1883, 48 dozen; in May, 1884, 109 dozen, giving a total of 3000 skins in sixteen months, nearly all the Rabbits coming over the boundary.

Messrs. Bullen have never laid any poison at all on the run. It is manifest that the two men employed, if they were doing nothing but rabbiting, could have no perceptible effect in reducing Rabbits on 90,000 acres of such country as I have described, and that no poison at all having been used, if, as I think I shall show, the Rabbits have been completely overcome, it is the Ferrets alone that have done the work. Before stating what I saw, I will give the sheep figures.

In 1878 Messrs. Bullen shored 51,578 sheep, but, being satisfied that the flock had suffered serious injury, and were deteriorating from Rabbits, they then reduced it by boiling down. In 1879 they shored 42,600 sheep, and again reduced the flock by boiling down. In 1880 they shored only 34,300. From this date the impression made by the Ferrets became sensible, and they began to increase the flock, as shown by the following shearing tallies:—

1881, 39,000 ; 1882, 42,000 ; 1883, 47,000 ; and the flock now stands at about 50,000, all the sheep I saw being in excellent condition.

I have visited different parts of the run, and I have been in the evening up gullies, along creeks, and by spurs, at which I was informed that at one time fifty to sixty Rabbits could be shot in one afternoon and evening with a single gun, and have never seen more than two Rabbits in a ride, and but very few signs of Rabbits. I travelled to Swyncombe, now Mr. Wood's property, past the Clarence Shearing Reserve (now occupied by Mr. Gibson, with the Clarence County) to the Green Hills, and saw comparatively few Rabbits, absolutely none on Messrs. Bullens' land. I rode over the Quail Range down the Charwell Creek, returning to the homestead after sundown, a ride of fifteen miles. I only saw two Rabbits and very rare signs of Rabbits ; and this country, the manager (Mr. McPhadson) informed me, was a few years back completely infested with Rabbits.

I rode from the Green Hills by the Shearing Reserve, and, leaving Swyncombe on the left, followed the creek down to the homestead. The day was warm and sunny after rain, yet I only saw five Rabbits during the whole ride, about seventeen miles, and the chief indications were not on Messrs Bullens' side. The whole of this country a few years back swarmed with Rabbits.

Besides Ferrets, Messrs. Bullen, in 1878, turned out two Weasels, but nothing has since been seen of any Weasel, and it is uncertain if the pair turned out were not two males. They have also recently let out six Mongoose, one of which was seen on the run, and another trapped on a neighbouring farm, both in good condition.

At present, the Ferret-keeper informed me, they have no place on which it is necessary to turn out Ferrets, and they are only being bred in case of accidents ; and he expressed the opinion that all the Rabbits on the run were wanted for the Ferrets, and further stated that wild pigs are killed and left on the run for the Ferrets to eat. The Ferrets have been almost as great enemies to the Rats as to the Rabbits. In 1880, during hot close weather, distemper took off a large number of Ferrets, and the Rabbits increased slightly in some parts.

Mr. Wood, who has had Swyncombe—35,000 acres—about two years, has poisoned largely in parts, and is now breeding

and turning out Ferrets. He has no rabbiters. He is entirely confident as to the result. There is no doubt that a large sprinkling of Ferrets spread into Swyncombe from Messrs. Bullens' run. Mr. Gibson, who, as I have said, has the Clarence Run and Shearing Reserve (over 100,000 acres), is pursuing the same course. He has no rabbiters, and is breeding Ferrets largely. He last year turned out as many as 380 Ferrets. He considers that the Ferrets have practically cleared the Rabbits off a tract of country fourteen miles by twelve. Below Messrs. Bullen, in the Amuri, a few Ferrets have been turned out as a precaution, but the measures taken by the Messrs. Bullen and the run-holders above practically stopped the spread of Rabbits on that side.

After leaving Messrs. Bullen, I rode a two days' journey from Kaikoura to Blenheim—ninety-five miles—and had an opportunity of seeing Mr. Stace, who is in charge of the Starborough Run. Except in patches, there were comparatively few Rabbits to be seen south of the Clarence River on the other side of the "Lookers on." The first real Rabbit-eaten country was reached on the further side of Flaxborne, but the poisoning had been going on, and but few Rabbits were to be seen. Starborough was in the same state. The hills and downs showed one large Rabbit-camp, and quantities of dead Rabbits. About a dozen rabbiters were employed on Starborough up to last year, when the number was reduced; but there are still some rabbiters employed. Last year about 400 Ferrets were turned out, but the distemper was fatal to considerable numbers. Mr. Stace tallied, in 1882, 163,000 rabbit-skins, and in 1883, 311,000 rabbit-skins. The black and grey Rabbit takes the place of the silver-grey north of the Clarence. He fears that the land is not adapted to Ferrets; it has a strong clay subsoil, has no bush or scrub whatever, but is entirely tussock, and has over a large portion little or no water in summer. The whole run contains over 35,000 acres, of which, perhaps, from 10,000 to 13,000 acres would be ploughable.

While fully admitting the disadvantages to Ferrets of the absence of all shelter, other than the tussock-grass and water-holes, and Rabbit-burrows, and the still greater disadvantage of want of water, I think, from several things mentioned to me by Mr. Stace, he is premature in concluding that Ferrets will not give the results on his country which they have below. Whether

this be so or not, we have no country like Starborough in the Wairarapa; none that I have seen that will not hold Ferrets as well as, or even better than, the Kaikoura country.

When nearing Blenheim I was surprised to find on one run a considerable number of Rabbits. I was informed that they were not poisoning there because the Rabbits were sent into Rabbit preserving works. We are fortunate, I think, in not having any Rabbit preserving works in the Wairarapa.

I think it needless to express any opinion on the above statement of what I have heard and seen. I would only say that common action is necessary. It is no use one man turning out Ferrets if they are to be systematically killed on the adjoining run or farms.

No doubt if the Ferret is, with one consent, adopted by all the pastoral settlers in the Wairarapa, a substantial number of persons will be at once thrown out of the employment they are now engaged in. I cannot but feel that these men have greatly helped the community to the best of their ability when no better means of keeping Rabbits under was at our disposal, and I hope that the greater part will soon enter on some other employment. But at the same time I must point out how vast the gain will be to the whole population in setting free the very large sums of money which have been yearly paid away in entirely unprofitable labour, and in turning very large quantities of wheat and oats to utterly unproductive purposes. The same money employed in felling bush and scrub, in ploughing and fencing, would have given a large return, adding to the aggregate wealth of the Wairarapa, increasing the demand for productive labour, and benefitting the whole community. Nor is it merely the money wasted in its application to unproductive purposes; the damage done to flocks and the depreciation of property has told and is telling heavily against the general prosperity of the district.

It is the common interest of all that this solution of the Rabbit difficulty should be brought about.

One word to the settler on small plots. If a Ferret visits your poultry-yard do not kill it. Get a mate and make it pay for the damage. A pair of full-grown Ferrets, if well cared for—and one of the boys could easily do it—will bring you in from £5 to £8 a year, not a bad beginning for a savings' bank account for a boy at school; and he may easily make it £15 or £20.

BIRDS USED FOR SPORT IN CHINA.

At a meeting of the Société Nationale d'Acclimatation held some little time ago in Paris, Monsieur P. A. Pichot exhibited a curious collection of drawings sent from Peking by M. Collin de Plancy, one of the interpreters of the French legation. These drawings, made on thin paper by Chinese artists, were designed to illustrate the various methods of taming and training birds in China, concerning which M. Pichot gave the following interesting account, which we translate from the 'Bulletin de la Société':—*

“The birds used for sport in China, as represented in this series, may be divided into two classes, the first comprising those used for what may be termed violent sport, like game cocks and hawks. Unfortunately they are not all represented in this series. We miss the great Eagle with white eyebrows, which in certain provinces of China has long been trained, as Falcons are in Europe, but for catching wolves, foxes, deer, and roebucks. Sheng-Ching-t'ung Chih relates that in Mantchouria, towards the middle of the eighteenth century, the Emperor Kienlung used to fly at Roebuck with the Hai-tung Ching, that is with the Eagle with white eyebrows, of which Père du Halde, in his description of China, says:—‘One of the finest birds is that called Haitsing, which is only taken in the district of Han-tchong-fu, in the province of Chensi, and in certain cantons of Tartary. It may be compared with our finest falcons, although of course much larger and stronger. It may be called the king of birds of prey in Tartary and China, for it is the handsomest, the keenest, and the most courageous. It is, moreover, so highly prized that as soon as a specimen is captured it is obliged to be taken to the Court, where it is presented to the Emperor, and then handed over to his falconers.’

“M. Tony Conte has lately given an account of the travels of MM. Benoist-Méchin and de Mailly in Turkestan. They brought back with them one of these Eagles. To the best of my belief it is the same species as that found in Mantchouria, *Haliaëtus albicilla*. This bird is now in the hands of one of my friends and competitors in falconry, M. Paul Gervais. He has trained it, or continued its training, for the bird was brought to Europe in charge of a native falconer, and had already distinguished

* Bull. Soc. Nat. d'Acclim. 4 Ser. tome i. pp. 627—635.

itself by numerous exploits. In the plains of la Brie there are now no wolves to hunt; the Eagle of Meaux has to be satisfied with humbler quarry; only a few cats from time to time fall into its clutches. I do not know that the householders of the neighbourhood care much for this kind of Tartarian sport, but at any rate M. Gervais' Eagle is very clever at it, and it is a pity there is no nobler quarry to offer it. It is rather a heavy bird to carry out hawking, for it measures from 70 to 80 centimetres in height. Like all birds of prey, it only kills when it is hungry, and as it can fast for several days without seeming to feel it, it is not always easy to get it into condition and to keep it in wind.

“The true Falcons seem to be less used in China than they have been heretofore in our country. Thus I have not yet been able to obtain any precise information on the use of the Peregrine Falcon in China. I have found it difficult to recognise, in any of the ancient or modern drawings which have been sent to me from time to time, the true *Falco peregrinus*. On the other hand, the Goshawk, *Astur palumbarius*, and other short-winged species, are easily recognisable. These are powerful birds that can take Cranes and Hares, and even larger game. But it is the little Sparrowhawk, especially, which seems to be generally employed, and which is represented in various ways in M. Colin de Plancy's collection of drawings. It is used for flying at Quail and Snipe; this latter flight appears to us European falconers a very difficult one, unless, as is possible, the Snipe of that country is slower and heavier on the wing than ours. I do not think there exists in the annals of European falconry any account of hawks being flown regularly at Snipe. In China, on the contrary, it is often done. The training of Chinese falcons, however, appears not to be carried so far as with us; for, generally speaking, instead of allowing their birds complete liberty when flying them, they keep them fastened to a reel of twine rolled up close in their sleeve. When they cast off their hawks at Snipe or Quail, the moment the latter rise, after allowing a tolerably near approach, the reel unwinds with wonderful rapidity, and the hawk 'binding,' being himself 'bound,' cannot carry the quarry, and escape from the owner, who approaches to take it up.

“So much for the birds composing the first group in the collection of M. Colin de Plancy, and this group I have called *Oiseaux de guerre ou de combat*. The second comprises birds for

sport, which are gentle and docile, and this group I call *Oiseaux de paix*.

“Everything in China is, more than anywhere else, a matter of fashion and season. At certain periods of the year you will see the air full of stag-beetles. When the season of stag-beetles is over there comes in a sort of game which is something like what we call ‘*le diable*,’ in vogue in France at the commencement of the present century. It is a top with an opening, which is held balanced with twine, and then thrown up to a great height when it has been set going, and which you try to catch in different ways. When the season for ‘*le diable*’ comes round in China everyone provides himself with one of these toys—everyone plays at it in the streets and in the houses.

“Another game of the season is the promenade of the birds. This of all others seems to me extremely curious. At this time of year everyone walks with some feathered pet on his hand, not perched on the finger nor on the shoulder, but on a little crutch, the top of which is wrapped round with linen or cotton, so that the bird may not hurt his feet. It has a little leash passed round its neck: but it is so tame that it does not try to fly away, and remains on the little crutch as if stuffed. The Chinese then carry these little crutches from place to place through the streets, holding them gravely as one holds a taper; they stop in the streets and in the crossings to greet each other and exhibit their captives, and seem as delighted with their little crutches as we do to put flowers in our button-holes in spring.

“There are three birds especially which are used for these promenades: the Red-tailed Shrike, *Lanius luzionensis*, of which the Chinese name, *U-po-la*, means tiger-bird or thrush-tiger, doubtless on account of its fierce character and cruel habits. They sometimes train these Shrikes to fly at little birds, and the Chinese consider them more difficult to train than Falcons. Dr. Mollendorf has seen Sparrows taken with *Lanius bucephalus*; but it is especially for promenading with them on little perches that they are tamed.

“Another species much used in this way is the Chinese Blue Magpie with red feet, *Urocissa sinensis*, which, like all Magpies in China, are supposed to bring good luck. Thus they are called by the Chinese *Hsi-ch'ueh*, auspicious birds, and *Pên-ti'ao* says, ‘They foretell happiness, so they call them birds of joy.’

“ Finally, a third species, also much used in the promenades, is a sort of Titmouse, *Suthora Webbiana*, Gray, which the Chinese call *Hsiang-sse-niao*, meaning ‘love-bird,’ because they keep close to each other on their perches and seem exceedingly affectionate.

“ It is thus that, indirectly and by transparent allusions, the Chinese promenaders exchange over the wings of their captives their pledges of affection, and their wishes for prosperity. Is not this more delicate and more refined than the simple touch of the hat with which we in passing greet each other ?

“ But a fresh season brings fresh amusement, namely, the game of Grosbeaks, of which three species are recognised, one exactly resembling our own, but more particularly remarkable from its large wax-coloured beak, from whence its Chinese name of *La-tsui* is derived ; this is the Grosbeak of Japan and of Mantchouria, *Eophona personata*, Schlegel. These birds are wonderfully docile, and when the promenades of birds have ceased, the Chinese fix little perches on the fronts of their dwellings, to which the Grosbeaks are fastened. There are householders who have ten, twenty, up to thirty Grosbeaks fastened by the neck. They touch and handle them without their manifesting any signs of fear. The sport for which they are used is this :—The owner undoes the fastening which goes round the neck of his bird ; he then goes to a distance and shows it a grain of millet-seed which he puts in his mouth. Then he has a little ball of clay, which he throws up in the air to a great height. The Grosbeak springs from his perch, flies up and catches the little ball at the instant when, having ceased to ascend, it is about to fall to the ground ; then he returns and perches on the shoulder of his master, who rewards him by giving him the grain of millet-seed. Some of these birds are so clever at this kind of exercise that, not satisfied with fetching a single ball, they will even catch a second one thrown up at the same time as the first. But as the ball is a hard substance, either clay or ivory, and the bird’s beak is not elastic, they resort to a trick which enables them to carry two balls at the same time. The first ball thrown up must be smaller than the second, so that the first goes well into the mouth, while the largest one is held between the mandibles ; otherwise the bird, opening his beak to seize the second, would be obliged, like the crow in the fable, to let fall

the first. Such is, at quite a different season, the popular amusement in certain provinces or towns of the Celestial Empire.

“If from these tricksters in the highways we turn to operatic artists, I have a few words to say about the Mantchourian Lark. It is much larger than that which we have here. It sings marvellously, with great flexibility and compass, and not only its own particular song; for it is easy to teach it the songs of many other birds, and even the cries of many animals. Mme. Gray, the wife of a Protestant missionary at Canton, in a work which she has written on her sojourn in that country, states that she once saw at Gambon a Lark which imitated the barking of a dog and the mewling of a cat, as a Starling would do in this country. In spring the Chinese may be seen bringing out their cages with Larks, and carrying them about the streets. They establish singing competitions, and appoint jurors to award the prize. At the time of certain religious festivals they bring these cages into the temples and hang them to the joists of the ceiling, so that the singing of their birds may do honour to the divinities they venerate.

“The album of illustrations of which I have spoken will better exemplify the charming and simple nature of the pastimes to which I have alluded.”

At the invitation of the President, a discussion then ensued as follows:—

M. Decroix: May I ask Mgr. Perny, who is present, whether these pastimes are generally practised throughout the country, or whether they are only exceptional, and, for instance, confined to the South, North, East, or West?

Mgr. Perny: That which M. Pichot has described takes place more particularly in certain provinces of China. The customs are nearly the same everywhere, but with variation. In the provinces of Szu-tchouan and of Kouang-tchéou they are less common.

M. Pichot: The information which I have received comes chiefly from Shanghai and Peking.

Mgr. Perny: There is another very interesting bird in China—the Cormorant—of which M. Pichot has not said anything, and which the Chinese use especially for fishing. They train these birds very well. A fisherman has a dozen or so in his

boat, and when he comes to a place where there are fish, he sends them in. They disappear under water, and in about five minutes reappear, bringing the fish to the feet of their owner. It is most interesting to see two or three of them join together in bringing back an unusually large fish. This sort of fishing is very profitable and very amusing.

M. le President: Would the Chinese Cormorant be easy to introduce into this country?

M. Pichot: The Cormorant is a bird of our own country. The Chinese species, although smaller, differs very little from ours. They are called *Lu-tze* in China, or *Shui-lao-ya*, which means 'Sea-crow.' I may add on this subject, that having given my attention to falconry for fifteen years, I have been naturally attracted to fishing with Cormorants. I had, in 1861, the first trained Cormorants which had been seen in France for many years, for at one time Cormorant fishing was a royal sport.* I had in my service at that time a well-known Scotch falconer, John Barr, who was clever in training all sorts of birds, and who was for a long time in India with the Maharajah Dhuleep Singh, now resident in England, where he owns one of the finest sporting estates imaginable. John Barr trained some Cormorants for me to perfection. Since that time my friends or myself have almost constantly had trained Cormorants, and I have often worked some of these birds in the water in the Jardin d'Acclimatation. I do not know at this moment whether any of my friends still keep Cormorants, but about eighteen months ago, during the autumn vacation, I trained two Cormorants perfectly for fishing which I had simply taken from the lake in the Jardin d'Acclimatation. In a fortnight they were perfectly trained, going to the water to look for fish and bringing them back, though rather unwillingly, be it understood; for it is necessary to put a strap round their necks to prevent them from swallowing the smaller fish.

M. le Secrétaire Raveret-Wattel: I may add that at the International Fisheries Exhibition in London there were a great number of Cormorants, which were exhibited by Chinese, and fished every day before the public, forming one of the great attractions of the Exhibition. All these birds were, in fact, furnished with straps, so as to prevent them from swallowing

* See the chapter on "Fishing with Cormorants" in 'Essays on Sport and Natural History,' by J. E. Harting, pp. 423—440.

the smaller fishes. I believe that at the close of the Exhibition these birds were bought by the Prince of Wales.*

M. Maurice Girard: There was an Inspector of Forests, I think, who interested himself very much about this mode of fishing, and I am not sure whether he did not make some communication on the subject to the Société d'Acclimatation.

M. Pichot: Yes, that was M. Delarue, formerly Inspector of Royal Forests, and it was with John Barr and with me that he learned to train his first birds.

M. Maurice Girard: I was under the impression that we had in our 'Bulletin' some notes from M. Delarue on the subject.

A VISIT TO THE CLAREMONT ISLANDS.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S.

At three o'clock on the afternoon of the 12th of April, 1885, H.M.S. 'Espègle' anchored off No. 5 (on the Admiralty Chart) of a group of small islands, called the Claremont Islands, lying inside the Great Barrier Reef, between Cooktown and Cape York, and in latitude 13° 42' S. This group consists of eight principal islands, with a few islets, No. 1 being the farthest to the south in latitude 13° 57' S., and just off Point Claremont, while No. 8, the farthest north, is in latitude 13° 16' S., so that they extend for some forty-one miles from north to south. They are low flat islands, more or less covered with scrubby brushwood, and with a few trees in the centre, and some of them are fringed with a belt of mangrove bushes. At the time of our visit these islands were looking beautifully green.

No. 5, having no name, we will call "Espègle Island." It is one of the smallest of the group, being little more than one and a half or two miles in circumference, and is covered with high grass, with patches of low bushes and a few trees at one corner of it. A sloping sandy beach runs round the greater part of it,

* This is a mistake: the Cormorants referred to, in the Chinese Court, were stuffed, and perched, some eight or ten in number, on the gunwale of a Chinese fishing-boat. A single live bird, however, belonging to Capt. F. H. Salvin took fish daily in one of the basins in the Exhibition grounds.
—Ed.

and at low tide a large tract of coral flats and reefs, extending for several miles on each side of the islands is uncovered, and affords fine feeding grounds for numerous species of shore birds.

Soon after the ship anchored I landed in company with one of my messmates, Lieut. Allenby, to explore the island and see what it produced in the way of sport or natural history. Allenby took his gun, but I contented myself with a butterfly-net and a few collecting boxes. As we approached the island we noticed that most of the low bushes were covered with white and blue reef Herons, as was also the beach; while feeding upon the reefs, which were then uncovered, were a multitude of shore birds. Some of the latter, as we drew nearer, became suspicious and took wing, and with loud cries moved off to a more distant point along the reef. Among them I recognised the familiar notes of the Curlew, Whimbrel, Grey and Golden Plover, &c. Directly we landed, Allenby went off after the birds on the reef, while I strolled up towards the bushes to look for Lepidoptera, &c. The reef Herons were quite tame and permitted me to approach within a short distance before they took wing. While watching them, a bevy of Quail rose suddenly at my feet and quite startled me with the whirr of their wings as they flew off at an amazing pace for a short distance, and then alighted abruptly among the high grass; and I almost regretted that I had not brought a gun.

There were many interesting plants growing a little way above high-water mark, and some were in flower, but most of them, I am sorry to say, were unknown to me. However, there appeared to be several species of *Mesembryanthemum* and *Euphorbia*, and a plant which was exactly similar to, if not identical with, our English *Salsola kali*. But the commonest plant was a kind of *Convolvulus*, with fine pinkish-purple flowers and vigorous stems, which in some instances were to be observed creeping over the sand for sixty or eighty feet in a perfectly straight line. It was frequent all over the island, and is a plant which seems to flourish upon all the islands I have visited in the Western Pacific, for I have met with it commonly at Fiji, Tonga, Samoa, the New Hebrides, &c. It is a favourite food of the larvæ of *Protoparce distans*, a moth which is closely identical to *Sphinx convolvuli*.

A leguminous plant, much resembling our familiar garden scarlet-runner, was creeping in profusion over the low bushes, and numbers of a small dark metallic-blue *Lycæna* were disporting

themselves about it. They were in such swarms, and attached themselves so exclusively to this plant, that I suspected that it formed the food of their larvæ, so waited a bit and watched them, and presently observed a female settle upon one of the clusters of flower-buds, and after crawling backwards and forwards once or twice over them, and touching each individual bud with her antennæ, as if looking out for a suitable spot, she thrust her abdomen between two of the buds and deposited an egg at their base. After this I had no difficulty in finding larvæ of all sizes feeding in the flowers; the petals of all those attacked withered and drooped, so that they could easily be detected. This *Lycæna* was the most abundant butterfly upon the island; but several other species were taken, as well as a few small moths.

At six o'clock Allenby rejoined me. He had bagged twenty Plovers and Sandpipers of different kinds, and said that they were remarkably wild, and that it was no easy matter to get within shot of them. On our way to the ship a tremendous white Shark followed the boat, and at one time I really thought it was going to attack us. It was a formidable looking monster, and must have been quite ten or twelve feet long.

The next day, April 13th, the ship remained at anchor all day off the island, exercising at various drills, &c., and I was able to get on shore directly after breakfast. I took a gun, butterfly-net, and some lunch, and having deposited the heavy gear beneath the shadiest tree, put some cartridges in my pocket and proceeded to beat the island for Quail, &c. This took me about an hour, when I returned to the tree and rested for half an hour or so, and then went for an entomological ramble, returning to my tree again for lunch and rest, and so on until four o'clock, when I went on board. The time passed very quickly and pleasantly, though it was rather hot tramping through the long grass in a blazing sun. While eating my lunch, or dozing in the shade, the Herons pitched in the tree above or upon the bushes on each side, and seemed to scrutinize me very intently, and passed remarks to each other on my appearance and occupation in dismal croaks. I append a list of the birds met with.

White Nutmeg Pigeon, *Myristicivora spilorrhœa*, G. R. Gray.— Only one seen and shot. It was a young bird, apparently not more than a couple of weeks from the nest, and much smaller than

examples obtained at the North Barnard Islands in December, 1882. Its plumage, too, as far as I can remember, is slightly different, though this may perhaps be due to its youth.

Northern Swamp Quail, *Synoicus cervinus*, Gould.— These little birds were tolerably plentiful lying in the high grass, but were difficult to flush, and generally allowed themselves to be almost trodden upon before they rose. Eight couples were bagged, and double that number might have been obtained had I had the services of a good steady retriever. Unless I marked the exact spot where the bird fell, and ran to it at once, it was almost certain to be lost, as they were so difficult to find in the thick grass. They usually rose five or six at a time, but it was quite out of the question firing a double shot, as one of the birds would certainly have been lost. They varied a good deal in size, but I think I am right in referring them to the above species. They were excellent eating.

Long-billed Oystercatcher, *Hæmatopus longirostris*, Vieill.— There were several small flocks of these handsome birds. They looked very conspicuous when flying among a host of other shore birds. One I shot was a remarkably fine heavy specimen.

Grey Plover, *Squatarola helvetica*, Linn.— Common.

Eastern Golden Plover, *Charadrius orientalis*, Temm. & Schleg.— Numerous. This is decidedly much smaller than the European species, and by no means such a delicately-flavoured bird. All those that I have eaten have been obtained upon the sea-shore, or upon coral reefs, where the nature of their food probably imparts a fishy flavour to their flesh.

Red-capped Dotterel, *Ægialitis ruficapillus*, Temm.— Common.

Mongolian Dotterel, *Æ. mongolicus*, Pallas; *inornatus*, Gould.— This beautiful little Plover, with its bright rufous head and rufous band across the chest, was plentiful and conspicuous among the other species. [*Æ. inornatus*, Gould, is this bird in winter plumage.—ED.]

Australian Godwit, *Limosa uropygialis*, Gould.— Very near the European Bar-tailed Godwit.

Curlew Sandpiper, *Tringa subarquata*, Temm.— Common, and in breeding plumage.

Australian Little Stint, *T. albescens*, Temm.— A few seen.

Knot, *T. canutus*, Linn.— Several shot, in breeding plumage.

Greenshank' *Totanus canescens*, Gmel.— Common.

Grey-backed Sandpiper, *Totanus pulverulentus*, Müll. — Numerous, but very shy and noisy.

Australian Curlew, *Numenius cyanopus*, Vieill.— This fine species was not common, and was so wild that it was useless to try and get a shot at it. Its size and unusually long bill at once distinguish it from its European cousin, besides which its cry is slightly different.

Australian Whimbrel, *N. uropygialis*, Gould.— Common. This is decidedly smaller than the European bird, though its call-note is identical.

White and Blue Reef Herons, *Demigretta jugularis*, Forst., and *D. Greyi*, Gray.— These were the most numerous birds upon the island, and I believe them to be one and the same species, for I have constantly seen them in all stages of plumage, passing from blue to white. There is no difference in their size or habits, and they are always found together. Unfortunately I have never been able to find them breeding, though there were plenty of nests upon the low shrubs on this island. Mr. Macgillivray, quoted by Gould in his 'Birds of Australia,' is of opinion that the two forms are specifically distinct, and states that he has never seen any exhibiting a change from blue to white, or *vice versâ*, and upon Dugong Island he had seen the young white from the nest. I have seen them in this intermediate state of plumage at the New Hebrides, Solomon Islands, Tonga, and elsewhere, and I do not think that the blue are adult birds.

Silver Gull, *Larus Jamesoni* var. *Gouldi*, Bonap.— Only a pair of these birds were noticed, and they were very vociferous as I approached a certain point of the island, flying to and fro overhead in a very excited manner, as if they had a nest or young close at hand. However, a careful search failed to disclose any. At times they came so near that I was able to observe them minutely. They were certainly larger than those to be seen every day in Sydney Harbour, and their beaks were of a dark brownish red, almost black at the tip, but otherwise I could detect no difference.

Caspian Tern, *Sterna caspia*, Pallas.— A pair seen.

Torres Straits Tern, *S. cristata*, Stephens.— Common.

Little Tern, *S. nereis*, Gould.— Several of these elegant little birds were observed and one shot. They were perfectly fearless,

and darted down upon their prey within a few yards of the spot upon which I stood.

Pelican, *Pelecanus conspicillatus*, Temm.—Only one seen, and a magnificent bird it looked as it sat in solitary grandeur far out on the coral flats, its black and white plumage most conspicuous in the bright sun. I was anxious to obtain it, but it was very wary, and would not permit me to approach within half a mile of it.

Little Cormorant, *Phalacrocorax melanoleucus*, Vieill.—Many seen flying over the island.

Amongst the scrub there were Honey-eaters, Flycatchers, two kinds of Kingfishers, and several other species unknown to me; and from one of the trees I shot a pair of large handsome Doves.

In addition to the shore birds enumerated above, three or four examples were shot of a bird which to me appeared to be identical with the European Dunlin, *Tringa variabilis*. They were in summer dress. I was surprised to find so many of these birds still in their summer plumage at this time of year, when I should have imagined they would have been in their winter dress.

[So far as we are aware, the Dunlin has not been met with in Australia, but occurring as it does in Borneo (Müller) and Java (Kuhl and Van Hasselt), whence specimens were forwarded to the Leiden Museum, we are not surprised to hear of it on the Claremont Islands, which lie in the same latitude as Java. As the specimens in question are said to have been in summer plumage (that is with black breasts), they could hardly have been confounded with any other species, since, with the exception of the much larger *Tringa crassirostris*, Temm. and Schleg., no other *Tringa* visiting Australia is similarly coloured in the breeding plumage.—Ed.]

NOTES ON THE VERTEBRATE ANIMALS OF
LEICESTERSHIRE.

BY MONTAGU BROWNE, F.Z.S.

Curator, Town Museum, Leicester.

(Continued from p. 421.)

Fam. ORIOLIDÆ.

Oriolus galbula, Linn. Golden Oriole.—The only note I have on this species is one by the late Mr. Robert Widdowson, who wrote that one was seen about the Railway Gardens some few years ago. It is possible, however, that this may have been a brightly-plumaged Green Woodpecker.

Fam. LANIIDÆ.

Lanius excubitor, Linn. Great Grey Shrike.—A rare winter visitant. Harley received one alive in December, 1848, which was found perched on the branch of a hawthorn bush. Its discovery and capture was attributed to a flock of Sparrows and Chaffinches drawn together by its appearance. Some days later he received a second—a fine male—which was shot in the vicinity of Knight Thorpe. Its flight was described as remarkable, being undulating, and occasionally, also, like that of a Wagtail. The two birds quoted above were mounted for Harley by Widdowson, one of which he kept for himself, the other was given to Mr. Simson, of Great Glen. Since then Widdowson informed me of a specimen picked up dead by the gardener at Little Dalby Hall on March 25th, 1883. I also purchased a poor specimen, apparently a female, for the Leicester Museum—already mounted—said to have been shot by Mr. Duffin, a keeper, between Syston and Queniborough in the autumn of 1882. I am informed that another was shot at Ansty some years since. Mr. Ingram writes, "One shot at Knipton, amongst Fieldfares, by Mr. Brewster"; and we were fortunate to receive in the flesh, from the former gentleman, a fine female specimen, shot at Belvoir 8th February, 1885. Its weight was a little over $2\frac{1}{4}$ oz. The measurements were as follow:—Wing, from carpus to tip, $3\frac{5}{8}$ in.; tarsus, 1 in.; tail, $4\frac{1}{2}$ in.; extreme length, from tip of bill to tip of tail, 10 in.; culmen, $\frac{3}{4}$ in. The stomach contained foot and fur of field-mouse.

Lanius collurio, Linn. Red-backed Shrike. ("Butcher-bird.")—An uncommon summer migrant, breeding annually. The nest, which is loose and somewhat slovenly, is generally fixed on a bough, horizontally growing in some tangled hedgerow a few feet from the ground. The foundation of the nest consists of small sticks, fibres, and twigs, with which is intertwined a little green moss, and the stalks of long grass and bents. It is lined with wool, hair, and other soft substances. Mr. Macaulay writes "not very common"; the late Mr. Widdowson "had young ones brought to him from the neighbourhood of Melton"; Mr. T. B. Ellis, of the Gynsills, writes "seen once or twice"; and I saw a fine male perched upon the dead branch of a tree in Naborough "bogs" on June 20th, 1885.

Fam. AMPELIDÆ.

Ampelis garrulus, Linn. Waxwing.—Rare winter visitant. Harley states that it appeared in the year 1827 in small parties; and again in the fall of 1835-36, when it became partially dispersed over the county, especially in the more wooded parts. During the winter of 1850-1 it was again pretty plentiful, and numbers were shot in various parts of the county. He particularly mentions one, probably fully adult, which was shot at Swanington, and adds that the food consists chiefly of the fruit of the mountain ash (*Pyrus aucuparia*, Gaertn.), the berries of the elder, and the fruit of the hawthorn. There is a specimen in the Leicester Museum which was shot near Melton Mowbray, where others have been obtained. Six or seven years ago one was shot at Belgrave; and another was shot at Ansty at Christmas, 1883, by Mr. Alfred Wm. Matts.

Fam. MUSCICAPIDÆ.

Muscicapa grisola, Linn. Spotted or Grey Flycatcher.—A summer migrant, commonly distributed, and breeding even in gardens close to the town of Leicester. Harley saw a nest fixed in a disused mortice-hole of a door-post some feet from the floor, where in due time a brood was reared, despite the constant passing of persons to and fro. Davenport writes:—"A Chaffinch had its nest, with five eggs, in a laurel-bush bordering on the lawn-tennis ground at Ashlands, in May, 1883; but, being unavoidably and so frequently disturbed,

forsook it. Three weeks later a Spotted Flycatcher appropriated the nest, laid four eggs, and successfully hatched off; repairing again to the same nest she laid a second batch of eggs. I found three eggs of a pale blue colour, with no markings, in May, 1879, at Skeffington." The old MS. Donation Book, Leicester Museum, records that Mr. W. Gimson presented "a portion of a nest and three eggs, found in an old elm tree, apparently without any external opening, on January 8th, 1853." This tree was probably one cut up at the saw-mills, Mr. Gimson being a timber merchant.

Muscicapa atricapilla, Linn. Pied Flycatcher.—A rare summer migrant.—Harley writes, "A young male was shot on the banks of Groby Pool in the autumn of 1840." Under date April 28th, 1859, he says, "Examined to-day, at Collins's, the birdstuffer, a fine male example shot at Markfield." Collins informed him that he once had a Pied Flycatcher said to have been captured in Bradgate Park. Mr. Macaulay saw one in his garden at Kibworth in May, 1859; and another was seen at Twyford, near Melton Mowbray, on May 5th, 1883, by Mr. Kestin. About five years ago a male bird of this species was taken in a barn at Wanlip. The late Mr. R. Widdowson had one killed at Melton, and I received an immature male, shot at Bardon Hill by Mr. Ward on 12th May, 1883.

FAM. HIRUNDINIDÆ.

Hirundo rustica, Linn. Swallow.—A summer migrant, generally distributed, and breeding. Harley writes that on the 31st of May, 1855, the temperature was unusually low, attended by a strong north-east wind, with heavy rain and sleet. Hundreds of Swallows and Martins perished from the cold and rain, particularly at farmsteads in Lubbethorpe, Glenfield, and elsewhere. In May, 1885, I saw a curious variety, in the possession of Mr. W. Whitaker, of Wistow, in which the wings, tail, and back were greyish white, the throat faintly rufescent, the under parts almost of the normal colour but paler, the head and nape faintly tinged with dusky brown, the oval spots on the tail-feathers of an isabelline colour. Elkington received one pure white in 1880. At Aylestone I have found the Swallow to be treble-brooded.

Chelidon urbica, Linn. Martin.—A summer migrant, generally distributed, and breeding. The House Martin, like the

Swallow, sometimes suffers much from the inclemency of the season on its first arrival. I saw a pure white example this summer (1885) in the hands of Elkington for preservation.

Cotile riparia, Linn. Sand Martin. — A summer migrant, commonly distributed, and breeding as close to Leicester as the Aylestone sand-pits.

Fam. CETHIIDÆ.

Certhia familiaris, Linn. Tree Creeper. — Resident, generally distributed, and breeding. Mr. Davenport finds the nest and eggs every year, and Mr. Ingram showed me one containing young in June, 1884, built behind the loose bark of a tree at Belvoir. In the MS. Donation Book, Leicester Town Museum, I find the following entry:—“Remains of nest of Creeper (*Certhia familiaris*), with ten eggs, found embedded in the solid trunk of an old elm tree containing nearly 150 ft. of timber, together with the two slabs of wood, showing the cavity in which they were deposited without any opening to the exterior.—Presented by Mr. Gimson, Saw Mills, Welford Road, May 7th, 1852.”

Fam. FRINGILLIDÆ.

Carduelis elegans, Stephens. Goldfinch (“Thistle Finch,” “Tailor,” “Proud Tailor.”)—Resident and sparingly distributed. Probably no small bird has suffered more from cultivation and the enclosure of what are termed waste lands than the Goldfinch. Birdcatchers also have helped to make it scarce. Elkington receives it in small numbers in the autumn from birdcatchers from the vicinity of Leicester. Mr. Ingram writes that it “builds in apple trees; two or three pairs generally in the garden.” Mr. T. B. Ellis, of the Gynsills, writes, “In one or two apple-orchards I know it builds regularly.” Mr. J. S. Ellis tells me that up to 1863, when he left Glenfield Lodge, there was always a nest or two to be found every year in the orchard, and always built in a fork at the top of an apple tree.

Chrysomitris spinus, Linn. Siskin (“Aberdevine”).—A rare winter visitant. In Potter’s ‘History of Charnwood Forest’ it is noticed as having been observed in flocks at Thringstone and Rothley Temple, among alders, during 1837. Harley some years since fell in with a vast company of Siskins (some 400 or 500), in the northern division of the county, among large alder trees beside

a stream at the lower end of Oakley Wood. In the autumn of 1849 the species was frequently met with, but has not appeared since in such numbers in any part of the county. Mr. Macaulay saw a flock of about twenty in Gumley Lane, Nov. 15th, 1882. One in the Museum, taken at Thurcaston in 1881, was presented by Mr. J. Ponsford, who kept it in a cage until it died in July, 1883.

Ligurinus chloris, Linn. Greenfinch ("Green Linnet").—Resident and commonly distributed in gardens and fields close to the town of Leicester. The eggs are very variable in size, shape, and colour. Occasionally as many as six are laid.

Coccothraustes vulgaris, Pallas. Hawfinch.—Resident. Generally distributed, but not common, except in certain seasons; breeding occasionally. Harley says, "During the winter seasons of 1830-1-2-3, the Hawfinch was abundant, and numbers were shot in many parts of the county." The MS. Donation Book, Leicester Museum, records two specimens from Atherstone, July, 1862. I received several others for the Museum in January, 1881, from Sapcote, Cropston, &c. How common they become in certain seasons may be estimated by the fact that in the winter of 1883 Elkington had twenty-one brought to him on one day from the vicinity of Ansty, and during the past three years he believes he must have had sixty or seventy. In November, 1884, I purchased two specimens, and on February 23rd, 1885, Mr. Rowley purchased two others. All were males, and were from the vicinity of Groby and Ansty. Mr. Macaulay states that Sir George Beaumont, of Coleorton Hall, has Hawfinches breeding there every year, and on Aug. 4th, 1880, a young bird was picked up dead at Gumley. Mr. Ingram writes me, "Common in the Belvoir Woods, haunting large yew trees. It is shy, builds a slight nest; the young have been taken and reared." A male, female, and five young, in the Leicester Museum, were presented by Mr. W. T. Everard, as having been taken from a nest in his garden at Bardon Hill, in June, 1867. Mr. T. Baker writes me, "Some eight or nine years ago a nest and eggs were taken from the top bough of a pear-tree in a garden opposite the Grammar School at Atherstone; both birds were shot at the same time."

Passer domesticus, Linn. House Sparrow.—Resident, and far too common, breeding everywhere. Subject to much variation

of colour. A white one was seen about Melton in 1884. It nested, and amongst the brood was one somewhat resembling the parent. The late Mr. Widdowson had a hen bird of this species dusky all over, with the margins of the primaries and secondaries dark brown, the chest and under parts being of a sooty tint. Between Aylestone and Knighton, on January 12th, 1884, I shot a male with bright chestnut wings and back, and dark chestnut throat. Another, which I shot near the Cattle Market, Aylestone Road, on February 7th, 1884, had the wings white, each feather margined with pale chestnut; upper wing-coverts and back light chestnut; head paler than ordinary; under parts greyish white, as if faded; tail, a dull white. Apparently it was a male, but dissection showed that it might be a barren female assuming other plumage. Mr. R. Hazlewood, writing on the 3rd October last, reported a snuff-coloured one. Eggs vary considerably, and Davenport writes that he took at Skeffington, in May, 1880, a white egg of this bird.

Passer montanus, Linn. Tree Sparrow.—Resident, but sparingly distributed over the woodlands. Harley found the nest in holes in trees, “especially those made by the Green Woodpecker,” and once met with nests immediately beneath those of a Magpie and Rook. The late Mr. R. Widdowson sent me one from Melton Mowbray. Mr. H. Ellis shot one at Glenfield on December 29th, 1881, and Mr. Davenport another at Skeffington in December, 1876. I killed one at Blaby on March 25th, 1884, and others consorting with Chaffinches and Greenfinches in snowy weather at Knighton in January, 1885.

Fringilla cœlebs, Linn. Chaffinch (locally “Pink,” no doubt from its note).—Resident and commonly distributed, breeding in gardens and plantations close to the town of Leicester. With regard to the flocking of hen Chaffinches in the autumn, as narrated by Gilbert White, Harley was of opinion that that writer was in error, as the birds might be immature individuals of the year, and not females, as he himself had observed. I have shot many, and found the apparent females to be, as noted above, immature specimens of both sexes. Mr. Ingram writes from Belvoir that they flock there “in thousands, and are useful in destroying the seeds of weeds.” The eggs vary: Mr. Davenport notes “an extraordinary pale green elongated egg, taken at Skeffington in May, 1879;” and Mr. W. A. Vice presented to the

Leicester Museum on May 9th, 1885, a nest containing a clutch of five eggs, entirely unspotted, and of a delicate pale blue, taken by him at Blaby. [See Zool. 1862, pp. 8091, 8161.—ED.]

Fringilla montifringilla, Linn. Brambling ("Mountain Finch.")—A winter visitant; sparingly distributed, though sometimes found in flocks. A wounded bird obtained at Swannington, and kept some time in a cage, lost all its yellow and chestnut plumage and turned dark brown, after being fed on hemp-seed. Potter, who mentions this, refers to others obtained near Glenfield, Castle Donnington, and Coleorton. During the winter of 1843-4 it was very abundant, and great numbers were shot in various parts of the county. It appeared again in the winter of 1854-5. The MS. Donation Book, Leicester Museum, records one presented on March 29th, 1860, from Barkby Thorpe. Others have been obtained at Skeffington and at Thornton Reservoir. In the winter of 1884 they were unusually numerous in Leicestershire, and I received specimens in February and March from Saddington, and from a field on the Groby Road where corn was being winnowed, and to which the Bramblings resorted in hundreds.

Linota cannabina, Linn. Linnet.—Resident and generally distributed. Harley occasionally found a nest on the lateral branch of an elm, some six or eight feet from the ground. I found a nest on June 13th, 1884, containing five eggs, now in the Museum, built in a magnolia trained on the wall of Belvoir Castle.

Linota rufescens, Vieill. Lesser Redpoll.—Resident and sparingly distributed. Harley met with its nest and eggs in North Leicestershire, in a rough place known at that time by the name of "Leake Lings." The nest was fixed in a thick gorse-bush five or six feet from the ground; it was more compact than the nest of the Common Linnet, smaller, and more elegantly woven. Davenport found a nest with three eggs in May, 1883, at Ashlands; and, according to the late R. Widdowson, it often breeds about Melton. In June, 1883, a nest was found at Kibworth, and another at Ansty on the 21st May last; both contained eggs.

Linota flavirostris, Linn. Twite. ("Mountain Linnet.")—Resident, but sparingly distributed.

Pyrhula europæa, Vieill. Bullfinch.—Resident and generally distributed. Breeding at Belvoir, &c.

Loxia pityopsittacus, Bechstein. Parrot Crossbill.—Rare.

Harley states that it appeared in Leicestershire in 1849. With reference to this statement the late R. Widdowson wrote me, "A pair of Parrot Crossbills, killed close to Melton, are in the Bickley collection."

Loxia curvirostra, Linn. Crossbill.—A rare visitant, but has bred in the county. During the winter of 1839-40 Crossbills visited us in large flocks, and many were captured in various parts of the Midland counties. Harley recorded for the first time its nidification in Leicestershire in the summer of 1839. A pair of Crossbills took up their residence in a fir plantation surrounding the northernmost part of Bradgate Park, not far from a farmhouse known as "Hall Gates." The nest was fixed on the branch of a thick fir, some twelve or thirteen feet from the ground. The young were fledged, and disappeared with their parents. In February, 1854, Crossbills visited us in small flocks. Mr. Macaulay reports having seen one, in 1881, on August 11th, an unusual date at which to meet with it.

Emberiza miliaria, Linn. Corn Bunting ("Common Bunting," "Bunting Lark," "Writing Lark."). — Resident and generally distributed, but not numerous. Turner tells me of a pied variety of this bird which he saw caught in this county some five years ago.

Emberiza citrinella, Linn. Yellowhammer (Yellow Bunting, "Writing Lark," as the preceding, in allusion to its eggs).—Resident and commonly distributed.

Emberiza cirrus, Linn. Cirl Bunting.—Rare. Has occurred but once, on the authority of Harley, who says that he met with it a few years since, in company with the Yellow Bunting, in the lordship of Thurmaston.

Emberiza hortulana, Linn. Ortolan.—A rare winter visitant. The late Mr. R. Widdowson, of Melton Mowbray, knew of two "killed with Larks; both young."

Emberiza schœniclus, Linn. Reed Bunting.* ("Reed Sparrow.").—Resident and generally distributed. I have found it breeding in the Castle reed-bed, Leicester, as well as at Aylestone, and have seen flights of immature birds at Saddington, Bosworth, &c. This bird occasionally breeds away from water; Davenport records a nest of five eggs, built in a spinney at Ash-

* This bird is often called in error the "Black-headed Bunting," a term properly applied to *E. melanocephala*, a doubtful British bird, which is yellow breasted, with a black head.

lands, May 24th, 1883; and on June 2nd, 1885, I had one brought to me, containing four eggs, from a roadside hedge at Aylestone.

Plectrophanes nivalis, Linn. Snow Bunting.—A rare winter visitant. A specimen was killed at Laughton (probably about 1865), and is now in the possession of the Rev. A. Matthews. Four others were shot at Burton Overy during severe frost in the winter of 1880-81. Mr. J. S. Ellis tells me that when living at Glenfield Lodge he remembers a small party of four or five being seen there, probably about 1854 or 1855; and Turner states that a large flock was seen by W. Bond at the Abbey Meadow some twelve or fourteen years ago. I saw a beautiful specimen, in the possession of Elkington, shot in Braunstone Lane by Mr. T. H. Ashby, Nov. 7th, 1885.

(To be continued.)

NOTES AND OBSERVATIONS ON BRITISH STALK-EYED CRUSTACEA.

BY EDWARD LOVETT.

(Continued from p. 255.)

Crangon vulgaris, Fabr.

WE have now arrived at a group of crustaceans differing very considerably from any we have as yet discussed. The *Crangonidæ*, or family of Shrimps, will occupy our attention first, to be followed by the *Alpheidæ* and *Palæmonidæ*, the latter of which comprises the Prawn family.

The central one of these three families, *viz.*, the *Alpheidæ*, are, in their general structure, more like the Lobsters than the *Crangonidæ* and *Palæmonidæ*; for we shall see that, whilst the carapace of the latter two families is thin and almost chitinous in its formation, that of the former is comparatively robust and calcareous for so small an animal as the British representatives of the genus *Athanas*, which also develops a somewhat massive little pair of forceps as compared with the pincer-feet of the Shrimps and Prawns.

The Common Shrimp is so well known that a description of it is hardly necessary; but, notwithstanding its being such a common object, considerable confusion prevails regarding it by

those who recognise it as a toothsome morsel rather than an object of Natural History.

It is quite common to hear of the distinction "Brown Shrimp" and "Red Shrimp," the preference being generally in favour of the former. Now the "Brown Shrimp" is our *Crangon vulgaris*, which in boiling never turns to the bright coral-red assumed by the Prawns when similarly treated. The "Red Shrimp," on the other hand, includes several species, and even a few genera. For example, on the Thames steamboats the "Red Shrimp" is *Pandalus annulicornis*; in Jersey I have seen *Nika edulis* sold under the same name. In Southampton I saw *Palæmon squilla* (the small Prawn) similarly hawked about; and *P. varians* has occupied a similar position in places where it occurs in sufficient abundance to be of any marketable value.

In his work on the Stalk-eyed Crustacea, I notice that Bell refers to this general term "Shrimp": he states that the smaller *Palæmonidæ* are called "Rock Shrimps," to distinguish them from *Crangon*, or the "Sand Shrimp." He also records that at Youghal the "Gray Shrimp," as *Crangon* is there called, is not much esteemed, but that the true Prawn, *Palæmon serratus*, is thought a great deal of, and is called the "Shrimp."

I will now give a short description of the species under observation. The carapace is full for so small an animal, flattened at the cephalo-thorax, or head portion, and narrowing off rapidly at the last two segments of the abdomen. The antennæ are long, and protected by a fringed scale at their base. The first pair of legs are the largest, and possess each a movable finger or terminal joint, capable of closing on to the upper edge of the main joint, affording a firm hold for the animal; the remaining legs are simple. The abdominal legs or swimmerets are rather long and slightly plumose; the ova are attached to the base of these, as in the case of other crustaceans. The ova themselves are slightly oval in form, and are exuded about the early part of the year. The tail consists of a central plate shaped like a spine, with two fringed rounded edge-plates on either side.

The colour of this species is grey or brownish grey, speckled with darker cells of pigment, but of course, like many crustaceans, this colour varies according to the habitat of the specimens; for those from a light sandy bottom are paler and slightly yellow,

whereas those from a muddy estuarine locality are dark and dirty-looking: in fact, so completely does *Crangon vulgaris* resemble in tint the bottom on which it lives, that it is absolutely impossible to detect it when motionless. I have frequently observed this in shallow clear water where Shrimps almost covered the sand; and yet, when not actually moving, not an outline could be traced or a single living thing seen, but on alarm hundreds of little flashes showed where these thoroughly invisible little things really were. I have, when collecting, touched them with my hand, and caught a momentary glimpse of them when something, such as a white shell or pebble, served as a background to show them up.

The Shrimp is an exceedingly common coast crustacean, and is much fished for, being such a generally recognised article of food. Who has not heard of the celebrated Shrimps of Pegwell Bay? I fancy from what I have seen of its distribution that it prefers the sandy stretches on the shores of cretaceous rocks to others, for in some localities it is by no means common, and these are spots of a different geological character. It has been recorded specially from Shetland, Dublin, Galway, Belfast, Berwick, the Hebrides, and from the Adriatic Sea; perhaps nowhere is it finer than from the estuaries of the Thames and the Stour. Its crustacean characteristic of having its spines, &c., pointing forwards is not always so conducive to its welfare as might be supposed. I once found a Shrimp in a tube of an Annelid, *Pectinaria belgica*; this tube is conical and composed of grains of sand cemented together. The Shrimp had backed into this empty tube tail first, expecting probably to get right through, but this of course was impossible, and so was it for him to get out again the way he had got in, for his spines prevented this most completely. How many crustaceans may destroy themselves in this way?

I may mention that the best way to tell the true Shrimp from other inferior crustaceans that are sometimes sold as Shrimps (I mean before they are boiled), is that the true Shrimp is flat on the head-part; and other sorts likely to be offered as Shrimps have a rostrum or sort of comb on the back of the head and projecting between the eyes.

(To be continued.)

NOTES ON AQUATIC MOLLUSCA OCCURRING IN THE
NEIGHBOURHOOD OF PONTEFRACT.

BY GEORGE ROBERTS.

(Continued from p. 429).

THE principal places for aquatic Mollusca in the Pontefract district are the ponds and ditches near Castleford and Fairburn on the north side, and the small River Went on the south side, together with the canals at Castleford and Knottingly. The canals, however, are very much less prolific in shells than they were five-and-twenty years ago, owing mainly to the pollution of the water. Near Castleford there are a good many ponds and ditches filled with water-weeds, and in these a considerable number of species and varieties occur, but great numbers are destroyed every year by cleaning out the ditches. Wherever the Canadian weed, *Anacharis Alsinastrum*, occurs, shells are to be found, and it is perhaps owing to the extension of this alien plant (introduced about 1841) that certain species, such as *Planorbis contortus* and *Limnæa stagnalis*, have become more frequent.

In the Rivers Aire and Calder, which are now simply great open sewers, we find absolutely nothing. Many shells may be found in the tributary streams, but in these they seem to be of very uncertain occurrence, a consequence probably of displacements and destruction, caused by floods; and, in the canals, very many are destroyed by the vessels continually passing to and fro, by dredging, and by clearing out the water-plants from the sides. Eastward of Pontefract the streams are slow-running, and the average height above sea-level may be about 100 feet.

II.—AQUATIC MOLLUSCA.

LAMELLIBRANCHIATA.

Fam. SPHÆRIIDÆ.

Sphærium corneum, Linn.—Castleford, Methley, Ackworth, and other places; common.

Var. *flavescens*, Macgill.—Castleford and Fairburn. Some are much more shining than others.

S. rivicola, Leach.—River Went.

S. ovale, Ferrus.—Once abundant in the canal near Normanton; now much scarcer.

S. lacustre, Mull.—Brick-ponds near Ackworth.

Pisidium amnicum, Mull.—Knottingly; local.

P. fontinale, Drap.—Stream at Brotherton, and in the Went.

Var. *pulchella*, Jenyns.—Ferrybridge and River Went.

P. pusillum, Gmelin.—Common. “In 1864 I collected fourteen specimens of this species from a patch of damp moss in a ploughed field where there was no ditch or other place where water could remain.”—J. Wilcock in MS.

P. nitidum, Jenyns. Shining *Pisidium*.—Said to be frequent. I once found a few specimens among damp leaves in Holywell Wood, near Pontefract, where there was no water. Mr. Wilcock has found a variety of this species with a small plate attached to the umbo, similar to the variety *Henslowana* of *P. fontinale*, but which could not be referred to the plated variety *splendens* of *nitidum*.

Fam. UNIONIDÆ.

Unio tumidus, Phil. Common Pond Mussel.—Knottingly and River Went. Much less common in the Castleford Canal than formerly. Many deformed shells occur which have been broken by vessels, by dredgers, or by other means in the canals, and then repaired. Many are repaired which have had one end rubbed or ground off by passing vessels.

Var. *radiata*, Colb.—Frequent.

U. pictorum, Linn. Painter's Mussel.—Knottingly and River Went; not so frequent as formerly. The valves of this species, smooth and pearly inside, were formerly used by painters for holding colours; hence the name. In the York Museum there is a shell of *Helix aspersa* which had been used by the Romans as a spoon; it was found, along with various other little utensils, among the *débris* of a Roman household.

Anodonta cygnea, Linn. Swan Mussel.—In the neighbourhood of Knottingly and in the River Went this species is not uncommon.

Var. *radiata*.—Near Askern.

Anodonta anatina, Linn.—River Went.

Var. *radiata*.—River Went.

Fam. DREISSENIDÆ.

Dreissena polymorpha, Pallas. Zebra Mussel.—Abundant some years since at Ferrybridge, where in some places the sides of the canal were lined from top to bottom. “Often eroded; but in some stations, very limited in extent and apparently nowise different from the contiguous parts where the eroded specimens occur, they are not eroded.”—*J. Wilcock, in MS.*

PECTINIBRANCHIATA.

Fam. NERITIDÆ.

Neritina fluviatilis, Linn. River Neritine.—On stones in the shallow parts of the River Went. Formerly near Castleford. Black, yellow, brown, and variously spotted and streaked varieties occur.

Fam. PALUDINIDÆ.

Paludina vivipara, Linn. Common Marsh Shell.—Brotherton; small in size. Often much decollated.

Bythinia tentaculata, Linn. Tentacled Bythinia.—Common in nearly every stream.

Var. *ventricosa*.—“Abundant in the River Went; in some places in greater profusion than the type. Specimens of this variety, occurring in the Went, vary in colour from horn-colour to white, and also in degree of thickness, some being semi-transparent; the latter are found at Smeaton, near Pontefract, but not common.”—*J. Wilcock, in MS.*

Var. *excavata*.—Common. As this variety is only distinguished by having a rather deeper suture, it should be merged with the type. Nearly all univalves vary in the depth of the suture.

Var. *alba*.—River Went, and near Askern; small.

Monst. *decollata*.—Castleford and other places; sparingly.

B. Leachii, Shepp.—Knottingly Canal, amongst the bur-reeds, and at Norton, near Askern. Specimens with a deeper suture than the recognised type, and more produced spire, are often found.

Fam. VALVATIDÆ.

Valvata piscinalis, Mull. Stream Valve Shell.—Near Castleford, and in the River Went. Monstrosities are various; some have the apex or one or two whorls intorted.

Var. *subcylindrica*.—River Went.

V. cristata, Mull.—Near Fairburn, on caddis-cases.

PULMONOBRANCHIATA.

Fam. LIMNEIDÆ.

Planorbis nitidus, Mull. Shining Coil Shell.—Hemsworth Dam, and roadside leading to Doncaster.

P. nautilus, Linn. Nautilus Coil Shell.—Hemsworth and other places.

Var. *crista*.—Said to be more abundant than the type.

P. albus, Mull. White Coir Shell.—Hemsworth, Castleford, and other places.

Var. *Draparnaldi*.—Said to have occurred at Streethouse, near Pontefract, and other places.

P. parvus, Say = *glaber* of Jeffreys. Smooth Coil Shell.—Found by Mr. Charles Ashford at Ackworth about 1873, and reported later from same place by Mr. Hugh Richardson. Mr. Wilcock gives "Pond at Burton Salmon; rare." I have never yet been so fortunate as to fall in with this species.

P. spirorbis, Mull. Round-edged Coil Shell.—Common.

Var. *ecarinata*?.—"At Stanley I have found specimens which agreed with the description of var. *ecarinata* in being light grey in colour, and in having one whorl less than the type, but the majority were bluntly keeled. Only in very few the keel was obsolete."—*J. Wilcock*.

P. vortex, Linn. Flat Coil Shell.—Frequent near Castleford.

P. carinatus, Mull. Keeled Coil Shell.—River Went, and also in ponds at Castleford.

Var. *disciformis*.—Ponds at Castleford.

P. complanatus, Linn. Edged Coil Shell.—Common in ponds at Castleford, Ackworth, and elsewhere. Many of the specimens at Castleford are very concave on both sides. In some the thin keel is slightly recurved.

Var. *rhombæa* = *P. rhombæus* of Turton.—Near Askern, and a few specimens very indistinctly keeled near Castleford.

Var. *albida*.—Near Fairburn, 1885.

P. corneus, Linn. Horny Coil Shell.—Abundant in two or three ponds near Castleford. In the summer of this year (1885), during the drought, they occurred in a shallow muddy pond, a dozen together, scarcely covered with water, in the horse

foot-marks. In other places I noticed them lying on the mud. Some full-grown ones were one inch and a quarter in diameter. At Askern this species is found both in a living and a sub-fossil state.

P. contortus, Linn. Contorted Coil Shell.—Frequent in ponds and drains near Castleford.

Var. *albida*.—"Three specimens from a pond at Castleford, 1869."—*J. Wilcock, in MS.*

Physa hypnorum, Linn.—Ponds and ditches near Castleford, often swum together in hundreds, dead. "Of the carnivorous propensities of this species I have had several proofs. In 1865 I put a few into an aquarium to observe their habits. In a few days afterwards I noticed four sticklebacks lying at the bottom of the tank, and several mollusks upon them. The body of the fish was eaten and the head and tail left. About a week after, other sticklebacks were devoured, but I could not ascertain whether they had been killed by the mollusks or not."—*J. Wilcock, in MS.*

P. fontinalis, Linn. Stream Bubble Shell.—Plentiful near Castleford, and at other places.

Var. *inflata*.—River Went.

Var. *oblonga*.—River Went. "In 1868 one part of the river about ten yards in length swarmed with this variety, intermixed with a few of the variety *inflata*. I have not observed them in such profusion since."—*J. Wilcock.*

Limnea peregra, Mull. Wandering Mud Snail.—Abundant.

Var. *ovata*.—One of the commonest varieties.

Var. *acuminata*.—Ditches at Ackworth.

Var. *oblonga*.—Canal at Knottingley.

Var. *labiosa*.—Whitwood and Castleford.

L. auricularia, Linn. Ear-shaped Mud Shell.—River Went, and disused quarry at Hillam.

L. stagnalis, Linn. Lake Mud Shell.—Abundant at Castleford. Specimens occur in ponds which have the last whorl very much enlarged and somewhat square in form.

Var. *fragilis*.—This form, which some conchologists consider a distinct species, is common in the Castleford drains. It is somewhat difficult to distinguish when associated with immature specimens of the type. In May of this year I observed several thousands of this variety with young of the type in a narrow

dyke in a grass-field near Castleford; in fact, the bottom of the dyke was paved with them, but there were no adults of the type, except one or two dead ones. The shells are often slightly covered with *Confervæ*, but when cleaned they appear of a very fine and somewhat ruddy horn-colour. *Apropos* of cleaning, I may remark that some care is necessary, otherwise the thin edge of the mouth will become chipped. I usually soak them nine or ten hours in soap and warm water, with a little soda, and then brush them well with a hard tooth-brush, keeping the brush well soaped.

L. palustris, Mull. Marsh Mud Shell.—Near Methley, and near Milford. I have not seen it anywhere nearer to Pontefract. Although described in books as common, it is not so in this district.

L. truncatula, Mull. Small Mud Shell. — Frequent, but less so than formerly. I have often rambled a whole day without seeing one.

Var. *major*.—Castleford.

Var. *elegans*.—Methley.

L. glabra, Mull. Elongated Mud Shell.—Near Castleford, and near Ackworth.

Var. *elongata*.—Castleford, in company with *Physa hypnorum*.

Ancylus fluviatilis, Mull. River Limpet.—River Went, and near Brotherton.

Var. *capuloides*.—Wentbridge and Ackworth. “In 1864 the stones at the bottom of the shallow places in the Went were one compact mass of this variety, but a strong flood in the autumn swept nearly all the stones and shells away. Light horn-coloured specimens often occur, which might easily be mistaken for the variety *albida*.”—*J. Wilcock*.

L. lacustris, Linn. Oblong Limpet.—In Lord Houghton’s fish-ponds at Fryston; also at Castleford and Ferrybridge.

Var. *albida*.—In the River Went, on leaves of the water-lily; rare.

(To be continued.)

NOTES AND QUERIES.

'The Zoological Record.'—It has been found that a condensed Record of all that appears each year in the scattered literature of all parts of the globe, on any branch of Science, is of most essential service to all scientific workers, and 'The Zoological Record' was started in 1865 in order to supply this great desideratum for all branches of Zoology. Twenty volumes of 'The Zoological Record' have already appeared, and it was sanguinely hoped that by this time the subscribers to the work would have become sufficiently numerous to make it self-supporting, or nearly so. This, however, has not yet been the case, partly owing to the increased cost of the publication (arising mainly from the continuous increase in serial scientific literature, which has all to be examined and collated by the Recorders), and though valuable assistance has been received from the British Association for the Advancement of Science, also, formerly, from the Zoological Society of London, and more recently from the Government Grant Fund of the Royal Society, there is yet considerable risk that the work will have to be discontinued unless an increased amount of support can be obtained from new subscribers. The annual volumes (stout octavos, which have latterly run to between seven and eight hundred pages) are sold to the public at thirty shillings. The volumes are supplied to subscribers in return for an annual payment of twenty shillings. After the first six volumes of 'The Zoological Record' had been brought out by Mr. John Van Voorst, at his own risk, the Zoological Record Association was founded in 1871, as the most probable means of successfully continuing the undertaking, which would otherwise have dropped at the close of the sixth volume. The Association has continued the work up to the present time. There are, probably, many local Libraries and Natural History Societies which would be quite willing to become subscribers to the work, especially if it were known that by so doing they would probably ensure the continuance of the publication, or at any rate avert the possibility of any immediate collapse. The Zoological Record Association consists of members and subscribers. Members are public-spirited persons, who receive a copy of the annual volume, and make themselves liable to the extent of five pounds, in the event of the funds from all other sources not being equal to meet the annual expenditure. When this amount of five pounds has once been reached, members can either withdraw, or renew their membership and thereby incur a fresh liability. The average cost to members of the volumes already issued by the Association has been twenty-four shillings. Subscribers pay annually, on the 1st of July, twenty shillings, but incur no other liability; in return for this they receive the volume containing the "Record of Zoological Literature" of the preceding year as soon as published. There

are, probably, many who would gladly aid Science by contributing an annual subscription to keep up 'The Zoological Record,' but who, perhaps, till reading these lines, have been unaware of its existence. Anyone wishing to join in the good work should forward his name as soon as possible to the undersigned, who will be glad to hear from the Secretary of any Natural History Society, Scientific Institution, or Public Library, wishing to be enrolled amongst the subscribers to the Zoological Record Association.—H. T. STAINTON, Secretary (Mountsfield, Lewisham).

[We are very glad to publish this appeal on behalf of 'The Zoological Record,' for it would be a great pity if so useful a publication, so long established, were now to be withdrawn for want of support. We trust that the Secretary of every local Natural History Society throughout the kingdom will bring the matter before the council or committee of management of his Society, and as a result be empowered to subscribe regularly for the annual volume. Societies professedly formed for the furtherance of zoological science will surely not grudge the annual payment of £1 to secure a work which is admitted by all practical zoologists to be so extremely useful. As an illustration of its utility we may observe, for the benefit of those who are unacquainted with the work, that anyone proposing to write a zoological paper for the 'Proceedings' or 'Transactions' of any Society to which he may belong, may discover, by reference to 'The Zoological Record,' all that has been published in any language on his particular subject during the last twenty years (that is, since the publication commenced), each annual volume containing the classified titles of all books and papers on Zoology published during the preceding year. The saving of trouble to the writer thus ensured is incalculable.—ED.]

MAMMALIA.

Deer striking with their Fore-feet.—I was surprised to find by the last two numbers of 'The Zoologist' (pp. 397, 430) that it is considered anything out of the common that Deer should defend themselves with their fore feet—*i. e.*, defend themselves from enemies not of their own kind, for the horns are, of course (during their season), the natural offensive and defensive weapons, at least among the male animals for fights *inter se*. When Mountain Lapps milk their herds of tame Reindeer, it is quite a common occurrence to see a doe, as soon as she feels the lasso round her horns, rear up on her hind legs, and strike out with her fore legs "from the shoulder," in a way worthy of a prize-fighter. Of course, in this case, they are debarred from the use of their horns by the lasso; but in stalking wild Reindeer, it chances occasionally that one stops an animal with a bullet somewhere too far aft, and it remains standing on all four legs, but allows one to come up with it. One has then to catch it by the horns,

throw it over, and plunge a knife into its heart. On approaching it one speculates on the amount of strength it retains, much more with regard to its fore legs than to its horns. And in Elk hunting I have frequently been cautioned as to the danger of approaching the animal when shot before one is quite certain that it is dead, on account of the enormous power of its long fore-legs, but have never heard a word about the horns. I cannot speak from personal experience of Elk, as I have never been lucky enough to get a shot at one, although I have several times been quite close to one.—A. H. COCKS (Great Marlow, Bucks).

An Albino Leveret.—A short time since there was alive, and for sale, in the Plymouth Market, a pure white Leveret with pink eyes, apparently about six or seven weeks old. It had been confined in a large cage for over a fortnight, after which it was purchased by Mr. Robert Bayly, of Tor Grove, near Plymouth, in whose possession it now is. It fed well, and when I last saw it, seemed to be in perfect health. On inquiry I found that it had been sent to Plymouth from North Devon, where it was captured.—J. GATCOMBE (Stonehouse, Devon).

Habits of the Squirrel.—Walking through Farnborough Park, Warwickshire, in the afternoon of October 18th last, I watched for some time a pair of Squirrels, which were busy gathering beech-mast and carrying it to their winter retreat in some thick spruce firs adjoining the beech trees. As the mast grows at the extreme outside of the trees, and only at the ends of the slender drooping twigs, and usually out of (Squirrel) reach of any of the thicker branches, I imagined they had to content themselves with the fallen nuts. But I found that they ventured boldly out into the small twigs, and, hanging on by their hind legs, drew the mast to them with their fore-paws and bit it off, when, with the exercise of the greatest agility, they twisted round, and with a quick jump regained the stronger branches. Of course, a good deal of the mast fell to the ground, and *Sciurus* seemed occasionally to get quite out of temper with a refractory twig which refused to come to hand; when this happened, the angry, impatient snatches made by the little animals were quite amusing. No doubt they felt their position precarious, for the breaking of a twig or the slip of a claw meant a clear twenty-foot drop, with nothing to catch at; no great matter, of course, to a Squirrel when it throws itself off a bough to drop, parachute-like, to the ground, but quite another thing when taken as an unexpected fall. With regard to their alleged egg-sucking propensities, I remember once, years ago, on visiting a Missel Thrush's nest in an orchard joining a plantation inhabited by Squirrels, we found the eggs "sucked"; they were slightly broken and exhibited teeth-marks, such as would be made by a Squirrel's incisors, very plainly. We had no doubt at the time about the robber. I think the light colour of the tail is—sometimes at least—an individual

variation not dependent on age or change of coat. In some large trees on the lawn of the house near where the above occurrence took place, there was, one summer, a nest of young Squirrels with very light-coloured tails—nearly white, in fact. I often saw them about the place after they were full-grown, when they had a very striking appearance.—OLIVER V. APLIN (Great Bourton, Oxon).

The Beaver in Norway.—In Christiania, on October 22nd, I had the melancholy pleasure of examining, in the flesh, an adult male Beaver, which Prof. R. Collett kindly took me to see in the University Museum. It had been shot on the 14th at the principal Beaver colony in the South of Norway. Prof. Collett informed me that it measured 1 mètre 20 mm. in total length (about 3 ft. 4·1 in.); the tail 251 mm. (about 10·2 in.); weight, just 18 kilos (about 39 lbs. 10 oz.). The skull was entirely smashed by a shot at very close quarters, so it could not be made into a skeleton, but the skin was to be mounted for the Museum, and the loose bones preserved.—A. H. COCKS (Great Marlow, Bucks).

Attempted Acclimatisation of the Dormouse in Ireland.—I have to-day (November 13th) set free six healthy Dormice which I received from London. They have been released in a thicket near some hazel-bushes. The Dormouse is not an Irish quadruped, and it may be as well to place on record an indication of what is, so far as I am aware, the first “centre of introduction” in Ireland.—R. M. BARRINGTON (Fassaroe, Bray, County Wicklow).

BIRDS.

Occurrence of the Desert Wheatear in Yorkshire.—Through the kindness of Mr. P. W. Lawton, I received what purported to be “a light variety of the Wheatear,” shot between the villages of Easington and Kilnsea, on the Holderness coast, on October 17th last. A glance at the specimen, however, at once suggested a rarity, and on examination a suspicion that it was *Saxicola deserti*, Temminck. This surmise as to the species has been confirmed by Prof. Newton and Mr. H. E. Dresser, who kindly examined and compared the bird, which, being tailless, rendered certainty in identification a matter of some difficulty. The specimen is a female, though it was too much shattered to prove it to be such by dissection; it is now in my possession, and was exhibited by Mr. Dresser at the meeting of the Zoological Society on the 17th ult. It is the first English specimen; the second British—one having been shot in Clackmannanshire on November 26th, 1880; and, I believe, the fourth occurrence of the species in Western Europe—two having been obtained on Heligoland. This bird appears to be an accidental visitant to countries north of the Mediterranean, its true home being the desert regions of Northern and North-eastern Africa, extending eastwards through Persia to North-west India.—WM. EAGLE CLARKE (Leeds).

Purple Sandpiper in Nottinghamshire.—When shooting near here on September 25th a tramp brought me a bird which he had just picked up under the telegraph-wires. It was a Purple Sandpiper (*Tringa maritima*), and, I need hardly say, I was as pleased to give as he was to receive a shilling for it. This maritime species had occurred but very few times in this county, which is situated far from its usual haunts, and this is the only county-killed specimen I possess.—J. WHITAKER (Rainworth Lodge, Notts).

Roller near Norwich.—On October 24th an adult female Roller was shot at Felthorpe, seven miles from Norwich. It was seen in the same spot three days previously by the person who eventually shot it. Just twenty years have elapsed since the first example of this uncommon bird passed through my hands—an adult male, which was caught in the rigging of a vessel off the Yarmouth coast ('Huddersfield Naturalist,' 1865, vol. ii., p. 64). This bird has recently been added to the Norwich Museum. I found on dissection that both had been feeding on the tumbler dung-beetle.—T. E. GUNN (Norwich).

Breeding Places of the Fulmar.—Referring to 'The Zoologist,' 1879, p. 380, I find that an editorial note quotes the statement of Mr. Robert Gray ('Birds of the West of Scotland,' p. 499), to the effect that *Fulmarus glacialis* "breeds" on a Stack off the Skye coast. I have the authority of Capt. Cameron, who supplied the original note, for stating that he was misled by his informants, and that the species which nests upon the Stack in question is not the Fulmar, but the Manx Shearwater. Should I be able to visit the Stack personally, as I hope to do, I shall be glad to report further.—H. A. MACPHERSON (Carlisle).

Eared Grebe at Hunstanton.—On November 7th I received from Hunstanton an adult example of the Eared Grebe, showing traces of the summer plumage on the head. The eyes of this specimen were orange-yellow, not red, as usually described in ornithological works.—JULIAN TUCK (St. Mary's, Bucknall, Stoke-on-Trent).

Recent occurrence of the Nutcracker in Kent.—Your readers will be interested to hear of the recent occurrence in Kent of the Nutcracker, *Nucifraga caryocatactes*, a bird sufficiently rare in this country to deserve notice. The specimen referred to was shot by me on Nov. 17th near Eddington. I saw this bird two days before it was shot, and had good opportunity of observing its movements, which appears to partake of those of the Jackdaw and Magpie. It was flying from an elm tree to the ground, and raking among the fallen leaves with a sharp busy motion, quite undisturbed by the presence of myself and a friend, whose attention I called to the indifference which the bird displayed. Although I spoke very loudly, to try the effect, no notice was taken, and it was only the abrupt appearance of a

fox-terrier on the scene that caused the bird to take refuge in the tree overhead. We were standing within forty yards, and it allowed the dog to approach within a yard of it before taking wing.—COLLIS WILLMOTT (Eddington Cottage, Eddington, Kent).

[If our correspondent will refer to the Editor's 'Handbook of British Birds' (pp. 118, 119) he will find reference to many more recent occurrences of this bird than those mentioned in the old records quoted by him, which we have consequently struck out. One observed in Somersetshire in August, 1873, is noticed in 'The Zoologist' for that year (p. 3689).—ED.]

Note on the Red-throated Diver. — A bird of this species, which was hanging in Leadenhall Market on November 5th, and apparently had been killed but a few days previously, was in full adult breeding plumage, with the exception of a slight sprinkling of small white feathers on the chin and cheeks; but it had lost all the quill-feathers from both wings, and, I presume, had moulted them. As the above date seems to me to be a late one for the assumption of the winter dress to be just commencing, I think the above may be worth recording; but I would take the opportunity of referring to some interesting remarks on this subject by Mr. H. Blake-Knox in 'The Zoologist' for 1870, p. 2183, and also to those in Audubon's 'Ornithological Biography,' vol. iii., p. 21. — J. H. GURNEY (Northrepps, Norwich).

Unrecorded Occurrence of the Whiskered and Roseate Terns. — At the sale of the late Mr. Rising's collection of birds, which took place at Horsey, near Great Yarmouth, on September 17th last, most of which were of local interest, there were two birds from other counties which I think should be placed on record, as I am not aware that either of the species are known to have occurred in the counties named. I am indebted for the localities and dates to the kindness of Mr. George Frederick, into whose collection both birds came in the first instance, and passed direct from him to the late Mr. Rising. The Whiskered Tern, *Hydrochelidon hybrida*, was shot on the River Swale, at Hornby Castle, Yorkshire, by one of the Duke of Leeds' gamekeepers in 1842. At the recent sale by auction this bird passed into the possession of Mr. W. H. Jeary, of Burlingham Hall, Norfolk. The Roseate Tern, *Sterna dougalli*, was shot on the Sussex coast, near Eastbourne, about the year 1848. It was purchased at the auction by Mr. Ashmead, the taxidermist, of Bishopsgate Street, London. — THOMAS SOUTHWELL (Norwich).

Grey Phalarope at Mansfield. — One of these birds was shot on the Reservoir at Mansfield on October 17th by Mr. Tomasson, who kindly offered it to me. It is in full winter plumage, and (as usual) was very tame. This species has occurred once before on the same piece of water, and a few times in other parts of this county.—J. WHITAKER.

The Green-backed Porphyrio near Norwich. — A good specimen of this species was shot by the river-side at Horning on October 16th, and was brought to me the following day. This makes the fourth example out of five killed in Norfolk that has passed through my hands. The present specimen proved to be a female, and weighed one pound five ounces and a half. The gizzard contained a quantity of small white stones and grit, together with some small brown seeds of a species of rush. — T. E. GUNN (Norwich).

Night Heron and Pied Flycatcher in Clackmannanshire.—The Night Heron killed in Clackmannanshire, referred to by Mr. Erskine (p. 434), is evidently the same as that recorded in 'The Zoologist' for 1879 (p. 382), and by Mr. R. Gray, Proc. Roy. Phys. Soc. Edin., vol. v., p. 355. The Pied Flycatcher has been found in several places in Scotland this season, and even breeding.—JOHN J. DALGLEISH (Athole Crescent, Edinburgh).

Uncommon Birds in the Isle of Wight.—I am glad to be able to state that in the Freshwater cliffs, this year, the Peregrine reared its young in safety, which it is seldom allowed to do. A Green Woodpecker (an uncommon bird in the Isle of Wight) has been recently obtained, and the Black Redstart, Grey Phalarope, and Pied Flycatcher (not an infrequent visitant of late years) have all occurred during the past autumn.—HENRY HADFIELD (High Cliff, Ventnor, Isle of Wight).

Redshanks nesting in Notts. — I am glad to be able to state that five or six pairs of Redshanks nested in some low rushy meadows in the north of this county last spring. I never came across them before in Notts, and need hardly say how delighted I was at this discovery. The exact locality is best kept a secret, though, from what I heard, they reared their young in safety.—J. WHITAKER (Rainworth Lodge, Notts).

Wood Sandpiper on Hackney Marsh.—On the 31st August last I received, for preservation, a Wood Sandpiper (*Totanus glareola*), which was shot on Hackney Marsh, near Temple Mills, and had been seen about there for eight or ten days previously.—B. HESSE (Chisenhale Road, Old Ford).

FISHES.

The Young of the Garfish.—In your last issue, at page 439, is a communication from Mr. Cornish "On the Young of the Gar-fish," wherein he claims that the observations he adduced "have disposed of the 'Half-beak' Fish, in which Yarrell apparently had no faith." The history of this fish is as follows:—Mr. Couch, in 1818, obtained a young Garfish, about one inch long, in the Polperro Harbour; this he noticed in the Linnean Transactions, vol. xiv., p. 85, suggesting that it might be the *Esox Brasiliensis*, Linn. Fleming, in his 'History of British Animals,' 1828, p. 184, observed, under the head of Gar or *Belone*, "The fish to which

Mr. Couch refers as probably *Esox Brasiliensis*, Linn., seems to be the young of this species." On August 18th, 1837, Dr. Clarke, of Ipswich, transmitted to Mr. Yarrell a fish 5·8 in. long, and which is figured half the natural size in the 'Magazine of Natural History,' 1837, p. 507, as *Hemiramphus Europeus*, Yarrell. Mr. Couch, in 'The Zoologist,' 1848, p. 1978, redescribed this fish from examples secured in Mounts Bay in 1846, giving two figures, and at the same time remarked on what he supposed to be a new species, *Hemiramphus obtusus*, Couch, from a specimen half an inch long, captured in 1841, and of which he gave three delineations. In Yarrell's 'British Fishes' (3rd ed. 1859, vol. i. p. 472) it is observed, "These notices would lead us to believe that the *Hemiramphus europeus* is in truth the fry of the *Belone*, and that *H. obtusus* is an early stage in the growth of the young fish." In the 'Catalogue of the Fishes of the British Museum,' vol. vi. 1866, p. 254, not only are the above references to be found as the young of the *Belone vulgaris* or Garfish, but in the succeeding page Couch's own specimen is recorded as among the examples of this fish preserved in the National Collection. In Professor Lütken's splendid 'Spolia Atlantica,' 1880, p. 567, the development of this fish is traced from its fry to its more maturest age, and five figures are likewise given, showing the changes which occur when the head, including the beak, is only about 0·3 of an inch long, until it successively reaches 0·5, 1·0, 1·9, and 2·8 inches. All these facts and references are to be found in my 'British and Irish Fishes' (vol. ii.), and at p. 149 a description is given of specimens from our south coast commencing under one inch in their entire length and continued up to those in which the length of the head only was 2·8 in. In plate 127 I have figured both the head of the young and the egg with its curious filaments; while for most of my specimens I must express my indebtedness to my excellent correspondent, Mr. Dunn, of Mevagissey, from whom Mr. Cornish has now received some similar examples. From their examination he does not appear to have arrived at any different conclusions from those already ascertained as well as recorded by previous writers.—FRANCIS DAY (Kenilworth House, Pittville, Cheltenham).

Pike and Water Vole. — On August 4th, the river being rather low, there was exposed, in many places where the banks are steep, a narrow ledge projecting a few inches beyond the face of the bank, which is usually above water. Along such a ledge on that day, a short distance below here, I saw a Water Vole running, when suddenly a large fish—I have little doubt it was a Pike, but cannot be certain—thrust its head right out of the water and grabbed at the rat, though it was some three inches clear of the water; the rat made a spring out of the way, and continued scuttling along the ledge until it reached the nearest hole. That a Pike should take a rat when in the water would be nothing out of the common, but an attempt to

take one when on dry land some inches clear of the water is, I think, worth putting on record.—A. H. COCKS (Great Marlow, Bucks).

Ray's Sea Bream on the Norfolk Coast.—A fine example of Ray's Sea Bream, *Brama Raiti*, was caught on October 30th in a small trawl-net off Palling Beach. I purchased it the following day from the man who captured it, and now have it preserved. It had a metallic appearance not unlike lead, but still retained a silvery sheen in some parts, not near so bright, however, as when caught. The scales beneath the pectoral fins had a worn appearance, as if the constant working of these organs had rubbed the silver off; these fins were long and pointed. The lower jaw projects considerably beyond the upper when the mouth is open, both jaws being armed with rows of sharp-pointed teeth. It measured two feet in length from nose to end of deeply-forked tail, and eight inches in depth. It weighed five pounds and a half, which is one pound heavier than the specimen received by Buckland from Alwicks, as recorded in his 'Natural History of British Fishes.' Its stomach contained but a little gelatinous matter. This species is decidedly rare on the East Coast of England, and has only occurred on two previous occasions, so far as I am able to learn, viz., one now preserved in the Norwich Museum, and a second seen by the Rev. E. W. Dowell at Norwich on January 25th, 1847. Both these were caught off Yarmouth.—T. E. GUNN (Norwich).

MOLLUSCA.

The Mollusca of East Sussex.—We have received from Mr. J. H. A. Jenner, of Lewes, a copy of his 'List of the Land and Freshwater Mollusca of East Sussex,' reprinted from the Proceedings of the Eastbourne Natural History Society, 1884-5. Ninety-seven species belonging to thirty genera are recorded, and include seven forms not mentioned in our list for Sussex published in 'The Zoologist' for 1878 (pp. 84-94, 122-6, 181-8). These additions are:—*Spharium ovale*, *Pisidium roseum*, *Unio tumidus*, *Anodonta anatina*, *Limnæa glutinosa*, *Amalia gagates*, and *Bulimus acutus*. The last named has been found only in the neighbourhood of Eastbourne, where it may possibly have been introduced. On the other hand, doubtless by accident, *Paludina vivipara*, which occurs on the Pevensy Level, has been omitted. *Dreissena polymorpha* is only mentioned to show that it has not yet been met with in the county. The list is swollen by a large number of the now fashionable "vars."

The Mollusca of Northamptonshire.—The Journal of the Northamptonshire Natural History Society and Field Club (vol. iii. 1885, 281-8) contains a "Supplementary authenticated list of the Mollusca of Northamptonshire," by W. D. Roebuck and J. W. Taylor. Seventy-seven species and thirty-three varieties (!), or, as we make it, forty-five (!), are

now recorded for this county, so that, as the authors say,—previously remarking that all the specimens have been submitted to *them*,—"Northamptonshire, which till within the last decade was one of the *terra incognita* of Conchology, bids fair to become one of the most systematically and most intelligently investigated counties of Britain."

Varietal Nomenclature.—May I be allowed a few words in answer to Mr. Woodward's remarks (pp. 408–414). It appears that we start on common ground; we both agree that it is expedient that varieties should be described, and that variation ought not to be ignored; but it is in the method of making them public and of subsequently referring to them that we differ. I have already explained my views on this subject (Sci. Gos. 1885, pp. 179, 180), and will therefore not go over them again, but will confine my line of argument to the case in point. If, then, varieties are to be described, they must either be described in Latin or in the native language of the describer. The international character of Latin seems to me an unanswerable argument in favour of its use. Mr. Woodward, however, writes of his varieties in English terms, as, for instance, his "rufous type" of *H. arbustorum*. Suppose we change this term into Latin; what is the result? We have it simply reduced to *H. arbustorum*, var. *rufa*, or its equivalent. Having, then, so easily produced one varietal name by a mere translation of the name Mr. Woodward uses, what rules shall we observe in the production of similar ones? I would suggest the following:—1. Avoid a combination of many characters, but as far as possible give a name to each character, and in a specimen having, like var. *Baylei*, many characters, mention as many names as there are distinct characters. 2. Except in some geographical varieties or subspecies, when certain unusual characters are always associated. 3. Let the name you give describe, as nearly as possible, the abnormal character it refers to. 4. Name no varieties (or, for the matter of that, species) after individuals, nor, except in some exceptional instances, after the habitat. (The use of the word "variety" is by no means essential; the Americans dispense with it in their trinomial system.) If these rules were followed, var. *Baylei* would become *H. arbustorum*, var. *minor*+*conoidea*+*tenuis*+*virescens*+*unicolor*. Rather a long name, or set of names, but I think that what is lost in length is gained in clearness and accuracy. These names should not be loosely applied, but each one should refer to a definite character, and the same name should be used to express the same character in every species in which it occurs. Nevertheless, the law of priority should not be infringed, unless, at least, a majority of those concerned can be shown to be in favour of the reform, and, until it is so proved, to avoid still greater confusion, we should continue to use the term *Baylei*. The best way, I think, to get over the difficulty would be to submit the matter to the vote of those interested, and abide by the result. To sum up: if I had the remodelling

of the varieties of *H. arbustorum*, I should give them as follows, adopting Mr. Woodward's order, each one with a description:—*H. arbustorum*, (a) varieties of the shell. (1), in colour, *flavescens*, *rufoescens*, &c.; (2), in markings, *unicolor*, *efasciata*, &c.; (3), in thickness, *tenuis*, *crassa*; (4), in size, *major*, *minor*; (5), in shape, *depressa*, *conica*, *sinistrorsa*, &c.; (6), combinations, *major-depressa*, *tenuis-efasciata*, &c. (b), varieties of the soft parts. Many of the above varietal names are now in use, but some, especially the combinations, now stand under other names. The ! after Lecoque's name, which seems to puzzle Mr. Woodward, is merely a certificate of authentication. — T. D. A. COCKERELL (51, Woodstock Road Bedford Park). [Or, placed after the name of a locality, it may denote that that locality is a new one for the species.—ED.]

Science versus Nomenclature.—I am glad to see that my friend, Mr. B. B. Woodward, has entered a well-timed protest in the name of true Science against the tide of misdirected energy, which at the present time bids fair to flood our scientific literature, and render useless to the progress of Science an expenditure of zeal upon a scale worthy of a better cause. I refer to the wholesale manufacture of varieties (so-called) to express differences of extremely doubtful value which present themselves, apparently for the first time, to the eye or the imagination of several well-intentioned student observers. The study of Conchology is one that admits of special facilities in this direction, and it is to this branch of Natural History that our attention is more urgently attracted. The recording of every variation or slight departure from a normal type—whether the variations relate to colour, markings, dwarfing, or what not; or the slightest variation in, or departure from, a recognised type-form in one particular feature or structural portion of a shell—is a very useful habit, and far be it from my intention to seek to discourage such observation, or to depreciate or cast a slight upon its true value. For it is only by bestowing close attention upon individual differences that we can arrive at the sum of the liability to variation presented by any one species. The value which we would assign to an individual variation must be governed by certain well-ascertained generalisations which apply to the species as a whole. We cannot properly recognise as true variations such points as size or colour, perfection or imperfection, monstrosities, &c., because these are variable characters belonging to, and shared equally by all the members of a species, and should for this reason be excluded from a systematic classification resting upon a scientific basis. The pursuit of true Science insists upon a due share of respect being paid to the term "variety," as a term, the right understanding and appreciation of which assigns to it its due rank in the classificatory system. If this were not so, and if every so-called variation that presents itself within the limits of a species were to be tacked on to the name of that species, we should fall into a method of classifying in

which it would be next to impossible to discriminate between important or "intermediate" variations, and those which were insignificant, unstable, and individual in character. Such a classification, too, would serve to impart a considerable degree of colour to the belief in the immutability of species, because the significance of the important variations would be lost sight of in the observation and chronicling of trifling and commonly variable characters. Whilst, therefore, I do not desire for one moment to cast the slightest doubt upon the earnestness of spirit in which these investigations are pursued by many of the young observers of the present day, I deprecate most strongly the addition to our scientific nomenclature of varietal names which cannot be of use, but only disfigure and overload our classification, and help to clog the channels through which alone the haven of true Science can be reached.—F. J. ROWBOTHAM. [We entirely concur in this view.—ED.]

ney **Mollusca of Middlesex.**—The following important correction affords an illustration of the occasional inaccuracy of the published records:—In the August number of 'The Zoologist' *Limnæa glutinosa* is recorded for Barnes, on the authority of Messrs. Loydell and Rowe. Mr. Rowe now tells me that the specimens were wrongly identified, and that the record is therefore erroneous.—T. D. A. COCKERELL.

The Mollusca of Kent, Surrey, and Middlesex.—I can add the following species and varieties to my brother's list, found for the most part since its compilation:—*Pisidium roseum*, Fulham. *Planorbis corneus* var. *albinus*, West Moulsey, Surrey. *Limnæa auricularia* var. *ampla*, River Thames at Hampton, very fine. *L. peregra* monst. *sinistrorsum*: I took several specimens of this rare form near Tooting towards the end of September, associated with the type and *Planorbis nautilus*. *Cardium fasciatum*, Margate. *Lepton Clarkiæ*, in shell-sand from Margate with *Cyamium minutum*, *Crenella rhombea* (single valves), *Rissoa inconspicua*, *R. semistriata* var. *pura*, *Odostomia conoidea*, *O. spiralis*, *O. dolioliformis*, *O. interstincta*, *O. rissoides*, *O. indistincta*, *Cæcum glabrum*, and others already recorded for this district.—SYDNEY C. COCKERELL (Bedford Park).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

November 5, 1885.—Sir JOHN LUBBOCK, Bart., F.R.S., M.P., President, in the chair.

Mr. Alfred E. Heath exhibited a Golden Eagle in the plumage characteristic of the second year.

The first part of an exhaustive monograph "On Recent Brachiopoda," accompanied by illustrations, by the late Dr. Thomas Davidson, was read by

the Secretary. In this the author reviews the labours of his predecessors in the same field, with regard to the shell, the anatomy of the adult, and the embryology. As regards the perplexing question of affinities, he remarks:—"Now, although I do not admit the Brachiopoda to be Worms, they, as well as the Mollusca and some other groups of Invertebrates, may have originally diverged from an ancestral vermiform stem, such as the remarkable worm-like mollusk, *Neomenia*, would denote." He lays stress on the Brachiopodous individual being the product of a single ovum, and not giving rise to others by gemmation. He considers that the shell, the pallial lobes, the intestine, the nerves, and the atrial system afford characters amply sufficient to define the class. The greatest depth at which a living species has been found alive has been 2990 fathoms. As to classification, he groups the recent species in two great divisions, *viz.*:— I. *Anthropomata* (Owen) = *Clistenterata* (King); II. *Lypomata* (Owen) = *Tretenterata* (King). The *Anthropomata* he divides into three families:— (1), *Terebratulacea*, with seven subfamilies, thirteen genera and subgenera, seventy species, and twenty-one uncertain species; (2), *Thecideida*, with one genus and two species; (3), *Rhynchonellida*, one genus, one subgenus, and eight species. The *Lypomata* he also divides into three families, five genera and subgenera, twenty-three species, and seven uncertain species: (1), *Craniida*, with one genus and four species; (2), *Discinida*, with one genus, one subgenus, and eight species; (3), *Lingulida*, with one genus, one subgenus, and eleven species. He does not accept M. Delongchamp's scheme (1884) of classifying the *Terebratulina*, bringing forward Mr. Dall's observations on *Waldheimia floridana* of delicate spiculæ in the floor of the great sinuses as telling evidence against the arrangement. The various genera and species are then dealt with, followed by remarks on the *Terebratulacea*, with copious descriptions and observations.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

November 3, 1885.—Prof. W. H. FLOWER, LL.D., V.-P.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, 1885, and called attention to certain interesting accessions which had been received during that period. Amongst these were specially noted a Spurred Chameleon, *Chamaleon calcarifer*, from Aden, presented by Major J. W. Yerbury; and a fine series of Australian Reptiles, received in exchange from the Zoological Society of New South Wales.

Mr. Sclater exhibited the skull of a Tapir received by the Society in May, 1878, which was then described as *Tapirus roulini*, but which had since been found, upon anatomical examination, to be merely a dark variety of *Tapirus americanus*.

A letter was read from Mr. J. Cardwell, of Port Louis, Mauritius, announcing the discovery of a new deposit of Dodo-bones in a small cavern in the south-west part of the island.

An extract was read from a letter addressed to the Secretary by Dr. F. H. Bauer, of Buitenzorg, Java, containing some notes on the Flying Lizard, *Ptychozoon homalocephalum*, of that island.

Professor Bell exhibited and made remarks on a fine specimen of the Decapod Crustacean, *Alpheus megacheles*, obtained by Mr. Spencer at Herm, Channel Islands.

Mr. Martin Jacoby communicated the second portion of his paper on the Phytophagous Coleoptera of Japan obtained by Mr. George Lewis during his second journey, 1880-81. This part treats of the *Halticina* and *Galerucinae* of Mr. Lewis's collection.

Mr. A. G. Butler read a paper containing an account of two collections of Lepidoptera recently received from Somali-land. He considered that the lepidopterous fauna of Somali-land was essentially Arabian in character.

Mr. L. R. Lydekker described a last upper molar of a Mastodon, which had been obtained by Mr. A. H. Everett, of Borneo, and referred it to a small race of *M. latidens*, previously known only from the Pliocene Siwaliks of India and Burma. The specimen was of much interest, as increasing our knowledge of the eastern range of the Siwalik mammals.

Mr. W. T. Blanford read a monograph of the genus *Paradoxurus*. After a critical examination of a large series of specimens, Mr. Blanford came to the conclusion that it would be necessary to reduce the numerous so-called species of this genus to about ten well-marked forms.

Mr. W. T. Blanford, on behalf of Mr. J. A. Murray, read a paper containing the description of a new species of *Mus* from Sind, proposed to be called *Mus gleadowi*.

Mr. F. E. Beddard read an account of the specific characters and structure of some New Zealand Earthworms of the genus *Acanthodrilus*.

November 17, 1185.—Prof. W. H. FLOWER, 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 October, 1885, and called attention to a collection of North-American Reptiles, presented by Mr. F. J. Thompson, amongst which were examples of the Alleghany Snake, *Coluber alleghaniensis*, new to the Society's Collection; and to an example of the Black-eye-browed Albatross, *Diomedea melanophrys*, obtained in False Bay, Cape Colony, and presented to the Society by Mr. W. Ayshford Sanford.

The Secretary also exhibited to the meeting two curious Millipedes, believed to be *Spirostreptus annulipes*, which had been sent home from the Cape by Mr. Fisk for the Insect House.

An extract was read from a letter addressed to the Secretary by Major S. W. Yerbury, respecting the exact locality of a Chameleon, *Chamæleon calcarifer*, presented to the Society by that gentleman in June, 1885. Major Yerbury had obtained this specimen near Aden.

Mr. Sclater exhibited and made remarks upon two Newts, *Molge vittata*, transmitted to the Society by Dr. E. B. Dickson, of Constantinople, by whom they had been obtained from Brussa, Asia Minor.

Mr. H. E. Dresser exhibited and made remarks on a female specimen of the Kildeer Plover, *Ægialitis vocifera*, killed, in January, 1885, by Mr. Jenkinson on the Scilly Isles; and a young female Desert-Chat, *Saxicola deserti*, obtained near Spurn Head, Lincolnshire, in October, 1885.

Prof. F. Jeffrey Bell exhibited and gave an account of a specimen of a species of *Balanoglossus* obtained by Mr. Spencer at Herm, Channel Islands, being the first recorded instance of the occurrence of this Hemichordate in any part of the British Seas.

Mr. F. E. Beddard read the first of a proposed series of notes on the visceral anatomy of birds. The present paper treated of the so-called omentum of birds and its homologies. It was pointed out that this structure, present in many birds, but apparently absent, or only present in rudiment, in a few others, was represented by a structure having similar relations to the Crocodile, but in no other reptile.

Mr. Oldfield Thomas read a description of *Heterocephalus Phillipi*, an extremely remarkable burrowing Rodent from Somali-land, belonging to a genus of which the only known species was based upon a single specimen obtained by Rüppell's collector in Schoa. Mr. Thomas considered the affinities of this Rodent to be with *Georychus* and *Bathyergus*.

Mr. Sclater read a paper containing a description of an apparently new species of Tanager of the genus *Calliste*, based on a specimen formerly in the Gould Collection, now in the British Museum. He proposed to dedicate this bird to its former owner as *Calliste Gouldi*.

Mr. Boulenger gave the description of a new Frog from Perak, Malacca, which he proposed to name *Megalophrys longipes*.—P. L. SCLATER, *Sec.*

NOTICES OF NEW BOOKS.

A Tour in Sutherlandshire; with extracts from the Field-books of a Sportsman and Naturalist. By CHARLES ST. JOHN. Second Edition. With an Appendix on the Fauna of Sutherland, by J. A. HARVIE BROWN and T. E. BUCKLEY. 2 vols. post 8vo. Edinburgh: D. Douglas. 1885.

THE works of Charles St. John will always have place amongst favourite authors on the book-shelves of naturalists and sports-

men. They contain a fund of information concerning the wild animals of the district in which he lived, imparted in such a delightful style that one is never tired of reading them. Although the author made no pretext of being a scientific zoologist, he was a naturalist in the true sense of the word, and, as every chapter in his book shows, a real sportsman. He derived more pleasure in studying the habits and instincts of the wild creatures he pursued than in endeavouring to make "the biggest bag on record," and it would be well if more sportsmen of the present day were to follow his example by observing more and slaying less.

Considering that the first edition of the 'Tour in Sutherland' was published in 1849, and has long been out of print, it is somewhat surprising that a second edition has not long ago been issued. It can hardly be said to be inferior to either of the other two works by the same author, and that it is the least popular of the three must be due to the fact that it is the least known. At length a new edition has appeared in two volumes, on smaller paper than the original, but tastefully printed and bound, like everything published by Mr. Douglas.

The old full-page illustrations are reproduced, although of little merit as compared with engravings of the present day; nor can we admire the introduction, as head- and tail-pieces of the pen-and-ink sketches, or scratches, by the author, many of which are no better than those which any schoolboy might draw upon his blotting-pad, and are, moreover, seldom correct. In our opinion they would have been better omitted; for they teach nothing, and detract from the favourable impression produced by a perusal of the text.

In a book so full of information on the haunts and habits of numerous species, the absence of an Index is a serious drawback, and impairs the utility of the work. It is true there was none to the first edition, but that, we should have supposed, was a defect to be remedied. A useful addition, however, has been made in the shape of an Appendix on the Fauna of Sutherland, contributed by Messrs. Harvie Brown and T. E. Buckley, than whom it would be difficult to find more competent authorities; for, besides having a personal acquaintance with the county, they possess the experience of practical field-naturalists. This Appendix, extending over eighty-six pages, contains, besides an introduction on the physical aspect of Sutherlandshire, lists of the Mammals,

Reptiles and Amphibians, Birds, and Fishes which have been met with in the county, including the Fishes of the Moray Firth.

The other portion of the work must be sufficiently familiar to our readers to render comments upon it unnecessary. We have no doubt there are many who will be glad to possess it in its present handy and portable form.

A List of Irish Birds: showing the Species contained in the Science and Art Museum, Dublin. By A. G. MORE, F.L.S., Curator of the Natural History Museum. 8vo, pp. 32. Dublin: Thom & Co. 1885.

ALTHOUGH intended chiefly as a catalogue of the species of birds preserved in the Science and Art Museum, Dublin, this timely publication is practically a key to the Irish avifauna. On looking carefully through it, two facts at once suggest themselves. The first is that several species reputed to have been met with in Ireland have been included in the list on too slender evidence; the second is that, owing to the more careful attention which of late years has been paid to Ornithology in Ireland, many other species not known to Thompson as Irish, have, since his day, been well ascertained to visit that country, and even to breed there. It would seem from Mr. More's "List," that he has not overlooked this, but has obviously endeavoured to sift the claims of all the rarer birds which have been hitherto included in the Irish catalogue, and to add fresh instances of the occurrence in Ireland of species which hitherto have been only noticed there in one or two instances.

We understand that this "List" is intended to pave the way for a new edition of Thompson's 'Natural History of Ireland,' which has been long needed, and we do not doubt that Mr. More will be glad to receive assistance from all those whose opportunities may enable them to be of use in collecting information.

Sixth Report on the Migration of Birds in the Spring and Autumn of 1884. By a Committee of the British Association. 8vo, pp. 186. London: West, Newman & Co. 1885.

THE Sixth Annual Report of this Committee forms a thick pamphlet of 186 pages, and comprises observations taken at

lighthouses and light-vessels, as well as at several land-stations, on the coasts of Great Britain and Ireland (except the South Coast of England), and the outlying islands; also from Heligoland, two stations in the Baltic, the Faroe Islands, and Iceland. Altogether 193 stations have been supplied with printed schedules for registering observations, and returns have been sent in from 118. We are at a loss to understand why the South Coast of England has been so neglected, there being no returns from any station between the Start L.H. and the Varne L.V.

The periods of migration occupied by different species vary greatly, from four weeks to as many months; no general rule can be laid down in this respect.

There was an immense and continuous rush on the coast from October 15th to 31st, migrants arriving continuously night and day. This rush was continued at some of the stations with but slight intermissions to the middle of November.

On the East Coast of Scotland, whilst desultory movements continued during September and October, the heaviest rushes are recorded in the middle of November. The last fortnight in October is the average annual period of what may be called the "great rush" of immigrants on the East Coast of England.

In previous Reports attention has been drawn to the fact of a migration in opposite directions going on at the same time over the North Sea. This is observed more particularly at south-eastern stations, on light-vessels moored at many miles distance from the nearest land, where, during the spring and autumn, the same species of birds, as Crows, Rooks, Jackdaws, Starlings, Larks, Sparrows, Buntings, and Finches, are recorded crossing the North Sea, moving from opposite quarters and passing both towards the British coast and towards the Continent. This apparently abnormal movement in opposite directions was again indicated in the autumn and spring of 1884-5.

With few exceptions, the majority of resident British birds leave these islands in the autumn, their place being taken by others, not always necessarily of the same species, coming from more northern latitudes, or from districts of Eastern Europe, where, on the approach of winter, the conditions of locality and food-supply are less favourable to existence. These immigrants, on the approach of spring, return to the Continent on the same lines, but in the reverse direction to those traversed in the

autumn ; at the same time, also, our own birds return from the Continent to their nesting-quarters in these islands.

The notes under the head of separate species indicate several movements of special interest. Blackbirds crossed the North Sea in extraordinary numbers, commencing on September 12th and throughout October, and immense numbers in November ; on the 11th, 12th, and 13th the rush appears to have been continuous, night and day, over the whole coast line ; after this, intermittent to the end of the third week in January, 1885.

The Arctic Bluethroat occurred in some numbers between September 8th and 18th ; eighty to one hundred were observed in one locality on the Norfolk coast on the 12th.

The migration of the Golderest was very pronounced. With one exception, the migration of this bird on the East and West Coasts of England commenced at the same date, August 28th, and also ended on the same date, November 16th.

On the night of October 4th, the time of the total eclipse of the moon, during the hours of greatest darkness, between 9 and 12 p.m., as observed by a member of the Committee (Mr. Harvie Brown), Golderests were striking the lantern of the Isle of May Lighthouse. On the Irish Coast the same night, at the South Maidens Lighthouse, twenty struck at 10 p.m., and at Rathlin Island Lighthouse the same number were taken at midnight.

There was a great arrival of Pied Flycatchers during the first week in May, 1885, at stations between Yarmouth and the Pentland Skerries. At Flamborough they arrived with a N.E. wind, accompanied by male Redstarts. Immense numbers of Ring Doves and Stock Doves crossed from the Continent between the 21st October and the end of November.

The main body of Woodcocks generally arrive in two flights, known to east-coast sportsmen as the "first flight," and after this the "great flight." In the autumn of 1884 the immigration of this species was most prolonged, commencing on September 1st, and continuing onward to January 20th, 1885, or 142 days. Four distinct rushes or flights are indicated : October 5th and 6th, another on the 10th to the 16th, a third, probably the "great flight," on the 28th ; and again a very large flight between November 11th and 13th—a flight which also extended very far north, to the Pentland Skerries. The dates of the chief flights across Heligoland will be found to correlate very closely

with the arrivals on the East Coast. Very few Woodcocks are recorded from the West Coast of England. The notes, however, taken from October 8th to 14th, at the Nash East Lighthouse in the Bristol Channel, on this species are very interesting. The mean time of arrival may be fixed at 3.30 a.m. On the 8th a bird, after flying round the light, went off in a south-westerly direction. It is fair to presume that these Woodcocks formed part of the great flight which we know crossed Heligoland from the 12th to the 15th, and are also shown to have arrived on the East Coast between October 10th and 16th. Woodcocks migrate by night, and probably start on their journey in the dusk of evening. Supposing them to have left the coast of Denmark at 5 p.m., and travelling from north-east to south-west across Heligoland, so as to arrive at the Nash light at or about 3.30 a.m., the distance traversed would be 550 miles in $10\frac{1}{2}$ hours, or about 52 miles an hour, a rate of progress, from what we know of the flight of birds, probably nearly correct.

An unusual migration of Gulls to the Scotch coasts was remarked in 1884, in connection with swarms of sprats or "garvies" (*Clupea sprattus*), following and feeding on myriads of minute marine creatures. This aggregation has been attributed, and perhaps with reason (though it is a point on which the Committee has not sufficient information to decide), to the vast accumulation of ice west of Spitzbergen in the summer of 1884, and the consequent lowering of the temperature of the sea, which cause has impelled and driven southward the food-fishes along the course of the milder Gulf Stream to the uttermost limits of its possible extension, the firths and inlets of the East Coast of Scotland.

As a rule very few of our rarer immigrants are recorded from the East Coast of Scotland. The King Eider was seen off the Isle of May on September 24th, and the Black Redstart is recorded from the same station and Pentland Skerries. On the East Coast of England, besides the Bluethroats, already noticed, several rare and casual visitants have been recorded during the autumn: two examples of the Barred Warbler, one at Spurn Point and another on the Norfolk coast; the Icterine Warbler, also on the Norfolk coast; and an Ortolan, likewise from the same locality. The Lapland Bunting, in Lincolnshire and Norfolk; Tengmalm's Owl, in Holderness; and a Rose-coloured Starling, near Spurn.

On the West Coast of England the Report embraces notes on the White Wagtail, Pallas's Grey Shrike, Waxwing, Cassin's Snow Goose, Garganey Teal, Red-necked Phalarope, Ruff, Black Tern; whilst the scarcity or entire absence of the Tree Sparrow, Hooded Crow, and Brent Goose, and the presence of the Bernacle Goose, are of interest to one accustomed to east-coast observations. The capture, too, of eight Storm Petrels at the South Bishop, on October 14th, is a noteworthy incident. The lanterns vary not a little in their death-dealing attractions, those of the Bardsey, South Bishop, Smalls, Nash (E.), Godrevy, and Eddystone Lighthouses being most attractive, occasionally misleading two hundred victims in a single night.

In Ireland the great bulk of migrants arrive on the southern half of the East Coast, and on the easternmost of the southern counties—in other words, along the shore from Dublin to Waterford, between Rockabill and Dungarvan Lighthouses.

The usual course taken by birds seems to be either N.W. or S.E. The number of those which occur singly and do not migrate in flocks is large. In such cases it is difficult to trace the line of migration. As might be expected, the Snow Bunting is of more frequent occurrence on the western and northern coasts. A few remained as late as the first week in May, and it was again seen early in September, dates which have not hitherto been recorded in Ireland. Geese were also more numerous on the north and west coasts.

A remarkable migration of Rooks was observed at the Tearaght and Skelligs, both stations being several miles off the coast of Kerry. It lasted for three weeks, from November 2nd to 20th, the direction of flight being from west to east. The light-keepers were puzzled to know whence the birds could have come, the nearest land to the west being America, where this species is not found.

Mr. Gätke's Heligoland notes, from June 28th to the end of the year, comprise 118 species, including, as usual, several rare visitors to this ornithological observatory.

The Committee have this year made a useful addition to their Report in an outline map of the British Isles, showing the stations, marked in red.



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

MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION.



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
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